




ISCOMS
science beyond borders



umcg



university of
groningen

BOOK OF ABSTRACTS



Preface

Organisation

Research in Groningen

Congress

Abstracts Plenary

Abstracts Oral

Abstracts Poster

Postscript



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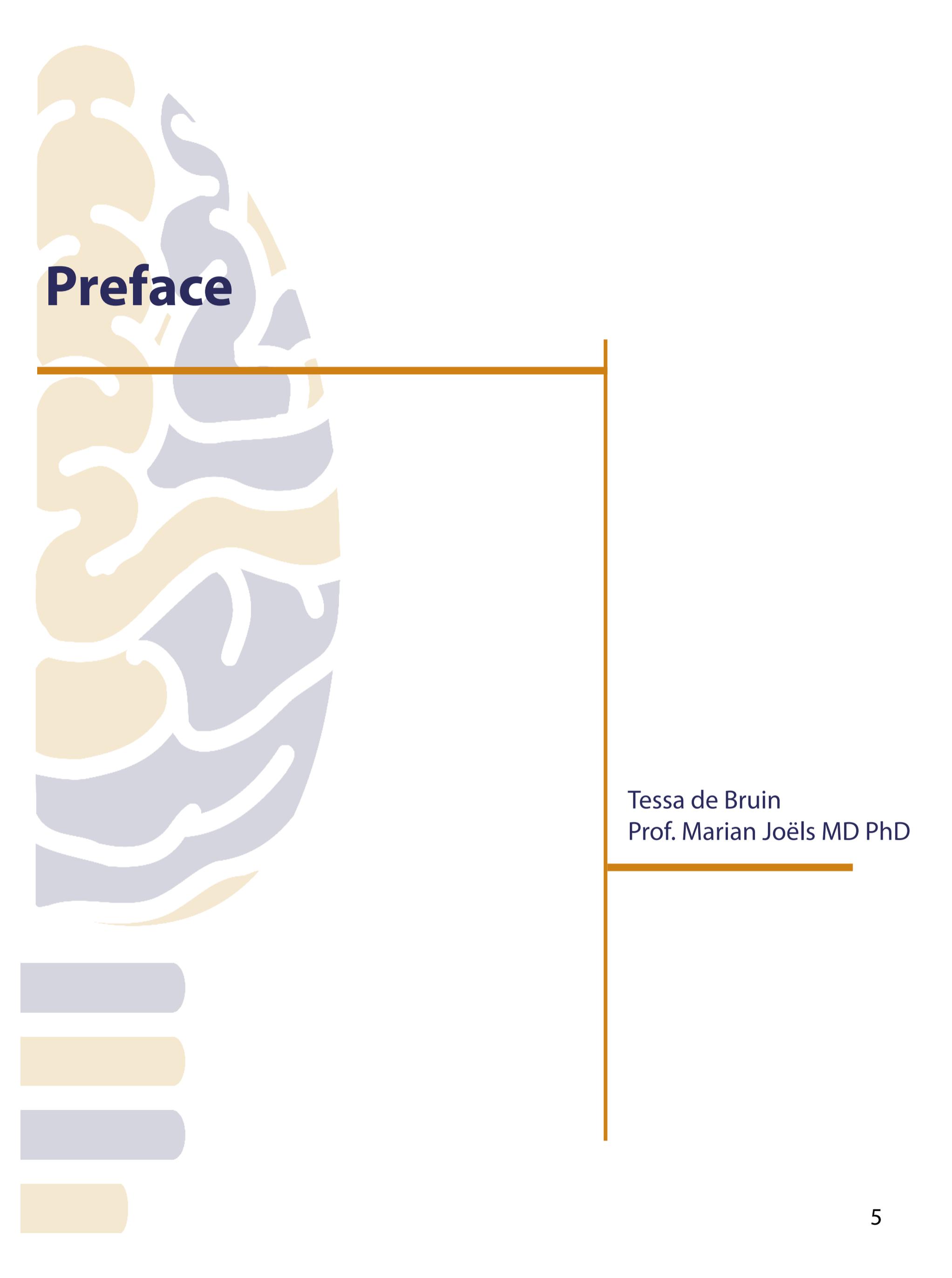


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Preface

Tessa de Bruin
Prof. Marian Joëls MD PhD

Tessa de Bruin

President ISCOMS 2021



Dear participants,

It is with great pleasure that I welcome you to the digital version of the 28th edition of the International Student Congress of (bio)Medical Sciences.

Over the past 28 years, ISCOMS has grown to become one of the world's leading (bio)medical student congresses. However, this year, our congress cannot take place as planned due to the global outbreak of the COVID-19 pandemic. After a year of hard work of the Organising Committee, and, most importantly, after all the enthusiasm and support you as participants have always shown us, we organised a digital congress.

Over the past year our Organising Committee has been working very hard to put together, a programme that all participants are able to follow from home. By doing so, we hope that ISCOMS can continue to provide students the opportunity to present their research on an international platform, to acquire knowledge by attending the programme, and to expand their network by interacting with other participants.

Our online programme exists of a digital platform on which participants are able to attend three full days of inspiring lectures and student presentations. This year, for the first time ever, we chose a day theme namely 'Nutrition'. On Wednesday the 9th of June, both keynote speakers, a couple of workshops and oral presentations will pay attention to this theme.

On Monday we will start with the pre-course, a day in which enthusiastic students can improve their research skills by attending informative masterclasses. During the following three congress days, we will welcome Nobel Laureate prof. Sir Peter J. Ratcliffe MD, prof. Jaap Seidell PhD, prof. Marion Koopmans DVM PhD and last but not least prof. Ellen Roche PhD.

On Tuesday we will kick-off with a keynote lecture by prof. Sir Peter J. Ratcliffe, who won the Nobel Prize in Physiology or Medicine in 2019. Prof. Sir Peter J. Ratcliffe is best known for his discovery on how cells sense and adapt to oxygen availability. In his lecture, Sir Peter J. Ratcliffe will talk about 'Understanding cellular oxygen sensing mechanisms: implications for medicine'.

After the congress, fourteen young and talented foreign (bio)medical students will start with the ISCOMS Research Fellowships where they will join the two-week online research internships at Research Institutes of the UMCG.

Besides all the cons of the global outbreak of the COVID-19 pandemic, I also see the benefits. The people who did normally not have the ability to visit the physical ISCOMS versions, do now have the ability to visit ISCOMS in a digital way.

On behalf of the entire Organising Committee, I wish you all a wonderful time and I hope you will enjoy ISCOMS as much as I did organising it!

Prof. Marian Joëls MD PhD

*Dean/Member of the Board of Directors University
Medical Center Groningen*



Dear participants of ISCOMS 2021,

It is my great pleasure to welcome all guests to the 28th edition of the International Student Congress Of (bio)Medical Sciences in Groningen, an annual event organized by students from Groningen for students from all over the world of which we are very proud.

ISCOMS has become a tradition and is regarded by many as one of the highlights of the University Medical Center Groningen (UMCG) academic year. We would like to congratulate the Organising Committee for putting together such an exciting scientific programme. Again, this year's ISCOMS edition hosts an impressive number of renowned speakers, among which are Jaap Seidell, Marion Koopmans, Ellen Roche and Nobelprize winner Sir Peter Ratcliffe. No doubt these and other speakers will be a source of inspiration to the participants.

International contacts and collaborations are essential to push science forwards. The UMCG and the University of Groningen foster such international contacts, not only in their research collaborations but also at all levels of our educational system. We have strategic partnerships with many institutions across the world. ISCOMS is one of the examples through which international ties are strengthened, in this case by bringing together students from a great variety of countries.

ISCOMS offers a wonderful opportunity to all participants to get an inside in the world that science has to offer. Often it is the starting point for new collaborations and friendships for life.

Please enjoy the excellent science and the relaxed atmosphere!

Prof. Marian Joëls MD PhD
Dean of the Medical Faculty
Member Board of Directors UMCG

Organisation



Executive Board
Advisory Board
President, Secretary, Treasurer
Scientific Programme
Sponsors and Fundraising
International Contacts
Hosting and Logistics
Public Relations
Research and Development
First Year Crew
Ambassadors
Partners

Executive Board

The ISCOMS Executive Board consists of nine (bio)medical students of the University of Groningen and was formed in April 2021. Some of us were already part of the Organising Committee in previous editions of (D)ISCOMS, but not everyone. During the intensive start of the year, despite the COVID-19 difficulties, we accustomed ourselves to the functions and responsibilities and became close very quickly. During the online meetings we had twice a week, we made sure every task was done and everyone was informed accurately.

Besides our professional collaboration, we also became friends. Despite the group being filled with completely different personalities, we made sure we complemented each other and helped each other in case it was needed.

We want to express our gratitude towards the entire Organising Committee for their amazing effort they have put into this edition. Furthermore, we want to thank the advisory board and everyone else who supported us this year.

We are honoured to welcome you to the 28th edition of the International Student Congress Of (bio) Medical Sciences on the, digital platform! We wish you an extraordinary time!



Tessa de Bruin, India Hoekman, Jort Braams, Berend Bremer, Margot Vijn Villalever, Femke de Vries, Joris Kamp, Himaya Smit, Laura Liethof

Advisory Board

Advisory board

ISCOMS is a congress organised for and by students. Thirty biomedical students are responsible for all scientific, financial, and organisational aspects of the congress. As the congress is organised every year by a new team of students, the advisory board can assist in the continuity of the congress. They have helped organising ISCOMS for many years now. Their expertise, experience and contacts are of great support for the Organising Committee. The advisory board consists of three seniors from the University Medical Center Groningen (UMCG).

Advisory board:

Prof. Paul de Vos PhD

Full professor immunoendocrinology at the University of Groningen
Advisor since 2009



Matijs van Meurs MD PhD

Intensivist at the UMCG
Advisor since 2016



Robert Pol MD PhD

Vascular and transplant surgeon at the UMCG
Advisor since 2018



We would like to thank the advisory board for their continuous support and useful advice.

President, Secretary, Treasurer

The president, secretary and treasurer are responsible for overseeing the Organising Committee, as head of the Executive Board.

The main task of the president, **Tessa de Bruin**, is to lead the Executive Board. She is responsible for the whole organisation towards and during the congress. Additionally, her task is to find suitable day chairs and jury members.

The secretary, **India Hoekman**, is the contact person of the organisation. During this year she will work closely with the president. Besides that, she will be responsible for all of the registrations, both online and during the congress. She will manage the registration desk and will be happy to welcome you.

The treasurer, **Jort Braams**, is responsible for all of the budgetary aspects of the congress. As treasurer, he is in charge of the incoming and outgoing money and he will manage the budget estimate for the congress.

Furthermore, we will take care of the statistics of our congress, to improve ISCOMS for the coming years.

We are looking forward to meeting you at ISCOMS 2021!

*Tessa de Bruin
India Hoekman
Jort Braams*



Scientific Programme

The Scientific Programme committee consists of six young and enthusiastic (bio)medical students. It is our responsibility to organise the scientific part of ISCOMS 2021. We are in charge of the keynote lectures, workshops, pre-course, interactive operation and the ISCOMS Research Fellowships (IRF). It is our aim to make the scientific programme of ISCOMS challenging and diverse. Besides this, we also supervise the abstract selection and ensure that students can present their research in a plenary, oral or poster session.

During the pre-course, the Graduate School of Medical Sciences will tell you all about the research possibilities in Groningen at 'Your Future at the UMCG'. You will have the chance to improve your research skills in masterclasses and attend interesting speed-keynotes. On three congress days, five internationally well-established researchers will share their knowledge and experiences with us in keynote lectures. There are also a lot of exciting workshops you can participate in, ranging from practical workshops to patient demonstrations and interactive ethical workshops. Additionally, you will have the opportunity to attend an interactive operation. Even if you are not very familiar with research yet, you can visit the lectures, participate actively in hands-on workshops and gain new scientific skills.

For students who are interested in doing research in Groningen in the University Medical Center Groningen (UMCG), we organise the two-week ISCOMS Research Fellowships. These short internships will take place directly after the congress and brings you into contact with researchers. Another possibility in order to come in contact with researchers from the UMCG is the workshop "Speeddating with Researchers". This workshop will be organised during the congress and will provide you the opportunity to talk to researchers of various Research Institutes of the UMCG.

We are convinced ISCOMS is the perfect opportunity for students and young researchers from all around the world to present their recent work, meet fellow researchers and get enthusiastic about research. We enjoy creating a challenging and diverse scientific programme for ISCOMS 2021 a lot and we are looking forward to meeting you all!

Berend Bremer

Carien Dermer

Paula Volkers

Pelle Scholten

Pieter Dahmen

Selena Glättli



Sponsors & Fundraising

ISCOMS cannot take place without its financial funding. The committee of Sponsors and Fundraising takes care of the financial resources. Our committee consists of four enthusiastic, dedicated students who will make every effort to make this congress financially possible. Meet Mark, Hugo, Anne and Margot. We will do our very best to contact and inform companies in order to establish a good cooperation between the sponsors and ISCOMS.

Due to the fact that we are one of the biggest student congresses for biomedical sciences within Europe and due to the numerous national and international students attending, we have a great amount of sponsoring opportunities to offer. Besides students, there will also be scientists, professors, researchers and UMCG medical specialists attending the presentations, lectures and workshops. Hence making ISCOMS very attractive for potential sponsors.

Being a sponsor of ISCOMS allows extensive prospects for both large and small companies to create more awareness for the company, subsequently acquiring new business opportunities. Our purpose is to establish an agreement of mutual benefits. Companies can present themselves with a stand or they can choose for an appearance of their logo on for example our website or our congress bag. Our sponsor programme is available on the website under the heading 'supporters'.

Apart from contacting potential sponsors, we will also subscribe several funds to support ISCOMS. Besides that, Anne is going to assist the treasurer with the finances during the congress. Mark is responsible for the journal subscriptions which the presenting participants can win during the congress. And last but not least, Hugo carries the responsibility to provide the participants with a full online congress bag which contains a variety of useful gadgets and information.

If you are interested in supporting biomedical research and if you want it to be able to reach hundreds of national and international motivated (bio)medical students or if you are willing to support ISCOMS as a high standing platform to exchange in international scientific knowledge, please go to our site! If you have any questions, please contact us and we are more than willing to give you all the information you need.

Margot Vijn Villalever

Anne von Hebel

Hugo Teixeira

Mark Broekman



International Contacts

The International Contacts Committee takes care of the international part of ISCOMS. Our daily responsibilities include the worldwide promotion of our congress, and taking care of participants who encounter problems with their registration or experience other difficulties while preparing themselves for ISCOMS 2021.

We take care of the promotion by e-mailing, calling, and sending promotional materials across the globe. In this worldwide promotion we are supported by our highly motivated and valued ambassadors, who were inspired by their own ISCOMS experience. Furthermore, we are responsible for the social media community of ISCOMS, including Facebook, Twitter, Instagram and LinkedIn. Besides following us on social media, you can also subscribe to our two-monthly newsletter in order to read interviews and to be kept up to date on the latest progress about organising ISCOMS 2021.

All incoming emails of students who want to submit their abstract or who are seeking additional information about ISCOMS are answered by us. We are also the committee that has contact with the embassies when aiding students in obtaining their Visa. Lastly, we are responsible for the ISCOMS grants for students that require financial aid in order to attend our congress.

As the International Contacts Committee we are constantly looking for new contacts around the world that would like to help us with promoting ISCOMS 2021. If you believe you can help, please send an email to iscoms@umcg.nl. If you have any other questions regarding promotion, Visas, ambassadors, ISCOMS grants, and so forth, please send us an email and we will be glad to help you!

We hope to see you at ISCOMS 2021!

Femke de Vries
Carmen Moes
Heleen Quekel
Mats van Rietschoten
Tom Lieverse



Hosting & Logistics

The Hosting and Logistics committee is not only responsible for the social programme, but also for the accommodations, the City Tour and the plan of action during the congress.

The social programme is the perfect way to extend your social contacts. During off congress activities you can meet people from many different countries and cultures.

On Sunday, there will be a City Tour through the center of Groningen and a pub quiz afterwards. On Tuesday the recreational evening will be held. There you will be able to choose one of the various activities we have set up for you.

We, as the Hosting and Logistics committee, will provide you with options for accommodation during the congress. You can stay at an international student accommodation or we can give you advice on hostels or hotels. Usually the social programme of ISCOMS is more extensive, but due to the COVID-19 pandemic, parts of the social programme would be irresponsible.

However we want to ensure you we will do everything to make this congress memorable. We hope you are as excited as we are and we are looking forward to seeing you at ISCOMS 2021!

Joris Kamp
Koen Eppink
Minouk Broekers
Nienke van der Linde



Public Relations

The Public Relations committee is responsible for the appearance of ISCOMS and for the promotion of ISCOMS in Groningen and in The Netherlands.

To reach as many students as possible we are in contact with all other (bio)medical faculties in the Netherlands. They help us to get a lot of attention to ISCOMS, for example, by hanging posters in their faculties and by posting information about the congress on their website. Furthermore we communicate with faculty coordinators to make sure they stimulate their students to visit ISCOMS. Besides this, we are setting up a promotional campaign and communicate with the press.

Together, we are also responsible for the graphical design of all material that will be handed out at the congress and of all flyers, posters, booklets and cards that are spread all over the world by our colleagues from the International Contacts committee. Last but not least, we compose and design the Book of Abstracts that will be handed out at the congress to all participants. This book contains information about the congress and the people involved and contains all abstracts of participants who present their research at ISCOMS 2021.

Himaya Smit
Floris Stumphius
Hylke Prins
Jolien Oud
Willemijn Vrijlandt



Research & Development

The main goal of the Research & Development committee of ISCOMS is to innovate and improve every upcoming edition of the congress. We establish this by extensive evaluation that helps us determine what we can and should change. Also, we try to think of how it could be changed. The R&D committee makes sure the improvements are implemented at the upcoming congress. Brainstorming is a great part of our committee's task. Thinking of new ideas that will enhance the congress. These ideas come from the evaluation sheets that participants fill out and, for example, brainstorm sessions with the entire organisation that our committee organises.

A good example of innovation of ISCOMS is the application for smartphones that has been set up and launched five years ago. In the meantime, it has been updated by R&D and we will try to keep improving it every year.

Furthermore, R&D is responsible for the website. This means that, in addition to providing the website with its lay-out, we also keep the website up to date at all times to ensure you will receive the correct information.

We maintain partnerships, because these are vitally important to the improvement of medical congresses. Each year we evaluate these partnerships and look for possible new ones. As partners, ISCOMS tries to become an even more inspiring congress.

We would be delighted to welcome you to ISCOMS 2021!

Laura Liethof
Julia Boshouwers
Thomas Luchies



First Year Crew

The ISCOMS First Year Crew (FYC) is made up of eight enthusiastic first year (bio)medical students. The FYC gives the Organising Committee a helping hand during the congress. They help building up the congress and they participate in the social and scientific programme. The FYC also awards one plenary speaker with the First Year Jury award. Although these first year students do not have a lot of medical experience, they will judge the plenary sessions open minded and with care. One of the things the FYC likes most about helping out at the congress is meeting and socialising with the international students, so if you see them at the congress, have a chat and say hi!



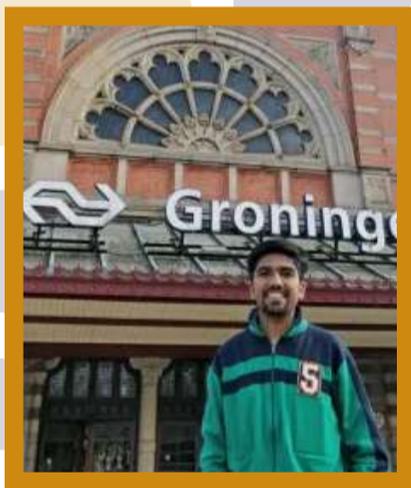
ISCOMS First Year Crew 2019

Ambassadors

The ambassadors of ISCOMS are participants or presenters from a previous ISCOMS who were so enthusiastic about the congress, that they decided to apply to become a well-respected ambassador. They play a vital role in our international promotional campaign. Each year, ambassadors are selected after the congress and maintain the ambassadorship for exactly one year, until the next congress takes place. However, some ambassadors can be reselected as they provided such devotion to ISCOMS that they cannot be missed. The ambassadors start their main promotion in October. They share our social media posts and promote ISCOMS in their country by distributing posters and flyers. Some of the ambassadors even organise meetings or give presentations to explain how great their experience was at ISCOMS. The enthusiasm and excitement that we wish to bring across to everyone all around the world, is accomplished by this group of young excited scientists. We have ambassadors from over 35 countries worldwide, who we have close contact with.

On the website you can find all of our ambassadors and their passion is evident in their words.

'Hello there! I am Dr. Viral Dave, a practicing dentist from India. I graduated from Manipal College of Dental Sciences, Mangalore. I got the opportunity to be a presenting participant at the 25th edition of ISCOMS. It was a very enriching experience to present my research in front of the enthusiastic international crowd and UMCG experts in the field. This is my third year as an ISCOMS ambassador. Without a doubt, ISCOMS is a distinguished chance to network with people from across the globe. Expanding learning horizons through hands-on workshops, key-note sessions by Nobel laureates, patient lecture (very novel concept), and viewing 3D surgery were really worth the experience. Speeddating with the researchers was a unique way to interact and learn the possibilities of doing a Ph.D. at UMCG. I highly recommend being a participant at ISCOMS 2021 and experience 'Science Beyond Borders'. Don't hesitate to contact me for any doubts: vkdave95@gmail.com'



For any question about ISCOMS, please do not hesitate to contact our ambassadors, as they will be more than happy to help you out. Their e-mail addresses can be found on our website.

If ISCOMS 2021 also excited you and makes you want to share your experience with others, you can apply to become an ambassador for ISCOMS 2022. Help us with our promotional campaign yourself! During the congress you can fill in an application form by contacting the ambassador coordinator or you can apply by sending an e-mail with a short motivation letter to iscoms@umcg.nl in the days following the congress.



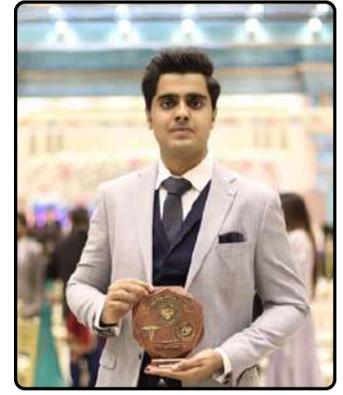
Achival Dani
India



Akinsola Akinyemi
China



Alex Arya
Chile



Ali Hamza
Pakistan



Alireza Majd
Iran



Ashwini Priyadarshini
India



Ayat Yaseen
Sudan



Bahram Askarpour
Iran



Benson Oguttu
Uganda



Bernard Annan
Ghana



Birce Atas
Turkey



Boyan Zhang
China



Collins Osei Owusu
Ghana



Faizan Akram
Pakistan



Farid Masoud
Iran



Felipe Calderón Salazar
Mexico



Georgii Krivoshein
Russia



Gita Nur Siwi
Indonesia



Grace Thundekire Sibande
Malawi



Gulfairus Tukinova
Kazakhstan



Ibrahim Al Yaeesh
Saudi Arabia



Ishani Desai
Georgia



Ishika Mahajan
India



Jordan Popviç
Serbia



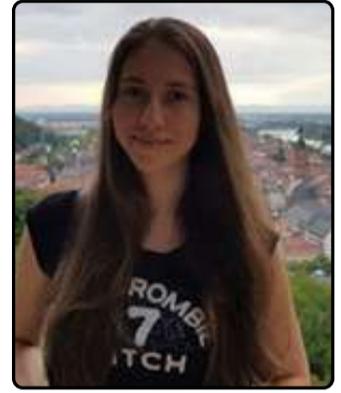
José Luna Mendoza
Mexico



Khusronasir Mohamedfaruq
Georgia



Kritika Pathak
India



Liubov Shilova
Russia



Liza Korniiiko
Ukraine



Miho Takemura
Japan



Milica Malesevic
Bosnia and Herzegovina



Montserrat Miranda
Mexico



Mostafa Samír
Arab Republic of Egypt



Nad'a Majerníková
Slovakia



Nazanin Hazrati
Iran



Nikhil Chauchan
Georgia



Omar al Sowayigh
Saudia Arabia



Onyeka Kingsley Nwosu
Nigeria



Palsam Sandeep
India



Prinisha Kanabathy
Malaysia



Raful Navarro
Mexico



René Novysedlak
Czech Republic



Riya Vaidya
India



Rizana Riyaz
India



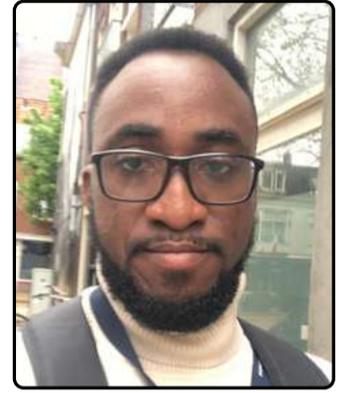
Ruby Owusua Diabene
UK



Ruchika Sukhwai
India



Saeed Keshtkar
Iran



Samuel Ed Mensah
Ghana



Shonza Felicitee
Rwanda



Siddharth Agrawal
India



Suranjana Banik
India



Terje Skeie
Poland



Veronika Shinkevich
Bolaris



Viral Dave
India



Waradana Viraj Virant
Sri Lanka



Widyan Putra
Indonesia



Yaa Owwuaa Offei
Ghana

Dutch ambassadors

This year ISCOMS is not only promoted by ambassadors around the world, but also within the Netherlands enthusiastic students throughout the whole country are helping out. These ISCOMS ambassadors are settled in Amsterdam, Enschede, Leiden, Maastricht, Rotterdam and Utrecht. Our ambassadors raise awareness for ISCOMS across the Netherlands and make sure that students from their faculty come to ISCOMS this year. They do this by posting on the social media platforms of their universities, spreading posters around their city and of course word of mouth promotion. We are extremely happy with all the help we get and are proud that the following ambassadors are a part of ISCOMS 2021!



Pien Kootstra
Amsterdam



Hidde Hekman
Utrecht



James Hoekman
Maastricht



Maarten Bolscher
Leider



Mark-Jan Vles
Rotterdam



Matthijs Burger
Utrecht



Thijs Straatsma
Utrecht



Meghan Scheers
Enschede



Esther Lubberts
Leiden

Thank you!

AMSA

The Asian Medical Students' Association (AMSA) International is a peak representative organisation for medical students from across Asia, the Asia-Pacific and beyond. Training doctors from 16 Member Nations and 11 Associate/Observer Nations combine to share knowledge, undertake activities and social services and create international and transcontinental friendships.

AMSA was officially founded in Manila, Philippines in 1985, and from this day it has been an active, dynamic and exciting student-led, not-for-profit, non-political organisation. Today, with members and friends spanning the globe AMSA has an active student-exchange program, regularly undertakes national and regional projects, provides humanitarian assistance at times of need, produces quarterly student publications and liaises with the World Health Organisation, the Association of Medical Doctors of Asia, and many other international and regional medical student organisations.

Since it was first established in 1979 and the first conference was held in Mahidol University of Thailand, the Asian Medical Students' Conferences have been a key focus for the organisation. Now it is held biannually in January/February and July/August. These events see over 700 students from across the world to learn from each other, teach their fellow peers and develop lasting friendships.

The AMSA Vision is Knowledge, Action and Friendship. Three areas we continuously strive to in our members and peers through our organisational missions:

Knowledge: We promote scientific and medical activities to increase and expand our knowledge whilst training to become the medical professionals of the future

Action: As medical students, we are concerned for the community around us and endeavour to do things for the benefit and improvement of our fellow citizens

Friendship: As future doctors, we aim to build and maintain a good relationship among our colleagues of the Asia-Pacific and beyond

www.amsa-international.org



BRAINCOMS

The Brazilian International Congress of Medical Students is an incredible opportunity for every medical student who wants to learn from renowned keynote speakers, to practice skills at hands-on workshops and to build up a network with other students from all over the world. Our scientific programme includes, also, outstanding student researchers (posters and oral presentation), presented to a professional audience. This congress also comprises sensitization activities – and, of course -, great food and social programme! We combine it all with an inspiring environment, with smart people and a lot of fun!

This congress has everything to boost your personal and medical development. You can't spend these 3 days in a better way! Don't waste this amazing chance, join us!

For more information, please, check our website: <http://www.braincoms.com> or send us an email: braincoms@gmail.com.



CROSS

Croatian Student Summit – CROSS is an international science congress for biomedical students and young scientists which has, over the past few years, found its place as one of the leading students' congresses in Croatia, as well as in this part of Europe.

CROSS is a place for exchanging ideas, spreading information, achieving co-operation and making long-term acquaintances. The aim of CROSS is to enable students and young scientists to learn the importance and the purpose of participating in congresses as part of their further education. Attending CROSS and similar congresses will make their daily work easier because, both networking and keeping up with the newest accomplishments in medicine are crucial in leading a successful professional life.

Follow our social networks for further information about CROSS17!

Find all about CROSS at our official webpage <http://cross.mef.hr>

Instagram profile – https://www.instagram.com/croatian_student_summit/

Facebook profile – <https://www.facebook.com/croatianstudentsummit/>

For any questions send us an e-mail: cross.pr@mefhr.org



EMSA

The European Medical Students' Association (EMSA) is a politically neutral, non-governmental, non-profit and independent organization that represents students from individual medical faculties across geographical Europe. It was established in 1991 in Brussels, Belgium and is currently uniting 96 medical faculties in 24 different European countries. European Medical Students Association seeks to improve the health and quality of care of the European citizens, by acting as a conduit for increased interaction and sharing of knowledge between European medical students in the areas of medical education, medical ethics, medical science and European integration. The main objectives of EMSA are to form a network between European medical students in order to facilitate European integration and develop a sense of European identity, to represent and voice the opinions of medical students of Europe and to promote the highest standards in European medical education, science and ethics.

Our webpage: www.emsa-europe.org



ICHAMS

The International Conference for Healthcare and Medical Students (ICHAMS) is held annually at the Royal College of Surgeons in Ireland (RCSI) to allow undergraduate healthcare and medical students to present their research to peers and professionals in this field. Our mission is to create a platform for students across the globe to interact with one another in order to challenge conventional methodology and encourage innovation in medicine.

The conference includes workshops offered on a variety of topics as well as keynote speakers representing incredibly impactful realms of medicine. Centered in the vibrant city of Dublin, Ireland, we also encourage our participants to embrace the rich culture via city walking tours and traditional Irish music.

The first conference was held in 2011 and in 2013, the conference received the Irish Healthcare Award for student project of the year. As we continue to grow as an international conference, we are continuing to follow our mission of creating a global platform for innovation and medical research.

For more information visit our website www.ichams.org or contact us at ichams@rcsi.ie



ICMS

International Congress of Medical Sciences (ICMS) is an international event that welcomes more than 500 participants every year.

The congress gives the opportunity to students and young doctors from all over the world to present their research in a set of Preclinic, Therapy, Surgery and Public Health poster and oral sessions. We aim to inspire innovation and promote academic quality through an outstanding list of hands-on workshops and keynote lectures by world-renowned scientists and doctors.

The organizer of the forum is the Association of Medical Students in Bulgaria – Sofia (AMSB-Sofia).

www.icmsbg.org



IFMSA

International Federation of Medical Students Associations of the Netherlands (IFMSA-NL) is an organisation for Dutch medical students, situated at each of the eight medical faculties. Our mission is to offer future physicians a comprehensive introduction to global health issues. Through our programming and opportunities, we develop culturally sensitive medical students, intent on influencing the trans-national inequalities that shape the health of our planet. Besides being the Dutch member organisation of the worldwide federation called IFMSA, IFMSA-NL is also part of the European Medical Students Association (EMSA).

More information at: <http://www.ifmsa.nl/>

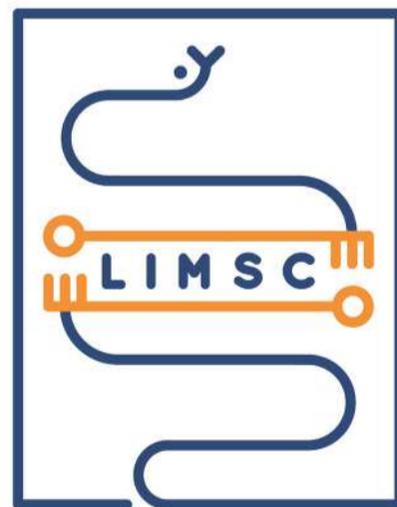


IFMSA-NL

LIMSC

The Leiden International (Bio)Medical Student Conference (LIMSC) is the largest biennial student conference in the world. Founded in 1999, LIMSC strives to create an opportunity for (bio)medical students to present their research and to share knowledge whilst meeting their peers. The conference takes place at the Leiden University Medical Center (LUMC) and is composed of guest lectures, various state-of-the-art workshops and a special Career & Internship Fair. On top of this, there's an extensive Social Programme including a Black Tie Dinner and Post Conference Tour. The 11th edition in 2019 had more than 700 participants from 70 nationalities.

For more information visit our website (www.limsc.org).



YES Meeting

The YES (Young European Scientist) Meeting is an international conference organized by students from the Faculty of Medicine of the University of Porto, in Portugal. Its major goal is to provide a global platform of scientific and cultural exchange to biomedical students all over the world. Our target audience consists of undergraduate biomedical students and recently graduate students who wish to present their research work. Furthermore, any student interested in learning about cutting-edge innovations may attend the conference and enjoy our Scientific and Workshops Programme and Clinical Competition, as well as have the opportunity to visit the beautiful city of Porto or enjoy our Gala Dinner, an event included in our Social Programme.

<https://www.yesmeeting.org>



ZIMS

Zagreb International Medical Summit is a student scientific congress organised by members of the European Medical Students' Association Zagreb and the Students' section of Croatian Medical Association. For 18 years in a row, as November nears its end, Zagreb becomes the meeting place of biomedical students and young doctors from all around the world. In the next 4 days, participants take part in various medical and non-medical workshops, listen to engaging lectures from esteemed professors, present their scientific work and enjoy the social program. Another special feature of ZIMS is that it is one of few congresses in Europe where the abstracts of papers presented by active participants will be published as a supplement to Liječnički vijesnik, a journal indexed in EMBASE/Index Medicus. Best works are published as full texts! It's our aim that when it's time to go home, you'll be going back not only with new knowledge and practical skills, but also with great memories of your time in Zagreb and a few new friends.

www.zims.hlz.hr





Research in Groningen

The UMCG
Junior Scientific Masterclass
Graduate School of Medical
Sciences
Research Master's Programme
Research Institutes
ISCOMS Research Fellowships
Summer School



The UMCG

Building the future of health

The UMCG is one of the largest hospitals in the Netherlands and the largest employer in the Northern Netherlands. More than 10,000 employees work on providing patient care and cutting-edge scientific research, focused on 'healthy and active ageing'. In the framework of scientific research and education, the UMCG collaborates closely with the University of Groningen. Over 3,400 students are trained at the university as physicians, dentists, and movement scientists, and more than 450 physicians are trained as medical specialists.

Research in the UMCG

Researchers at the UMCG are involved in fundamental, clinical, and translational research. All of UMCG's research has been organised into five Research Institutes, within the Graduate School of Medical Science (see below). Research at the UMCG is dynamic and innovative and has its main focus on Healthy Ageing.

LifeLines

In the LifeLine Study, 165,000 residents of the Northern Netherlands were monitored over a period of thirty years. The residents include children, parents and even grandparents. This three-generation approach is unique in the world. Once every five years participants are called in to be examined, at which they are asked to complete detailed questionnaires about illness, lifestyle, health, use of medication, eating habits, and more. In addition, various parameters are measured including blood pressure, weight, height, lung function, heart function and blood and urine values. The aim of this three-generation research is to assess the interaction between genetic and environmental factors in the development of multifactorial diseases, their concurrent development in individuals and their complications as a complex trait. It might also help to explain why some people reach a healthy old age, while others suffer serious difficulties while still young.

Leading teaching and training center

With its courses in Medicine, Dentistry, and Movement Sciences, the UMCG is amongst the best academic training centers in the Netherlands. Groningen is not only renowned for its successful modernisation of academic education, but also for its innovative approach to nursing studies and in-service training, courses and training programmes for (para)medics and nursing staff. The fact that we are clear frontrunners in the development of education and training is further underlined by the presence of the hypermodern Wenckebach Skills Center. Within this mini hospital with its own operating room, patient rooms, and an Intensive Care Unit, caregivers in a range of disciplines and from a variety of educational backgrounds can train new operating techniques and treatment methods, in an extremely lifelike virtual environment. Other aspects including teamwork can also be trained at the Skills Center.

Junior Scientific Masterclass

The route to become a physician-scientist

Are you dreaming of becoming a physician who is trained to combine the care for patients with clinical science? The Junior Scientific Masterclass (JSM) of the University Medical Center Groningen (UMCG) presents you a unique possibility to realise this dream. Because of the major growth in biomedical knowledge, there is a dire need for physicians who can translate fundamental insights into new clinical applications and, simultaneously, generate scientific questions based on clinical observations (i.e. translational research). In order to enforce clinical research, it is essential to immerse medical students into research during the pre-clinical phase of their curriculum. Therefore, the JSM educational programme encourages motivated students to seek research experience from the start of their medical education.

The JSM educational programme also enables medical students to apply for MD/PhD projects. The MD/PhD programme consists of clinical internships ('co-schappen') combined with a financed period of two extra years within the medical curriculum. This programme gives medical students the opportunity to successfully finish both their medical education (MD) and a PhD project within a period of eight years.

The JSM educational programme in the Bachelor phase, the 'Bachelor Honours programme', consists of two phases. The first phase entails getting familiar with research within (the Graduate School Medical Sciences of) the UMCG (GUIDE, BCN, SHARE and Kolff Institute). The second phase is meant to be a turning point and consists of a one-week course of intensive training in clinical research for a (selected) group of students, called the COMPASS week. In the second phase the students are also stimulated to choose their own line of research and apply for research grants.

The JSM programme has grown considerably since it started in 1999. In the period of 2001 until 2014, more than 850 students have been awarded Pilot Projects and 480 students an MD/PhD project. Until now, more than 200 students successfully mastered the MD/PhD programme. In 2008, the 'Mandema-stipendium' was introduced which enables young physician-scientists (MD PhD) to combine their specialist training with research and establish their own line of research.

The route to become a physician-scientist is challenging, but also highly rewarding. It represents an investment for a lifelong learning in the field of academic medicine.

Additional information: www.jsmgroningen.nl or j.s.masterclass@umcg.nl



*Prof. Robert Porte MD PhD
Chair Junior Scientific Masterclass*

PhD training programmes (MD/PhD, 2+2, 3 or 4 years)

The Graduate School of Medical Sciences PhD curriculum has an extensive programme (choice of more than 70 courses and activities) offering each PhD student the opportunity to join courses and activities related to the Research Institute they participate in and their own specific research interest. Five Research Institutes work together to organise these courses and activities each based on their own field of expertise:

1. Behavioural and Cognitive Neurosciences (Research School BCN/Research Institute BCN-BRAIN)
2. Chronic Diseases and Drug Exploration (Research Institute GUIDE)
3. Cancer Research (Cancer Research Center Groningen)
4. Health Research (Research Institute SHARE)
5. Biomedical Engineering (Research Institute W.J. Kolff).

The Graduate School offers different types of PhD training programmes:

1. The MD/PhD programme offers medical and dental students the opportunity to combine the last two years of the Master phase with a PhD training (two additional years of research training financed by the UMCG) to obtain a (D)MD and PhD degree upon completion.
2. The Abel Tasman Talent Programme (also see below) offers PhD Sandwich Scholarships (2+2 years). First, PhD students pursue a two years PhD education and training programme at their home university followed by a two years programme in Groningen (funded by the UMCG) where the thesis will be completed.
3. Upon successful completion of their Research Master's programmes GSMS Research Master's students have the opportunity to apply for a three-year PhD education and training programme within the GSMS.
4. Finally, within the UMCG regular four-year PhD positions are available (offered by individual researchers or research groups) and posted on the UMCG website.

Degree awarded: PhD



Martin Smit PhD
Director GSMS

Research Master's programmes (2 years)

The Graduate School of Medical Sciences administrates three Research Master's Programmes:

1. Behavioural and Cognitive Neurosciences (BCN/BCN-BRAIN)

The Research Master Behavioural & Cognitive Neurosciences, organised by the Research School of Behavioural and Cognitive Neurosciences (BCN), concentrates on three focal and closely related areas of particular strength within the field of neurosciences: Animal and human behaviour (B-track), Cognitive neuroscience and cognitive modelling (C-track), and Molecular and clinical neuroscience (N-track). The programme is characterised by its interactive setting, offering the unique chance of a truly multidisciplinary neuroscience education, while becoming an expert in one specialistic track. The programme is essentially tailor-made. Depending on the student's research interest (or future career aspiration) the student can design his or her own training programme.

More information: www.rug.nl/research/behavioural-cognitive-neurosciences/education/researchmaster/

2. Clinical and Psychosocial Epidemiology (CPE-SHARE)

Clinical and Psychosocial Epidemiology (CPE) is a selective two-year research master. The programme is unique in the sense that students are encouraged to focus on their individual development as a researcher. Therefore, classes are taught in small groups. Students can choose additional courses that suit their personal interests and moreover, research will be conducted side by side with scientists who are leading experts in their field. Mental and physical health and the reciprocal relationship between these two forms the basis of the programme. There is a strong focus on prevention, diagnosis and treatment of physical and mental health conditions. The central idea is that psychological, biological and social aspects all play a role in any physical condition. Students conduct research in several populations, including children, adults and elderly, with or without a physical or mental condition.

More information: www.rug.nl/masters/clinical-and-psychosocial-epidemiology-research/

3. Medical Pharmaceutical Drug Innovation (MPDI-GUIDE)

The selective two-year master programme Medical and Pharmaceutical Drug Innovation (MPDI) offers research-minded students small-group interactive teaching in an international and multidisciplinary environment. You will learn how to creatively apply knowledge and we will train you to become a critical and analytical scientist. You will be challenged with exciting cutting-edge research and methodologies and will learn how to critically read the literature, design novel research questions, translate hypotheses into testable research plans, and write scientific essays. As a student you can focus on your interests and ambitions by participating in one of the following tracks after the first semester: Oncology, Medical Neurosciences and Neurological Diseases, Infection and Immunity, Medical Nutrition and Metabolic Diseases, Medical System Biology and Bioinformatics, Drug Innovation.

More information: www.rug.nl/masters/medical-and-pharmaceutical-drug-innovation/

Degree awarded: Master of Science

More information:

<http://www.rug.nl/research/gradschool-medical-sciences/phd-programme>

http://www.umcg.nl/NL/UMCG/werken_in_het_umcg/vacatures/Pages/default.aspx



Abel Tasman Talent Programme

The Abel Tasman Talent Programme (ATTP) supports high-potential international students to excel in the field of (bio)medical or pharmaceutical sciences. Two types of financial support can be distinguished: Financial support for students from one of our so-called 'preferred partner universities' Financial support for exceptionally talented students from other institutions.

More information: <https://www.groningenbiomed.com/practical/abel-tasman-talent-programme/>

Erasmus Mundus Action 2 mobility

The European Committee's programme 'Education and Training' offers many opportunities to stimulate education, training and exchange of Research Master's and PhD students of the European Union and beyond. The University of Groningen participates in many of these exchange programmes.

More information: <https://www.rug.nl/about-us/internationalization/global-focus/europe/erasmus-programme>

Research Institutes

Research Institute BCN-BRAIN

Director: Prof. Iris Sommer MD PhD

Central theme: Behavioural and Cognitive Neurosciences

The Research Institute BCN-BRAIN was established in 2005 and is part of the Graduate School of Medical Sciences and of the Research School of Behavioural and Cognitive Neurosciences. BCN-BRAIN promotes research that is aimed at understanding the function of the healthy brain and dysfunction of the nervous system with reference to neurological and psychiatric disorders. Research is focused on translational collaboration between lab-based (molecular- and cell biological) and hospital-based (clinical) researchers integrating different levels of neuroscience research.

Research Institute GUIDE

Director: Prof. Jos Kosterink MD PhD

Central theme: Chronic Diseases and Drug Exploration

The main asset of the Groningen University Institute for Drug Exploration (GUIDE) is the integration of clinical, biomedical and pharmaceutical research stimulating translational research and researchers with a keen eye on the complete spectrum of biomedical research: from bed to bench to drugs. Ageing is a central theme as most chronic diseases are age-dependent. Research focuses mainly on 1. Lead discovery, development of new drugs, drug delivery and advanced formulation technology and 2. Translational research on molecular and cellular mechanisms underlying disease (etiology and pathophysiology) and on research related to treatment of disease, e.g. in the context of clinical trials and by using relevant animal models.

Cancer Research Center Groningen (CRCG)

Director: Prof. Mark van Vugt MD PhD

Central theme: Cancer Research

The Cancer Research Center Groningen (CRCG) organises and facilitates high-quality, oncology-related research activities within the UMCG and University of Groningen. All research activities at CRCG share the overall perspective of 'healthier and longer lives of cancer patients through improved care'. Research is performed at the fundamental, translational and clinical levels and organized in a coherent and effective manner in several research programmes to achieve fundamental, clinical and societal relevant research output. Ultimately this leads to personalized cancer therapy, thus reducing the unintended side effects of treatment on normal tissues and improving the quality of life of cancer patients.

Research Institute SHARE (Science in Healthy Ageing and healthcaRE)

Director: Prof. Maarten Postma MD PhD

Central theme: Prevention in Health Research

SHARE's mission is to identify determinants and consequences of illness and Healthy Ageing, conducted within inter-/multidisciplinary programmes, in close connection with societal parties and often based on observational data. The institute investigates and evaluates factors and interventions that are population-, patient- and/or healthcare-system-related. It adds knowledge on prevention of and adaptation to disease, enhancing societal participation of patients with chronic somatic and mental disease and cost-effectiveness and efficacy of pharmaceutical, medical, life-style and psychosocial interventions. Notably, a life-course perspective is taken, addressing research questions spanning from the preconception period, through infancy, reproductive and working ages to old age.

Research Institute W.J. Kolff

Director: Prof. Yijin Ren DDS PhD

Central theme: Biomaterials

The primary objective of the W.J. Kolff Institute for Biomedical Engineering and Materials Science is to bring together pre-clinical and clinical research groups and to establish a center of expertise for the entire stage of biomedical materials science and its application involving basic materials science, medical product development and clinical evaluation that will contribute to the long-lasting well-being of patients in need of biomaterial implants and extra-corporal support systems. Research is conducted within four thematic research programmes each with their own specific theme: 1. Bioadhesion, biocompatibility and infection, 2. Nanobiotechnology and advanced therapeutic materials, 3. Restoring organ function by means of regenerative medicine and 4. Maintaining oral health and oral function.

European Research Institute for the Biology of Ageing (ERIBA)

The mission of the European Institute for the Biology of Ageing (ERIBA) is to gain more knowledge about the biology of ageing. Their studies are focused on the mechanisms that result in cell loss with age and the decline in the function of old cells and tissue. The aim is to develop novel strategies to prevent or combat age-related diseases and to provide evidence-based recommendations for healthy ageing. Their approach is based on curiosity, communication, and collaboration. Group leaders and their team working with unique model systems and technology platforms meet regularly and share their knowledge and expertise to accelerate discoveries.

Education at ERIBA

Research in ERIBA is strongly connected with education and training of the future generation of Biology-of-Ageing researchers. ERIBA aims to be “the place to be” for the best students by offering comprehensive training in some of the best Biology-of-Ageing laboratories in the world. We have developed a cutting-edge graduate curriculum in Ageing biology in which students will be exposed to a wide variety of model systems and approaches. The extensive training experience of the international faculty at ERIBA in other research institutes worldwide ensures an optimal educational and research environment.

Undergraduate students

ERIBA welcomes applications from undergraduate (pre-BSc and MSc) students who wish to pursue an internship in one of the ERIBA labs. Students would typically be enrolled at a biomedical, chemical, pharmaceutical, medical or bioinformatic programme at their home University or University of Applied Sciences (“Hogeschool”). Prospective students are invited to explore the different research teams on the ERIBA website, and motivate in their application the interest for the lab of their choice. Although some short-term internships may be available, we prefer rotations that last for 5 months or longer.

PhD students

ERIBA offers an exciting environment to pursue a PhD degree in the Biology of Ageing. We aim to train PhD students to become independent, creative, multi-skilled scientists. Students devote most of their time to their own research project, but will be enriched by and benefit from the complimentary research activities in neighbouring labs. A large variety of courses, all taught in English, is available for PhD students to acquire additional skills. A PhD degree from one of the ERIBA labs will optimally prepare students for the next phase in their University or corporate career. PhD students in ERIBA will be enrolled in the Graduate School of Medical Sciences and defend their thesis at the University of Groningen. PhD projects in ERIBA typically will last 4 years.

Postdoctoral fellows

We are always searching for outstanding postdoctoral candidates with a proper training in molecular or cell biology who wish to solve scientific questions in ageing science. We encourage postdoctoral candidates to directly contact one of the ERIBA Principle Investigators to explore job opportunities.

For more information, please visit www.eriba.umcg.nl.

The ERIBA logo consists of the word "ERIBA" in a bold, white, sans-serif font. The letters are set against a solid orange rectangular background that is slightly tilted. The background is part of a larger graphic design featuring abstract, wavy shapes in shades of orange and light purple on the left side of the page.

ERIBA

ISCOMS Research Fellowships

The ISCOMS Research Fellowships (IRF) will take place directly after the congress, from the 14th of June till the 25th of June 2021. In short, the IRF give presenting participants of ISCOMS, a chance to participate in a two-week research project at one of the UMCG Research Institutes.

The IRF consist of a challenging programme, in which students are expected to actively participate in research and gather a great deal of knowledge related to the topic of research. As a student you get the chance to perform research at a leading institute, meet top researchers and learn about the possibilities of doing a PhD programme in the Netherlands. There are many international students who have been able to start a PhD-programme in the UMCG as a result of participation in the IRF!

Everything will be arranged free of charge during the IRF. Accommodation is organised for all students and every student receives pocket money to facilitate the stay. Last but not least, a lot of social activities are organised during the IRF. During these social activities the students get the opportunity to get to know the other IRF participants.

You can apply for the IRF on our website (www.iscoms.com). On our website you can find the section "ISCOMS Research Fellowships" under the heading "Programme". A broad range of projects is available so you will definitely find one that suits you.

The following documents are required for your application:

- Your user ID and title of your (accepted) abstract;
- Curriculum vitae (with accurate timeline/dates);
- Letter of motivation for participating in the IRF. Also, explain your preference for a specific project (and state a second and third choice). Word limit: 400 words;
- Letter of recommendation from your supervisor.

Because of the limited availability of projects, we have to make a selection from the students who applied. The ISCOMS Organising Committee together with the UMCG Research Institutes are responsible for the selection procedure. Within three weeks after the application deadline, you will be informed about the results. In these three weeks there can be no correspondence about the selection procedure.

When you are selected to participate in the IRF, we expect that you will come to Groningen and join ISCOMS and the IRF for which you are selected. If you have any problems regarding your visa application or if you don't have the financial resources or other kinds of problems, please contact us by sending an e-mail to iscoms@umcg.nl addressed to Paula Volkers.

IRF projects

A: Translation of bench results to use of drugs in the clinic in lymphoma

Department: Pathology and Medical Biology

Supervisor: Lydia Visser PhD

We have a choice of 2 projects to work on, one is the use of BCL-2 inhibitor venetoclax in diffuse large B cell lymphoma. BCL-2 is highly expressed in DLBCL and venetoclax has been shown very effective and safe in the clinic. What are the problems and possibilities to use venetoclax in DLBCL? The other project is the mechanism of PD-L1 inhibition in Hodgkin lymphoma. PD-L1 inhibition is a very effective treatment in Hodgkin lymphoma, but it is not clear how it works.

We will read papers and work with data already available in our lab to explore these mechanisms.

B: Improving maternal care in low income countries: how are interprofessional education and collaboration implemented?

Department: Health Sciences

Supervisor: M.A.C. Versluis PhD, F.Y. Asmara, E.L. Wanders MD

The 'Millennium development goals' for decreasing the global maternal death rate (MMR) to 102 per 100.000 live-births by 2015 have not been met. The highest MMR, present in Sub-Saharan Africa, is even up to 550-680 per 100.000 live-births. The new aim is to decrease the MMR to 70 per 100.000 live-births by 2030. Studies have shown that teamwork and collaboration improve quality of care. It has also been shown in literature that interprofessional education (IPE) is increasingly viewed as a learning approach to improve cooperation in health work teams.

Is such an improvement in quality of care also feasible in maternal health in low income countries? What projects in IPE are already implemented in low resource settings and with what results? What do we know about IPE in this setting, and what questions remain unanswered? To find out, we are performing a scoping review.

If you are interested in international health care, maternity care and the field of health education, we could use your help! Our goal is to include you in verifying articles for implementation and analyzing the outcomes. We would also appreciate your input regarding the broader discussion around the subject of international maternal health and the possibilities of interprofessional education.

IRF projects

C: Mining the human gut metagenomes to understand the human- bacteria interactions

Department: Genetics

Supervisors: S. Garmaeva MSc, Prof. A. Zhernakova PhD

In the last year, due to the COVID-19 pandemic, the whole world started realising how the microbes and especially viruses surrounding us can affect our health, lifestyle and even mood. Even our body is not sterile, it harbours a complex ecosystem of microorganisms, including bacteria and prokaryotic and eukaryotic viruses. The majority of these microbial communities resides in the gut, forming the human gut microbiome. The human gut microbiome's composition and diversity have been recently established using large population-based studies and associated with multiple human-health factors, lifestyle and diet. However, we still do not know the mechanisms behind the majority of microbiome associations. To study these mechanisms, one would need to culture every bacterial species from the human microbiota and perform many cloning and animal model experiments. Luckily, the use of the recent advances in genome assembly and annotation can prioritize the bacterial species for in vitro studies. During the internship, we will get familiar with the main bacterial genome assembly and annotation tools and try to study particular microbiome associations.

D: Are young people more complex than older people? Changes in cardio-respiratory-locomotor coupling during physical activity

Department: Human Movement Sciences

Supervisor: Prof. Claudine Lamoth MD PhD

The natural process of aging is accompanied by a myriad of structural and functional changes in the human body. As these changes progress a decline in physical fitness, balance control, sensorimotor function, and motor control is observed. At the behavioral level, the decline in these systems inhibits the capacity of the body to function independently and adapt to the environment, especially among the expanding number of old (older than 60 yr.) and very old (older than 80 yr.) adults. The neuro-motor-physiological systems are complex systems comprising of many interacting component subsystems that are connected over a variety of different scales and levels. A hallmark of healthy complex systems is that various neuro-motor-physiological parameters tend to oscillate between several steady states, and are coupled resulting in synchronized behavior, e.g. cardio-respiratory, locomotor-cardio or locomotor-respiratory systems. When we breathe and walk, we frequently make the same number of steps during each breath and our breath syncs with the heartbeat. Heart-beats per minute or time between steps of walking may stay relatively constant for a long time, yet the fluctuations between beats, or the variability of steps during waking become more regular and less complex with age.

In this project, we study the effect of age on the interaction between the locomotor, cardiac respiratory systems in terms of coupling during controlled physical activity tasks (walking on a treadmill, balance task) and during daily life activities. Participants (18–70 years) will wear a smart T-shirt with embedded textile sensors when walking (5 min) running (5 min) rest and again walking and running outside.

Synchronization of locomotion-respiratory-cardio rhythms will be established by applying signal analysis methods that quantify phase- or frequency locking epochs.

For this project knowledge of Matlab or Python and/or R-software is required.

IRF projects

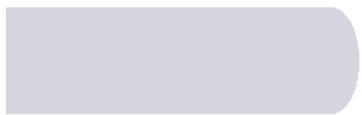
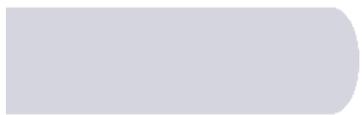
E: Pseudolesions and pseudodefects of the humerus; how to differentiate them from true lesions?

Department: Radiology

Supervisor: Sandra Hein MD

The main question will be: what is known about the pseudolesion, pseudo Hill Sachs defect, and the pseudo reversed Hill Sachs defect so far? And how can we differentiate them from tumors or a Hill Sachs c.q. a Reversed Hill Sachs defect.

Anatomical knowledge of the shoulder is required for participation.



Summer schools

The Medical Sciences Summer School programme of the University Medical Center Groningen (UMCG) and the University of Groningen consists of several Summer Schools including a wide range of medical disciplines. The aim of these Summer School programmes is to provide international students with a highly stimulating environment and increase their knowledge in specific areas of medicine and biomedical sciences.

A hallmark of all Summer Schools is the combination of clinical practice and research. Translational medicine is highly qualified at our University Medical Center. Therefore, we stimulate medical students to get acquainted with (bio)medical research.

The diverse programmes leave students with many opportunities for furthering their career in medical research and practice, by enhancing connections to the Graduate School of Medical Sciences, as well as creating new connections with individual (international) guest speakers and professors.

From the 4th until the 14th of July 2021:

- Ageing Brain (online)
- Data Sciences & AI in Health (online)
- Global Health (online)
- Oncology (online)

From the 29th of August until the 3rd of September 2021:

- Innovative Perspectives In Medicine (IPIM) (online)

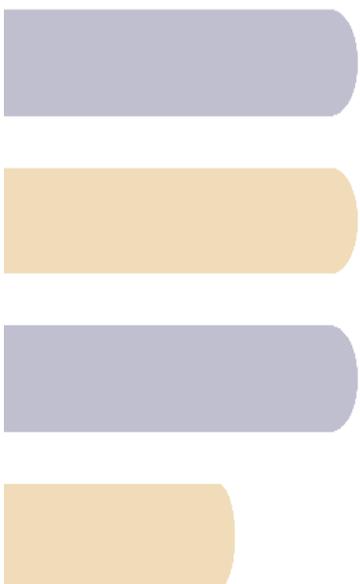
Attending one of these programmes could be combined perfectly with your attendance to ISCOMS and will give you the opportunity to increase your knowledge even further.

For general information about the Medical Sciences Summer Schools Groningen, please visit their website (<http://www.rug.nl/research/gradschool-medical-sciences/summerschools/>) or e-mail them at summer.schools@umcg.nl.



Congress

Programme ISCOMS 2021
Day Chairs
Jury members
Awards
Pre course
Keynotes
Operation
Workshops
Social Programme



Programme ISCOMS 2021

Monday, 7th of June - Pre-course

- 08:15-09:00 Registration
- 09:00-09:30 Day opening
- 09:30-11:10 Masterclass I
- 11:10-11:50 Break
- 11:50-13:20 Science Elective
- 13:20-14:30 Lunch
- 14:30-15:00 Your Future at the UMCG
- 15:00-16:00 Speed keynote lectures
- 16:00-17:30 Masterclass II
- 19:30-21:00 Social Programme

Tuesday, 8th of June - Congress day 1

- 07:45-08:30 Registration
- 08:30-09:15 Opening ceremony
- 09:15-10:15 Keynote lecture I
- 10:15-11:15 Plenary session I
- 11:15-12:00 Break
- 12:00-13:15 Workshops I
- 13:15-14:30 Lunch
- 14:30-15:55 Oral session I
- 15:55-16:25 Break
- 16:30-17:40 Patient Lecture
- 17:40-17:55 Closing ceremony
- 19:30-20:30 Social Programme

Programme ISCOMS 2021

Wednesday, 9th of June - Congress day 2

08:30-09:00 Registration

09:00-09:15 Opening ceremony

09:15-10:15 Keynote lecture II

10:15-11:15 Plenary session II

11:15-11:45 Break

11:45-13:00 Workshops II

13:00-14:00 Lunch

14:00-15:00 Keynote Lecture III

15:00-15:15 Closing ceremony

19:30-20:30 Social Programme

Thursday, 10th of June - Congress day 3

08:30-09:00 Registration

09:00-09:15 Opening ceremony

09:15-10:35 Operation

10:35-11:35 Plenary session IV

11:35-12:05 Break

12:05-13:20 Workshops III

13:20-14:20 Lunch

14:20-15:45 Oral session II

15:45-16:15 Break

16:15-17:15 Keynote Lecture IV

17:15-18:00 Award & closing ceremony

Day chairs

Froukje Hoogenboom MD

Day chair on Monday the 7th of June



Froukje Hoogenboom MD works as a colorectal surgeon in the University Medical Center Groningen (UMCG). After she finished her surgical training at the UMCG in 2012, she stayed there, becoming a consultant. During the final year of her training, she worked for a few months at the well-known St Mark's Hospital in London, gaining more knowledge on proctology.

The focus of her work is IBD, proctology (benign diseases of the anorectum), endometriosis, functional problems of the colon and rectum (also prolapse). The combining theme in is the presence of benign problems that generally don't affect life expectancy, but have great impact on the quality of life. Another similarity between these topics is the necessity to work together with other specialties, to work in a multidisciplinary team. For example, as IBD specialist, she works a lot with the gastroenterologists. In endometriosis care (deep infiltrating endometriosis in the bowel), we see patients together with the gynecologists and perform surgery on either the DaVinci robot or laparoscopically. In the care for patients with pelvic pain and functional problems (for instance inability to empty the bowel) the team can be even bigger, with a gynecologist, a pain specialist, psychologist and a specialized pelvic floor physiotherapist. The main challenge in her work is the multidisciplinary approach and task to try to solve patient problems that are not solved easily (tertiary referrals).

As a student I never expected to become a surgeon and never was part of ISCOMS. With the clinical experience over the years research questions become more relevant, and it is great that ISCOMS students make an early start working in research enabling them to continue this in the rest of their career. I look forward on being part of ISCOMS 2021!

Prof. Gerjan Navis MD PhD

Day chair on Tuesday the 8th of June



Prof. Gerjan Navis MD PhD (1956) trained as Internist-Nephrologist at the University Medical Center Groningen (UMCG), and was appointed Chair of Experimental Nephrology in 2000. Along with her clinical work she established a translational research line addressing prevention of progression of kidney disease with pharmacological and non-pharmacological measures. Impressed by the major impact of non-pharmacological measures, and its relative neglect in clinical medicine, she increasingly turned towards research and health policy on non-pharmacological measures. Accordingly, as of 2015 she holds the endowed Chair of Nutrition in Medicine, as part of the strategic program Nutrition and Health of the RUG/UMCG. Her current work addresses the potential of objective lifestyle monitoring in clinical medicine (for which a lifestyle-dashboard is now being implemented at UMCG as a tool for clinical management as well as research), and the combat against socio-economic health differences in healthy ageing and prevention. For the latter, she was appointed fellow of the Aletta Jacobs School for Public Health (2019). Her personal healthy ageing strategy includes cycling to work for physical activity and bird-spotting for mental and overall well-being.

She was among the founders of ISCOMS (formerly known as SCG) in 1993 and was at its board for 18 years, also promoting research interest and research opportunities for medical students along other lines, such as the Junior Scientific Masterclass of the UMCG, where she was first chair of the review board. She has mentored > 65 PhD students (~ half of them as medical student at the start of their PhD), and (co-) authored > 650 peer-reviewed papers and/or book chapters. She has chaired the board of the prestigious VICI-funding program for personal career grants and is current chair of the Scientific Board of the Dutch Kidney Foundation. She holds advisory positions for the Dutch Ministry of Health (VWS) and the government, including membership of the National Health Council, and of the expertise platform for prevention of the Ministry of Health. By this combination of activities, many of the scientific insights she generates together with her students, find their way to health policy, medicine and society.

Prof. Martin de Borst MD PhD

Day chair on Wednesday the 9th of June



Prof. Martin de Borst MD PhD is consultant nephrologist at the University Medical Center Groningen (UMCG) and adjunct professor of medicine at the University of Groningen.

His clinical duties include the care for patients with chronic kidney disease and kidney transplant recipients. This includes the prevention and treatment of allograft rejection and infections, and cardiovascular risk management. At the UMCG, each year ± 180 patients undergo a kidney transplantation, the majority from a living donor.

Prof. De Borst's research focuses on cardio-renal medicine: the interaction between chronic kidney disease and cardiovascular complications. His main scientific aim is to identify targetable factors and innovative treatments to prevent progressive kidney function loss and the development of cardiovascular disease. So far, he has published over 180 peer-reviewed articles in leading scientific journals including the New England Journal of Medicine, Lancet Diabetes and Endocrinology, and Nature Reviews Nephrology. His work is embedded in several national and international research consortia, and is supported by the Dutch Organization for Scientific Research (ZonMW/NWO), Dutch Kidney Foundation, Dutch Heart Foundation, and the European Union. Prof. De Borst is also involved in multiple public-private collaborations, supported by the Dutch Ministry of Economic Affairs (TKI grants). He supervises a team of eleven PhD students, three post-docs, two research analysts and many students. He is the co-founder of NOVO, a national platform that facilitates clinical trials and large cohort studies in the Netherlands. He is (co-)Principal Investigator of several multicenter clinical trials, including the K+ in CKD trial (clinicaltrials.gov NCT03253172) and the EFFECT-KTx study (NCT03769441). In 2020, he received the Stanley Shaldon award for young investigators from the European Renal Association (ERA-EDTA).

Prof. De Borst is Associate Editor of Nephrology Dialysis Transplantation, the flagship scientific journal of the ERA-EDTA. He is also chair of the Young Nephrologists' Platform, an ERA-EDTA committee dedicated to promoting the development of young kidney specialists in Europe.

I vividly remember my participation in ISCOMS as a medical student in 2002. I was very excited when I received both the Public's Award and the First-year-student-Jury Award at the time. Presenting and discussing my work at ISCOMS was one of the fine opportunities that set the stage for my future as a clinical researcher. I hope you will have the same experience, and look forward to meeting you at the congress!

Prof. Jean-Paul de Vries MD PhD

Day chair on Thursday the 10th of June



Prof. Jean-Paul de Vries MD PhD is vascular surgeon and head of the department of Surgery of the University Medical Centre Groningen (UMCG). The department covers the whole spectrum of Surgery including Vascular Surgery, Surgical Oncology, Pediatric Surgery, Hepato-pancreatico-biliary Surgery including the liver transplant programme, Traumasurgery, Gastro-intestinal Surgery, and Kidney, Pancreas and Bowel Transplant Surgery.

Jean-Paul de Vries is also professor in surgery, with focus on innovative technology, imbedded in the dr. W.J. Kolff Institute. He is one of the board members of the Centre of Medical Imaging- North Eastern Netherlands (CMI-NEN). There is a strong collaboration with the Technical University in Enschede and multiple PhD students are working at the department of Surgery as well as at the Technical University. Moreover, there is a partnership with the department of Biomedical Engineering and the Surgical Research Lab. This results in a mixture of fundamental and patient-orientated research lines.

He is one of the founders of the Dutch Endovascular Alliance (DEALL), a multicentre Dutch research platform to perform dedicated (endo)vascular research. He is in the frontiers of innovative research in Vascular Surgery mainly focussing on optimizing imaging pre- and post-endovascular aneurysm repair, development of non-invasive tissue perfusion techniques in peripheral arterial disease and implementation of telemonitoring in the peri-operative period. Besides, he is a distinguished reviewer for the Journal of Vascular Surgery, reviewer of the European Journal of Vascular and Endovascular Surgery, Vascular, and the Journal of Endovascular Therapy. He is a member of the editorial boards of the Journal of Endovascular Therapy (JEVT), J. Cardiovasc Surg, and the European Journal of Vascular & Endovascular Surgery (EJVES). He published more than 370 peer review manuscripts, several book chapters for international vascular textbooks, edited a textbook with focus on endovascular aneurysm repair, and is faculty member of multiple international vascular congresses.

Jury members

Prof. Yijin Ren DDS PhD

Head of the Department of Orthodontics at University Medical Centre Groningen (UMCG)



Prof. Yijin Ren DDS PhD is head of the Department of Orthodontics at University Medical Centre Groningen (UMCG), University of Groningen. She is also the programme director (opleider) for specialist training in orthodontics. Clinically Prof. Ren keeps an active practice in her department mainly on patients born with cleft lip and palate and other craniofacial anomalies. She is a consultant orthodontist in the Cleft Lip and Palate Team of Northern Netherlands. Scientifically, Prof. Ren is Director of the W.J. Kolff Institute of Biomedical Engineering and Materials Science, named after the godfather of biomaterials implants and devices Dr. W.J. Kolff. The Kolff Institute (KOLFF) is the only engineering-centered institute that is embedded in an academic hospital in the Netherlands, with main areas on the development and application of innovative biomedical technique and technology, including novel bio(nano)materials to improve quality of health care and to realize a sustainable healthcare.

Prof. Ren her research interests include biofilms and biomaterials-associated (oral) infection, novel alternatives to antibiotics, application of 3D imaging, workflow and 3D printing in clinical practice. The PhD projects she cosupervises focus on responsive nanoparticles and nanostructured surfaces for bacterial adhesion and biofilm control harnessing their unique features such as biofilm penetration and eradication, photo-thermal effects, ROS production, increased antibiotic housing and decreased possibility of generating resistance. Given that antibiotic-resistance amongst infecting bacteria has become a global threat, the outcome of this line of research expects to have significant impact in the biomedical fields. Prof. Ren is also consortium member for a COFUND from MARIE SKŁODOWSKA-CURIE ACTIONS on novel tailor-made antimicrobials and delivery strategies. Prof. Ren serves as a board member in a number of renowned national and international professional organisations, and as an editorial member/editor in a number scientific journals.

emProf. Cees Th. Smit Sibinga MD PhD

Expert advisor World Health Organisation



emProf. Cees Th. Smit Sibinga MD PhD is a clinical haematologist and specialist of Transfusion Medicine. He is special professor of International Development of Transfusion Medicine at the University of Groningen. He has been involved in the development of Transfusion Medicine and quality systems and management for developing economies since 1980 through his work with the World Health Organization (WHO). At the WHO, he has been regional coordinator of the global Quality Management Project for the Europe region. For 25 years he has served as the Managing Director of Sanquin Division Blood Bank North Netherlands in Groningen. From 1993 until 2005 the Blood Bank incorporated the WHO Collaborating Center for Blood Transfusion and the WFH International Hemophilia Training Center in Groningen.

emProf. Smit Sibinga is the founder of the Dutch Blood Bank Inspection and the Accreditation Program and the Hemovigilance system. Besides this, he is the founder of the Academic Institute for International Development of Transfusion Medicine at the UMCG. This institute used to provide a post-academic Master in Management of Transfusion Medicine, which is now part of the Master programme of the University of Groningen Graduate School of Medical Sciences.

emProf. Smit Sibinga is still deeply involved in transfusion medicine and related health sciences research focused on developing countries. He serves WHO Eastern Mediterranean Region as a Lead Technical Adviser in their Strategic Framework for Blood Safety and Availability 2016-2025 and its priority interventions.

Prof. Ton Lisman PhD

Professor of Experimental Surgery at the University Medical Center Groningen (UMCG)



Prof. Ton Lisman PhD (1976) is a Professor of Experimental Surgery at the University Medical Center Groningen (UMCG). He studied chemistry at the University of Utrecht and obtained a PhD in the Department of Haematology in the University Medical Center Utrecht. After working as assistant professor in Utrecht for several years, he moved to Groningen in 2007 where he was appointed full professor in 2015.

His research interests include the pathogenesis of bleeding and thrombosis with a particular interest in the changes in the haemostatic system in patients with liver disease. In addition, he studies the role of components of the haemostatic system in liver injury and repair.

The translational research of Prof. Lisman is facilitated by long-term collaborations within the UMCG and with various partners worldwide.

In addition to research, Prof. Lisman enjoys teaching thrombosis and haemostasis courses and scientific writing. He is a member of the editorial team of two high-ranked thrombosis and haemostasis journals and has leadership roles in national and international scientific societies.

Prof. Inge S. Zuhorn PhD

Professor of Nanomedicine at the UMCG



Prof. Inge S. Zuhorn PhD (1973) is a Professor of Nanomedicine at the University Medical Center Groningen (UMCG). She was trained as a medical biologist and did her PhD on non-viral gene delivery at the University of Groningen. After her PhD she worked for five years at the Biomade Technology Foundation, a company that focused on the translation and commercialization of academic research findings, after which she returned to academia to start a new research line on drug delivery to the brain. In 2013 she was awarded with a prestigious Vidi grant by the Dutch Research Council (NWO). Zuhorn is editorial board member of two journals, 'SN Applied Science' and 'Pharmaceutics', and has served as a guest editor for 'Tissue Barriers' and 'Accounts of Chemical Research'. As member of the management team of the W.J. Kolff Research institute at the UMCG, she is involved with talent development at the UMCG.

Her research focuses on exploiting natural transport pathways in cells for drug delivery, which she also teaches in several bachelor and master programs at the University of Groningen. Together with her team she has generated important insight in the mechanisms behind the cellular uptake of nanoparticles and the intracellular release of therapeutic compounds. In addition, she discovered a peptide that can shuttle nanoparticles across the blood-brain barrier into the brain, which she aims to further develop for the treatment of brain diseases.

In her research she follows an interdisciplinary approach, integrating human and natural sciences through collaboration with chemists, physicists, and clinicians. She believes that progress that is being made in a certain scientific discipline opens up many opportunities in other disciplines and she underscores the importance of looking beyond the disciplinary boundaries. In this regard, she acknowledges the importance of dialogue between (basic) scientists and clinicians to find solutions for clinical challenges as well as stimulate the clinical translation of research findings. She believes that a thorough understanding of the cellular processing of nanoparticles is essential for the clinical translation of nanomedicine.

Sharon Eskandar BSc

MD/PhD candidate UMCG



Sharon Eskandar is a MD/PhD candidate in the UMCG. She started medical school in 2013 at the UMCG and during medical school her interest in the scientific field was sparked. She enrolled in the JSM scientific programme and after finishing her research internship, she started her PhD in 2017.

Her research is a collaboration between the Department of Obstetrics and Gynaecology and the Department of Biomedical Sciences of Cells and Systems, section neurobiology. In her PhD, she is studying the relation between maternal immune activation during pregnancy and its detrimental effect on fetal neurodevelopment. Within this context, she is mainly interested in the role of immune cells and in particular macrophages.

Marijn Hendriksz BSc

MD/PhD candidate UMCG



Dear participants,

As the secretary of the 26th edition of ISCOMS in 2019, I am very excited to experience the congress from the perspective of a jury member this year. The COVID-19 pandemic has revealed how great the impact of (bio)medical research can be, and how valuable events like ISCOMS are in motivating young researchers to make an impact. Fortunately, the digital version of ISCOMS continues to bring participants together from all over the world in order to connect, learn and share their knowledge during the excellent scientific programme that the Executive Board and Organising Committee have created.

My name is Marijn Hendriksz, and I finished my Life Science and Technology bachelor's in 2019 from the University of Groningen. Currently, I am enrolled at the University of Wageningen for the master programme of Molecular Nutrition and Toxicology, where I am writing my master thesis at the research department of Nutrition, Metabolism and Genomics. Momentarily, I am conducting my own research project in the laboratory, continually gaining experience in my field and enjoying the work. It is remarkable to see how science is currently progressing and is inspiring so many. Participants of ISCOMS 2021, I cannot wait to hear your presentations, read your abstracts and meet you all. Your applications, your enthusiasm and ambition make you of great value to the scientific field. To all non-presenting participants, I hope that you will all experience a wonderful 28th of ISCOMS. To all presenting participants, I wish you the best of luck!

Kind regards,

Marijn Hendriksz

Awards

Plenary awards

Students who are selected to present their research during the plenary sessions, have a chance of winning one of the three plenary awards. The first prize consists of €1250,-, the second prize of €750,-, and the third prize of €250,-. You can spend this money on visiting biomedical congresses of your choice. All of these winners will also receive a one-year online subscription to The New England Journal of Medicine. The winners will be selected by a jury of renowned medical scientists and (bio)medical students.

Plenary presentation: Audience award

The winner of this award will be determined by the audience. The plenary presenter most appreciated by the audience will receive a cheque of €150,- to spend on visiting a biomedical congress of his or her choice.

Plenary presentation: First Year Jury award

This is a special award, as the jury consists of first year (bio)medical students only. Despite not having much research experience, they will judge the plenary sessions open minded and with great care. The winner of this award will receive €150,- and a one-year online subscription to The New England Journal of Medicine.

World Health award

To stimulate and acknowledge students in the research of global health issues and their contribution to global health in general, the WHO supported World Health consists of a one-year online subscription to the Eastern Mediterranean Health Journal (EMHJ). This means that either the presenter comes from a developing country or the subject of the research affects developing countries.

Best Oral Abstract awards

The best oral abstracts will be awarded with either an abstract award for the Clinical Sciences, the Basic Sciences or the Community Health. Our official jury will select three winners out of all different oral topics. Winners will receive a cheque of €100,- to spend on visiting a biomedical congress.

Session winners

In each oral session the best presentation will be selected. All session winners will receive an official certificate.

Please note, all of the prizes which include money, should be claimed within a maximum of three years after this 28th edition of ISCOMS. The awards can only be spent on visiting (bio)medical congresses, and only the travel costs and the costs for the congress itself can be declared.

Pre-Course

On Monday the 7th of June, the pre-course will take place. The pre-course aims at improving your research skills. To master your research skills, several masterclasses are organised. In addition to that, a lecture about Your Future at the UMCG, two speed keynote lectures, a Science Elective and to finish the day a social programme activity will be held.

Programme:

08:15-09:00 Registration

09:00-09:30 Day opening

09:30-11:10 Masterclass I

11:10-11:50 Break

11:50-13:20 Science Elective

13:20-14:30 Lunch

14:30-15:00 Your future at the UMCG

15:00-16:00 Speed keynote lectures: Prof. Minke van den Berge MD PhD and Jasper Nuninga PhD

16:00-17:30 Masterclass II

19:00-23:00 Social Programme



Prof. Minke van den Berge MD PhD



Jasper Nuninga PhD

Keynotes

Prof. Sir Peter J. Ratcliffe (Nobel Prize Laureate 2019)



Prof. Sir Peter J. Ratcliffe MD, was born in Lancashire, England, in 1954. He attended Lancaster Royal Grammar School from 1965 to 1972. He won an open scholarship to Gonville and Caius College, Cambridge in 1972 to study Medicine at the University of Cambridge. Later he completed his MB ChB medical degree at St Bartholomew's Hospital Medical College in 1978. Ratcliffe then trained in renal medicine at Oxford University, focusing on renal oxygenation, before founding the hypoxia biology laboratory at Oxford. His laboratory elucidated mechanisms by which human and animal cells sense oxygen levels and transduce these signals to direct adaptive changes in gene expression. He earned a higher MD degree from the University of Cambridge in 1987. He holds appointments as Director of Clinical Research at the Francis Crick Institute, London, Director of the Target Discovery Institute at the University of Oxford and is a member of the Ludwig Institute for Cancer Research.

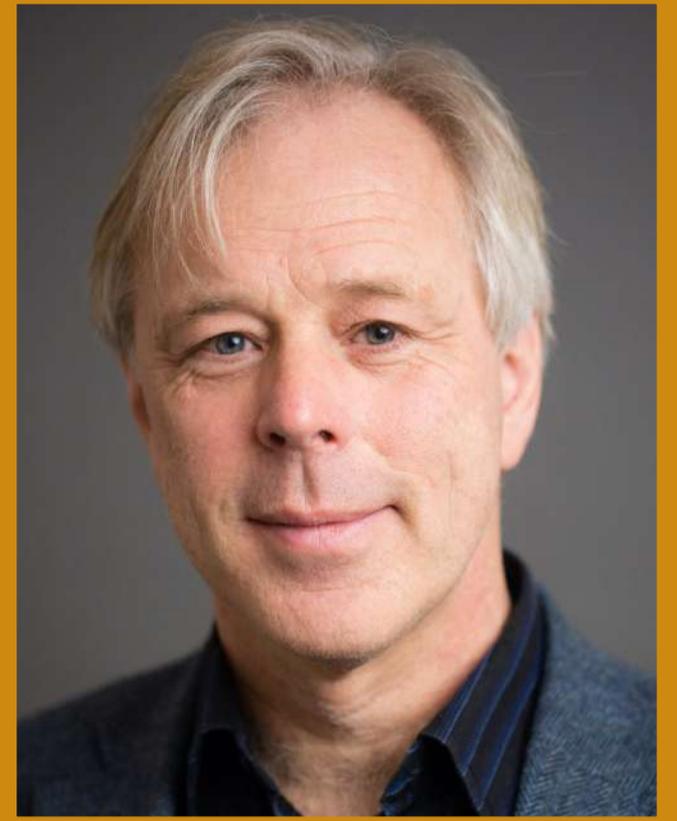
Prof. Sir Peter J. Ratcliffe is best known for his discovery on how cells sense and adapt to oxygen availability, for which he shared the 2019 Nobel Prize in Physiology or Medicine with William Kaelin Jr. and Gregg L. Semenza. He is also a Fellow of the Royal Society and a recipient of several international awards for his laboratory's work on oxygen sensing, including the Louis-Jeantet Prize for Medicine (2009), the Canada Gairdner International Award (2010), the Lasker Award for Basic Biomedical Research (2016), the Buchanan Medal of the Royal Society (2017) and the Massry Prize (2018). He was knighted for his services to medicine in 2014.

Prof. Sir Peter J. Ratcliffe's lecture will be about 'Understanding cellular oxygen sensing mechanisms: implications for medicine'. The lecture will outline advances in the molecular understanding of oxygen sensing mechanisms, including the remarkable finding that all eukaryotic kingdoms use enzymatic protein oxidations coupled to proteostasis to signal oxygen levels in their cells. The physiological implications of these advances will be discussed, together with the opportunities and challenges raised in the therapeutic modulation of human oxygen sensing systems.

Keynotes

Prof. Jaap Seidell MD PhD

Prof. Jaap Seidell MD PhD is an internationally recognised researcher of nutrition and Director of the Department of Health Sciences at the VU University of Amsterdam. He is an eminent researcher whose expertise spans on diet, healthy nutrition, chronic diseases and the management of overweight and obesity. Professor Seidell is an expert in nutrition and social medicine. He consults gratuitously for the Dutch government, research funding organisations, the food industry, pharmaceutical companies, health care organizations, NGO's and the media. He graduated cum laude from Wageningen University, did an internship at the University of Cambridge and received his post doc at Sahlgrens Hospital, University of Göteborg. He became a member of the The Royal Netherlands Academy of Arts and Sciences in 2012.



Professor Jaap Seidell's lecture will be about 'The effect of information accessibility on health in different parts of the world'. The lecture will outline the different elements of lifestyle diseases like diabetes and obesity worldwide. Various aspects including consequences, management and prevention will be addressed during his keynote lecture. During his talk, the importance of information provision will be outlined next to other important factors that play a key role in the prevention of these kinds of diseases.

Keynotes

Prof. Marion Koopmans DVM PhD

Prof. Marion Koopmans, DVM PhD focuses on global population level impact of rapidly spreading zoonotic virus infections, with special emphasis on foodborne transmission. Her research focuses on unravelling the modes of transmission of viruses among animals and between animals and humans through food transmission. She uses the pathogenic genomic information to unravel these pathways and to signal changes in transmission or disease impact. Professor Koopmans is the initiator of the global Noronet network, a global network of scientists sharing information on disease outbreaks into a jointly owned database to study norovirus diversity related to human health impact. She is a scientific coordinator of COMPARE, a multidisciplinary research network that has the common vision to become the enabling analytical framework and globally linked data and information sharing platform for the rapid identification, containment and mitigation of emerging infectious diseases and foodborne outbreaks. Next to these projects she is also co-leader in the PREPARE project, an EU funded network for harmonized large-scale clinical research studies on infectious diseases. This project is prepared to rapidly respond to any severe ID outbreak, providing real-time evidence for clinical management of patients and for informing public health responses.

Marion Koopmans is the director of the WHO- cooperation centre for Emerging Diseases at the Erasmus MC and scientific director of Emerging Diseases of the Netherlands Centre for One Health. She has received the Infectious disease award of the Dutch Association for Infectious Diseases and is the recipient of the Stevin Premium 2018. In 2019, she became a member of the The Royal Netherlands Academy of Arts and Sciences. She has co-authored over 500 papers that have been cited over 20.000 times.

Professor Marion Koopmans lecture will be about 'The Rapidly Evolving World of Emerging Viruses'. The lecture will outline basic concepts of disease emergence, and go into the factors that drive emerging disease outbreaks in our globalising world. Are emerging disease outbreaks a hype? Should we worry about them? What drives their occurrence? What can we do to prevent and control them, specifically food related changes?



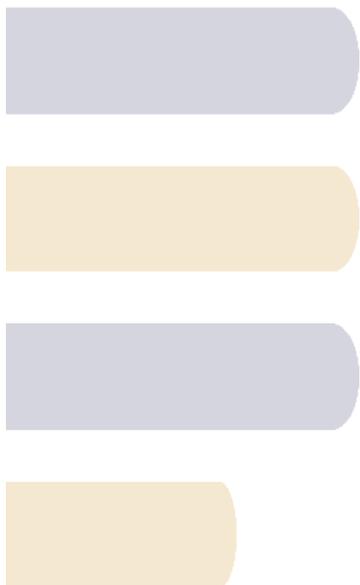
Keynotes

Prof. Ellen Roche MD PhD



Prof. Ellen Roche MD PhD is currently the W.M Keck Foundation Career Development Professor at the Institute for Medical Engineering and Science and the Department of Mechanical Engineering at the Massachusetts Institute of Technology. She directs the Therapeutic Technology Design and Development Lab. She completed her PhD at Harvard University School of Engineering and Applied Sciences. Her research focuses on applying innovative technologies to the development of cardiac devices. Her research includes the development of novel devices to repair or augment cardiac function. To establish this she uses disruptive approaches such as soft robotics, a combination of mechanical actuation with delivery of cell therapy and use of light-activated biodegradable adhesives. Dr. Roche was employed in the medical device industry for over five years as a research and development engineer. She understands the regulatory pathways to medical device commercialization. Professor Roche holds 5 issued patents, with ten pending and is the author of over 40 conference/journal papers. She is the recipient of multiple awards including the Fulbright International Science and Technology Award, the Wellcome Trust Seed Award in Science, an American Heart Association Pre-Doctoral Award, a National Science Foundation CAREER Award and a Charles H. Hood Award for Excellence in Child Health Research.

Professor Ellen Roche's lecture will be about 'Therapeutic strategies for cardiac disease using soft materials, structures and devices'. The lecture will outline the future of what implantable cardiovascular devices should be: a multi-targeted, synergistic combination of (i) structural repair (ii) active assistance and (iii) biological therapy. This seminar will focus on representative implantable cardiac devices that Ellen Roche has worked on in each of these three areas, each addressing an identified shortcoming of existing technologies.



Operation

The operation that will be shown at ISCOMS 2021 is a paediatric partial liver transplantation from an adult, living donor. Liver transplant surgeon Vincent de Meijer MD PhD will explain the surgical anatomy in relation to the transplant procedure.

Liver transplantation is a lifesaving therapy for patients suffering from end stage liver disease. The University Medical Center Groningen (UMCG) is the largest transplant centre in the Netherlands and is the only centre performing paediatric liver transplantation.

Liver transplantation is a multidisciplinary treatment in which a team of specialists work closely together. To ensure optimal patient outcome, organ-specific knowledge in terms of both physiology and anatomy, is essential. In addition, knowledge about donor management and optimisation, donor organ preservation, post-transplantation (ICU) management and quality of life are all relevant aspects that require continuous research and development. The impact of the transplantation on paediatric liver transplant recipients and their parents/caretakers is enormous. Their quality of life as well as their life expectancy increases substantially after the transplantation.

If you want to know more about paediatric liver transplantation, you can attend the ISCOMS operation on **Thursday the 10th of June from 9:15 until 10:35.**



Vincent de Meijer MD PhD

Patient lecture

Parkinson's Disease: a patient's perspective

Slow moves, rigidity, tremor, stoop posture, we just need a few words to characterize people with Parkinson's Disease (PD). And although in the last few decades it is well understood that PD is more than just a movement disorder, the emphasis is still on lack of motor control. PD is the disease of the motor system and everything else seems of secondary importance.

What doctors and even some neurologists do not realize is that not motor but behavioural cause the most devastating consequences of the disease. In my experience as a patient representative for five years, and having been involved in some tens of studies on PD, I think we should care more about those who face difficulties to start a conversation or take action when they want to, embrace their loved ones when they want to. Because this is also what PD is about. PD is the visitor that you take along with you whether you like it or not. It is there 24/7 in head and mind, in brain and behaviour. The mere fact that physical symptoms require easier treatment than mental and cognitive problems should not distract our attention from mental and cognitive problems in every day life.

Our patient Rob Hagen and neurosurgeon prof. Marc van Dijk will provide you with an interesting lecture from the patient's perspective of PD and discuss treatment with Deep-Brain Stimulation in the process.

Visit the patient lecture at ISCOMS on **tuesday the 8th of June from 16:25 to 17:40.**



Rob Hagen

Workshops

Tuesday June 8th

Title: Basic Oncopathology: gross examination of pathology specimens

Date: 8th of June

Department: Department of Pathology

Supervisors: Prof. A. Suurmeijer PhD

Despite the introduction of sophisticated techniques in modern pathology, macroscopic interpretation of resection specimens remains a cornerstone in the daily practice of surgical pathology. After a short introduction regarding the role of pathology in oncologic patient care and basic terminology the participants will be asked to interpret 4-5 macroscopic specimens from surgical resections. In each case, we will translate pathology highlights (tumor diagnosis, tumor stage, etiology-pathogenesis) into patient care (prognosis, therapeutic options).

Title: Basic Life Support: Heroes are not born, they are trained

Date: 8th and 10th of June

Department: Wenckebach Institute for Education and Training

Supervisors: Monique Timmer, Instructor ERC / NRR CPR-Instructor

Even from the other side of the world, you can learn how to save a life from your own home. You only need a smartphone with the right app and either a cuddly toy, a pillow, a duvet, or a sleeping bag.

Through an online training, the theory will be explained and all over the world we are going to practice the associated skills. It's a hands only training. After the workshop you can get reference work and a diploma.

We look forward to seeing you, online.

Title: Light up the tissue and brighten your parents' odds

Date: 8th and 10th of June

Department: Department of Oral and Maxillofacial Surgery, University Medical Center Groningen

Supervisors: J. Vonk, MD/Phd Student, P. Steinkamp, MD/PhD Student, J. de Wit, MD

The ultimate surgical goal in surgical oncology is resection of all tumor tissue, while preserving adjacent healthy tissue. The presence of tumor-positive surgical margins significantly decreases survival in a variety of solid tumors. However, intraoperative tumor delineation is performed with ancient techniques: human vision and tactile information.

Although conventional imaging techniques, such as CT and MRI, support the surgeon by providing preoperative information, reliable imaging techniques that can provide information on the resection margins during surgery are lacking. In the University Medical Center Groningen(UMCG), we have one of the world's pioneering research groups in fluorescence-guided surgery. Here, we lighten up the tumor with the use of targeted fluorescent tracers and enhance the contrast between tumor and adjacent tissue. The main goal is to improve tumor visualization where it is needed most: the surgical theatre. Before surgery, patients are administered with the tracer and with dedicated fluorescence camera systems. This allows us to directly visualize these tumor-specific tracers intra-operatively and provide direct surgical margin evaluation. During this workshop, you will be able to track tumors in a phantom model and try to resect all of these with the aid of our dedicated fluorescence camera systems.

Workshops

Title: Speeddating with researchers

Date: 8th and 9th of June

During this workshop you will get the chance to get in touch with researchers from the different Research Institutes of the UMCG (more information about the UMCG Research Institutes can be found under "Research in Groningen" on our website). The researchers will tell you everything about their current research projects, their departments and what it is like to do research (at the UMCG). You can choose the research (sub)topics of your own interest! Therefore you have the chance to meet the expert in the UMCG in your field of expertise.

This workshop is meant for presenting students interested in (doing) (PhD-)research at the UMCG. Everyone will be able to talk to three different researchers. You might want to exchange some contact information during that time for any future correspondence. Do not underestimate the possibilities of what these short introductions and first impressions can offer you. Please note that research in the UMCG is performed mainly by PhD/master students and covers the entire range of (bio)medical sciences. Research involving patient contact and/or performing a residency is very difficult. You will receive detailed information about the researchers and departments participating in this workshop several weeks before the congress. Afterwards, you can get a list of all the email addresses for you in order to contact the Research Institute of your choice in the future.

The registration for this workshop stops at the 28th of April. This is in order for us to find the best match between you and a researcher from the UMCG. For the online workshops we will work with time slots. Every discipline will have 15 minutes to give a short presentation and answer questions afterwards. The time slots will be posted on the website as soon as possible.

Title: Transgender: a debate with the UMCG gender team

Date: 8th of June

Department: Genderteam UMCG (gynaecology and plastic surgery)

Supervisor: A. G. Schuringa

Transgender people experience a mismatch between their gender identity or gender expression and their assigned sex. Transgender is an umbrella term, because in addition to including trans men and trans women (whose binary gender identity is the opposite of their assigned sex), it may also include gender queer people (whose identities are not exclusively masculine or feminine, for example: bigender, pangender, genderfluid, or agender).

Since the late '70s the University Medical Center Groningen (UMCG) in the Netherlands offers a treatment programme for transgenders, according to the professional standards of the World Professional Association of Transgender Health (WPATH). Once patients have been diagnosed with gender dysphoria by the psychiatrist, the 'real life phase' starts. This includes living their gender identity and cross sex hormone therapy. When the 'real-life phase' has been followed through with success, one can apply for sex reassignment surgery. After these operations, lifelong continuation of cross sex hormone therapy is needed to maintain secondary sex characteristics of the desired gender.

What does the transition contain and cause physically, mentally, and socially and how can we guide the patients in this process? During this workshop you will be able to ask questions to a member of the UMCG Genderteam and a transgender patient.

Workshops

Title: Crime scene or no crime scene?

Date: 8th of June

Department: Community Health Service (GGD) Groningen

Supervisor: Taco van Mesdag and Tatjana Naujocks, both MD forensic medicine

Finding a dead person requires further investigation. In the first place it is necessary to be sure a person is dead indeed. Secondly, it is important to find out whether a person died from natural causes or not. Last but not least, declaring a person dead and signing the death certificate requires certainty about the identity of the person you want to declare dead. Making mistakes in these situations creates a lot of problems for the 'living-dead' person.

During this workshop we will present one crime scene investigation, not as you see them on TV, but as we see them in real life. Questions like what happened here, when did it happen, why did it happen and to whom did it happen will have to be answered.

Real forensic investigators will be present to join us in the investigation. The body – of course – won't be real, but will be represented by two LOTUS-volunteer. LOTUS is an organization that participates in all kinds of training where casualties/victims are needed, dead or alive. They do a perfect job by playing their roles lifelike, or in our case deathlike.

Title: Surgical anatomy of the heart and surgical treatment of end-stage heart failure: LVAD

Date: 9th of June

Department: Cardiothoracic Surgery, UMCG

Supervisor: M. Kuijpers MD, W. Bouma MD PhD

Heart failure is an increasing world-wide problem. Until recently, heart transplantation was the only effective option to prolong survival of patients with end-stage heart failure. Nowadays it can be treated by implantation of a left ventricular assist device (LVAD). In this workshop the problem of end-stage heart failure, the relevant cardiac anatomy, and concepts of different types of left ventricular assist devices will be discussed (emergency implantation and destination therapy). The implantation technique of an internal LVAD used for destination therapy will be shown. After this workshop, medical students will understand the entity of heart failure and the concepts and problems related to LVAD therapy.

Wednesday June 9th

Title: Introduction to medial radiography

Date: 9th of June

Department: Radiology, UMCG

Supervisors: A. van Hulzen MSc

At every radiology department in the world radiography is the trusted workhorse of medical imaging since the discovery of X-rays in 1895. Today most radiographic systems are fully digital, and the technique has matured to a steady level. In this workshop basic principles of radiographic imaging are explained and examples from daily practice are demonstrated with the help of life like phantoms. After this workshop participants will have a basic understanding of the use of X-rays in radiography. The relation between dose and image quality and the different factors that influence image quality are explained and demonstrated.

Workshops

Title: Dissection of the human brain

Date: 9th of June

Department: Biomedical Sciences of Cells & Systems, section Anatomy & Medical Physiology

Supervisors: J. Georgiadis PhD, G. Ruesink MSc

Dissection of the human body in general and of the brain in particular is an underexposed part of the average medical curriculum. In this context, the workshop “Dissection of the human brain” will address this omission. The workshop will be organised as a livestream from the dissection room of the Anatomy Department of the UMCG and is especially intended for students with a specific interest in the brain. The workshop will start with inspection of the external parts of the human brain. The morphology of meninges, blood vessels and, neocortical areas are central topics. Subsequently, transversal and horizontal sections of fixated human brains will be used to inspect the inner parts of the brain. Attention will be paid to the three-dimensional location of the cortical, extrapyramidal and, limbic structures. At the end of the workshop students will have gained a better insight in the structure and function of the human brain.

Title: Speeddating with researchers

Date: 8th and 9th of June

During this workshop you will get the chance to get in touch with researchers from the different Research Institutes of the UMCG (more information about the UMCG Research Institutes can be found under “Research in Groningen” on our website). The researchers will tell you everything about their current research projects, their departments and what it is like to do research (at the UMCG). You can choose the research (sub)topics of your own interest! Therefore you have to the chance to meet the expert in the UMCG in your field of expertise.

This workshop is meant for presenting students interested in (doing) (PhD-)research at the UMCG. Everyone will be able to talk to three different researchers. You might want to exchange some contact information during that time for any future correspondence. Do not underestimate the possibilities of what these short introductions and first impressions can offer you. Please note that research in the UMCG is performed mainly by PhD/master students and covers the entire range of (bio)medical sciences. Research involving patient contact and/or performing a residency is very difficult. You will receive detailed information about the researchers and departments participating in this workshop several weeks before the congress. Afterwards, you can get a list of all the email addresses for you in order to contact the Research Institute of your choice in the future.

The registration for this workshop stops at the 28th of April. This is in order for us to find the best match between you and a researcher from the UMCG. For the online workshops we will work with time slots.

Every discipline will have 15 minutes to give a short presentation and answer questions afterwards. The time slots will be posted on the website as soon as possible.

Workshops

Title: Interactive trauma lecture

Date: 9th of June

Department: Orthopaedics

Supervisor: Patrick Nieboer MD

The topic of the interactive trauma lecture will be: Dealing with dilemmas in the emergency room. You are the on call surgeon and disaster strikes. What choices do you make? A trauma surgeon will discuss and guide you through the different dilemmas from the Emergency room. As a group you will make the choices of the trauma surgeon and the right course of action will be explained.

Title: Surgical anatomy of the heart and surgical treatment of atrial fibrillation

Date: 8th of June

Department: Cardiothoracic Surgery, UMCG

Supervisor: Prof. M. Mariani MD PhD, W. Bouma MD PhD

Atrial fibrillation is an increasing world-wide problem and is associated with significant morbidity and mortality. In this workshop the basic anatomy of the heart and its relationship with the etiology and pathophysiology of atrial fibrillation will be discussed. A basic understanding of cardiac anatomy is essential in understanding atrial fibrillation and the different surgical treatment modalities. The different surgical treatment modalities for atrial fibrillation will be explained and shown during this workshop. Advantages and disadvantages of these techniques will be discussed. After this workshop, medical students will understand the basics of atrial fibrillation and its surgical treatment.

Thursday June 10th

Title: Plastic surgery: tissue expander and hand exam

Date: 10th of June

Department: Plastic Surgery, UMCG

Supervisor: V.C. van Aalst MsC

Plastic surgeons perform a variety of different reconstructive and aesthetic procedures. These vary from basic wound care to extensive reconstructions after tissue loss or removal due to trauma or disease, like cancer. At the University Medical Center Groningen (UMCG) we collaborate with many different medical specialists. Considering the high incidence of breast cancer (more than 1 in 8 women will have breast cancer in their life time), a large part of our practice focuses on breast reconstruction after cancer removal. For this reconstruction, we not only have the option of using patients' own tissue, but also implants. A tissue expander is a temporary implant which we use to expand soft tissue to create a pocket for a permanent implant. Another focus of our practice is hand surgery. To be able to make a correct diagnosis and choose to appropriate (surgical) treatment it is important to perform a detailed and comprehensive exam of the hand. There are two main goals of this workshop. First, to familiarize participants with different treatment options available for breast reconstruction. Specifically, the participants will learn how to use (and fill) a tissue expander. Secondly, they will learn how to perform a detailed and comprehensive hand exam.

Workshops

Title: Inside the psychotic experience

Date: 10th of June

Department: Psychiatry, UMCG

Supervisor: F. D. van Es MD

Psychosis is a generic psychiatric term for a mental state often described as loss of contact with reality. Patients experiencing psychosis may report hallucinations (seeing or hearing things that are not there) or delusional beliefs (false beliefs about what is taking place or who one is). The combination of both often cause a severe disruption of perception, thinking, emotion and behaviour. Depending on its severity, a psychotic episode may thus be accompanied by unusual or bizarre behaviour, as well as difficulty with social interaction and impairment in carrying out daily life activities. As a result, patients with psychosis are caught in a hostile environment. They are therefore in need of your dedication and medical skills: how can you meet their needs? How can you avoid stigma and promote health and social recovery? During this workshop you will be able to ask questions to a psychiatrist and a patient who has suffered from psychosis.

Title: Basic Life Support: Heroes are not born, they are trained

Date: 8th and 10th of June

Department: Wenckebach Institute for Education and Training

Supervisors: Monique Timmer, Instructor ERC / NRR CPR-Instructor

Even from the other side of the world, you can learn how to save a life from your own home. You only need a smartphone with the right app and either a cuddly toy, a pillow, a duvet, or a sleeping bag. Through an online training, the theory will be explained and all over the world we are going to practice the associated skills. It's a hands only training. After the workshop you can get reference work and a diploma. We look forward to seeing you, online.

Title: Light up the tissue and brighten your parents' odds

Date: 8th and 10th of June

Department: Department of Oral and Maxillofacial Surgery, University Medical Center Groningen

Supervisors: J. Vonk, MD/Phd Student, P. Steinkamp, MD/PhD Student, J. de Wit, MD

The ultimate surgical goal in surgical oncology is resection of all tumor tissue, while preserving adjacent healthy tissue. The presence of tumor-positive surgical margins significantly decreases survival in a variety of solid tumors. However, intraoperative tumor delineation is performed with ancient techniques: human vision and tactile information.

Although conventional imaging techniques, such as CT and MRI, support the surgeon by providing preoperative information, reliable imaging techniques that can provide information on the resection margins during surgery are lacking. In the University Medical Center Groningen (UMCG), we have one of the world's pioneering research groups in fluorescence-guided surgery. Here, we lighten up the tumor with the use of targeted fluorescent tracers and enhance the contrast between tumor and adjacent tissue. The main goal is to improve tumor visualization where it is needed most: the surgical theatre. Before surgery, patients are administered with the tracer and with dedicated fluorescence camera systems. This allows us to directly visualize these tumor-specific tracers intra-operatively and provide direct surgical margin evaluation. During this workshop, you will be able to track tumors in a phantom model and try to resect all of these with the aid of our dedicated fluorescence camera systems.

Workshops

Title: Artificial intelligence in Medicine - an interactive workshop

Date: 10th of June

Supervisor: G. Markousis-Mavrogenis MD/PhD Student

Artificial intelligence (AI) is playing an increasingly important role in medical research in recent years. However, adoption of AI-related solutions in clinical practice remains challenging, primarily because of unfamiliarity with the concepts behind AI. In this interactive workshop, given by the co-chair of the Groningen student association for AI in medicine (AiMED), we will try to demystify AI by discussing some of its introductory concepts. Furthermore, we will discuss its potential applications in medical research and practice. In addition to that, we will discover how you can integrate AI into your research.



Social Programme

Haka

Haka, the world-famous dance from New-Zealand, is now available as an online workshop via ZOOM! During the workshop we will teach you the most famous Haka: The Ka Mate! The workshop consists of history, background stories and lots of practicing with movements and the Haka itself. We will begin at a slow pace to get used to the rhythm and form. Then we will add more moves, calls and of course stick out our tongues (one of the famous characteristics of Haka). The participants will challenge each other and each get time to perform their dance. The duration of this workshop is 45- 60 minutes. You will need a laptop with audio and a webcam. The workshop will be given in English.

Cartoon

Cartoon drawing is not only for cartoonists. A few lines, an idea and some humour will already go a long way, even if you think you can't draw! Participate and see for yourself. We will do this in a special online workshop: together with other participants you will log in to Zoom and via videocall we will do an online training. We will explore the power of cartoons and then practice your drawing skills. With a pen and paper you will practice drawing techniques to draw a cartoon all by yourself. We will teach you how you can capture the world in a catchy, powerful cartoon. The duration of this workshop is 60 minutes. You will need a laptop with audio and a webcam, a pen/ pencil and paper. The workshop will be given in English.

Improv

During this improvisation workshop you will work as a team with techniques used in comedy theatre and improvisation. In a light-hearted and easy flowing manner, the basic techniques of improv theatre will be explained to you. Techniques such as letting go, listening, working together, and accepting and appreciating others will be combined to create a beautiful improvised scene. In this fun session the participants will feel a sense of 'togetherness,' even though you are in your own home. The duration of this workshop is 60 minutes. You will need a laptop with audio and a webcam. The workshop will be given in English.



Plenary Session

Presenters:

Zhang, J. (Junsheng) MD

Tasić, I. (Isidora)

Muhammad, A.R.M. (Akbar Reza)

Chelchowska, A. (Anna)

Schaafsma, I.J. (Irene)

Szergyuk, I. (Ivan)

Nkansah, C.N. (Charles)

Stratilová, M. (Mária)

Alonso, A. (Alberto)

Mazzoleni, A (Adele)

Pradipta, BPAP (Bernardinus)

Verheijen, F.W.M (Fenne)

Yamashita, Y. (Yoko)

Escobar-Chaves, E.L (Elkin Leandro)

Survival outcomes after breast-conserving therapy compared with mastectomy for patients with early-stage metaplastic breast cancer: a population-based study of 2412 patients

Zhang, J. (Junsheng) MD¹, Yang, C. (Ciqiu) MD, PhD¹, Wang, K. (Kun) MD, PhD¹

¹ Guangdong Provincial People's Hospital, Department of Breast Cancer, Guangzhou, China

Introduction

Previous studies revealed that patients with early-stage metaplastic breast cancer (MBC) underwent mastectomy more often than breast-conserving therapy (BCT) mainly due to the larger tumor size. This study was performed to compare the survival outcomes following BCT versus mastectomy for patients with early-stage MBC.

Materials & Methods

Surveillance, Epidemiology, and End Results (SEER) database was used to identify women diagnosed with early-stage MBC (T1-3N0-3M0) between 2001 and 2016, who were treated with either BCT or mastectomy. We assessed overall survival (OS) and breast cancer-specific survival (BCSS) using the Kaplan-Meier method and hazard ratios using Cox proportional hazards models.

Results

A total of 2412 MBC patients were identified, 881 (36.5%) of whom underwent BCT and 1531 (63.5%) underwent mastectomy. The median follow-up time was 73 months. Most of patients had older age (≥ 50 years old), larger tumor size, higher American Joint Committee on Cancer (AJCC) stage and hormone receptor negativity. After adjustment for confounding variables, patients who underwent BCT had significantly improved OS (5-year OS: 84.3% vs 62.5%; 10-year OS: 73.0% vs 52.1%; adjusted HR=0.76, 95%CI: 0.59-0.97, $p=0.026$) and BCSS (5-year BCSS: 89.1% vs 70.8%; 10-year BCSS: 83.9% vs 67.5%; adjusted HR=0.71, 95%CI: 0.53-0.95, $p=0.023$) than those who underwent mastectomy, and this improvement remained significant for all T and N stages of MBC except for N2-3 stage.

Conclusion

BCT conferred improved OS and BCSS compared with mastectomy for patients with early-stage MBC, and the improvement persisted in almost all of the subgroups of different T and N stages.

Oxidative/nitrosative stress parameters and the expression of HIF-1 α in rat liver subjected to ischemia-reperfusion injury: the role of prostaglandins

Tasić, I. (Isidora)¹, Stojiljković, B.¹, Stojanović, N.¹

¹ Medical Faculty University of Nis, Physiology, Nis, Serbia

Introduction

Liver ischemia-reperfusion injury (IRI) is a process where after the initial ischemic injury the reflow of blood (reperfusion) induces further tissue damage. Hypoxia-inducible factor-1 α (HIF-1 α) has been reported to have an important role in the pathophysiology of IRI, as well as do oxidative and nitrosative stresses. Indomethacin is a drug belonging to the NSAID group, whose effects in the IRI model are not fully investigated, nor understood. The aim of the present study was to examine how prostaglandin depletion, which occurs after indomethacin application, affects HIF-1 α expression, and 4-hydroxynonenal (4-HNE) and 3-nitrotyrosine (3-NT) presence in rat liver subjected to IRI.

Materials & Methods

The study was conducted on 30 male Wistar rats evenly distributed into five groups: (I) the negative control group (animals not subjected to incision or IRI), (II) the sham-opened group (subjected to incision, but not IRI), (III) the positive control group (subjected to IRI), (IV) the vehicle-treated group (subjected to IRI), and (V) the experimental group (before being subjected to IRI, the animals were given indomethacin in a dose of 5 mg/kg). Liver tissue expression of HIF-1 α , and the occurrence of 4-HNE or 3-NT was quantified using ImageJ software and the obtained results were compared using ANOVA and Tukey's post-hoc test.

Results

We found that IRI leads to a statistically significant increase in HIF-1 α expression, 4-HNE and 3-NT levels in the groups III and IV, compared to the control group. The application of indomethacin had no statistically significant effect on HIF-1 α expression in comparison to the control and IRI (III) groups. Contrastingly, both 4-HNE and 3-NT were found to be statistically significantly decreased in group V in comparison to group III (IRI control).

Conclusion

Our results indicate that indomethacin-induced prostaglandin depletion does not prevent an increase in liver HIF-1 α expression but prevents oxidative and nitrosative liver cell damage that follows IRI. These results suggest that prostaglandins are associated with oxidative and nitrosative tissue damage occurring during IRI, which are most probably not mediated by HIF-1 α .

The Optimum Effect of Fucoidan from Sargassum sp. Extract as a Mesenchymal Stem Cells (Mscs) Mobilization Promotor in Osteoarthritis Joints Regeneration: An In Vivo Studies

Muhammad, A.R.M. (Akbar Reza) S.Ked¹, Zulfikar, M.Q.B.Z (Mohammad Qoimam Bilqisthi) S.Ked¹, Arifin, S.A. (Syaiful) MD, M.Biomed², Irawan, D.I. (Danny) MD, Sp.PD³, Guritno, T.G. (Theofilus)⁴, Syafira Idhatun, S.I.N (Nasyiah)⁴, Aulia, N.A.A. (Nur Alma)⁴, Bramantyo, B.B.B. (Bernadus Bernardino)⁴, Martin, A.M.M. (Amandus Michael)⁴, Kristi, B.K. (Brenda)⁴

¹ Universitas Nahdlatul Ulama Surabaya, Medical Study Program, Surabaya, Indonesia

² Universitas Brawijaya, Master of Biomedical Sciences Study Program, Malang, Indonesia

³ Universitas Nahdlatul Ulama Surabaya, Departement of Internal Medicine, Surabaya, Indonesia

⁴ Universitas Brawijaya, Medical Study Program, Malang, Indonesia

Introduction

In the aging process, osteoarthritis is a major problem of morbidity increased risk. However, the current treatment methods are still limited in symptom reduction and surgical therapy which is considered ineffective and tends to be expensive. By utilizing the regeneration concept of Mesenchymal Stem Cells (MSCs), this study aims to prove the potential effects of Fucoidan contained in Sargassum sp.

Materials & Methods

An experimental study with a randomized post-test only control group design was performed on nine groups of male Wistar rats, each of which consisted of four rats (n=4). Nine groups were divided into one negative control group, one positive control group, one steroid therapy control group, and the rest was intra-articular injection treatment group with fucoidan doses of 20, 40, and 60 mg/kg BW and a combination of dexamethasone (steroid) optimal dose (10 mg/kg BW) + Fucoidan doses of 20, 40 and 60 mg/kg BW. We measured the reduction in joint diameter by Fucoidan and/or steroids injection after osteoarthritis induction by CFA injection. The results were analyzed using one-way ANOVA with SPSS 18

Results

This study showed that the therapy effect on rat's joint diameter, in general, had a significant p-value = 0.000 (Anova, p<0.05). The steroid control group was able to reduce the size of the rat's joint diameter, but it did not approach normal rats with a p-value = 0.012 (post hoc, p<0.05). There was no significant difference between the negative control group and the treatment group (post hoc, p>0.05). And when compared with the positive control group, the most significant difference found in the Fucoidan treatment group with a dose of 40 mg/kg BW

Conclusion

In conclusion, we found that Fucoidan can be optimized to promote Mesenchymal Stem Cells (MSCs) mobilization by regenerating joints damaged by osteoarthritis. Evidenced by reducing the swollen joint diameter in the osteoarthritis rat model to near normal compared to the positive control group. However, this research still able to continue until the most suitable dose founded for human application

Developing a novel CRISPR/Cas9-based tool to investigate macrophage-derived collagen deposition during cardiac regeneration in zebrafish

Chelchowska, A. (Anna)¹, Simões, F. (Filipa) PhD², Sauka-Spengler, T. (Tatjana) Professor²

¹ University of Oxford, Medical Sciences Division, Oxford, United Kingdom

² University of Oxford, The MRC Weatherall Institute of Molecular Medicine, Oxford, United Kingdom

Introduction

The adult human heart cannot regenerate after a myocardial infarction (MI) and the subsequent wound healing process is associated with the formation of a permanent fibrotic scar. Unlike humans, zebrafish possess a remarkable capacity for heart regeneration, despite a transient scar formation. Thus far, macrophages have been believed to indirectly contribute to the cardiac fibrotic response through recruitment and activation of fibroblasts into collagen-synthesising myofibroblasts. Transcriptome analysis previously performed by our lab revealed that macrophages may also directly synthesise collagen during the transient fibrosis in cryoinjured zebrafish hearts. In this study we aimed to test this hypothesis at a protein level by using a new CRISPR/Cas9-based tool to tag two collagen genes with a fluorescent reporter, Citrine.

Materials & Methods

We used a novel "Trio" gene trapping strategy to label two zebrafish collagen genes, col1a1b and col4a1, with an in-frame endogenous Citrine tag. We first tested the on-target cleavage efficiency of the sgRNAs by means of two methods - T7 endonuclease I (T7EI) assay and high-resolution melt analysis (HRMA). We subsequently performed an adoptive transfer of FACS-purified macrophages from the Trio-trapped embryos into wild type (WT) cryoinjured adult fish to investigate whether macrophage-origin fluorescent fusion collagens were being deposited at the site of cardiac damage.

Results

T7EI assay together with HRMA allowed us to identify the sgRNAs with the highest on-target cleavage efficiency for both col1a1b and col4a1. Live confocal imaging of Trio-injected embryos that had their tails clipped at 6 days post-fertilisation confirmed that the Trio trapping approach was successful *in vivo* and that macrophages may indeed have a collagen-synthesising role in an injury setting. Lastly, confocal imaging following the adoptive transfer experiment confirmed deposition of the green Citrine-labelled fibrils of col1a1b and col4a1 by macrophages at the site of cardiac cryoinjury at 14 days post-injury.

Conclusion

This study showed that Trio trapping is a new promising gene editing tool to visualise full-length, functional proteins *in vivo*. Moreover, this is the first demonstration of macrophages' ability to directly contribute collagen to scar formation following cryoinjury in zebrafish. In the future our findings could lead to the development of new therapeutic solutions for post-MI patients.

Pregnant women with perianal Crohn's disease: suggestions for the improvement of the current guideline on delivery method

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¹ *Rijksuniversiteit Groningen, Abdominal surgery, Groningen, Netherlands*

² *UMCG, Abdominal surgery, Groningen, Netherlands*

³ *UMCG, Gastro-intestinal medicine, Groningen, Netherlands*

⁴ *UMCG, Gynaecology, Groningen, Netherlands*

Introduction

Pregnant women with active perianal Crohn's disease (CD), have an indication for a caesarean section according to the current ECCO guidelines. This advice is based on the assumption that vaginal delivery leads to exacerbation of perianal disease and to worsening of faecal continence. However, there is no strong evidence to support this. This study aims to examine the effects of delivery method on perianal disease progression and faecal incontinence in women with perianal CD.

Materials & Methods

In this retrospective cohort study, 209 women were selected from a large IBD database within a tertiary hospital in the Netherlands. All women are aged >18 years, have perianal CD, and have at least one child. In addition, 102 women of this cohort completed a questionnaire. Faecal continence was scored using the Vaizey-score. Descriptive analysis using SPSS and linear regression analysis were performed. The outcome was corrected for the years after delivery (median 15, range 0-55). p-values <0,05 were considered statistically significant.

Results

The caesarean section rate within this cohort was 27,8%, which is high when compared the general Dutch population (14%). Within the group of women who delivered at least one child vaginally (n=84), 25,5% reported an alteration of faecal continence, compared to 18,8% of the women who never had a vaginal delivery (n=18). No significant relation between mode of delivery and faecal continence was found (B 0,97 [-1,19-3,14] p 0,375). The average Vaizey-score within this cohort in women who delivered solely through caesarean section had a median Vaizey-score of 5 (range 0-12). Women who had at least one vaginal delivery had a median Vaizey-score of 7 (range 0-20). In a large study amongst the general Dutch population (n=1259) a median Vaizey-score of 11 (range 0-17) was reported.

Conclusion

Faecal incontinence after vaginal delivery in CD women with perianal fistula is not significantly increased. Therefore the current guideline to advice a caesarean section should be adjusted and other factors such as the location of the fistula should be taken into account. To draw solid conclusions, better registration of fistula location and objective documentation of fistula activity (using PDAI-score) and stool consistency is needed.

Google Trends predict the epidemiological trajectory of Coronavirus Disease 2019 (COVID-19) in Poland

Szergyuk, I. (Ivan)¹, Henry, B.M. (Brandon) Dr², de Oliveira, M.H.S. (Maria)³, Lippi, G. (Giuseppe) Prof.⁴, Mikos, M. (Marcin)⁵, Juszczak, G. (Grzegorz)⁶

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⁶ Medical University of Warsaw, Department of Public Health, Warsaw, Poland

Introduction

Internet user data has been widely employed as a forecasting tool to predict infectious outbreaks such as Influenza. Shortages in test kits and lack of preparedness for surges in infection rates during the current coronavirus disease 2019 (COVID-19) pandemic has pointed to the need for alternative surveillance methods to anticipate these outbreaks. We analyzed the performance of Google Trends at predicting weekly COVID-19 cases in Poland based on past surveillance data.

Materials & Methods

Google Trend scores for Polish search terms pertaining COVID-19 symptoms were correlated with number of new weekly COVID-19 cases in Poland, using cross correlation analysis to determine the time lag required to provide the highest correlation between the variables. Then, time series linear regression for Google Trend data was performed to identify whether there is a statistically significant fit between the model and actual surveillance data, and at which time lag.

Results

Statistically significant correlations were found between all symptoms and new weekly COVID-19 cases. Cross correlation analysis revealed that this association was the strongest for anosmia and dysgeusia, both at one-week lag ($r=0.91$, 95% CI, 0.72-1, $P<0.001$ and $r=0.93$, 95% CI, 0.74-1, $P<0.001$, respectively). The rest of the symptoms had weaker correlations (r between 0.41-0.85). Time series linear regression analysis produced fitted models with a near perfect fit ($R^2=0.99$ for smell loss, $R^2=0.98$ for taste loss). Statistically significant coefficient values were found for taste loss both at one- and two-week delays (111.5, 95% CI, 65.4-157.6, $P<0.001$ and 251.2, 95% CI, 201.2-301.1, $P<0.001$), whilst for smell loss only at two-week delay (340.7, 95% CI, 327.2-354.2, $P<0.001$).

Conclusion

Google Trends for anosmia and dysgeusia have a high predictive power for anticipating new COVID-19 cases 1-2 weeks ahead of official reports in Poland, serving as a useful infodemiological tool for predicting an impending outbreak, with the potential of providing valuable buffer time to allocate necessary supplies and personnel to hospitals expecting a surge in COVID-19 patients. Upon verification by prospective research comparing model performance in different regions of Poland, public health organizations are encouraged to take advantage of this free forecasting system to anticipate and effectively manage COVID-19 outbreaks throughout Poland.

Plasminogen activator inhibitor-1 in poorly controlled type-2 diabetes mellitus patients; a cross-sectional study in a district hospital in Ghana

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⁵ Pan African University of Life and Earth Sciences Institute, University of Ibadan, Obstetrics and Gynaecology, Ibadan, Nigeria

Introduction

Hypofibrinolysis resulting from the up-regulation of plasminogen activator inhibitor-1 (PAI-1) usually occurs in patients with type 2 diabetes mellitus (T2DM), rendering them hypercoagulable. This study assessed the plasma antigen and activity levels of the PAI-1 enzyme in T2DM patients in a district hospital in Ghana.

Materials & Methods

This was a hospital-based cross-sectional study conducted from December 2018 to May 2019 at Nkenkaasu District Hospital. Sixty subjects with T2DM (30 T2DM subjects with good glycaemic control and 30 with poor glycaemic control), and 30 non-diabetic subjects were recruited into the study. Blood specimens were collected for complete blood count, lipid profile, PAI-1 Ag and PAI-1 activity levels. A pre-tested questionnaire was used to obtain demographic and clinical information. The data was analysed using SPSS version 22.0.

Results

Elevated PAI-1 Ag and activity levels were observed in the T2DM subjects compared to the non-diabetics, with the levels and activity significantly higher (PAI-1 Ag ; $p < 0.001$, PAI-1 activity level; $p = 0.004$) in the T2DM subjects with poor glycaemic control in comparison to those with good glycaemic control. A significant positive correlation was observed between HbA1c and PAI-1 enzymes. PAI-1 Ag levels significantly increased along with increased total cholesterol ($B = 0.262$, $p = 0.033$), triglyceride ($B = 0.785$, $p = 0.000$) and VLDL-c ($B = 0.167$, $p = 0.026$). Similarly, PAI-1 activity level was associated with total cholesterol ($B = 0.325$, $p = 0.009$) and triglyceride ($B = 0.762$, $p = 0.000$).

Conclusion

PAI-1 antigen/activity is enhanced in poorly controlled Ghanaian T2DM subjects. The hypercoagulable state of the affected individuals put them at higher risk of developing cardiovascular diseases. Good glycaemic control to regulate plasma PAI-1 levels is essential during T2DM lifelong management. Markers of fibrinolysis should be assessed in these individuals and appropriate anticoagulants given to prevent thrombosis and adverse cardiovascular diseases.

Macrophage polarization is associated with intracranial aneurysm rupture

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Introduction

Rupture of intracranial aneurysm (IA) cause one of the most severe forms of stroke with usually serious neurological consequences for patients. Inflammation seems to drive aneurysm formation and progression and macrophages play a crucial role in this process, but less is known about their mechanism in aneurysm rupture. This study aims to elucidate macrophage subtypes' relationship with respect to aneurysm structure leading to aneurysm rupture.

Materials & Methods

Forty-one saccular aneurysm wall samples were studied (thirteen ruptured aneurysms); eleven samples from similar locations of Willis circle without aneurysms were used as a control. The structural changes were evaluated using basic histological staining. The presence of lymphocytes was quantified by LCA antibody. Macrophages in the aneurysm wall were quantified and defined as M1 (pro-inflammatory subtype) and M2 (reparative subtype) using HLA-DR antibody and CD163 antibody, respectively. Data were analyzed by the Mann-Whitney U test.

Results

This study has shown the association between severity of structural changes and inflammatory cell infiltration in the aneurysm wall. More severe morphological changes and significantly higher numbers of inflammatory cells were observed in ruptured IAs ($p=0.0002$). There was the prevalence of M2 (reparative) macrophage subtype in ruptured aneurysms ($p=0.0006$). A subgroup of UIAs with morphological and inflammatory changes similar to ruptured IAs was observed. The common feature of this subgroup was the presence of intraluminal thrombus.

Conclusion

Degree of inflammatory cells infiltration and the ratio of M2:M1 macrophage phenotypes toward M2 macrophages could play an important role in structural changes of aneurysm wall leading to aneurysm rupture.

Anesthetic Preconditioning with Sevoflurane, Administration of Lidocaine and Ex-Vivo Lung Perfusion can control Ischemia-Reperfusion damage secondary to Lung Transplantation

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Introduction

In lung transplantation, the injury secondary to ischemia-reperfusion (I/R) has been identified as one of the main causes of primary acute rejection. Analyzing the entire surgical process, we found three critical moments: anesthetic preconditioning (APC), the preservation of organs until transplantation and the surgical process itself.

Firstly, APC attenuates inflammatory response during ischemia-reperfusion lung injury, however, the involved molecular mechanisms are not fully understood.

Secondly, Micro RNAs (miRNAs), contribute to induce a I/R lesion and, although it has been shown that lidocaine has anti-inflammatory activity in various tissues, its ability to modulate miRNAs has not been investigated.

Finally, PPAR α and PPAR γ have been implicated as regulators of different inflammatory processes and ex-vivo-lung-perfusion (EVLP) aims to modulate their expression.

Objectives:

- 1) To analyze the molecular mechanisms behind the protective effects of APC with sevoflurane (SEVO), focusing on MAPKs, NF- κ B and apoptosis.
- 2) To investigate the role of miRNAs in (I/R) lung damage and the effect of lidocaine administration (LIDO).
- 3) To study the changes in the expression of PPAR α and PPAR γ and the EVLP modulation.

Materials & Methods

Three independent lung autotransplant models were designed: SEVO, LIDO and EVLP with Large-White pigs (SEVO&LIDO) and minipigs (EVLP). Lung biopsies, hemodynamic measurements of arterial gases and blood samples were performed.

Biochemical mediators were analyzed by ELISA, Western-Blot and RT-QPCR and compared by parametric and non-parametric tests.

Results

SEVO: SEVO group showed after 30' of reperfusion significantly ($p < 0,05$) lower values of MAPK-p38, MAPK-P-p38, JNK, NF- κ B and caspase-9 than pigs anesthetized with intravenous propofol.

LIDO: 8 miARNs increased significantly 60' after reperfusion and 4 miARNs increased 30' and 60' after reperfusion (Control \leftrightarrow Sham $p < 0,001$). The administration of lidocaine attenuated these changes (Control \leftrightarrow Lidocaine $p < 0,001$).

EVLP: Protein expression of PPAR α and PPAR γ decreased significantly ($p < 0,01$) after reperfusion. This effect was partially blocked by EVLP ($p < 0,05$)

Conclusion

SEVO: APC with sevoflurane during experimental lung autotransplant was associated with attenuation of MAPKs, NF- κ B pathways and antiapoptotic effects.

LIDO: Intravenous administration of lidocaine reduced the inflammatory (I/R) response by significantly reducing/cancelling the alterations of miARNs observed in control group.

EVLP: PPAR α and PPAR γ may be involved in the inflammatory response by (I/R) and EVLP can prevent these alterations.

Correlating Presynaptic Structure and Function with Functional Imaging and Super-resolution Microscopy

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Introduction

Correlating presynaptic structure and function poses a challenge. Presynaptic function can be imaged by using genetically-encoded-reporters of presynaptic calcium influx and/or neurotransmitter release. However, structural descriptions of the synapse are limited by the diffraction limit of light: conventional light microscopy cannot be utilised to study the nanoscale molecular organisation of the machinery that regulates neurotransmitter release.

Here, we have combined functional imaging with super-resolution microscopy (SRM) to correlate presynaptic function with the nanoscale organisation of the presynaptic terminal.

Materials & Methods

Wistar rat embryos were dissected at day 18, transfected with sypHy-RGECO at day in vitro 7, and live imaged at day 17-21. Each neurone was stimulated with 1 and 10 consecutive action potentials to calculate release probability from calcium influx and vesicle exocytosis.

After fixation, immunocytochemistry was used to label the synaptic vesicles tagged with sypHy in order to visualise the presynaptic terminals with d-STORM.

The live images were analysed with custom made Matlab codes. The synapses which had a significant calcium influx were used for the correlation with SRM, and analysed on the SR-Tesseler software.

A total of 1556 synapses were considered, and 31 were picked for the correlation.

Results

We were able to recognise the synapses that were imaged live also with d-STORM by using dishes with a grid localisation system.

Calcium influx and vesicles exocytosis were show to be correlated ($r=0.6975$, $P<0.0001$), but also to be heterogeneous between synapses.

Moreover, the number of presynaptic vesicles correlated with the synaptic area ($r=0.6547$, $p<0.0001$); release probability did not correlate with the total number of vesicles ($r=-0.1039$, $p=0.5758$); presynaptic areas did not correlate with the release probability ($r=-0.0874$, $p=0.6402$); calcium influx did not correlate with vesicles number ($r=-0.0061$, $p=0.9745$) nor presynaptic boutons areas ($r=0.001$, $p=0.0057$).

Conclusion

In this study, we provided proof-of-principle experiments to show the feasibility of this approach. We showed that synapses where both calcium and neurotransmitter release were measured live could then be found again to carry out super-resolution microscopy. This tool could therefore be utilised in the future, with adjustments, to study presynaptic endogenous proteins and their role in regulating probability of neurotransmitter release at the single synapse level.

“Breast Milk Excels in Preventing Intestinal Inflammation through Increasing Secretory IgA in Preterm Neonates under Different Feeding Regimens”

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Introduction

Premature birth becomes the leading cause of death among children under five. Preterm neonates are estimated to have a 35% higher risk from suffering sepsis due to inflammation, one of which is intestinal inflammation. Human breast milk contains bioactive substances including secretory IgA (sIgA), contrary to formula milk. Consequently, exclusive breast milk is expected as the primary strategy for preventing intestinal inflammation. This study aims to prove the effectiveness of breast milk to prevent intestinal inflammation in preterm neonates.

Materials & Methods

This study used a prospective cohort design. Thirty-nine preterm neonates were enrolled through consecutive sampling and divided into three groups; N1 (expressed breast milk (EBM) 8-12 times in 24 h), N2 (combination breast milk and formula), N3 (formula S26[®]; energy 82Cal/100mL; protein 2.1 g/100mL). Preterm neonates were followed up until day 7 and 14. Absolute neutrophil counts (ANC) were collected from drawn blood and measured using Automated Haematology Analyser. Secretory IgA (sIgA) and human β -defensin 2 (hBD-2) were collected in feces and measured with enzyme-linked immunosorbent assay (ELISA).

Results

Preterm neonates fed with breast milk (N1) group had significantly higher sIgA levels than other groups (day 7 (1422.15±382.98) $p = 0.000$; 0.000) (day 14 (1542.69±419.47) $p = 0.000$; 0.000). There was not any significant difference in hBD-2 levels between N2 and N3 (day 7 $p = 0.343$) (day 14 $p = 0.478$), however N1 group showed significantly lower hBD-2 compared to N2 and N3 ($p = 0.000$; 0.000). N3 group also showed highly significant ANC (day 7 $p = 0.000$; 0.013) (day 14 $p = 0.000$; 0.013). All groups indicated a very strong correlation among all variables (hBD-2, ANC, and sIgA), N1 ($p = 0.000$); N2 ($p = 0.000$); N3 ($p = 0.000$).

Conclusion

Breast milk only feeding regimen increased sIgA levels, suppressed hBD-2 levels, and stabilized ANC, while formula milk only regimen had the lowest sIgA levels and tended to increase the inflammatory marker in preterm neonates. Therefore, breast milk can prevent intestinal inflammation in preterm neonates through increasing sIgA.

Characterization of the aged macrophage in experimental atherosclerosis

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Introduction

Aging is one of the most dominant risk factors for the development of atherosclerotic cardiovascular disease, which is the leading cause of death worldwide. Therefore, enhancing our knowledge of the impact of aging on atherosclerosis is a major healthcare priority. Macrophages play a cardinal role in atherosclerosis through foam cell formation and secretion of pro-inflammatory mediators. Although aging increases myeloid output, the effect of aging on macrophage phenotype and functionality in atherosclerosis remains unknown. In this study, we provide proteomic and transcriptomic insights in age-associated changes in macrophages in the context of atherosclerosis.

Materials & Methods

In order to gain more insights on the influence of aging on the immune landscape of murine atherosclerotic lesions we performed a Single-cell RNA sequencing analysis on the atherosclerotic aortas of aged (88 weeks) low-density lipoprotein receptor (LDLr) deficient mice. The effect of intrinsic age-associated changes on macrophages was subsequently analysed by performing a qPCR analysis on bone marrow-derived immature, M1 and M2 macrophages from young and aged LDLr^{-/-} mice. Finally, flow cytometry was performed on the blood, aortas and white adipose tissue of young and aged LDLr^{-/-} mice, to evaluate the effect of advanced age on macrophage subsets at protein level.

Results

Single-cell RNA sequencing analysis of the atherosclerotic aortas of young and aged LDLr^{-/-} mice resulted in the identification of 9 distinctive myeloid subsets including, M1-like, Trem2hi and resident M2-like macrophages, each showing great resemblance to myeloid subsets from human atherosclerotic lesions. Notably, Trem2hi macrophages showed high expression of genes involved in osteoclast function, suggesting their specialized function in the calcification process and subsequent (de)stabilization of atherosclerotic lesions. Interestingly, qPCR analysis revealed that aging skewed immature bone marrow-derived macrophages towards a more foamy M2-like phenotype. This age-associated M2-like skewing was confirmed at a protein level, as flow cytometry analysis showed an increase in M2-like macrophages in the aortas and white adipose tissue of aged LDLr^{-/-} mice.

Conclusion

This study demonstrates an age-associated skewing towards M2-like macrophages in LDLr^{-/-} mice. Moreover, we uncovered the phenotypic heterogeneity of aged macrophages within murine atherosclerotic aortas and subsequently identified several enriched genes within aged macrophages as potential future targets for atherosclerosis treatment.

Gastrointestinal pathology of Parkinson's disease in an A53T transgenic mouse model

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Introduction

Non-motor symptoms (NMS) in Parkinson's disease (PD) pose a significant burden to patients and caregivers and can precede motor symptom onset by decades. However, NMS are not well-studied and are consequently under-treated. Experimental and clinical evidence shows that NMS development correlates with Braak's hypothesis, which states that Lewy bodies—the pathological hallmark of PD—originate in the gastrointestinal (GI) system and eventually invade the brain. However, several studies have also presented conflicting results. The purpose of this study is to investigate how the overexpression of alpha-synuclein, a major component of Lewy bodies, contributes to GI pathology in PD using an A53T transgenic mouse model.

Materials & Methods

Duodenum, jejunum, ileum, cecum, and colon samples were collected from 8- to 12-month-old wild-type and A53T transgenic mice. The samples were homogenized in cell lysis buffer and sequentially fractionated into soluble and insoluble lysates. Insoluble lysates were run on SDS-PAGE (4-20% gel), transferred onto nitrocellulose membranes, and immunoblotted for phosphoserine-129-alpha-synuclein and alpha-synuclein as markers of pathology progression. HPLC-ECD was used to measure monoamine levels and turnover ratio in the cecum and colon. One-way ANOVA was performed between wild-type and A53T transgenic mice for statistical analysis, followed by Tukey's multiple comparison test for post-hoc analysis.

Results

The overexpression of human mutant A53T induced a significant increase in pathological alpha-synuclein aggregations in the cecum ($p=0.0074$) and colon ($p=0.0345$) compared to the wild-type mice. However, no significant changes were observed in the duodenum, jejunum, and ileum ($p>0.05$). A53T transgenic mice also had significantly lowered monoamine levels in the colon ($p=0.0033$) compared to the wild-type mice, but no significant changes were observed in the monoamine turnover ratio ($p>0.05$).

Conclusion

The results of this study are consistent with Braak's hypothesis that PD pathology occurs in the gut. Furthermore, the A53T transgenic mouse model proves to be valuable for exploring NMS that are often untreated in PD patients. Since NMS are common across all stages of PD and can predict motor symptom onset, understanding GI pathology in PD can increase the chances of achieving reliable early PD diagnosis to improve treatment and patients' quality of life.

Development of a phytotherapeutic prototype based on triterpenes encapsulated in nanocarriers for the treatment of T2DM.

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Introduction

Type 2 diabetes mellitus (T2DM) has reached endemic proportions, it is estimated that more than 350 million people around the world will suffer from this disease by the year 2025. Between 60% and 90% of the reported cases of DM2 are related to obesity. New approaches to developing anti-inflammatory and antioxidant drugs trying to break the connection between obesity and disease are proposed. Previous studies have revealed that a triterpene-rich fraction obtained from leaves of *Eucalyptus tereticornis* significantly reduces fasting blood glucose and improves glucose tolerance and insulin sensitivity in a T2DM murine model by intraperitoneal administration (IPA). Their limitation is related to their low stability and bioavailability across oral administration. In this project, we aim to use polymeric nanocarriers to optimize the bioavailability of triterpene and release it on the intestine protecting the compound and improving the stability. The goal is to develop a nanocarrier to transport triterpene-rich fractions orally through the gastrointestinal tract in pre-diabetic mice and control the effects of obesity and T2DM.

Materials & Methods

The nanocarrier was formulated using polymeric compounds encapsulating triterpenes, were self-assembled by the high-energy nanoemulsion method. Size, Z potential (ZP), polydispersity index (PDI), encapsulation efficiency (%EE), load capacity (%LC), and drug release kinetics were measured. In-vitro cytotoxicity assay, In-Vivo assay of antidiabetic activity in C57BL/6 mouse model, measurement of a diabetic condition, were performed. Comparisons between groups were analyzed using ANOVA followed by a Dunnett post hoc test.

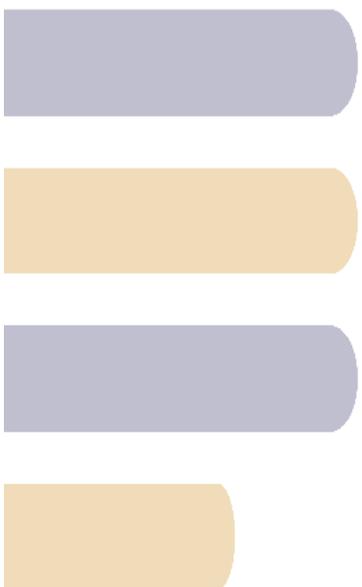
Results

We developed a polymeric nanocarrier with triterpene encapsulated with a media size of 165nm (P<0.05) ZP of -35,1 and PDI 0,18, 98% EE, and 3,5% LC. The release kinetics show 80% of drug released in the first 6 hours and up to 85% 72 hours after. The in-vitro cytotoxicity assay no-showed a cytotoxic effect over 3T3-L1 and HepG2 cell lines and the in-vivo assay demonstrated that the treatment with nanocarriers decreased the weight and glucose measured in blood.

Conclusion

These nanocarriers show the potential to decrease the effects of pre-diabetes and obesity in mice administrated orally. These results contribute to developing new strategies and therapeutic agents using natural products combined with nanobiotechnology to control T2DM and obesity.

Oral Sessions I



Public health & Infection



Presenters:

Karuga, F.F.K. (Filip)
Khataniar, HK (Himsikhar)
Maheshwari, KM (KALIKA)
Wang, X. (Xin)
Steen, O D (Olivier)

SARS-CoV-2 vaccination hesitancy among healthcare workers and medicine related students.

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Introduction

Healthcare clinical workers (HCW) and medicine related students (MRS) are especially exposed to biological risk during their occupational activities. Moreover, they might be a relevant vector of infectious diseases in society. Vaccination hesitancy in these groups might bring about an unfortunate outcome. We aimed to assess the SARS-CoV-2 vaccination hesitancy and explain the source of this behavior at the beginning of the public debate regarding SARS-CoV-2 vaccination.

Materials & Methods

We analyzed the answers of 5568 respondents obtained from a 53 item questionnaire study performed between 22.12.2020 and 15.01.2021 via Google Forms. Only people older than 18 years old were included in the study. The mean respondents age was 24.36 ± 7.85 (51.2% females). The respondents were divided into 3 groups: HCW (n=544), MRS (n=1375) and control (n=3649). HCW consisted of physicians, dentists, dieticians, emergency medical services workers, laboratory diagnostics workers, nurses, midwives, pharmacists, and physiotherapists. MRS consisted of HCW's students.

The qualitative data were analyzed using the chi-square test, Yates-corrected chi-square or Fisher's exact test based on the size of the smallest subgroup ($n \geq 15$, $>15n \geq 5$, $5 > n$, respectively). Statistical analysis was performed using STATISTICA 13.1 (TIBCO, Palo Alto, Santa Clara, CA, USA).

Results

The 86.5% of HCW and 92% of MRS declare a desire to get vaccinated against SARS-CoV-2, while in the control group only 71.2%. The most common concerns about SARS-CoV-2 vaccination were: long-term complications (HCW – 37.68%, MRS – 39.75%, Control – 44.01%), fever and malaise (HCW – 16.36%, MRS – 15.78%, Control – 13.73%). It also appears that COVID-19 vaccine conspiracy theories are less popular among HCW and MRS groups as compared to the Control (HCW vs Control: 9.01% vs 18.79%, $p < 0.001$; MRS vs Control: 7.27% vs 18.79%, $p < 0.001$). The most common conspiracy theories were: limitation of civil rights (HCW – 6.99%, MRS – 4.44%, Control – 13.73%) and control of births with the vaccine (HCW – 3.68%, MRS – 2.04%, Control – 5.51%).

Conclusion

Conspiracy theories were a relatively common phenomenon. The understanding of vaccine hesitancy reasons might be the first step to increase the SARS-CoV-2 vaccination level. This knowledge might be of special value for campaigns encouraging people to vaccinate.

A cross-sectional study on COVID-19 related stigma faced among healthcare workers in India

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Introduction

Exposure to common infections is an occupational risk for healthcare workers. Some of these diseases may pose a serious risk, if transmitted to the population at large. Examples of such outbreaks are, the SARS, influenza pandemic and, currently, the COVID-19 pandemic. In such public-health crisis, it is expected that healthcare workers are aware of the risks of disease transmission and adhere to necessary preventive measures. However, people may respond adversely, fearing that health workers might bring the disease home. This has led to many a stigma against healthcare workers, as reported in newspapers and social media, especially during the ongoing COVID 19 pandemic.

We therefore thought it necessary to document the stigma that healthcare workers have faced/continue to face due to the COVID-19 pandemic and identify associated factors to identify suitable interventions that can address stigmatizing behaviors towards healthcare workers.

Materials & Methods

A cross sectional study is being conducted with a projected sample size of 400, among healthcare workers in India, in which an online questionnaire is being forwarded through electronic media (mails, mobile apps) for data collection on topics of stigmatization, defenses used and impact on their health. Data is being analyzed in SPSS26.0.

Results

The project started on 27th January 2021 and we have analyzed preliminary data from 50 healthcare workers (mean age- 26.14 ± 6.43). 40 (80%) participants were directly involved in the care of COVID-19 patients. 11 (22%) participants reported significant level of COVID-19-related stigma, while 19 (38%) participants revealed they were treated differently by fellow colleagues on encountering COVID-19 patients, which further added to stress/headache (10%), easy irritation (6%) as few symptoms reported by them. 15(30%) reported to using coping up mechanisms to avoid getting stigmatized- conceal identity, conceal line of work. Final statistically significant results and multiple regression analysis of various factors related to stigmatization will be presented in the poster/presentation after the completion of data collection and its analysis.

Conclusion

A considerable proportion of Indian healthcare workers, who have enrolled in this preliminary study experienced COVID-19-related stigma. These preliminary findings highlight the need for specific research and targeted interventions particularly addressing COVID-19-related stigmatization among healthcare workers.

Knowledge and Practices Concerning Prevention of Mother to Child Transmission of Hepatitis B infection: A Cross-sectional Study in Rural Uttar Pradesh, India

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Introduction

Sustainable Development Goal - 3 aims to reduce the disease burden of hepatitis by 2030. Worldwide over 300 million persons are chronically infected with HBV and 75% among these are in Asia alone. In areas of intermediate prevalence like India (carrier rate 2%; prevailing infection in 20-50% population), if the mother is HBV positive, the risk of transmission of infection to a neonate can be as high as 85-90%. The present study was conducted to assess the knowledge of pregnant females, postnatal mothers and health workers concerning Hepatitis B infection, transmission and prevention.

Materials & Methods

A cross-sectional study was conducted with 124 Pregnant females (in the third trimester), 19 postnatal mothers and 49 health workers attending ANC clinic at a rural block Primary Health Centre (PHC). Collected data was entered and analyzed using trial version of SPSS 22.

Results

Despite more than 90% respondents being aware of Hepatitis B, only 1.5% knew that it was caused by a virus. Majority stated that infection was caused by consumption of oily, spicy, unhygienic food, and pollution. Almost all pregnant females and postnatal mothers who gave blood samples were unable to name diseases for which screening was being done. Understanding of mother to child transmission of HBV infection was poor as 39.2% stated that any disease during pregnancy is transmitted to and affects the child. A very low percentage of respondents were counselled during the antenatal period by health workers. 80% of health workers were aware of vertical transmission of Hepatitis B and only 36.7% were aware of vaccination as a prevention method.

Conclusion

This study's findings highlight that pregnant women and mothers have insufficient knowledge and misconceptions concerning HBV infection regardless of age, education, and socio-economic status. Therefore, it is imperative to utilize the antenatal period as an opportunity to advocate raising awareness about HBV infection. Findings were shared with the Medical officer at the PHC.

knowledge about hpv infection of students at secondary occupational health school

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Introduction

Cervical cancer (CC) is one of the most common causes of cancer-related deaths worldwide. It is mainly caused by human papilloma virus (HPV) which is a sexually transmitted virus and can be guarded against with HPV vaccines and safe sex. This study aimed to explore the awareness and knowledge level of HPV infection among the students of a secondary occupational health school.

Materials & Methods

We conducted a cross-sectional study in a secondary occupational health school where data were collected through an online questionnaire to assess the awareness and knowledge regarding HPV infection of the students. The questionnaire was consisted of two domains: socio-demographic characteristics; awareness and knowledge regarding HPV infection. The t-test, chi-square, multiple linear regression analysis and multivariate logistic regression analyses were used for data analysis.

Results

A total of 2,248 students participated with a response rate of 100%. Although females are generally agreed to know more about HPV infection, we found no direct effect in gender. Our results show insufficient awareness and knowledge about HPV infection among these students and link higher knowledge score of HPV infection with major, grade, age and so on. Besides, the Internet and educational system are the most important sources of HPV-related information. In multivariable logistic analysis, third-grade students had the most increased awareness of cervical cancer (OR=17.13), HPV (OR=6.59) and HPV vaccine (OR=2.78) when compared to first-grade students.

Conclusion

Awareness and knowledge regarding HPV infection was insufficient among students in secondary occupational health school. As the future healthcare providers, targeted education campaigns aimed at these students should be put on the agenda to improve their awareness and knowledge regarding HPV infection.

Impact of loneliness on depression and anxiety during the COVID-19 pandemic in the Netherlands

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Introduction

The COVID-19 pandemic has a profound impact on social interactions. Some studies indicate that the pandemic has increased the prevalence of anxiety and depression. Loneliness, the emotional experience of perceived isolation, is associated with depression. The COVID-19 pandemic represents a natural experiment to investigate this interaction. The current study aims to determine the extent to which loneliness contributes to depression and anxiety during the COVID-19 pandemic. Furthermore, we investigate which groups are most at risk.

Materials & Methods

Data were derived from the Lifelines COVID-19 study, an ongoing longitudinal assessment of the pandemic's health impact. Up until November 2020, 75600 individuals have completed at least one questionnaire. Loneliness scores were determined using the previously validated Three-Item Loneliness Scale. We assessed depressive and anxiety symptoms through the Mini-International Neuropsychiatric Interview. We calculated sum scores of anxiety and depressive symptoms. We will use longitudinal mixed-effects models, with the possibility of modeling individual-specific trajectories of depression and anxiety. However, for the preliminary data reported in this abstract, we performed a cross-sectional linear regression analysis, using mean loneliness and depression/anxiety sum scores across participants. All analyses were performed in R.

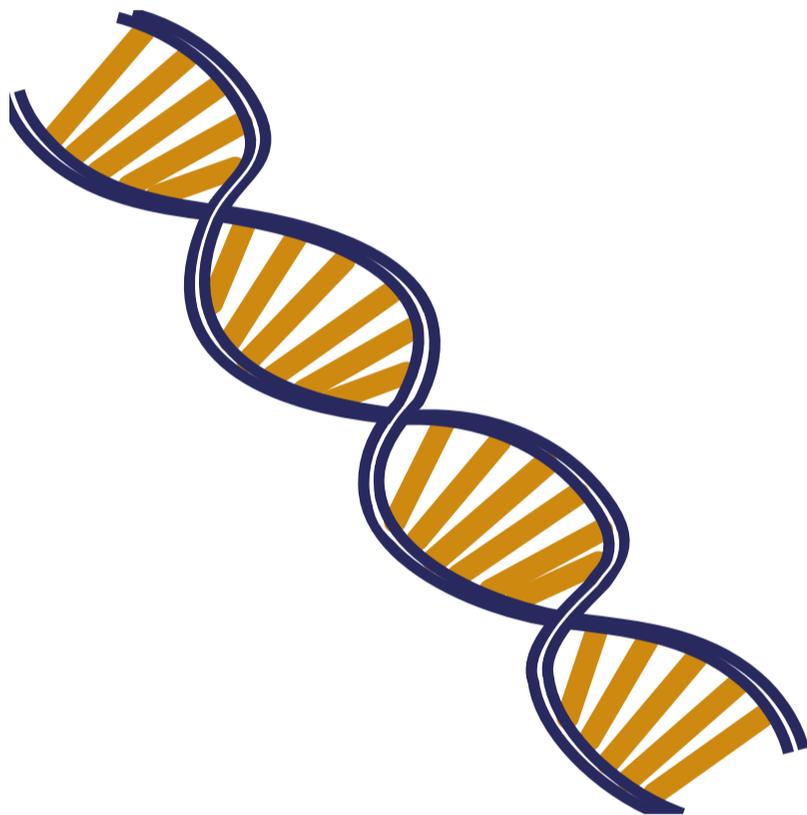
Results

Our preliminary data suggest an association between loneliness and depression ($B=0.43$, $p<0.001$), with the loneliest individuals reporting an average of 2.5 depressive symptoms more than the least lonely. This association was strongest in younger (age 18-30) individuals ($B=0.09$, $p<0.001$), while less pronounced in older (age 71-100) individuals ($B=-0.13$, $p<0.001$), while not significantly different between men and women. We also found an association between loneliness and anxiety ($B=0.33$, $p<0.001$), which was weaker in older (age 71-100) individuals ($B=-0.13$, $p<0.001$), and slightly stronger in women ($B=0.02$, $p<0.01$).

Conclusion

We found an association between loneliness and depressive symptoms, which was stronger in younger individuals. For anxiety, we observed a similar association, but this association was also slightly more pronounced in women. These findings highlight the role of age, and that younger individuals may be more severely affected by social isolation during COVID-19.

Cell Biology



Presenters:

B. Barbosa, Violina
Arefi, S.A. (Saba)
Dyachkova, U.D
Gooijers, I.F.M. (Iris)
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Micro-FISH: microfluidics combined with fluorescence in situ hybridization (FISH)

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Introduction

Culture methods are still considered to be the “gold standard” in microbiological detection and identification due to their specificity, sensitivity and low-cost. However, these methods are laborious, time- and reagent-consuming. Diagnostic methods relying on nucleic acids have been proposed as alternatives for microbial identification and can be adapted to point-of-care detection. Here, we propose to combine fluorescence in situ hybridization (FISH) with a microfluidic platform for microorganism detection.

Materials & Methods

Initially, a microfluidic trapping platform was designed with AutoCAD® and fabricated in polydimethylsiloxane (PDMS) using soft-lithography. To assess fabrication accuracy, the percent error (%) was calculated from measured experimental and nominal dimensions. Subsequently, the hydrodynamic flow conditions for cell trapping were determined by calculating the flow rate (Q , $\mu\text{L}/\text{min}$), mean velocity (V , m/s) and Reynolds number (Re). The microfluidic platform was then used to successfully trap *Candida tropicalis*. Using a specific peptide nucleic acid (PNA) probe, a FISH procedure was applied onto immobilised *C. tropicalis* cells. In all FISH experiments, fluorescence signal of hybridized cells was confirmed visually using epifluorescence microscopy.

Results

The fabrication accuracy assessment showed that the width and height percent error of the microfluidic platform ($n=3$) ranged between 1.6-17.2 % and 22.3-28.9 %, respectively, among micro-posts and gaps in different regions. To assess the hydrodynamic flow conditions, an inlet velocity of 0.006 m/s was assumed, corresponding to an inlet flow rate of 1 $\mu\text{L}/\text{min}$ in a cross section of $100\times 30\ \mu\text{m}$ when the fluid is water. The dimensionless Re number was 0.51, indicating a laminar flow profile. The PNA probe successfully detected *C. tropicalis* using the standard FISH and microfluidics-integrated method. In both methodologies, a strong fluorescence signal of the hybridized cells was observed.

Conclusion

Our findings reveal that FISH using nucleic acid mimics (PNA) in combination with microfluidics is a reliable method for the detection of microorganisms such as *C. tropicalis*. This work provides the basis for the development of a portable microorganism detection platform in the future.

Potential use of FTIR spectroscopy for the rapid identification of the blood Clonazepam in the poisoning management centers

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Introduction

Rapid diagnosis of the toxic agent is very much critical in the poisoned patients' management. A reliable rapid diagnosis test is of the great importance in using this golden time. Fourier transform infrared (FTIR) spectroscopy application for various medical diagnosis has recently been increased as a simple and fast precise method. Using the right protocol might well justify FTIR use as a fast toxicology test using a drop of patient sample in less than a minute. We have tried the application of this technique in the determination of Clonazepam in blood samples. The most diagnostic test of benzodiazepine toxicity is urine screening. Flumazenil can be used in benzodiazepine toxicity.

Materials & Methods

FTIR spectra at the range of 400 to 4000 cm^{-1} were taken from 20 microliter of blood samples taken from thirteen poisoned patients registered at Loghman Hakim poisoning center diagnosed with Clonazepam overdoses using standard urine analysis. These spectra were compared with 10 blood samples of normal volunteers proved not to have any Clonazepam in their bloods. The 100 co-added scan of each sample spectra was taken at the resolution of 4 cm^{-1} . Resulted spectra were analyzed using Successive Projection Algorithm (SPA) and the Linear Discrimination analysis (LDA) on Matlab software.

Results

The following peaks are determined as the discriminative regions to distinguish the Clonazepam poisoned samples when compared to the normal samples; 1535 cm^{-1} related to the C-N and C=O stretching of the nucleic acids, and 1683 cm^{-1} of the turns and bends of proteins. SPA-LDA analysis was proved to be more than 80% accurate in recognizing the Clonazepam contamination of the blood samples in less than a minute analysis.

Conclusion

FTIR-ATR analysis of the blood sample has potentially applicable for a fast and accurate diagnosis of Clonazepam poisoning in the blood.

The role of extracellular matrix components in differentiation of fibroblasts and endothelial cells into myofibroblasts.

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Introduction

Extracellular matrix (ECM) is essential component of tissue required for proper functioning of cells, tissues and organs. However, excessive amounts of ECM with defected structure and stiffness is generated and accumulated during pathological conditions, like pulmonary fibrosis (PF). Myofibroblasts are considered as the main effector cells of fibrosis. The pool of myofibroblasts is replenished by fibroblasts differentiation and by endothelial to mesenchymal transition (EndoMT). The aim of our work was to evaluate the effect of ECM on cellular differentiation into myofibroblasts.

Materials & Methods

Lung fibroblasts were derived from healthy mice (normal) and mice with bleomycin-induced fibrosis (fibrosis), then they were cultured in high density for generating cell sheets (CS). Thereafter, we performed CS decellularisation for getting decellularized ECM (dECM) with essential 3D structure. dECM was used for cultivating human skin fibroblasts or human umbilical vein endothelial cells (HUVEC) with/w/o transforming growth factor TGF- β 1. Plastic or gelatin was used as control for fibroblasts and HUVECs. Increased expression of smooth muscle actin (aSMA) and EDA-fibronectin - the main markers of myofibroblasts - was evaluated by immunocytochemical analysis and western blot analysis, expression of Snai1 and Snai2/Slug was evaluated by real-time PCR.

Results

Control fibroblasts showed increased level of aSMA included in stress fibrils, compared with cells cultured on dECM. Though TGF β -1 treatment increased expression of aSMA and EDA-fibronectin in cells cultivated on fibrotic dECM compared to plastic, while exposure to normal dECM lowered expression of these markers. Cultivation of HUVECs in the same conditions did not change significantly the expression of aSMA and we did not observe its integration into stress fibrils. At the same time, cultivation of HUVECs on fibrotic dECM induced expression of Snai1 и Snai2/Slug comparing with normal dECM, what indicates the stimulation of endoMT and converting endothelial cells into transitional state.

Conclusion

Thus, we developed the ECM model of fibrotic and normal lungs, which shows that dECM has a significant impact on fibrosis, creating conditions for the differentiation of fibroblasts into myofibroblasts and the induction of transitional state of endothelial cells.

DNA double-strand breaks in heterochromatin induce specific histone modifications at the break site in *Drosophila melanogaster*

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Introduction

One of the most dangerous types of DNA damage are double-strand breaks (DSBs). Inappropriate repair of DSBs may result in the formation of aberrant chromosomes linked to cancer and developmental diseases. Multiple DSB repair pathways have evolved to avoid the development of these diseases, including homologous recombination (HR) and non-homologous end joining (NHEJ). The past decade, it has become clear that histone modifications and histone remodelers are key players in guiding DSB repair and pathway choice in euchromatin. Interestingly, emerging evidence suggests that different mechanisms might be involved in DSB repair in the highly repetitive heterochromatin. For example, it has been shown that DSBs in heterochromatin move to the periphery of the heterochromatin domain while this movement is absent in euchromatin. Therefore, we hypothesize that DSB repair in heterochromatin might be regulated through a different set of specific histone modifications. This research aims to investigate histone modifications involved in DSB repair in heterochromatin.

Materials & Methods

We use the third instar larval stage of *Drosophila melanogaster* to study histone modifications involved in DSB repair in heterochromatin. To induce single DSBs in heterochromatin, we use a heat-shock inducible locus-specific DSB system called DR-white. To examine the incidence of specific histone modifications at the break site in heterochromatin after DSBs, we perform chromatin immunoprecipitation (ChIP) combined with qPCR.

Results

Our preliminary ChIP-qPCR results reveal an increased incidence of H3 lysine 9 acetylation (H3K9ac), H3 lysine 36 trimethylation (H3K36me3) and H3 lysine 4 mono/trimethylation (H3K4me1/me3) histone modifications at the break site of single DSBs in heterochromatin when compared to intact heterochromatin.

Conclusion

These observations suggest that H3K9ac, H3K36me3 and H3K4me1/me3 might be involved in heterochromatic DSB repair. Ongoing research aims to investigate the role of these histone modifications in DSB repair in heterochromatin by knocking down the corresponding histone modifiers in *Drosophila melanogaster* combined with immunofluorescence image analysis following DSB induction.

α -Cell and Glucagon Dynamics Throughout the Spectrum of β -cell Deficit

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Introduction

For more than four decades insulin and β -cells remained at the center of attention in the field of diabetes research. However, growing body of evidence supports the crucial role of α -cells and glucagon in the development of diabetes. Hyperglucagonemia is associated with type 1 and type 2 diabetes and is thought to exacerbate hyperglycemia, suggesting that glucagon inhibition could have therapeutic potential. However, information about the emergence and dynamics of hyperglucagonemia remains scarce. Here, we analyzed the impact of different degrees of β -cell loss on α -cell dynamics, plasma/pancreatic glucagon and plasma leptin.

Materials & Methods

We used the RIP-DTR mouse model, which allows β -cell ablation following diphtheria toxin (DT) administration. Mice receiving different doses of DT show graded β -cell loss and hyperglycemia. On days 0, 4 and 10 post DT injection (dpDT), we analyzed circulating glucagon and leptin. On 10 dpDT we quantified whole pancreatic glucagon content and performed histological analysis of α - and β -cell proliferation, size and numbers.

Results

Hyperglucagonemia occurred in male mice following extreme β -cell ablation ($> \sim 95\%$ loss of pancreatic insulin content (PIC)) and hyperglycemia ($> 30\text{mM}$). However, hyperglycemic mice with severe β -cell loss ($< \sim 85\%$ PIC), showed no elevated glucagon 10 dpDT, suggesting that extreme β -cell loss drives hyperglucagonemia irrespective of hyperglycemia. Moreover, plasma leptin, which inhibits glucagon secretion, significantly decreased 10 dpDT in hyperglucagonemic mice. Females exhibited milder changes in glucagon and leptin levels in the same conditions. α -cell abundance and proliferation increased with the severity of β -cell ablation and could underlie elevated glucagon levels. Remaining β -cells also showed increased proliferation even after extreme ablation of more than 99%.

Conclusion

This study clarifies the impact of gender and remaining β -cell mass on key pancreatic hormones and α - and β -cell proliferation. We are starting to understand what grade of β -cell loss causes possible pathological dysregulation on circulating glucagon and leptin, which could have clinical implications. This model allows to further study the factors involved in the development of hyperglucagonemia and will be useful for preclinical studies of glucagon-lowering drugs.

Surface biofunctionalization with Notch ligands to activate repair Schwann cells in the management of peripheral nerve injury

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Introduction

Peripheral nerve injury occurs in a substantial proportion of patients admitted for trauma. Management of segmental nerve gaps has a poor prognosis, and is limited by premature loss of the repair phenotype in Schwann cells. We aimed to tackle this dilemma through surface biofunctionalization with Notch ligands, which may be ultimately applied towards nerve guidance channel design.

Materials & Methods

We previously established a method for deriving Schwann cells from human bone marrow towards autologous cell therapy. These were seeded upon immobilized recombinant Jagged-1 orientated via a capturing anti-Fc secondary antibody (treatment group) whilst control cells were seeded upon culture dishes coated by anti-Fc antibody alone. We compared the immunoeexpression of Schwann cell markers (Sox10, p75), activated Notch-1 receptor, and markers of repair phenotype (cJun, Olig1) after 4 days of culture. We also conducted a growth factor assay to determine for upregulation in neurotrophin expression subsequent to treatment.

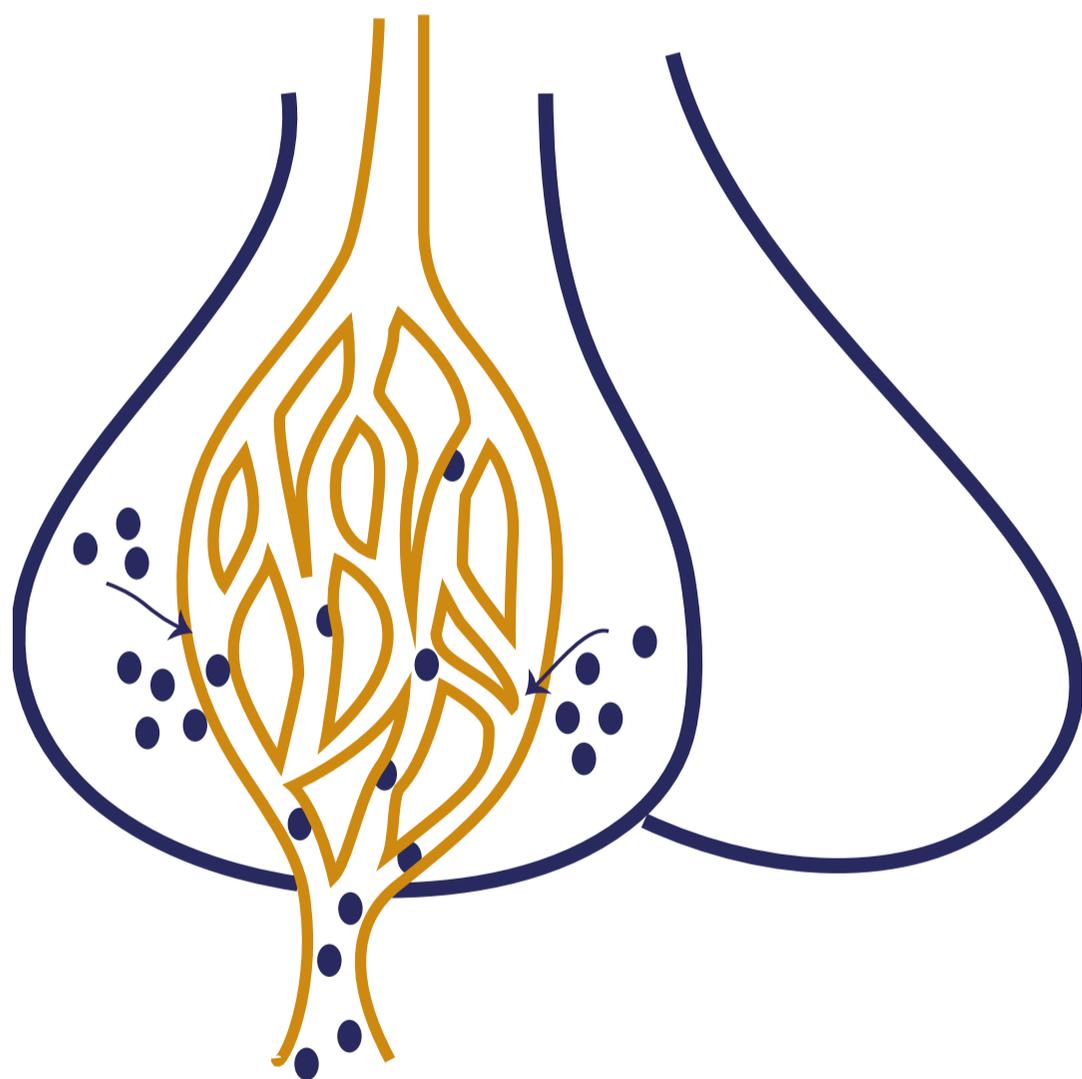
Results

Both treatment and control groups demonstrated expression of Schwann cell markers. The Jagged-1 treated group had a significantly higher ($p < 0.05$) immunoeexpression of repair Schwann cell markers subsequent to Notch pathway activation. The treatment group also upregulated hepatocyte growth factor (HGF) expression upon adopting the repair phenotype.

Conclusion

Notch ligands are key mediators of the repair phenotype. Upon adopting the repair phenotype, neurotrophin upregulation facilitates nerve regeneration. Surface biofunctionalization with Notch ligands in synthetic nerve guidance channels may enhance regeneration in the treatment of segmental nerve gaps. This will be exciting news for patient suffering from disabling peripheral nerve injuries.

Endocrinology & Diabetes



Presenters:

Hayford, A. K (Ato)

Yaroslavtseva, K. (Kristina)

Mytrokhina, M.N.A. (Nadiia)

Association of serum bilirubin and uric acid levels with albuminuria in type 2 diabetes patients.

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Introduction

The earliest clinical sign of diabetic nephropathy (DN) is slightly increased levels of urinary albumin (≥ 30 mg/day or $20 \mu\text{g}/\text{min}$), denoted microalbuminuria. Oxidative stress and microinflammation have been implicated in the development of DN for a long time. Bilirubin is a potent serum antioxidant and may protect against oxidant-mediated tissue damage. With the existing uric acid oxidant-antioxidant paradox, some studies have demonstrated that elevated serum uric acid is associated with DN, suggesting a potential role for uric acid in the disease pathogenesis. This study was aimed at determining the association of both serum bilirubin and uric acid levels with albuminuria in type 2 diabetes patients.

Materials & Methods

70 type 2 diabetes patients were enrolled in the cross-sectional study after informed consent was sought. Serum uric acid, serum bilirubin, and microalbumin levels were determined. Univariate and multivariate linear regression models adjusted for possible confounders were used to determine the associations of serum uric acid and bilirubin levels with albuminuria.

Results

86% of the study participants had microalbuminuria. After adjustment for age, duration of diabetes, systolic and diastolic blood pressure, gender, BMI, total cholesterol, drinking status, antidiabetic treatment, and antihypertensive treatment; uric acid was a significant predictor of microalbuminuria ($\beta=0.51$, $t(11)=3.54$, $p=0.011$). The Kruskal-Wallis test indicated a significant difference between uric acid levels of lower and higher albuminuria groups ($p=0.026$). Serum bilirubin levels did not have significant correlations with albuminuria.

Conclusion

Increased levels of serum uric acid are associated with increased albuminuria in the presence of the aforementioned clinical factors. The intracellular pro-oxidant activity of uric acid could overwhelm the reported antioxidant capacity of bilirubin. If future studies support the role of uric acid in the progression of DN, keeping its concentrations within normal may be a significant part of therapy.

Type 1 diabetes patients' behavior and frequency of hypoglycemia related to car driving - an analysis of blinded CGM records

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Introduction

Hypoglycemia as a common side-effect of insulin therapy which can impair driving performance with potentially fatal consequences. Available data describing the frequency of hypoglycemic episodes during driving in the group of patients with type 1 diabetes mellitus (DM) are mostly based on self-reports. Continuous glucose monitoring (CGM) records allow analyzing glycemic excursions related to the particular activity of patients including driving. Our study aimed at obtaining relevant data describing the frequency of hypoglycemia during driving with the use of blinded continuous glucose monitoring.

Materials & Methods

We monitored 20 patients with type 1 diabetes mellitus (8 females, 12 males), duration of disease $43 \pm 21,8$ years, duration of treatment $14 \pm 12,0$ years.

Each patient worn blinded CGMS for 5-7 working days during his normal activity. Patients were asked to record all important events (such as insulin injection, exercise, meals, working periods) including periods of a car driving. Continuous glucose profiles were reviewed to identify glycemic excursion during periods of car driving with a special interest in hypoglycemic episodes (values under 3,9 mmol/l). Data were also analyzed with linear mixed-effect models.

All patients were educated about the safe driving during previous visits.

Results

Mean time of monitoring was 146 hours 27 min per person, of that 4 hours and 34 minutes of driving; total number of drivings was 71. We found 89 episodes of hypoglycemia in all patients, of that 9 were during driving (all 9 in 5 patients). The mean glycemia during driving was significantly higher (difference 0.8 mmol/l, $p < 0.0001$) during driving compared with the rest of day (periods of night sleeping were excluded from the analysis).

Conclusion

Risk of hypoglycemia even in well experienced and regularly educated patients with type 1 diabetes mellitus during driving is considerable. Patients tend to keep glycemia at slightly higher levels driving. Patients do not perform regular blood glucose self-monitoring before driving. Driving should be regularly focused in education of type 1 diabetes patients.

Glycemic control impact on the development of depression among patients with diabetes mellitus

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Introduction

The rigors of managing diabetes mellitus (DM) can be stressful and lead to psychological disorders. Depression is common among patients with DM and, statistically, is often undiagnosed. In order to solve the problem, International Diabetes Federation recommends encouraging screening for depression in primary care diabetes clinics. In the present study, we aimed to assess the risk of depression development among patients with DM and determine whether screening for psychological disorders should be implemented into diabetes care management.

Materials & Methods

Patients with both T1DM and T2DM were analyzed (n=100), mean age 58.3 ± 11.2 , mean duration of diabetes – 9.2 ± 5.9 , male/female ratio 52%/48% (52/48). (T1DM – 13% (n=13), T2DM – 87% (n=87). The following tests were used to assess the psychological status of the patients: 1) Patient health questionnaire – 2 (PHQ-2); 2) The Minnesota Multiphasic Personality Inventory (MMPI); 3) SF-36 to evaluate the health-related quality of life (HRQoL).

Results

According to the PHQ-2 results, 21 patients have high risk of depression development (85-92.9%), 50 patient – moderate risk (48-81.2%) and 29 patients – low risk (<36.9%). The patients with the high risk of depression developing have the mean level of HbA1c (NGSP, %) 11.3 ± 2 ; patients with the moderate and low risk have the mean level of HbA1c – 8.4 ± 1 and 7.2 ± 1.3 accordingly. There were no significant associations between age, sex, diabetes types, duration of diabetes and the results of PHQ-2 ($p > 0.05$). High risk of depression development is associated with lower level of HRQoL. MMPI results show that bad glycemic control is associated with astheno-neurotic type of personality ($p < 0.05$); patients with good glycemic control show better results of psychological adjustment, compared to patients with the bad one ($p < 0.05$).

Conclusion

There is a tight connection between diabetes and the increased risk of depression. Considering diabetes and depression are highly prevalent chronic conditions that have significant impact on health outcomes, patients should be screened for psychological disorders. Bad glycemic control definitely can be a risk factor in depression developing, therefore the management of diabetes should include psychological aspects to improve the psychological well-being and health-related quality of life.

Pediatrics, Obstetrics & Reproductive health



Presenters:

Shi, X. (Xiaoling)

Apostolov, A. (Apostol)

Aarts, E.M.A. (Ellen)

Zgliczyńska, J.Z (Joanna)

Effects of polybrominated diphenyl ethers exposure in female adipose tissue on menstrual characteristics

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Introduction

Polybrominated diphenyl ethers (PBDEs) have become persistent and ubiquitous environmental pollutants due to their leach-out capability. They were widely applied in daily life consumer and different kinds of flame retardants products. A great number of studies have presented that PBDEs have adverse effects on female reproductive function. In this study, we intended to evaluate the associations between concentration of PBDEs in adipose tissue and menstrual cycle and duration.

Materials & Methods

Female participants including 209 newly diagnosed breast cancer and 165 abdominal plastic surgery cases were recruited from three hospitals in Shantou, China. The information of demographic, clinical, and pathological were collected and adipose tissue samples were obtained during surgery. Fourteen PBDE congeners in adipose tissue were analyzed by using the gas chromatograph equipped with a high-resolution mass spectrometer. Odds ratios (ORs) for the relationship between PBDE levels (tertile 3 [T3], tertile 2 [T2] vs. tertile 1 [T1]) and menstrual status were estimated by logistic regression models.

Results

The concentrations of PBDEs detected in the research were common when compared with other studies. The level of BDE-209 was associated with the shortened length of average menstrual cycle and duration of menstrual bleeding cycle. while BDE-71 was correlated with the prolonged length of longest menstrual cycle. No significantly difference was found for PBDEs levels between the low and high groups of age at menarche. Multivariate logistic regression analysis revealed that BDE-66 was positively (ORT3 vs T1=6.09) associated with irregular menstrual cycle length. BDE-47 (ORT3 vs T1=3.21) was positively associated with the risk of menstrual duration alteration, while BDE-138 (ORT3 vs T1=0.09, ORT2 vs T1=0.14) was negatively associated with the risk of menstrual duration alteration. There was no significant difference between the remaining PBDEs levels and the menstrual cycle.

Conclusion

A few of individual PBDE congeners were found associated with women menstrual cycle and menstrual duration alterations. It is concluded that PBDEs may have influence on women reproductive health through endocrine disrupting effects.

miR/isomiR expression dynamics during the transition from proliferative to secretory phase in healthy women

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Introduction

Successful implantation depends on the synchronization of a viable embryo and receptive endometrium during the window of implantation (WOI). In recent years, studies have identified that microRNAs (miRs) play a role in the maintenance and establishment of the endometrial receptivity. Our study focuses on isomiRs, which are sequence variations of canonical miRs, and the dynamics of their expression during the transition from proliferative to secretory phase.

Materials & Methods

Induction of ovulation and accurate phase dating was achieved by administration of human chorionic gonadotropin (hCG) to 4 healthy and fertile women, that donated endometrium biopsies during proliferative (P, hCG) and secretory (S, hCG+9) phases of the same menstrual cycle. Histological, ultrasonic and hormonal examinations were performed for both phases. RNA was extracted with Nucleospin miRNA kit (Machery Nagel). Small RNA sequencing was done by Novogene (Beijing, China). Bioinformatics analyses were conducted with an in-built Galaxy workflow and tools developed by our laboratory and differential expression (DE) was evaluated with DESeq2.

Results

A total of 30621 miRs and isomiRs were detected in all of the samples. Significant difference in miR/isomiR expression was observed between the P and S phases. The miRNA families that appeared to have the highest number of DE members during the S phase were miR30d, miR449a, miR449c, miR99a and miR375. The expression levels of these families, as well as of the X-chromosome encoded miR1298 -5p, tend to increase during the S phase, while the miR99a family members showed the inverse tendency. The number of templated isomiRs affected in the receptivity phase transition with a shifted seed site, was 10, mainly from the miR449c family. Some of them showed different target mRNAs, which were predicted to have a higher percentage of accuracy compared to the canonical miRs.

Conclusion

IsomiRs in which the 5'- end is shifted are of great interest, because their seed site is located within that part of the miR. Our results demonstrated DE of miR/isomiRs which could be used as an additional part of diagnostic tools for endometrial receptivity or dysfunction. Further analyses would be needed to confirm the result in larger number of individuals.

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Characterization of airway epithelial cells with single-cell RNA sequencing and application in an organoid model to predict drug responses for individuals with cystic fibrosis

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Introduction

Cystic fibrosis is a life-shortening monogenic airway disease which can be caused by more than 2000 different mutations in the cystic fibrosis transmembrane conductance regulator (CFTR) gene. CFTR is a chloride (Cl⁻) channel on the apical side of epithelial cells and regulates fluid secretion. Although CFTR-targeting drugs are developed for the most common mutations, there is a large group of individuals with rare mutations for which drug efficacy remains unclear. Patient-derived upper airway models can potentially be used to evaluate CFTR-targeting drug efficacy for rare mutations. In this study, airway epithelial cell cultures from individuals with CF were characterized and used for determining CFTR-targeting drug responses with a CFTR-dependent organoid swelling assay.

Materials & Methods

Airway epithelial cells from nasal brushings were collected from individuals with CF and healthy controls. First, cells were differentiated in an 2D air-liquid interface (ALI) model and characterized by single-cell RNA sequencing through comparison with ex vivo samples. ALI-differentiated airway epithelial cells were disrupted in fragments and cultured in a 3D extracellular matrix to form organoids. These organoids were used to determine CFTR-targeting drug responses in CFTR-dependent swelling assays.

Results

Single-cell RNA sequencing revealed overlap in cellular composition between ex vivo airway epithelial cells and ALI-differentiated airway epithelial cultures. In addition, differences in cellular subtypes were identified between CF and healthy epithelium, especially for basal and secretory cells. Furthermore, CFTR-targeting drug responses were identified in individuals with CF and healthy controls with the CFTR-dependent organoid swelling assay. The new therapy Trikafta was found to be very effective for individuals with CF.

Conclusion

ALI-differentiated airway epithelial cells were found to resemble the native airway epithelial tissue and different subtypes of basal and secretory cells were identified in CF and healthy epithelium. CFTR-dependent organoid swelling assays were found to effectively predict CFTR-targeting drug responses. After validation, these HNE patient-derived in vitro cell culture models could be used to facilitate drug development for CF and other respiratory diseases.

The association between abnormal vaginal microflora and duration of pregnancy as well as selected maternal and neonatal parameters.

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Introduction

Abnormal vaginal flora (AVF) is the result of excessive growth of aerobic bacteria and fungi in relation to the scarce presence of *Lactobacillus* spp. It has been suggested that AVF is responsible for preterm birth and many neonatal conditions including infections or sepsis. The aim of the study was to assess the influence of excessive vaginal colonisation with aerobic bacteria and fungi on the selected postnatal parameters of newborns, duration of pregnancy and length of hospitalisation of neonates.

Materials & Methods

Retrospective data of all 1057 patients who delivered between January and June 2019 in the Department of Perinatology of Medical University of Lodz was analysed. 809 patients were included in this study. The study group consisted of 396 patients with abundant microbial growth, from whom vaginal flora samples were obtained between 26 and 42 weeks of gestation, while 413 patients with physiologic vaginal biocenosis constituted the control group. 248 patients (23.46%) were excluded from the study due to incomplete data.

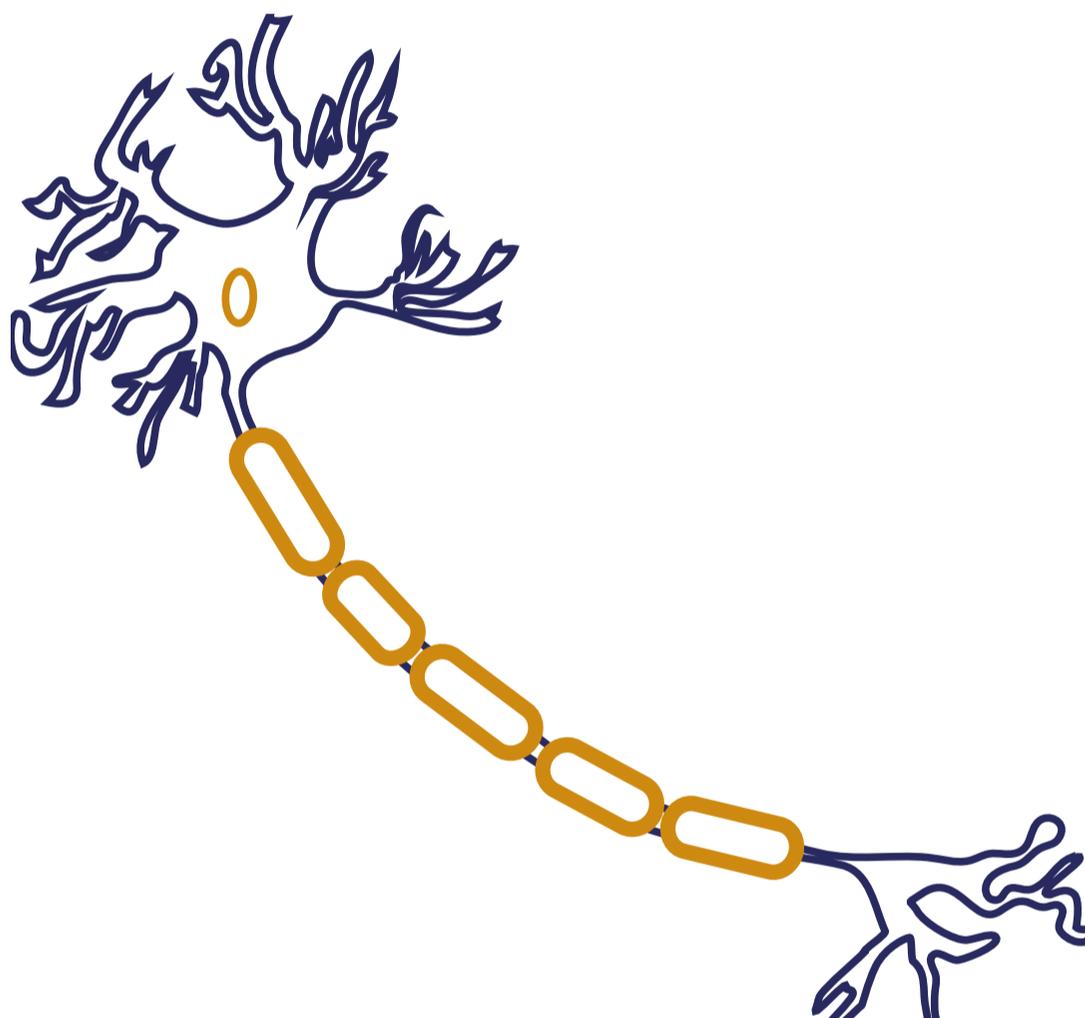
Results

Patients with AVF gave birth prematurely more often than patients with balanced microflora (9.09% vs 5.31%), $p=0.038$. Newborns of mothers with AVF obtained Apgar score under 4 more frequently (1.21% vs 0%; $p=0.024$). Eutrophic neonates were born less frequently in the study group (82.08% vs 88.65%; $p=0.025$). Hospitalisation period was longer for children of mothers with AVF (mean of 6.3 days vs 5.03; $p=0.025$). Newborns of mothers with AVF developed perinatal infections more often (23.97% vs 15.94%; $p=0.004$). 4 infants died in the study group ($p=0.045$). The most prevalent pathogens were: *Streptococcus agalactiae* 57.32%, *Candida* spp. 39.64%, *Klebsiella* spp. 9.85%, *Staphylococcus aureus* 7.32%. Signs of infection were more frequently recorded in newborns of mothers infected with *Klebsiella* spp. (35.90% vs 19.16%; $p=0.011$). Premature birth was more prevalent in GBS carriers (11.81% vs 6.28%; $p=0.022$).

Conclusion

Abundant growth of aerobic bacteria in the 3rd trimester of gestation contributes to preterm birth, leads to the development of infection signs in newborns, increases mortality rate and prolongs hospitalisation period. Preventive measures such as screening tests should be carried out regularly and efficient follow-up should be implemented.

Neurology & Neurosurgery



Presenters:

Badripour, A. (Abolfazl)
Piranviseh, A. (Ashkan)
Stalter, J.
Yogeswaran, V.
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Allergic rhinitis is associated with cognitive and memory dysfunction and altering seizure threshold through neuroinflammation in BALB/c mice

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Introduction

Allergic rhinitis is a systemic disease with high prevalence, which some of its neuropsychological problems had been reported previously. The main pathophysiology and mechanism of the neuropsychological dysfunction of AR patients has not been described yet, so herein we subjected an animal model of AR to identify any behavioral problems or changing seizure threshold, and to assess the pathophysiology of the disease.

Materials & Methods

80 male BALB/c mice were randomly divided in 2 groups, Allergic rhinitis group and controls. Allergic rhinitis was induced in first group by administration of ova-albumin and aluminum hydroxide intraperitoneally and then nasal injection of ova-albumin for 14 consecutive days. Both groups were subjected for different tests for assessing depressive like behavior (forced swimming test), anxiety (hole board and elevated plus maze), spatial (Morris water maze) and contextual memory (shuttle box test) and learning and seizure threshold. Hippocampus and plasma sample of mice were subjected for analyzing cytokines and immune modulator and for pathology and immunohistochemistry evaluation.

Results

The depressive and anxiety like behavior were promoted and also the spatial learning and memory were disturbed in AR group ($p < 0.001$, $p = 0.008$ and $p = 0.01$ respectively). Also AR mice had lower seizure threshold compared to controls ($p < 0.001$). Lab data suggested that TLR4, IL-1 β and TNF α were increased in AR brains as well as their plasma and also demyelination, cell death and M1 (CD86) microglial aggregation were increased in AR hippocampus ($p < 0.001$, $p = 0.008$ $p < 0.001$ respectively). AR is a systemic disease which could cause neuro-inflammation that can affect behavioral and cognitive functions of the brain. It seems that innate immunity has a major role in neuro-inflammation through M1 microglial polarization and pro inflammatory cytokine such as IL-1 β and TNF α .

Conclusion

In this study, AR could lead to behavioral obstacle including depressive and anxiety like behavior, contextual and spatial memory disturbance and also alteration in seizure threshold. Ova-albumin induced AR could also orchestrate neuroinflammation via regulating hippocampus microglial polarization. However, more clear mechanism of neuroinflammation in AR models requires further investigation.

Transcranial Electromagnetic Field Therapy as a potential non-pharmacological therapy in Alzheimer's disease

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Introduction

Alzheimer's disease (AD) is one of the most common forms of dementia among elderly without any successful pharmacological treatment in slowing down its progression. In AD transgenic mice, long-term transcranial electromagnetic treatment (TEMT) has shown intraneuronal and extracellular anti-A β aggregation effect, mitochondrial enhancement and increased neuronal activity without inducing any abnormal biological changes in the brain or peripheral tissues and thus, it appears safe in mice models.

Materials & Methods

In present study, Wechsler Memory Scale ed. 4 was used in order to assess cognitive function of 22 AD patients. Patients were divided into two subgroups according to time of exposure: A. 1 hr./session and 1 session per week and B. 2 hr./session and 1 session per week and exposed to electromagnetic field with frequency of 2.4 GHz and SAR of 1.0 Watt/Kg which was continued for 4 weeks and Wechsler memory scale was taken before and after of the first session and after the three following sessions.

Results

Mean age was 73.5 for group A and 76.0 for group B. Mean MMSE score was 21.36 and 20.81 in group A and B respectively and had no significant difference. Mean Dementia Rating Scale (DRS) was 115.3 in group A and 112.6 in group B which were not significantly different. In the Wechsler memory scale, statistical analysis revealed significant increase in delayed memory index, following the second session of therapy in group A. Following the third week group A showed significant increase in visual memory and logical memory indexes and by the end of the study, group A performance showed significant enhancement in 9 from the 12 measured indexes. Interestingly, group B only showed a slight improvement over logical memory indexes.

Conclusion

In this study, for the first time to our knowledge, positive effects of transcranial electromagnetic fields on AD patients cognitive functioning was shown. Our findings suggest these positive effects are correlated with exposure time to these electromagnetic fields and thus, encourages more research regarding this relationship. Also, this study was limited with the reliability and validity of Wechsler memory scale and further evaluation of possible potentials of this non-pharmacological treatment in AD is needed.

The impact of aging on morphometric changes in the cerebellum: A Voxel-Based Morphometry Study

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Introduction

Apart from the well-known cerebellar role in motor processes, little is known about its function in non-motor tasks. The loss of cerebellar grey matter (GM) can have serious consequences (Schmahmann 2019), however, the pattern of GM-loss during the aging process in literature is heterogenous and currently under investigation. Voxel-based morphometry offers one great possibility for investigation. The SUI-toolbox (SUI=spatially unbiased infratentorial template) is especially suitable due to its specialized templates and infratentorial masks. Therefore, we asked the following questions: Do cerebellar morphometric changes occur during aging, and if so, which areas/functions are affected?

Materials & Methods

In a retrospective observational study, MRI-scans of healthy older (AG; $64,8 \pm 6,7$ years; $n=25$) and younger individuals (JG; $24,6 \pm 2,1$ years; $n=25$) were processed with SUI. For group comparison, we used SPM12 ($p=0.05$ FWE, $k>300$). The SPM12 Anatomy-Toolbox was used for anatomical/functional classification. The Montreal Cognitive Assessment (MoCA) was also performed.

Results

According to the SUI-analysis, we found three clusters located on the right side and the vermis. Cluster 1 ($k=790$ voxels) is located mainly in Crus I/II and Lobulus VI. Cluster 2 (338 voxels) is found exclusively in right Crus I while Cluster 3 (319 voxels) is located in Lobulus VI extending into Vermis VIIa.

The classification of the clusters in functional networks and task-activity-maps showed that the clusters are located in the frontoparietal-network, the default-mode-network, and the ventral-attention-network. The maxima are in regions for working memory tasks, speech processing, and motor tasks. The MoCA showed a difference in the group results (JG 28.9 vs. AG 28.4; $p=0.044$).

Conclusion

The analysis demonstrated three right-sided clusters with significant atrophy in the elderly group. Three conclusions are made. First, our study confirms that the right cerebellum has a higher GM-loss rate during aging as found by previous researchers. Second, aging mainly affects cerebellar-cortical areas and not subcortical regions. Third, atrophies are especially evident in areas involved in cognitive functions, as language processing and spatial/executive tasks. The projection of Crus I/II into BA-46, an essential part of the working memory, supports this assignment. The behavioral correlates of these atrophies need to be explored by differentiated neuropsychological testing in future studies.

Reliability of semi-automatic methods to measure the liquor sheath of the optic nerve: an MRI pilot study

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Introduction

Intracranial hypertension can lead to optic nerve sheath (ONS) dilatation. Thus far, there has been no comparison between quantitative methods to determine the volume of the ONS in MRI scans. Therefore, we assessed the coincidence of two independent region of interest measurements (ROI) and if three semi-automatic methods yield similar results.

Materials & Methods

Data of 20 ONS from 10 MRI scans were analysed by two ROI-trained raters (A and B) with the program ImageJ. Thus, the ONS volumes were determined. The semi-automatic approaches used two threshold-functions of ImageJ (Default and Iso Data) and the “presegmentation”-function (classification) of the program ITK-Snap to binarize the MRI scans. In ImageJ, the “find-connected-region”-function for segmentation was used. In ITK-Snap the ONS was separated automatically. All approaches required manual image noise reduction. ImageJ counted the remaining pixels allowing to calculate the ONS volume. ITK-Snap calculated the volume directly.

Results

The two raters revealed excellent Intraclass correlation (ICC) with a value of 0.975 (95%CI: 0.940-0.990) regarding ONS volume. The effect size (Cohen’s d) for A vs. B was $d = 0.027$. The ICC between the mean volume of the two manual raters (R) and the Default-function of ImageJ was 0.693 (95%CI: -0.079-0.916), showing moderate alignment. R compared to Iso Data showed a lower ICC of 0.257 (95%CI: -0.059-0.650). The ICC between R and ITK-Snap was 0.664 (95%CI: -0.024-0.889), also giving a moderate interrater reliability. In pairwise comparisons, all semi-automatically determined volumes differed significantly from R ($p < 0.001$, effect sizes: R vs. Default: $d = 0.44$, R vs. Iso Data: $d = 1.93$, R vs. ITK: $d = 0.70$).

Conclusion

The manual ROI measurement can be used as a gold standard for measuring ONS volumes, as indicated by the excellent ICC. However, this method is time-consuming and requires training. The semi-automatic methods save time although they show varying reliability measured against R. Among the semi-automatic methods, Iso Data differs most from R, therefore it is not eligible. ITK-Snap could be suitable for semi-automatic ONS measurements, because of its easy and less time-consuming application. Reliability is acceptable, even if it tends to overestimate the volume compared to manual measurements.

International, multicenter assessment of short and long-term outcomes of Chiari malformation type I patients undergoing different posterior fossa decompression variants.

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Introduction

The choice of an appropriate surgical technique for Chiari malformation type I may be debatable because no guidelines regarding method selection in particular patients exist. Posterior fossa decompression (PFD) consisting of suboccipital craniectomy and typically C1 laminectomy is considered the safest and the most basic approach despite limited efficiency. Therefore, most studies stress the efficacy of the posterior fossa decompression with the expansion of the intradural space via additional duraplasty (PFDD). There is still little evidence regarding additional cerebellar tonsils resection (PFDRT), which is sometimes performed to achieve more extensive decompression. Our study aimed to evaluate the short and long-term outcomes of posterior fossa decompression (PFD), posterior fossa decompression with duraplasty (PFDD), and posterior fossa decompression with resection of tonsils (PFDRT) in symptomatic Chiari malformation type I (CM-I) patients.

Materials & Methods

We retrospectively reviewed the medical records of CM-I patients operated between 2010 and 2018 in eight neurosurgical departments from Katowice, Sosnowiec, Wroclaw, Szczecin, Gdansk and Hamburg. All patients were clinically assessed during the hospital stay (short-term outcomes) and at the latest available follow-up time-point (long-term outcomes) with an application of the Chicago Chiari Outcome Scale (CCOS) assessment within the last follow-up visit.

Results

62 patients were included: 9 patients underwent PFD, 39 PFDD, and 14 PFDRT. The mean follow-up was 57.9 months. Short-term clinical improvement was observed in 82.3% of patients, with the highest in the PFD (88.9%) followed by PFDD (84.6%) and PFDRT (71.4%). Long-term outcomes showed a 56.5% improvement rate, with the highest values in the PFDD (59%), PFDRT (57.1%), and PFD (44.4%). Only patients without syringomyelia who underwent PFD worsened significantly between short and long-term outcomes. Patients operated with PFDD and PFDRT did not show a significant decrease between short and long-term outcomes. PFD, PFDD, and PFDRT were statistically comparable regarding postoperative complications, syringomyelia reduction, CCOS scores, and both short and long-term clinical improvement.

Conclusion

Our data suggests the lack of long-term PFD efficacy in CM-I; therefore, its value needs further validation. Accordingly, PFDD and PFDRT can be considered superior to the PFD. Moreover, we conclude that PFDD and PFDRT are equally efficient.

Treatment challenges of severe Central Nervous System malformations in Poland.

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Introduction

In Poland there has been implemented a new law regarding legality of abortion in cases of severe and lethal embryo malformations, resulting in a near-total ban on pregnancy termination. This law was implemented on the 27th of January 2021, after a Constitutional Court ruling from the 22nd October 2020. In this study we explore the realities of palliative care in cases of severe CNS malformations, focusing on extreme hydrocephalus, resulting in nervous tissue compression, which leads to irreversible brain damage and atrophy. The advancement of medicine enables the maintenance of vital functions in patients born with lethal CNS malformations. Patients can live long lives with appropriate care and specialized pediatric treatment even with very low quality of their and their relatives live.

Materials & Methods

The retrospective study was carried out on 14 children hospitalized in the University Children's Hospital in Krakow due to extreme congenital hydrocephalus between 1996 and 2017. Based on medical histories, we analyzed treatment strategies and outcomes. We decided to carry out a follow-up study based on a questionnaire interview with the parents and examination of the children. The questionnaire was focused on analyzing children's disabilities, daily functioning, family dynamics as a result of the disease, socioeconomic problems and social perception of the child and family.

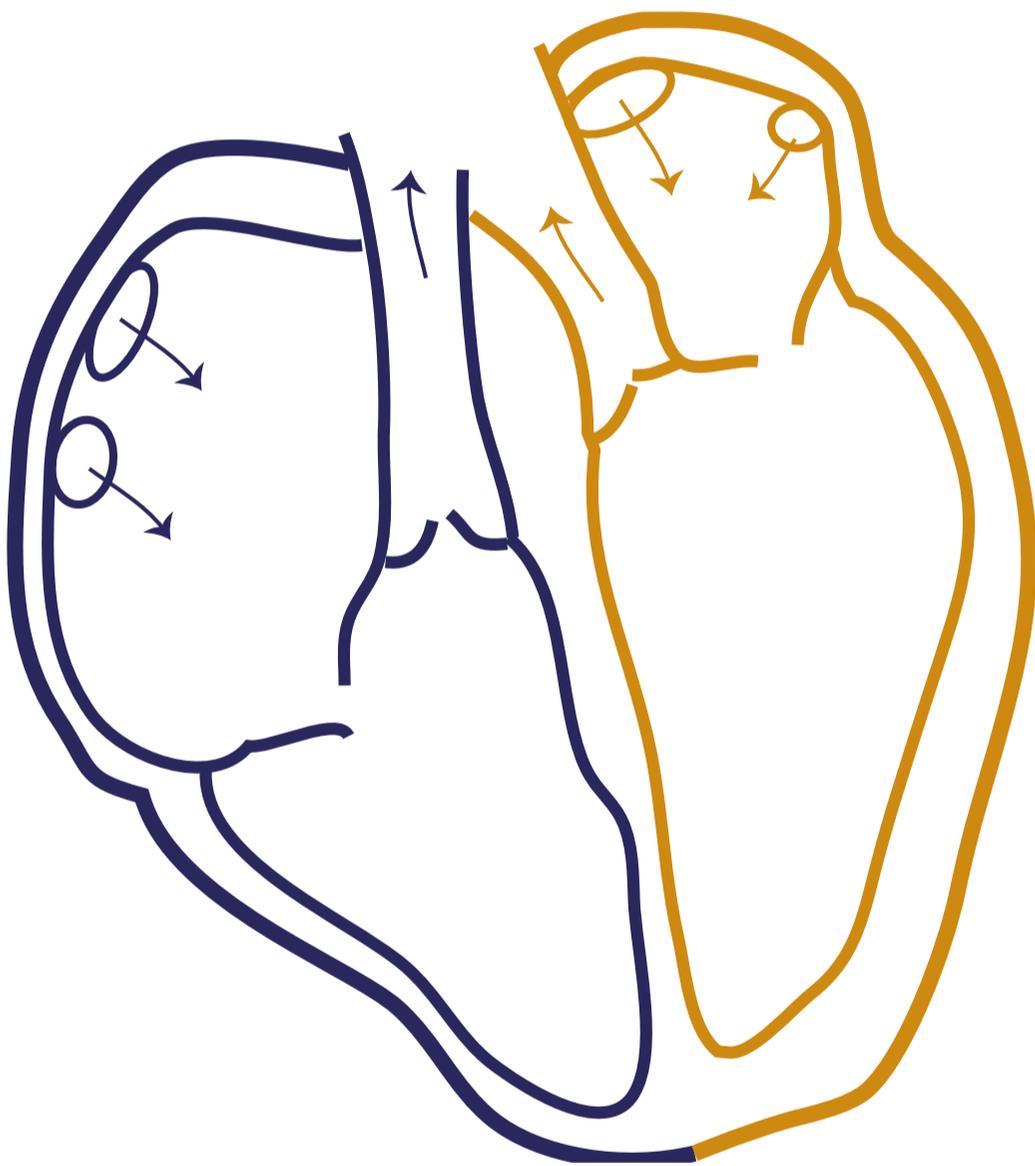
Results

Past medical history analysis uncovered multiple health conditions besides the CNS malformations and hydrocephalus. The main medical problems were: spinal muscular atrophy, drug resistant epilepsy, difficulties in feeding and serious cognitive abnormalities. One patient died due to an infection of their ventriculo-peritoneal shunt. All patients required multiple surgical interventions and multiple hospitalizations.

Conclusion

CNS malformations result in extreme changes in their families' daily lives and routines. They require 24/7 palliative care and, sometimes, artificial life support and multiple medical interventions. Therefore, early prenatal detection which enables the parents to undergo psychological and medical counselling should be followed by a knowledgeable decision regarding keeping the pregnancy or its termination, which is not the case in Poland.

Cardiology & Vascular



Presenters:

Thakkar, H.P. (Helly)
Palm, C.L. (Constantin)
Martin, A.M. (Amandus)
Santos, B.H.S dos (Brena)
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Role of immunomodulators in myocarditis: A Network Meta-analysis

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Introduction

Myocarditis is inflammation of the heart muscle, also known as inflammatory cardiomyopathy. In children, myocarditis is most likely due to viral infections. The most common viruses involved are: Parvovirus, Influenza virus, Adenovirus and coxsackie virus. Immunomodulator treatment for myocarditis is controversial. A number of uncontrolled trials demonstrated that immunomodulator treatment might improve the function in heart failure. This meta-analysis was conducted to see the role of different immunomodulators in children with myocarditis.

Materials & Methods

A total of 14 RCTs having 879 patients out of which 416 patients received immunomodulator therapy and 463 patients were given conservative treatment following PRISMA guidelines till August 2020 were matched for inclusion and exclusion criteria. The following search strings and MESH terms were used: "immunomodulator therapy", "myocarditis". Following this, role of different treatment options such as corticosteroids, intravenous immunoglobulin and corticosteroids plus azathioprine or cyclosporine combination on the outcome of rate of death or transplantation was analysed. RevMan 5.3 was used for appropriate statistical tests. Fixed and Random Effect Model Test were used and $p < 0.05$ was considered statistically significant.

Results

Intravenous immunoglobulin therapy was found to be associated with decreased incidence of death or need for transplantation (OR=0.421, CI= 0.208 to 0.854, $p < 0.017$). However, Corticosteroids plus azathioprine or cyclosporine therapy was found to be associated with incidence of death or need for transplantation (OR=1.781, CI=1.122 to 2.826, $p < 0.014$). There was no significant association between corticosteroids single therapy and incidence of death or need for transplantation. When the drugs were compared indirectly, corticosteroids was having statistically significant more risk of adverse outcome as

compared to immunoglobulin (RR=2.045, CI=1.558 to 2.683, $p < 0.001$ in fixed effect model).

Even the combination of corticosteroid and azathioprine was having statistically significant more risk of adverse outcome as compared to immunoglobulin. (RR=1.888, CI=1.437 to 2.479, $p < 0.001$). The combination of corticosteroid and azathioprine when compared to corticosteroid alone non-significant difference was found (RR=1.094, CI= 0.882 to 1.358, $p = 0.414$).

Conclusion

The present study does not support corticosteroids or combination of corticosteroids plus azathioprine or cyclosporine as superior to conventional therapy in myocarditis. However, intravenous immunoglobulin might be beneficial in reducing death or need for transplantation in myocarditis.

Unraveling molecular pathways in heart failure: PTPRZ1 and its role in cardiac fibroblast stress response

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Introduction

Heart failure is a complex end-stage clinical syndrome resulting among others from myocardial infarction, hypertension, cardiomyopathies, and valvular disease. Over the years, tyrosine phosphorylation and de-phosphorylation, by tyrosine kinases, has been characterized as an important motif in myocardial remodeling. Kinase signaling pathways have been shown to be involved in the response to oxidative stress, inflammation, recovery, function and fibrosis in myocardial tissue. Interestingly, despite considerable efforts on the evaluation of the role of protein kinase pathways, the role of protein phosphatase pathways has remained rather under appreciated. The aim of this study was to characterize the role of receptor-like protein tyrosine phosphatase zeta 1 (PTPRZ1), in heart failure and specifically its role in apoptosis.

Materials & Methods

PTPRZ1 RNA expression was determined in murine hearts post myocardial infarction (MI) (n=8) and sham treated animals (n=8). Neonatal murine cardiomyocytes and fibroblasts were isolated from 1-3 day old pups. RNA and protein were isolated from cardiomyocytes, fibroblasts, and fibroblasts stimulated with 10nM TGF-beta for 24hrs. Additionally, fibroblasts were also exposed to small interfering RNA (siRNA) targeting PTPRZ1. Data was analyzed by means of Mann-Whitney U testing for two-group comparisons and Kruskal Wallis testing for comparisons of more than two groups.

Results

PTPRZ1 was found to be upregulated in murine MI (p<0.001). In murine cardiac cells, PTPRZ1 was primarily expressed in fibroblasts (n=4-5, p<0.05). Fibroblasts stimulated with TGF-beta demonstrated an increase in α -smooth muscle actin (α -SMA, n=5, p<0.01), as well as in CTGF (n=5, p<0.01). PTPRZ1 only demonstrated a trend towards increased expression (n=5, p=0.06). Fibroblasts exposed to siPTPRZ1 had a 90% reduction in PTPRZ1 expression both on RNA (n=6, p<0.05) and protein level (n=1), leading to a dampened response to TGF-beta with respect to α -SMA expression (n=5, p<0.01). Apoptosis was unaffected as determined by the BAX/BCL-2 ratio.

Conclusion

PTPRZ1 is a novel heart failure associated gene primarily expressed in fibroblasts. Our findings suggest PTPRZ1 is not involved in fibroblast apoptosis, but could be associated to fibroblast differentiation and exert a pro-fibrotic effect.

Clinical study of collagen metabolism markers (PICP, PIIICP, PIIINP, MMP-1/TIMP ratio) as biomarker for the severity of mitral valve regurgitation in pediatric rheumatic heart disease

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Introduction

Rheumatic heart disease (RHD) is the most serious complication of acute rheumatic fever (ARF) sequelae. RHD abnormalities are most commonly seen in the mitral valve and manifest primarily as mitral regurgitation (MR) followed by mitral stenosis. Increased inflammation and oxidative stress components: Procollagen Type I and Type III Carboxy-Terminal Propeptide (PICP and PIIICP), Procollagen Type III N-Terminal Propeptide (PIIINP), and Matrix Metalloproteinase-1 (MMP-1)/Tissue Inhibitors of Metalloproteinases (TIMP-1) ratio have been shown in adult rheumatic mitral valve stenosis disease but there has never been a study in cases of pediatric RHD. This study examined the relationship between levels of collagen metabolism markers (PICP, PIIICP, PIIINP, MMP-1/TIMP Ratio) with the severity of mitral valve regurgitation in pediatric RHD.

Materials & Methods

Subjects of this cross-sectional study were 32 pediatric RHD patients underwent outpatient treatment divided into 4 groups: ARF without valve abnormalities, mild, moderate, and severe MR. The severity of mitral valve damage was determined by echocardiography to measure the Wilkin score and Effective Regurgitant Orifice Area. Peripheral blood samples were taken to measure the levels of PICP, PIIICP, MMP-1 and TIMP-1 using the ELISA method. Data analysis used SPSS 24 with a 95% CI.

Results

Wilkin's Score showed a significant mean difference ($p < 0.001$) between normal, mild and moderate, also severe groups (0.00 ± 0.00 ; 0.64 ± 1.05 ; 2.67 ± 1.50). There were significant correlation between Wilkin's Score with severity of mitral valve ($r = 0.829$, $p < 0.001$), PICP ($r = 0.35$; $p = 0.028$), but not with PIIICP and MMP-1/TIMP-1 ratio ($p > 0.05$). PICP showed a significant mean difference ($p = 0.002$) between normal (5.85 ± 1.58) and severe (5.63 ± 1.75) groups, but not mild and moderate groups (5.63 ± 1.75 ; $p > 0.05$). PIIICP showed a significant mean difference ($p = 0.049$) between normal (12.77 ± 2.81) with mild and moderate (15.85 ± 3.05) and severe (16.02 ± 3.85) groups. While MMP-1/TIMP-1 ratio did not show significant mean difference ($p = 0.623$) between groups. There were significant correlation between severity of mitral valve regurgitation with PICP ($r = 0.40$; $p = 0.011$) and PIIICP ($r = 0.35$; $p = 0.039$), but not with MMP-1/TIMP-1 ratio ($p = 0.599$). From multivariate analysis, only PICP ($r = 0.460$; $p = 0.005$) and PIIINP ($r = 0.372$; $p = 0.018$) were significantly correlated with severity of mitral valve regurgitation. Prediction accuracy test for valve regurgitation using ROC curve on PICP shows high accuracy (AUC = 0.804; $p = 0.006$) with cut off of 7,584 (sensitivity 66.7%, specificity 83.3%).

Conclusion

There is relationship between levels of collagen metabolism markers with the severity of mitral valve regurgitation in pediatric CHD especially PICP and PIIINP so that they might be considered as a biomarker.

Effects Of Central Venous Catheterization Exclusively Guided By Point-Of-Care Ultrasound

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Introduction

Central venous catheterization (CVC) is used as vascular access for hemodialysis, to drugs and fluids administration and also to measure central venous pressure. Ultrasound has been used as a diagnostic tool and as an aid to perform procedures, including at the bedside (point-of-care ultrasound (POCUS)). With the intention to reduce costs and exposure to radiation, the POCUS can be used to guide the venipuncture and the distal catheter extremity. We aimed to establish the applicability and the effects of the POCUS as the only resource to CVC.

Materials & Methods

A prospective cohort study developed in a quaternary hospital considered all patients with at least 18 years old, from both sex, with an indication of CVC and at least one patent cervical puncture site, from July 2020 to October 2020. All included participants were submitted to CVC exclusively guided with POCUS and confirmed by a chest x-ray. Categorical variables were described with frequency rates and compared using t-test. Continuous variables were described using mean and standard deviation values.

Results

We present 20 cases of patients submitted to CVC exclusively guided by POCUS. A trained vascular surgeon performed the internal jugular vein catheterization of all patients, in the B-mode, with a linear high-frequency ultrasound transducer. The guide-wire and the tip of the catheter were visualized by POCUS and confirmed by chest radiography. The length of the catheter was calculated by both. In 18 patients (90%), the positioning of the catheter by POCUS was correct. There were no complications such as pneumothorax or catheter malfunction. In all cases, the time of procedure was not affected by the use of POCUS and it was possible to guarantee the correct position of the catheter tip without the use of radiation, except in two patients.

Conclusion

The CVC exclusively guided by POCUS seems to be feasible, effective and safe in our sample. Studies with high sample size and with a comparative design (preferable randomized), comparing the standard radiation technique and the exclusively guided by POCUS is needed to reaffirm our data.

Comparative efficiency of postthrombotic venous obstruction stenting

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Introduction

Chronic obstructive diseases of the inferior vena cava (IVC) can be complicated by the development of IVC syndrome. Open IVC surgeries are rarely used, as they're technically complex. Endovascular methods of treatment are considered promising. We want to assess whether a therapy supplemented by venous stenting has any advantages.

Materials & Methods

A prospective comparative study was carried out by using a group of historical control. Patients who suffered acute proximal venous thrombosis with an outcome in stenosis or occlusion of the ileocaval segment, with signs of post-thrombotic disease (PTD) according to the Villalta Score (5 or more points) were included. The patients were divided into 2 groups. The first group (historical control group) included patients who received conservative treatment. The second group included patients who underwent venous stenting in addition to conservative therapy. The state of the venous bed was assessed using ultrasound examination. The "Villalta" score rate was performed 6 months after treatment.

Results

The technical success of stenting was achieved in all cases (100%). SAE not registered. Stent occlusion was detected in one case (5%) at the 4th month of follow-up and required re-intervention. Thus, the primary and secondary permeability were 95% and 100%, respectively. After 6 months, a significant decrease in the Villalta score was noted in the main group (from 15.1 ± 3.4 to 4.4 ± 2.1 ; $p < 0.0001$). In the control group, there were no such changes (13.1 ± 3.1 versus 12.8 ± 3.0). Major and NLCS bleeding was not observed. Minor bleeding was registered in one patient of each group (5%) and did not require a change in the antithrombotic therapy.

Conclusion

Stenting of the veins of the lower extremities in post-thrombotic obstruction is an effective and safe technique for restoring venous outflow, which significantly improves the results of treatment of patients with post-thrombotic disease.

Oncology I



Presenters:

Rajpoot, S.S. (Sultan Saeed)
Garrido-Zabala, B. (Berta)
Pateliya, B (Bharat)
Karsono, RK (Ramadhan)
Das, T.P. (Tilak)

Inhibition of GADD45 β Reprograms Immunosuppressive Tumour-Associated Dendritic Cells

Rajpoot, S.S. (Sultan Saeed)¹, Bennett, J. (Jason)¹, Verzella, D. (Daniella)¹, Begalli, F. (Federica)¹, Capece, D. (Daria)¹, D'Andrea, D. (Daniel)¹, Franzoso, G. (Guido)¹

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Introduction

The ability of dendritic cells (DCs) to efficiently present tumour antigens to cytotoxic T-cells has led to a continuous focus in exploiting their unique stimulatory abilities in therapeutic cancer strategies. However, an immunosuppressive tumour-microenvironment (TME) often results in DCs adopting a paralysed or immunosuppressed phenotype. The role of dysregulated NF- κ B signalling has additionally been implicated in various human malignancies, with its effector molecule, GADD45 β , suppressing pro-inflammatory tumour-associated macrophages. However, as the role of GADD45 β in DCs remain unknown, this study aimed to investigate the function of GADD45 β in DCs, and whether inhibiting GADD45 β could re-program DCs to a pro-inflammatory phenotype.

Materials & Methods

Bone marrow-derived dendritic cells (BMDCs) were pooled from 7 GADD45 β ^{-/-} mice and 7 GADD45 β ^{+/+} mice. BMDCs were treated with LPS/IFN γ , followed by cell lysate and RNA collection. Activation of the pro-inflammatory MAPK and STAT1 signalling pathways were assessed by western blot and the expression of pro-inflammatory genes via qRT-PCR. Pharmacological inhibition of GADD45 β was performed on the immortal dendritic cell line, JAWS-II by co-treating with a GADD45 β inhibitor, DTP3 and LPS/IFN γ . Western blotting and qRT-PCR were then used to assess pro-inflammatory JAWS II activation.

Results

Western blotting analysis revealed that BMDCs from GADD45 β ^{-/-} mice, showed an augmented p38 signalling phosphorylation compared to GADD45 β ^{+/+} BMDCs. This corresponded with the upregulation of pro-inflammatory genes, such as IL-1 β [Relative mRNA 375.58 (GADD45 β ^{+/+}, n=1); 1730.18 (GADD45 β ^{-/-}, n=1)]. The activation marker, MHC II, was also upregulated in GADD45 β ^{-/-} mice [Relative mRNA 369.74 (GADD45 β ^{+/+}, n=1); 640.56 (GADD45 β ^{-/-}, n=1)]. Western blot analysis of JAWS-II cells treated with DTP3, showed enhanced p38-MAPK signalling compared to the untreated control. This corresponded with the increased expression of pro-inflammatory markers, such as IL-1 β [Relative mRNA 1520.05 (control, n=2); 4565.27 (treated, n=2)] and MHC II [Relative mRNA 29.57 (control, n=2); 39.87 (treated, n=2)].

Conclusion

These findings indicate the role of GADD45 β in suppressing the pro-inflammatory p38-signalling pathway in DCs. Additionally, with DTP3 inducing pro-inflammatory activation, highlights the ability to re-program DCs from a TME-induced immunosuppressive state to an anti-tumour phenotype. As a result, this may highlight GADD45 β as a new targetable innate immune checkpoint, to increase the likelihood of eliminating even refractory cancers.

Characterization of regulation and function of G9a in Multiple Myeloma

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Introduction

Multiple myeloma (MM) is a hematologic disease that accumulates malignant plasma cells in the bone marrow. MM remains clinically challenging due to high clonal heterogeneity and thus ultimately incurable. Significant effort has been put into determining a common genetic denominator for disease establishment and progression, however, with limited success. Previous studies have suggested that a dysregulated epigenetic machinery could be a crucial factor in MM pathogenesis. G9A-mediated silencing through the deposition of H3K9me1/2 has been described to be overexpressed in MM cell lines and has been associated with poor prognosis in patients. DNMTs, responsible for de novo and maintenance of DNA methylation potential are overexpressed in MM cell lines. Our hypothesis is that G9A and DNA methylation-mediated silencing may contribute to the dysregulated epigenetic landscape in MM. In addition, the biological impact of this collaboration is poorly understood.

Materials & Methods

Here, we utilized a combinatorial treatment with a G9A inhibitor (A366), and the DNMTs inhibitor 5-azacytidine (AZA) to investigate cellular response and viability in MM cell lines. Western blot against H3K9me1/2/3, DNMT1, G9a, and tH3 is performed to analyze changes in the epigenetic landscape to the treatment. Molecular interaction between G9a and DNMT1 is studied by Co-IP. Cell cycle and apoptotic analysis is examined by FACS.

Results

Preliminary results of the combinatorial treatment reduced cell viability to 17%, while single treatments decrease viability to 66% and 44% respectively after 9 days of treatment. MM cell lines overexpress DNMT1, G9a, and H3K9me2/3 proteins compared to PBMC. After combinatorial treatment, DNMT1 and H3K9me2/3 are reduced in the MM cell line INA-6. In addition, G9a protein expression is increased.

Conclusion

Herein, we have shown that combinatorial treatment with G9ai and DNMTi is effective in reducing cell viability as well as decreasing the amount of H3K9me2/3 and DNMTs in MM cells. This novel approach could elucidate the interplay between G9A and DNMTs, as well as uncover a potential treatment of the disease.

Naringenin and metformin enhance the antitumor effect of doxorubicin against experimental models of breast carcinoma

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Introduction

Breast cancer is the most common malignancy in women worldwide and is curable in patients at an early stage. Strategies using cancer chemotherapy commonly require a combination of agents. However, the development of resistance to chemotherapeutic agents and toxicity to normal cells are the major problems. The present work is aimed to evaluate the potential of naringenin and metformin concomitant addition with doxorubicin chemotherapy against experimental breast carcinoma models.

Materials & Methods

The antitumor potential of drugs under the study was evaluated *in vivo* against methylnitrosourea (MNU)- induced breast cancer in rats and 4T1- induced orthotopic mouse model. Tumor-bearing animals were randomly divided into various groups to assess the effect of each single drug (naringenin or metformin or lipo-dox) and concomitant drug treatments. Parameters like tumor growth, body weight, survival rate, blood glucose, hematology and histology were determined.

Results

There was a significant reduction ($p < 0.05$) in tumor weight and an observed decrease in tumor multiplicity in naringenin and metformin concomitant addition with doxorubicin treatment as compared to doxorubicin alone against MNU-induced breast carcinoma. Likewise, naringenin and metformin with lipo-dox showed a significant reduction of tumor volume and tumor weight ($p < 0.01$) in 4T1 mouse model as compared to the same dose of lipo-dox alone, suggesting combination treatment enhanced antitumor activity *in vivo*. Further, histology of tumor biopsies presented the enhanced antitumor activity of doxorubicin through increasing tumor necrosis. Hematological parameters, body weight and survival data presented remarkable safety of combination treatment without compromising efficacy using a lower dose of doxorubicin as compared to the large dose of doxorubicin alone.

Conclusion

Our results demonstrate that naringenin and metformin enhanced the antitumor effect of doxorubicin in animal models of breast carcinoma and useful as an adjunct to increase the effectiveness of doxorubicin at a lower dose.

Effect of Primary Systemic Therapy on PD-1, PD-L1, and PD-L2 mRNA Expression in Advanced Breast Cancer

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Introduction

The association between PD-1, PD-L1, and PD-L2 expression and prognosis has been extensively studied in various cancers but remained controversial in breast cancer. Besides, little is known about the prognostic value of PD-1, PD-L1, and PD-L2 upregulation or downregulation following systemic therapy (chemotherapy and hormonal therapy) in breast cancer. Measurement of PD-L1 protein expression using immunohistochemistry (IHC) is a common method to predict response to anti PD-1/ PD-L1 therapy. However, PD-L1 IHC has several drawbacks including different cut offs and scoring systems, variable detection antibodies, and processing variability. Therefore, we aim to investigate the change of PD-1, PD-L1, and PD-L2 expression in mRNA level after primary systemic therapy in breast cancer patients and its clinical implications.

Materials & Methods

Expression of PD-1, PD-L1, and PD-L2 mRNA were measured before-after chemotherapy and hormonal therapy with real-time PCR in 80 advanced stage (3 and 4) breast cancer patients. The correlation between alteration of PD-1, PD-L1, and PD-L2 expression and clinocopathological characteristics as well as overall survival (OS) was also statistically analyzed.

Results

Chemotherapy and hormonal therapy altered PD-1, PD-L1, and PD-L2 expression in breast cancer with most patients have an increase expression. As much as 57.1%, 62.9% and 60% patients have an increase PD-1, PD-L1, and PD-L2 expression after chemotherapy, while 60%, 60%, and 64% patients have an increase PD-1, PD-L1, and PD-L2 expression after hormonal therapy. Alteration of PD-1, PD-L1, and PD-L2 expression was not correlated with all clinocopathological characteristics. Increase in PD-1, PD-L1, and PD-L2 expression was significantly associated with better OS ($p=0.029$, $p=0.018$, and $p=0.017$ for PD-1, PD-L1, and PD-L2, respectively), which remained significant in multivariate analysis including age, stage, primary systemic therapy, histology grade, subtype and primary tumor histology (HR PD-1 1.99 (95% CI 1.13-3.49) $p=0.031$; HR PD-L1 2.28 (95% CI 1.24-4.16) $p=0.019$; HR PD-L2 2.16 (95% CI 1.14-4.07), $p=0.019$).

Conclusion

Expression of PD-1, PD-L1, and PD-L2 in breast cancer patients is mostly enhanced after chemotherapy and hormonal therapy, and the enhancement is associated with good OS. This result revealed the potential of measuring PD-1, PD-L1, and PD-L2 mRNA expression in predicting clinical outcome.

Characterization of PD-L1 expression in Merkel cell carcinoma

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Introduction

Merkel cell carcinoma (MCC) is an aggressive skin cancer. The majority is associated with Merkel Cell Polyomavirus (MCPyV), while the remaining is caused by ultraviolet-induced DNA damage. The advent of immune checkpoint inhibitors targeting key immunoregulatory transmembrane proteins, such as programmed death ligand-1 (PD-L1) – conveying tumor immune evasion – has altered the treatment landscape for several cancers, including MCC. PD-L1 expression is associated with a higher response rate to PD-1/PD-L1 inhibitors in numerous tumor types. However, PD-L1 expression and its relation to immune checkpoint inhibitor response in MCC remains unclear. Here, we aim to characterize the expression of PD-L1 in MCPyV-positive (MCPyV+) and MCPyV-negative (MCPyV-) MCC cell lines, to discern the PD-L1-mediated immune evasive strategies of MCC.

Materials & Methods

The expression of PD-L1 splice variants was evaluated by 3' rapid amplification of cDNA ends and PD-L1 protein expressions were detected by immunoblotting with PD-L1 antibodies. The glycosylation status of PD-L1 was assessed by enzymatic digestion with a glycosidase: endoglycosidase H or peptide-N-glycosidase (PNGase), followed by immunoblotting with anti-PD-L1. The subcellular localization of PD-L1 was determined using immunofluorescence. Human MCPyV+ and MCPyV- MCC cell lines were used.

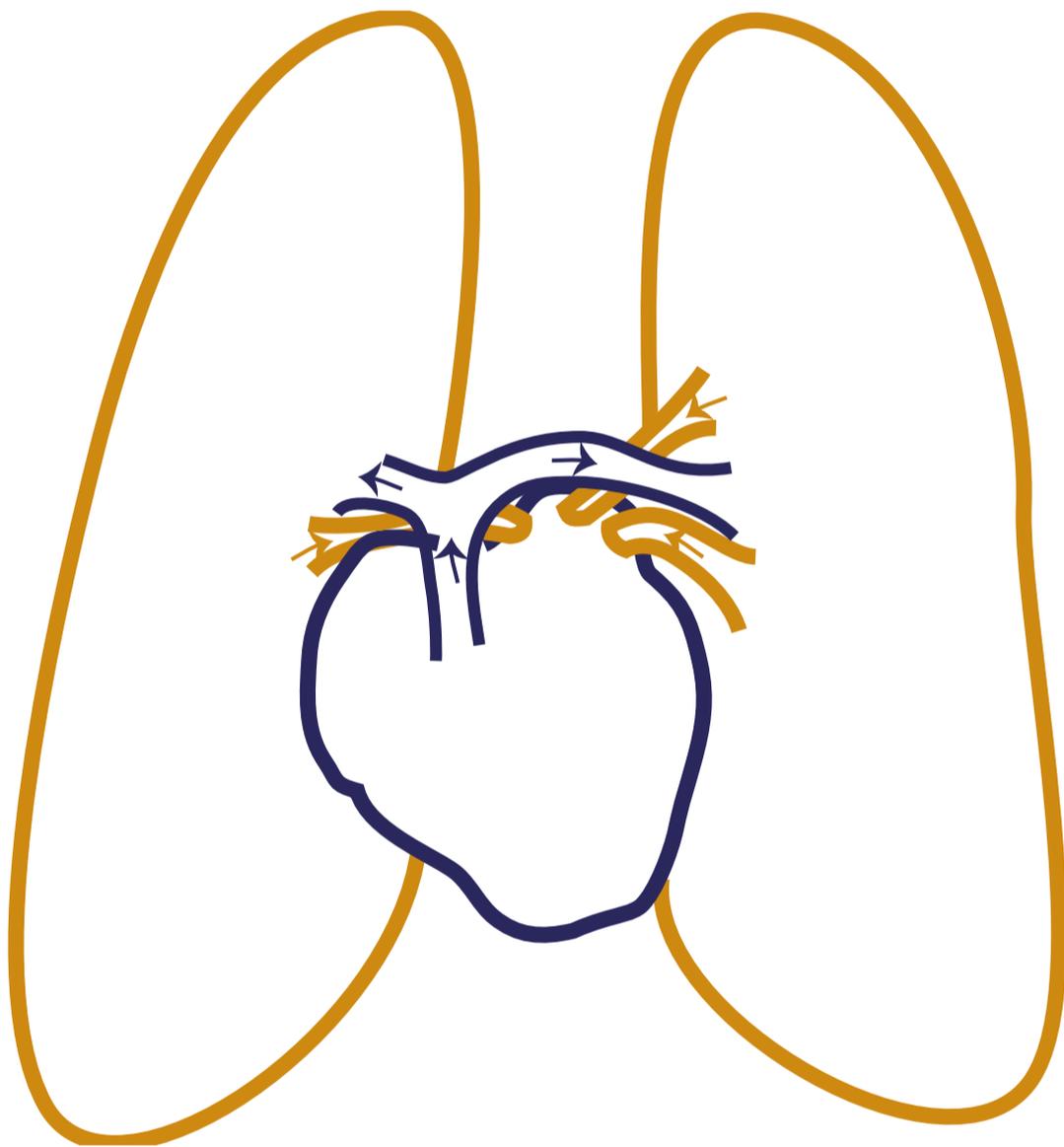
Results

Our results demonstrated the presence of several PD-L1 splicing transcripts in MCPyV+ and MCPyV- MCC cell lines. Using immunoblotting, we observed that the larger PD-L1 isoform (45 kDa) was the most abundant in the virus-negative cells, while the short isoform (25 kDa) in the virus-positive cell lines. Treatment with PNGase revealed that the 45 kDa PD-L1 was digested to the deglycosylated form (33 kDa), suggesting its glycosylation. However the 25 kDa PD-L1 was not digested by either glycosidases. The immunofluorescence assays showed that PD-L1 was predominantly detected on the plasma membrane of MCPyV- MCC cell lines, while the MCPyV+ cell lines exhibited nuclear membrane pattern of PD-L1.

Conclusion

Our results demonstrate different PD-L1 isoforms in MCPyV+ and MCPyV- MCC cell lines. The virus-negative cell lines predominantly express the 45 kDa isoform on the plasma membrane, while the virus-positive cell lines express mostly the non-glycosylated 25-kDa isoform on the nuclear membrane. Importantly, these findings suggest that MCPyV+ and MCPyV- MCC may apply distinct strategies for immune evasion.

Pulmonology



Presenters:

Yaqoubi, S (Shadi)
Kaczmariski, P. (Piotr)
sadeghdoust, A (Adel)
Janucik, A.J (Adrian)

Co-delivery of montelukast and budesonide as dry powder inhalation formulation

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Introduction

Oral inhalation of drugs is the main strategy to treat lung disorders such as asthma and chronic obstructive pulmonary disease (COPD). Using this method of delivery, the inhaled drug directly targets the diseased site, leading to increased drug concentration at the site of action, increased onset of action and lowered required dose which subsequently brought about reduced systemic side effects. Meanwhile, dry powder inhaler (DPI) provides great advantages over other inhalable systems representing higher stability and lower employed excipients. To this end, electro spraying methodology was used for particle to prepare a combined inhalable dry powder formulation from montelukast and budesonide which can be applicable as a smart regimen in asthma treatment.

Materials & Methods

Solutions of montelukast and budesonide at various concentrations and ratios dissolved in different solvents were prepared without adding carrier and electro sprayed at different conditions. The physicochemical properties of obtained drug particles were evaluated using scanning electron microscopy, particle size analysis, gas chromatography, powder X-ray diffraction, Fourier transform infrared spectroscopy, and differential scanning calorimetry. next generation impactor (NGI) was used to assess in vitro drug deposition pattern, and the dissolution profile of the selected formulations was characterized via modified diffusion franz cell method. The possible synergism or additive effects of budesonide and montelukast was tested by measuring the percentage of inhibited reactive oxygen species preventive in human normal lung cells.

Results

The co-electro sprayed carrier free formulation of montelukast-budesonide resulted in FPF value of 38%. Dissolution test showed that the combining montelukast and budesonide has led to increased dissolution rate of budesonide. ROS inhibition test revealed the presence of synergism effects.

Conclusion

The findings in the current study indicate that montelukast-budesonide combined formulation can be considered can be as a suitable choice for treatment of asthma and COPD. In this formulation montelukast acts as active ingredient and also carrier for budesonide. Furthermore, montelukast has improved the aerosolization behavior and dissolution rate of budesonide. The observed synergistic effects emphasize the suitability of this combination as an anti-asthmatic therapeutic.

Correlation between nocturnal hypoxemia and DM2 among OSA patients

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Introduction

Diabetes mellitus type 2 (DM2) is a common comorbidity in obstructive sleep apnea (OSA). There is still not enough information how to determine individuals at higher risk of DM2 among OSA patients. We performed this study to identify parameters that could predict the onset of DM2 in OSA.

Materials & Methods

The study consisted of 549 participants, who underwent polysomnography (PSG) examination. Based on apnea hypopnea index (AHI) 465 patients were diagnosed with OSA, 107 individuals had been diagnosed with DM2. Cox regression models were used to assess the effect of oxygen saturation parameters on the onset of DM2. Classification and regression trees (CART) analysis was used to assess the onset of the DM2 in the study group in context of oxygen saturation variables.

Results

One-way Cox regression showed higher risk of earlier DM2 for increased values of BMI ($p < 0.001$, 95%CI 1.083-1.153, HR=1.117), AHI ($p = 0.003$, 95%CI 1.004-1.017, HR=1.011), decreased basal O₂ ($p = 0.006$, 95%CI 0.886 - 0.9809, HR=0.933) and O₂ nadir ($p = 0.009$, 95%CI 0.972-0.996 HR=0.984) value, while lowered mean O₂ desaturation has not shown statistical significance. In the CART analysis following cut-off points 92.2%, 81.7%, 87.1% were determined for basal O₂, O₂ nadir and mean O₂ desaturation respectively with first 2 parameters being statistically significant.

Conclusion

Higher SpO₂ nadir and basal SpO₂ are associated with the later onset of DM2 in OSA patients. Basal O₂ is independent from AHI, BMI and age predictor of DM2 among OSA patients.

Anti-inflammatory effects of gold nanoparticles in animal model of asthma

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Introduction

Nanogold particles have anti-inflammatory effects in different disease by inhibiting the synthesis of pro-inflammatory cytokines and recruitment of inflammatory cells. Sublingual immunotherapy is a well-known effective, safe and clinically effective method way of immune response regulation which results in long-lasting symptoms reduction. This research was designed to find the immunological effects of sublingual immunotherapy using Nanogold in mice model of asthma.

Materials & Methods

Twenty BALB/c mice were divided into four groups including non-sensitized mice, and three groups of asthmatic mice which were treated sublingually with PBS, Nanogold and Beclomethasone. IL-4 and IFN- γ levels were measured in serum and spleen cells supernatant using ELISA. Bronchoalveolar lavage fluid inflammatory cells differential counting and lungs histological analysis were also done

Results

The results revealed that there was significant increase in level of IFN- γ and decrease in level of IL-4 in serum and spleen cells supernatant of Nanogold treated group ($p < 0.05$ for all). These findings indicates the shift of Th2/Th1 balance towards Th1 cells which is protective against asthma. In addition, histological and BAL fluid analysis demonstrated the reduction of cells and eosinophilic infiltration.

Conclusion

Based on our results, sublingual immunotherapy by Nanogold has significant anti-inflammatory roll in asthmatic mice. Thus, Nanogold is a potentially valuable agent for controlling the underlying inflammation in asthma. However, further investigations is recommended to find more details about its effects

A comparative analysis of mesenchymal stem cell (MSC)-mediated regulation of eosinophilic and neutrophilic experimental asthma

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Introduction

The vast majority of asthma cases can be controlled by using steroid therapy. However, long-term treatment may cause side effects or even lead to treatment resistance. On the other hand, suboptimal control of asthma leads to the development of irreversible changes within the lower airways, referred to as lung remodeling. Therefore there is still a substantial need to develop novel therapies allowing better control of asthma patients, especially for those non-responding to available treatment. Mesenchymal stem cell (MSC)-based therapy may represent an exciting option. Unfortunately, to date, our understanding of the mechanisms of MSC-mediated regulation of lung inflammation is limited. Therefore, here we aimed to analyze the mechanisms of MSC-mediated regulation of HDM induced eosinophilic and neutrophilic experimental asthma.

Materials & Methods

The mice were challenged with house dust mite (HDM) extract to induce eosinophilic (10µg/ml) and neutrophilic (100µg/ml) airway inflammation. Human adipose tissue-derived MSCs were administrated intranasally directly to the inflamed lungs on day six of the experiment. Hematoxylin & eosin and Masson's trichrome stainings were performed to assess lung inflammation and collagen deposition, respectively. Moreover, total RNA was isolated from mice lung and transcriptomic profiling was performed on the Illumina platform. The differentially regulated genes and canonical pathways were analyzed in 'R' software and Ingenuity Pathway Analysis (IPA), respectively.

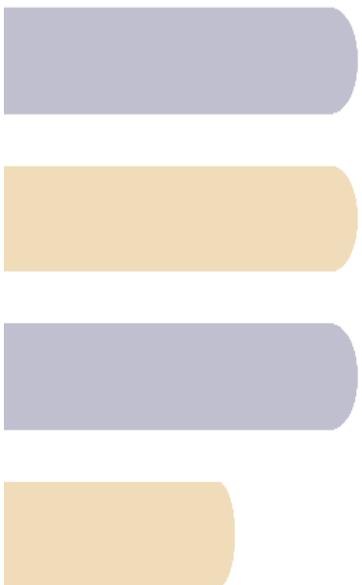
Results

First, as expected, we found that MSCs significantly decrease lung inflammation and collagen deposition. Next, transcriptomic profiling revealed 374 and 2108 differentially regulated genes in eosinophilic and neutrophilic lung inflammation after MSCs administration, respectively. Moreover, we found that therapeutic effects of MSCs-administration may be associated with a distinct mechanism in eosinophilic (immunoregulatory) compared to neutrophilic (metabolic) asthma.

Conclusion

Taking together, we showed here that human adipose tissue-derived MSCs possess therapeutic potential in asthma. More importantly, we found distinct putative mechanisms of MSC-mediated suppression of eosinophilic and neutrophilic experimental asthma.

Oral Sessions II



Public health II



Presenters:

Yuzkiv, R. P. (Rostyslav)

Aigbonoga, D. E. (Daniel)

Osonwa, I.C (Iruoma)

Mor, K (Kshitij)

Aldeguer, CT Ms. (Camille)

Views and awareness of medical students on blood donation in Ukraine

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Introduction

The current blood service and society's attitude to donation in Ukraine do not meet all the patients' needs in blood and blood components today. Due to the shortage of blood supplies, high requirements to donors, new principles of voluntary and non-remunerated donation for Ukraine, it is necessary to have an objective basis for the active promotion of donation for certain groups of the population. Our goal was to understand the views, needs, awareness of one of the target groups, which will provide an opportunity to form, plan and conduct informational and educational campaigns.

Materials & Methods

A survey study gathered the opinions of 320 medical students of the 1st-6th years of school from Bogomolets National Medical University. The questionnaire consisted of an introduction, passport, and the questions. The questions were divided into 3 groups: existing problems, obstacles to the donation, and myths.

Results

130 of respondents (41.3%) donated blood or blood components. Among donors, 19.4% of respondents donated blood more than 7 times. 81.4% of respondents agreed with the statement that it is necessary to create a system of incentives for donors, except for monetary remuneration. Many students mentioned awards, souvenirs, symbolic gifts, free medical consultation, a positive mark for a missed classes for donors, or even financial compensation as necessary incentives for blood donors. 75.6% of respondents also answered that they would donate much easily if they would not miss classes/work. 52.2% of respondents have never heard about volunteer projects related to donation. Note, however, that 26.3% of respondents do not believe that donating blood is good for health.

Conclusion

We found that the share of active donors among all donors who are medical students is higher than the average among the general population. It is now also clear that students need additional incentives from the university, volunteering programs or government which can significantly raise the engagement among them. We also discovered that it is crucial to decrease the time and efforts needed to make a donation.

Positive attitude towards acquiring basic life support (BLS) skills in a poor-resource setting

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Introduction

Cardiac arrest is a sudden and unexpected cessation of blood circulation due to failure of the heart to pump effectively. Out-of-hospital cardiac arrest (OHCA) is a major cause of sudden cardiac death which could be prevented by early cardiopulmonary resuscitation (CPR). Corporate bodies like the International Liaison Committee on Resuscitation (ILCOR), the European Parliament and the World Health Organization (WHO) recommend that basic life support (BLS) education in schools in order to increase the rate of bystander CPR and reduce mortality. We are not aware of any BLS education program for non-healthcare students in Nigeria. This study was therefore carried out to assess the awareness and attitude to acquiring BLS skills among Nigerian university students.

Materials & Methods

We conducted a cross-sectional study among final year university undergraduates using a questionnaire that assessed students' demography, awareness of CPR, previous experiences, and attitude to basic life support (BLS). Counts and proportions were compared for the demographic characteristics using Chi-squared and Fisher's exact tests.

Results

Four hundred and seventy-five students participated in this study, median age was 22.8 years (interquartile range: 21.2-24.5 years). Majority (82.5%) have heard of CPR, 29.7% have undergone CPR training; 77.3% of those who had been trained were confident that they could perform CPR. Previous CPR training was significantly associated with faculty, year of study and age. Eighty-nine (18.7%) students have witnessed someone die from a trauma. Four hundred and fifty (94.7%) respondents would like to get BLS training, 440 (92.6%) think that CPR training should be included in the school curriculum.

Conclusion

There is good awareness and positive attitude to the acquisition and practice of cardiopulmonary resuscitation among university students in Nigeria. Few students however, have been trained to administer bystander cardiopulmonary resuscitation. There is a need to implement school wide BLS education in resource-poor settings. We also advocate for the consolidation of every link in the American Heart Association (AHA) "chain of survival" through infrastructure revamp of Emergency Medical Services (EMS) and hospital services.

Knowledge, Attitude And Health-Seeking Behaviour Towards Acute Respiratory Tract Infections Among Mothers Of Children Under-five In Mushin LGA, Lagos, Nigeria.

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Introduction

The first five years of a child's life are formative as they shape future health, growth and development. A common illness encountered by under-fives is Acute Respiratory Tract Infections (ARIs). It is a major cause of morbidity among under-five children in Nigeria and across the world. This poses a significant economic burden on families and the health system.

Majority of the primary care-takers of children at this pivotal stage are mothers, hence they have a great role to play in curbing ARIs.

The study aimed to determine the knowledge and attitude towards ARIs, and the health-seeking behavior among mothers of children under-five in Mushin local government, Lagos, Nigeria.

Materials & Methods

It was a descriptive cross-sectional study which recruited 220 mothers from 5 wards in Mushin, using multi-stage sampling technique. Data was collected using interviewer-administered semi-structured questionnaires. Data from fully completed questionnaires were analyzed using Epi Info version 7.1 software.

Relationship between categorical and continuous variables was determined using chi square and $p < 0.05$ was considered statistically significant.

Results

Majority (85%) of the mothers had good knowledge of the causes, risk factors and types of childhood ARIs. Most (97.73%) showed good attitude towards ARI whilst health-seeking behavior was inappropriate (20.88%). Level of education ($p=0.022$), ethnicity ($p=0.038$) and religion ($p=0.043$) of mother, were statistically associated with the knowledge of ARIs. Statistically significant variables that contributed to inappropriate health-seeking behavior among the mothers were age ($p= 0.017$), occupation of respondents ($p= 0.011$) and child's gender ($p= 0.029$).

Conclusion

The study revealed good knowledge and attitude towards ARIs among mothers of under-five, but poor health-seeking behavior. This may be a contributing factor to the high morbidity and mortality of under-fives.

The study recommends a need to increase female literacy as mothers who were educated and employed had good knowledge, and appropriate health seeking behavior. This also enables the mothers be gainfully employed and seek quality care for their under-fives.

Who Will I Be? - The occupational expectations of Dutch adolescents and how they relate to mental health and work outcomes in young adulthood

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Introduction

Formation of occupational goals and expectations has been highlighted by different theoretical perspectives as an important aspect of mental health development during adolescence. Furthermore, work plays an important role in adult life and has an impact on the well-being of individuals. Given the limited research on future occupational expectations in relation to work outcomes and mental health, this study aims to explore future work expectations at the age of 19, and their achievement 10 years later, and how expectations and achievement relate to mental health problems from childhood to young adulthood.

Materials & Methods

This study uses data from the TRAILS cohort study which follows 2229 Dutch individuals for 17/18 years, starting at age 11. Chi-square analysis is used to examine whether occupational expectations differ by gender and mental health. Logistic regression is performed to study the role of mental health in the relationship between occupational expectations and later life work outcomes. Finally, we use a mixed-effects model to examine the mental health differences between people who achieved their expectations compared to those who did not

Results

The results of the chi-square analysis showed that sex is significantly related to job expectations, i.e. a higher percentage of females (17.7%) have unclear job expectations compared to males (10.3%; $p=0.001$). A history of mental health problems was not significantly associated with future occupational expectations. The regression analyses are yet to be performed to examine the relationship of mental health with occupational expectations and work outcomes.

Conclusion

The preliminary results from this study showed that the occupational expectations of females tend to be more unclear compared to males. A history of mental health problems, however, does not significantly relate to the type of job expectations that individuals hold. It is important to understand how expectations relate to future outcomes and the role of mental health in this relationship. More in-depth examination will be performed.

Knowledge, Attitudes, and Practices on Biomedical Waste Management of Nurses & Medical Technologists in the Philippines

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Introduction

Unregulated biomedical waste (BMW) management is an emerging public health problem in the Philippines. BMW may contain contaminants that could adversely affect those that handle it, thereby posing a threat to public health and safety. This study aims to quantify and differentiate the Knowledge, Attitudes, and Practices (KAP) of nurses and medical technologists toward Biomedical Waste Management in the Philippines.

Materials & Methods

Using an analytic cross-sectional study design, 196 participants, comprising 77 registered nurses and 119 medical technologists, were recruited from hospitals in the Philippines. The assessment of KAP on BMW management was done using an expert-validated online questionnaire. Chi-square test was utilized to determine significant differences in the responses for each domain in the KAP of nurses and medical technologists.

Results

A statistically significant difference was found between nurses and medical technologists in knowledge, while no significant difference was found in attitudes and practices. Medical technologists demonstrated better knowledge on the disposal of expired blood units and by-products waste (95% CI, $p=.003$), while nurses demonstrated better knowledge on the disposal of expired medications (95% CI, $p=.007$). Both groups demonstrated similar attitudes and similarly adequate practices in BMW management.

Conclusion

There is a statistically significant difference in the knowledge of nurses and medical technologists in terms of sanitary disposal of expired medication, expired blood units, and by-products waste.

Oncology II



Presenters:

Parekh, U Ms. (Urja)
Burger, M.D.L
Ramachandran, SPR (Sai)
Goncu, H. (Hatice)
Latacz, M. (Maria)
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Differential Identification of Biomarkers Between Normal Neural Stem Cells and Glioblastoma Stem Cells Using RNA Seq Analysis

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Introduction

Glioblastoma multiforme (GBM) is the most malignant and heterogenous primary brain tumour with an overall survival of only 15 months after therapy. There are two main hypotheses that suggest the formation of GBM tumour in the brain- one suggests that it arises from dysregulated neural stem cells (NSCs) that transform to form the tumour, and the other theory suggests that cancer or glioma stem cells (GSCs) initiate and cause progression of GBM. It is crucial to understand the origin of the tumour to elucidate specific and effective targets for therapy.

Materials & Methods

To understand the gene expression differences between these two types of stem cells, RNA Seq analysis was carried out on 20 RNA sequence samples of NSCs and GSCs each, selected from the SRA study SRP200400 on the NCBI database. Using the T-Bioinfo platform™, gene expression data in FPKM (Fragments Per Kilobase of transcript per Million mapped reads) units was obtained which was normalized and log scaled and further used to perform principal component analysis (PCA), differential expression analysis (DGE), hierarchical clustering and gene ontology (GO) studies on DAVID.

Results

DGE analysis showed that there were 192 significantly differentially expressed genes in GSCs (padj. value <0.05, log2fold change >3). and 156 significantly differentially expressed genes in NSCs (padj. value <0.05, log2fold change <-3). Many novel cufflink IDs were also obtained that had no established known function. Hierarchical clustering depicted the grouping of NSC and GSC samples in two separate clusters. An outlier of GSC sample was found in the NSC cluster (SRR9200898_PE). On performing PCA, a PC1 of 80.03% and PC2 of 2.13% was obtained. GO studies showed the involvement of both gene sets in tumorigenesis pathways.

Conclusion

A significant difference was found in the gene expression between the two types of stem cells suggesting a substantial genetic shift between NSCs and GSCs. The outlier sample could be a missing link that can provide hints on the transformation of neural stem cells to a cancerous phenotype. Novel cufflink IDs need further discovery pipelines as these could be potential biomarkers either to assess the prognosis of GBM or be essential targets for precision medicine.

Survival and toxicity of local metastasis-directed treatment and systemic therapy in patients with oligometastatic upper gastrointestinal cancer.

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Introduction

Local metastasis-directed treatment (MDT) for patients with oligometastases is associated with improved overall survival. However the survival benefit and toxicity of local MDT compared with systemic therapy alone remains unclear. The primary aim of this study was to compare overall survival between local MDT and systemic therapy in patients with oligometastatic esophageal or gastric cancer. The secondary aim was to compare toxicity rates between patients that underwent local MDT and systemic therapy.

Materials & Methods

Patients with synchronous or metachronous oligometastatic esophageal or gastric cancer diagnosed between 2010 and 2020 were eligible for inclusion. Oligometastatic disease was defined as ≤ 5 lesions in ≤ 2 organs. Propensity score matching (1:1) was performed to correct for differences in baseline characteristics. Initial treatment for oligometastatic disease was categorized into local MDT (i.e. stereotactic body radiation therapy or metastasectomy) or systemic therapy (i.e. chemotherapy and/or targeted therapy). The overall survival was defined as the time interval between the detection of oligometastasis and death or last follow-up. The secondary outcome was the occurrence of complications during the entire treatment course according to CTCAEv5 or Clavien-Dindo classification.

Results

A total of 83 patients were included of whom 46 patients (55%) underwent local MDT and 31 patients (45%) systemic therapy. After propensity score matching both groups were comparable and contained 28 patients. The median overall survival was 19 months (IQR: 9.5-46) after local MDT compared with 29 months (IQR: 8.0-41) after systemic therapy ($p=0.93$). Subsequent local MDT after initial systemic therapy was associated with improved overall survival (41 months [IQR: 29-68]). The incidence of complications grade $\geq II$ was 11% after local MDT compared with 43% after systemic therapy ($p<0.001$).

Conclusion

This retrospective study showed similar overall survival between local MDT and systemic therapy in oligometastatic upper gastrointestinal cancer patients. Complications were more frequently observed in patients treated with systemic therapy compared with local MDT. This suggests that local MDT is a viable surrogate for systemic therapy in patients with oligometastatic upper gastrointestinal cancer.

Extent of Palliative Care need among cancer patients undergoing chemotherapy: A cross sectional study

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Introduction

Palliative Care is an interdisciplinary approach aimed at optimising quality of life and mitigating suffering. Identifying patients who may benefit from a palliative approach to their care is a recognised challenge. Poor continuity of care, reduced quality of life, increased socioeconomic burden, etc are all suggested consequences of inconsistent identification of patients with palliative care needs. Therefore, an assessment of the extent of palliative care need in the hospital setting is crucial to appropriately match services and define priorities for care.

Materials & Methods

A comprehensive survey was undertaken among cancer patients undergoing chemotherapy in a tertiary care centre in Western Maharashtra, India. After due consent, participants were screened for palliative care need according to the Gold Standards Framework (GSF) Prognostic Indicator criteria. Participants also completed the Sheffield Profile for Assessment and Referral to Care (SPARC), a needs assessment tool that measures unmet needs across 7 domains from 0-3. Data was analysed using SPSS (USA) 23.0 and results were considered significant if $p < 0.05$.

Results

127 cancer patients who were currently enrolled in chemotherapy were included, with a mean age of 55.39 +/- 12.68. A total of 38% of participants met the GSF criteria for palliative care need. Patient self-reported data indicated that participants who rated a score of 3 for one or more domains in the SPARC questionnaire were 4.7 times more likely to meet the GSF criteria. The most frequently reported unmet needs among these patients were fatigue (76%), pain (71%), anxiety (49%), dependence (49%) and bowel and bladder issues (38%). Participants aged 60 and above scored higher on domains like loneliness and fatigue, compared to younger age groups who reported more concerns about issues like loss of independence, anxiety, etc.

Conclusion

Our results reveal that when using a systematic and objective measure, over a third of cancer patients undergoing chemotherapy met the GSF criteria for palliative care need. It also provides evidence of a large unmet need across various domains among patients, who may benefit from introduction of adjunctive palliative care, and lends support for the use of similar tools in the hospital setting.

The protective and therapeutic effect of ranolazine on cisplatin-induced renal damage in rats

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Introduction

Cisplatin (CIS), which offers effective treatment in many cancer types, requires restriction in its use due to nephrotoxic side effect. Oxidative stress, apoptosis, inflammation and fibrogenesis play a significant role in the nephrotoxicity. We have used ranolazine (RAN), a current antianginal drug that experimentally reduces oxidative damage by suppressing reactive oxygen species' formation.

Materials & Methods

Thirty-two Sprague Dawley rats were equally divided to four groups (n=8). Control group: Vehicle treated group; CIS group: A single dose of CIS (8 mg/kg, intraperitoneally) administered and the experiment is terminated at 72 hours; RAN+CIS group: RAN (50 mg/kg, per-oral) administered for five days, while a single dose of CIS is administered at 48 hours; CIS+RAN group: A single dose of CIS administration followed by RAN for five days from the third day. Kidney function in the serum [BUN (blood urea nitrogen), creatinine (Cre), electrolytes, albumin], tissue biochemical [malondialdehyde (MDA), GSH (reduced glutathione), SOD (superoxide dismutase), CAT (catalase)], and histopathological parameters were examined.

Results

A significant increase was observed in BUN and Cre values in the CIS group than the control group ($p < 0.05$). There was a significant decrease in BUN values ($p < 0.05$) in the CIS+RAN and RAN+CIS groups when compared to the CIS group. In contrast, the decrease in Cre values did not reach statistical significance ($p > 0.05$) and changes in the Na⁺, Cl⁻, K⁺, and Ca²⁺ values did not alter statistically significant between groups. A statistically significant increase was observed in the albumin levels in the CIS+RAN group when compared to the CIS group ($p < 0.05$). MDA levels were significantly decreased in the CIS+RAN group when compared to the CIS group as an indication for the antioxidant activity of RAN ($p < 0.05$). Necrosis and dilatation in epithelial cells of cortical and medullary tubules were more prominent in the CIS group ($p < 0.0001$). In the RAN+CIS group, the histopathological changes observed in the CIS group were found to be significantly reduced ($p < 0.0001$). Also, degenerative changes in tubules were observed to continue in the CIS+RAN group ($p > 0.05$).

Conclusion

Our results indicate that the beneficial effects of RAN on CIS-induced nephrotoxicity seem to be related its antioxidant effects.

Two haplotypes of vitamin D receptor (VDR) gene are associated with higher colorectal cancer risk

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Introduction

Colorectal cancer (CRC) is a growing worldwide concern. This neoplasm is considered to be the most strongly associated to vitamin D of all malignant neoplasms. Many studies have confirmed the effect of this molecule on such essential processes for carcinogenesis as proliferation, apoptosis or angiogenesis. These actions are only possible via nuclear receptor (vitamin D receptor - VDR); VDR gene is also expressed in the intestinal tissue. Heritable factors explain about 35% of the risk of CRC. We aim to assess the association of four different VDR single nucleotide polymorphisms (SNPs): TaqI (rs731236), ApaI (rs7975232), BsmI (rs1544410) and FokI (rs2228570) with susceptibility to CRC. So far, the results of SNPs and susceptibility to CRC investigations are contradictory. Rarely has haplotype analysis been performed.

Materials & Methods

In our case-control study, a total of 103 patients diagnosed with CRC and 109 healthy controls were genotyped using PCR-RFLP. For alleles and genotypes, crude and adjusted odds ratios (ORs) and associated 95% confidence intervals (CIs) were obtained with the univariate and multivariate logistic regression (ORs were adjusted for age and sex) in IBM SPSS26. The linkage disequilibrium (LD) and the haplotypes were defined with SHEsis software.

Results

After applying Bonferroni correction, neither genotypes nor alleles of individual SNPs modified the risk of CRC in the multivariate logistic regression analysis. LD plots showed that in both study groups three SNPs were in linkage disequilibrium (TaqI, ApaI, BsmI); FokI was excluded from further investigation. The evaluation of haplotypes revealed two enhancing probability of CRC development: taB (OR = 30.22; 95% CI 2.81–325.31; $p = 0.01$) and tAb (OR = 3.84; 95% CI 1.29–11.38; $p = 0.01$).

Conclusion

We determined an association between two haplotypes of VDR gene and CRC risk. Moreover, our results may indicate that analysis of multi-SNPs in linkage disequilibrium is crucial to evaluate risk of a certain pathology instead of individual SNPs analysis. In future, creating a panel of relevant SNPs can help in identifying the individuals with the highest risk of CRC, which needs strict oncologic surveillance.

The research was supported by Rector's Student Grant, University of Warmia and Mazury in Olsztyn.

Protective and therapeutic effects of ranolazine on methotrexate induced liver damage in rats.

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Introduction

Methotrexate (MTX) is an important drug therapy for rheumatic and non-rheumatic diseases. MTX has been associated with many adverse effects ranging from asymptomatic transaminase elevation to fibrotic tissue formation and fatal hepatic necrosis due to oxidative stress. Concerns regarding potential liver toxicity have led to the avoidance of medication, termination, or advice for inquiries in clinical care. The protective and therapeutic effects of ranolazine (RAN), a new generation anti-anginal agent, on liver damage caused by MTX were investigated through its antioxidant mechanism in rats.

Materials & Methods

Thirty-two female Wistar Albino rats were randomly divided into four groups (n=8): Control group: Rats were given only saline (vehicle). MTX group: Rats were given a single dose of MTX (20 mg/kg, intraperitoneally). RAN+MTX group: Rats were pre-treated with RAN (100 mg/kg, oral gavage) for seven days whereas a single dose of MTX on the third day. MTX+RAN group: Rats were post-treated with RAN for five days after five days of single dose MTX administration. Aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP), and lactate dehydrogenase (LDH) were measured from intracardiac blood samples for biochemical analysis. The lobus hepatis dexter portion of the liver was separated for histopathological examinations and sinister for biochemical analysis. Malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), reduced glutathione (GSH) were measured in the liver tissue.

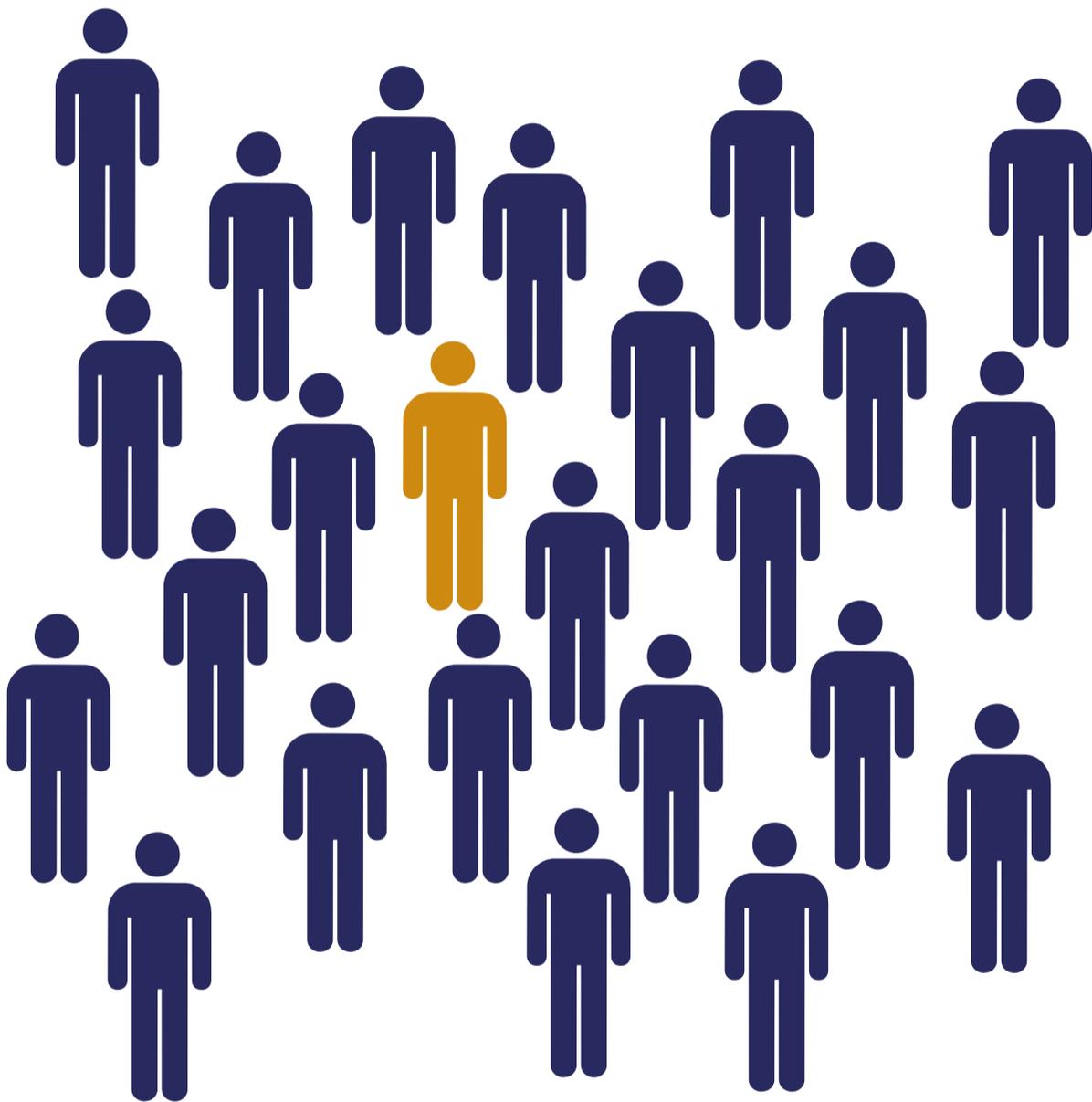
Results

MTX administration caused mononuclear inflammation, vascular congestion, ductal proliferation, vacuolization, and fibrosis evaluated using Roening grading and increased AST, ALT, ALP ve LDH levels ($p < 0.05$) in the blood which compatible with hepatocyte damage in the blood; MDA levels in the tissue. Histopathologically, vascular congestion and ductal proliferation, and biochemically MDA and SOD levels and also serum biochemical parameters were significantly decreased in the RAN+MTX and MTX+RAN groups ($p < 0.001$) when compared to the MTX group. No significant changes were observed in terms of SOD and GSH levels and also fibrosis scores in RAN-administered groups ($p > 0.05$).

Conclusion

According to our results, RAN may be a potential hepatoprotective agent against MTX-induced liver injury.

Epidemiology



Presenters:

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Lilu, Ding

Firigato, I. (Isabela)

Sriwong, S (Sasilawan)

Luo, X. (Xiuli)

Singhvi, Mr. (Shreyans)

Assessing the Quality of life (QoL) and Diabetes Treatment Satisfaction of Patients Adhering to Telemedicine over 15 years

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Introduction

The pros and cons of telemedicine in different specialties, has been highly debated during the COVID pandemic. With Diabetes Tele Management System (DTMS[®]), the telemedicine-based treatment follow-up and integrated EMR in our centre since 1997, changes in dosages, diet and exercise are carried out via telephone/email/secure website by a multidisciplinary diabetes team 24*7, based on reported structured glucose values and remote monitoring. The merits, demerits and the cost effectiveness of this modality has been researched and published extensively. We assessed the Quality of Life (QoL) and treatment satisfaction of patients adhering to DTMS[®] for 15±3 years compared with non-adherent patients.

Materials & Methods

T2DM patients (n=451, age= 62.91±11.64) with a follow-up via DTMS[®] for 15±3 years were de-identified from the EMR. The treatment group comprised (TG) 267 subjects who have had a minimum of 3 physical consultations, 5 telemedicine consultations and attended at least one patient education session per year. The control group (CG) (n=184) comprised of non-adherent subjects, who did not fit the above criteria. The subjects were interviewed via phone from June to August 2020, using validated questionnaires on treatment satisfaction (DTSQ) and Quality of life (QoL) (Eq-5D). The DTSQ and QoL scores were analysed statistically and compared using the independent sample "t" test.

Results

A significant number of patients expressed satisfaction with the DTMS[®] based intensive management and enjoyed a better quality of life. The treatment Satisfaction scores (t=13.206 & p< 0.001*) were 31.85±2.50 and 28.27±3.25 for TG and CG respectively. The overall QoL was higher for TG (45.81±3.49) than CG (41.48±4.01) with a t value= 12.140 and p< 0.001*.

(* Significant)

Conclusion

Telemedicine in diabetes with customized frequency for virtual consultations, counseling, coaching and troubleshooting significantly improves the patient treatment satisfaction score and has been proven advantageous in many aspects of diabetes management, such as frequent drug dose titration and a reduction in the number of hospital visits. Moreover, suggestions on lifestyle tuning measures such as diet and physical activity, ultimately aid them to achieve their customized goals of therapy and thus a better quality of life. Telemedicine in diabetes must therefore be promoted beyond the COVID-19 pandemic.

The role of socio-demographic factors in the coverage of breast cancer screening: insights from a quantile regression analysis

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Introduction

In Flanders, breast cancer (BC) screening is performed in a population-based breast cancer screening program (BCSP), as well as in an opportunistic setting. Women with different socio-demographic characteristics are not equally covered by BC screening. We aimed to evaluate the role of socio-demographic characteristics on the extreme (low and high) levels of BC screening coverage.

Materials & Methods

The coverage rates of 2017 of BCSP and opportunistic screening at the neighborhood level were linked to socio-demographic data of 2017. The association between the socio-demographic characteristics and the coverage rates of BCSP and opportunistic screening was evaluated per quantile of coverage using multivariable quantile regression models, with specific attention to the lower 10th and upper 90th quantiles.

Results

The median coverage in the BCSP was 50%, 33.5% in the 10th quantile, and 64.5% in the 90th quantile. The median coverage of the opportunistic screening was 12%, 4.2% and 24.8% in the 10th and 90th quantile, respectively. A lower coverage of BCSP was found in neighborhoods with more foreign residents and larger average household size, being indicators for lower socioeconomic status (SES). However a higher average personal annual income, being an indicator for higher SES, was also found in neighborhoods with lower coverage in the BCSP. For these neighborhoods that have the relatively low and high SES, the negative association between the percentage of foreign residents, average household size, and average personal annual income and the coverage in the BCSP had the smallest regression coefficient and 95% confidence interval (CI) values -0.75, (95%CI: -0.85, -0.65), -13.59, (95%CI: -15.81, -11.37), and -1.05, (95%CI: -1.18, -0.92), respectively in the 10th quantile. The neighborhoods with the higher coverage of opportunistic screening had a relatively higher average personal annual income, with the largest regression coefficient 1.72, (95%CI: 1.59, 1.85), in the 90th quantile.

Conclusion

Women from the relatively low and high SES neighborhoods tend to participate less in the BCSP, where women with relatively high SES tend to participate more in the opportunistic screening. For women from the low SES neighborhoods, tailored interventions are needed to improve the BCSP.

Look at DNA and be near the future: CNV of GSTM1 and GSTT1 associated with the development of OSCC recurrences and second primary tumors

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Introduction

The determination of molecular biomarkers for oral squamous cell carcinoma (OSCC) relapses can provide the appropriate surveillance and guide the best treatment management for patients. Thus, the copy number variation (CNV) of GSTM1 and GSTT1 is a good candidate, since these genes codify detoxifying enzymes of compounds related to OSCC relapses. This study aimed to determine the CNV of GSTM1 and GSTT1 and investigated the possible association with the occurrence of OSCC relapses.

Materials & Methods

A total of 234 OSCC patients were recruited from the Heliópolis Hospital (Brazil). The patients were distributed in four different groups according to the occurrence or not of relapses as followed: No relapses, Recurrences, Second primary tumors, and Distant metastases. The CNV of the genes were determined by qPCR using TaqMan Gene Copy Number Assay and the Copy Caller (version 2.1) software. The Fisher's exact test was applied to evaluate the distribution of each copy number of GSTM1 and GSTT1 in the groups. Odds ratio (OR) and 95% confidence interval (95% CI) values were calculated to analyze the association between CNV of genes and the risk of the occurrence of any relapses. Statistical analyses were performed on Graph Pad Prism (version 9.0.0) software.

Results

The determination of CNV of GSTM1 showed that the frequencies of zero copies of the gene were higher among the groups with any relapses in comparison with the no relapses group. One copy of GSTM1 was associated with a diminished recurrences risk (OR 0.45; 95% CI 0.25-0.81), while two copies of the gene decreased in 81% the chances of occurrence of OSCC second primary tumors (OR 0.19; 95% CI 0.05-0.72). None patients from Distant metastases group carried two copies of GSTM1. Regarding the CNV of GSTT1, the frequencies of zero copies of the gene were the lowest among groups. Two or more copies of GSTT1 were associated with the increased second primary tumors risk (OR 7.08; CI 1.08-78.82).

Conclusion

The determination of CNV of GSTM1 and GSTT1 may aid the prediction of OSCC relapses, which can lead the best choice of treatment strategies for each patient and improve the prognoses of the disease.

Development of a Screening Prediction Model for Fatty Liver in Annual Check-up Individuals

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Introduction

Fatty liver has a possibility to develop into hepatitis, cirrhosis, and liver malignancies. In clinical practice, abdominal ultrasonography is frequently employed to diagnose the condition. However, in our hospital this method depends on appointment system that put those who need it on long waiting lists. A simple screening tool is needed to detect fatty liver before further abdominal ultrasound investigation.

Objective: To develop a clinical prediction rule from clinical profiles for screening fatty liver in an individual who attends check-up clinic at Phrae hospital, Thailand

Materials & Methods

Prediction research with retrospective case-control design of data collection in individuals who attended check-up clinic between January 1st, 2019 to October 31st, 2020. Of 538 individuals undergone abdominal ultrasound by radiologists, 176 had fatty liver (cases) and 362 were confirmed negative (controls). The relationship of clinical profiles such as waist circumferences, Triglyceride (TG) and Alanine aminotransferase (ALT) with fatty liver were investigated using multivariable logistic regression. The discriminative ability of the parsimonious prediction model was represented by Area under Receiving Operator Curves (AuROC). The risk score was developed and was evaluated for goodness-of-fit (GOF) using Hosmer-and-Lemeshow test. Diagnostic odds ratio (DOR) and Likelihood ratio positive (LR+) were reported for each level of risk scores.

Results

Clinical profiles that are strongly related to fatty liver are being male, exceeding waist circumference, having a high level of TG and ALT. The final prediction model that consists of these predictors has an AuROC of 0.764. The total score ranges 0-14 marks, where 0-4 refers to a low risk group, 4.5-8 a moderate risk and 8.5-14 a high risk. Each group has the DOR of 0.19 (95%CI: 0.13-0.29), 1.56 (95%CI: 1.08-2.25), and 11.0 (95%CI: 5.90-20.51) and the likelihood ratio positive equals 0.38 (95%CI: 0.29-0.51), 1.30 (95%CI: 1.05-1.61), and 7.93 (95%CI: 4.53-13.88) respectively.

Conclusion

The screening prediction model can distinguish individuals with fatty liver from those without, especially with low and high scores. Abdominal ultrasound investigation is suggestive for individuals with high scores.

Increased intestinal permeability with elevated peripheral blood endotoxin and inflammatory indices for e-waste Pb exposure in children

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Introduction

Lead (Pb) entering the body through different channels can damage the function of intestinal mucosal barrier and cause the body stressful inflammatory response to enhance. This study aimed to investigate the effects of Pb exposure on intestinal permeability in children by detecting the level of bacterial endotoxin and index of inflammatory cell types in peripheral blood.

Materials & Methods

We recruited 187 children, aged 3–6 years, from an electronic-waste (e-waste)-exposed group (Guiyu, n = 82) and a reference group (Haojiang, n = 105), from November to December 2018. The levels of blood Pb, plasma endotoxin (as an indicator of increased intestinal permeability), and peripheral blood inflammatory cells of participants were determined. Independent-samples t-test and Mann-Whitney U test were used to compare the differences between the two groups for normal and skewed continuous data, respectively. The relationships between variables were estimated by multivariable adjusted linear regression models.

Results

Blood Pb (median: 4.49 $\mu\text{g}/\text{dL}$ vs. 4.11 $\mu\text{g}/\text{dL}$, $P = 0.010$) and plasma endotoxin (median: 2.24 EU/mL vs. 1.85 EU/mL, $P = 0.037$) were elevated in exposed children than reference children. The positive relationship between blood Pb and natural logarithm-transformed endotoxin level (Ln-endotoxin) was shown [B (95% CI) = 0.064 (0.006, 0.123), $P = 0.031$]. In addition, children in the exposed group had elevated peripheral monocyte counts than those in the reference group (median: $0.43 \times 10^9/\text{L}$ vs. $0.37 \times 10^9/\text{L}$, $P < 0.001$). Ln-endotoxin level was significantly positive correlated with Ln-neutrophils and monocytes [B (95% CI) = 0.054 (0.015-0.093) and 0.018 (0.005-0.031), respectively, both $P < 0.05$].

Conclusion

Increased intestinal permeability was showed in e-waste-exposed children and related to high blood Pb and peripheral inflammatory indices. The results suggest the possible adverse impact of higher Pb burdens on intestinal health and provide a novel viewpoint on the underlying factors for the changes of peripheral immune responses in Pb-exposed population.

Prevalence and comparison of depression rates in the geriatric population of an old age home and a community, and its association with demographic factors

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Introduction

Depression is the most common mental health problem in the elderly. This adds severe burden on the patient, also affecting their families and their financial situation. Finding out the prevalence of depression among older adults living in an old age home and a community provides information about the impetus one should give on mental health. Therefore, the results of this study will help the entire health care community to understand the severity of depression in the geriatric age group, find the leading causes of depression and help with the intervention of the linkage.

Materials & Methods

A cross section study of the geriatric group of population was performed, two sections of the geriatric group were taken for the study- geriatric population residing in an old age home (80) and geriatric population residing in a community (80). There were two forms used for data collection - a Geriatric Depression Scale (GDS), a standardized tool used to assess the level of depression and a demographic form was used to collect the demographic information. To find the association between different factors, the statistical method of Chi-square test and P-value was taken. A null hypothesis was formed with no association taken into consideration and Chi-square values and P-value was calculated to find the possible association between the decided factors. The confidence interval taken for P-value is 95% with 0.05 level of significance.

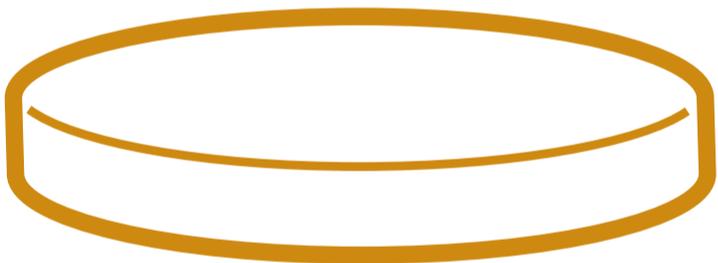
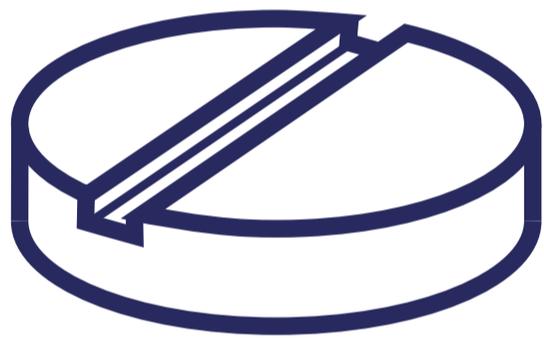
Results

It was found that the depression rate in the old age home was 36%, while in the community it was 24%. The following factors were found to be associated with these depression rates - gender (chi-square value-13.804, p-value-0.00029), educational status (chi-square value-11.941, p-value-0.008), chronic illness (chi-square value-5.854, p-value-0.0155), marital status (chi-square value-9.62, p-value-0.047).

Conclusion

Our study has highlighted a very critical issue, depression was prevalent in both, the geriatric population of the old age home and that of the community, being more prevailing in the former as compared to the latter. Therefore, increased attention to mental health care should be encouraged. Further, multiple factors were found associated with depression and therefore preventive management of such factors should be our goal.

Pharmacology



Presenters:

Sabuwala, N. (Naqeeya)

Jhaveri, S.S. (Sharan)

Kothari, A.K (Arpit)

Fouad, A.F. (Amr)

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Panchal, V (Viraj)

Comparing the efficacy of various anti-emetics in controlling post-op nausea and vomiting: A meta-analysis.

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Introduction

Post operative nausea and vomiting can be one of the most distressing factor in any surgical endeavor. It affects approximately 80% of patients within the first 24-48 hrs of surgery. PONV can lead to delayed postanaesthesia care unit (PACU) recovery room discharge and unanticipated hospital admission thereby increasing overall complications. The US FDA approved amisulpride injection (Barhemsys, Acacia Pharma) for the prevention of PONV on February 27, 2020. Amisulpride injection is the first and only antiemetic to be approved for the Rescue treatment of PONV in patients of failed prior prophylaxis using current standard of care. With the approval of a new drug it becomes crucial to evaluate and compare the current standard drugs with it.

We aim to compare Ondansetron, Dexamethasone, Metoclopramide, Aprepitant and amisulpride with placebo and indirectly each other to put into perspective the most appropriate choice with respect to their safety and efficacy in treating PONV related to any surgery.

Materials & Methods

A systemic and comprehensive search was performed using Google-scholar, PubMed, MEDLINE, Cochrane central register of controlled trials on various RCT's published related to PONV. We followed the PRISMA guidelines and included RCT's with endpoints being early, intermediate and delayed phases of PONV.

Data of 109 studies including 9397 intervention patients, 2712 placebo/control patients and 1597 patients with ondansetron as control were included.

Results

When amisulpride was compared with placebo—there was significant difference found {RR=0.825, CI=0.789-0.862, p<0.001}. With ondansetron & Placebo significant difference found {RR=0.601, CI=0.560-0.646, p<0.001}. Metoclopramide and placebo {RR=0.830, CI=0.733-0.939, p=0.003}, Dexamethasone & Placebo {RR=0.450, CI=0.397-0.509, p<0.001}, Aprepitant & Placebo {RR=0.470, CI=0.385-0.575, p<0.001} also showed significant difference. Ondansetron when compared with Metoclopramide, Dexamethasone and Aprepitant, the results were { RR=1.350, CI=1.230-1.482, p<0.001};{RR=0.909, CI=0.733-1.128, p=0.386 }; {RR=0.426 and, CI=0.295-0.615, p<0.001} respectively.

Conclusion

Amisulpride is an effective antiemetic. From the standard treatment drugs, Ondansetron and Dexamethasone are similar in efficacy for 0-24 hrs post-op, both better than metoclopramide.

Aprepitant is also an alternative treatment for Post operative nausea and vomiting.

Assessment Of Risk Of New Onset Diabetes Mellitus Associated With Statins: A Meta Analysis

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Introduction

Statins have shown to be highly beneficial in primary and secondary prevention of cardiovascular disease (CVD) in several trials. However, current reports of increased risk of type 2 diabetes with statin use are an area of concern. Given the immense utility of statins in managing cardiovascular diseases and keeping blood lipid levels under control, it is important to quantify any potential long-term risks to help patients and physicians make informed choices. Overestimation of clinical benefit or underestimation of risk is potentially hazardous and of major public health importance. This study will help us reassess the current guidelines with special emphasis on at risk individuals.

Materials & Methods

All language search was conducted on MEDLINE, COCHRANE, EMBASE and GOOGLE SCHOLAR following PRISMA guidelines till August 2019. The following search strings and MESH terms were used: "statins", "new-onset", "DM" "RCTs". After matching studies for inclusion and exclusion criteria, Revman v5.3 was used for appropriate statistical tests. Fixed and Random Effect Model Test was used and p value < 0.05 was considered statistically significant. Biases were assessed for each study using the Cochrane Collaboration Criteria.

Results

A total of 13 RCTs (46,262 individuals on statins/ 46,170 individuals on placebo) were included in this meta-analysis. Patients on statins were shown to have a significantly higher incidence of new-onset DM as compared to those only on placebo for fixed-effects model (RR=1.109, 95% CI=1.045-1.178, p=0.001) as well for the random-effects model (RR=1.104, 95% CI= 1.019-1.195, p=0.015). At-risk individuals were shown to be strongly associated with new-onset diabetes mellitus on statin use as compared to those only on placebo (RR=1.115, 95% CI=1.042-1.192, p=0.001) for fixed-effects model and (RR=1.116, 95% CI= 1.029-1.210, p=0.008) for the random effects model.

Conclusion

Statin use was associated with a significantly higher risk of new-onset DM as compared to placebo.

Effect Of Vitamin D On Cardiovascular Risk Factors Among Adults With Obesity: A Meta-Analysis

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Introduction

The major public health problems today in both developed, as well as developing countries, are cardiovascular diseases. Vitamin D functions as a steroid hormone and well known for its role in calcium and bone homeostasis. In recent times, it has been recognized that a variety of processes and regulatory systems, including metabolic syndrome (obesity and diabetes), immunity, inflammation is modulated by Vitamin D. The relationship between vitamin D status correction and cardiometabolic profile improvement in adults with obesity can help in starting public health initiatives in using vitamin D supplementation for decreasing cardiovascular risk.

Materials & Methods

Fourteen studies containing 1580 patients were taken up for Meta-Analysis.

Statistical software RevMan 5.3 Version was utilized. Random and Fixed-effect models were applied to calculate the Standardized Mean difference of change between groups. The principal summary measure was the standardized mean difference (SMD) (at a 95% Confidence Interval). Funnel Plots and Forest Plots were plotted.

Results

We have found statistically significant results in the efficacy of Vitamin D in increasing HDL-c (95% Confidence interval (CI) 0.00918 to 0.454 (fixed), $P = 0.041$) and LDL-c as well (95% confidence interval (CI) 0.402 to 0.856 (fixed), $P < 0.001$). Statistically non-significant decrease in Body Weight, BMI and Triglyceride levels were noted. Statistically significant decrease in Diastolic blood pressure (95% confidence interval (CI) -0.402 to -0.034 (fixed), $P = 0.020$) and Blood Glucose levels (95% confidence interval (CI) 0.0898 to 0.578 (fixed), $P = 0.008$) and Statistically non-significant decrease in Systolic blood pressure were noted.

Conclusion

Vitamin D appears to be cardioprotective from most of the results obtained but a statistically significant increase in LDL-c levels contraindicates the above statement. Large scale studies at pharmacologically relevant doses and for sufficient duration are warranted before definitive conclusions can be reached.

Protective Effect of Epigallocatechin Against Paracetamol Nephrotoxicity in Rats

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Introduction

Background: Paracetamol is the commonest globally used analgesic. In high concentrations, paracetamol may damage the kidney and liver tissues by causing an oxidative stress. N-Acetyl Cysteine has long been the preferred antidote for paracetamol overdose through its antioxidant effects. Epigallocatechin-3-gallate (EGCG) is an extract of green tea which showed antioxidant properties among several others.

Aim: To investigate the potential protective effect of epigallocatechin against paracetamol nephrotoxicity in rats.

Materials & Methods

Fifteen male rats weighing 200-250g were randomly distributed among 3 groups, 5 rats in each group. First group was a control that received nothing but water, food and libitum like all other rats. Second group was a group that received only paracetamol. Third group was a group that received paracetamol and epigallocatechin treatment. Second and third group rats were given a single intraperitoneal (i.p.) injection of paracetamol (350mg/kg). Epigallocatechin treatment was administered to the third group for two days (10mg/kg/day, i.p.). After three days, blood samples were taken for measurement of serum creatinine and also both kidneys were taken; one was sent for histopathology and another was sent for biochemical measurement of Malondialdehyde (MDA) and Nitric Oxide (NO).

Results

A significant increase in serum creatinine and kidney tissue levels of MDA and NO was found in the group which was given paracetamol in comparison to the control group. By administering epigallocatechin, it significantly decreased serum creatinine and kidney tissue levels of MDA and NO in comparison to the paracetamol only group. Also, the histopathological kidney tissue damage induced by paracetamol was markedly reduced by epigallocatechin.

Conclusion

Epigallocatechin may significantly protect against paracetamol nephrotoxicity in rats.

Efficacy and safety of erenumab in preventive and therapeutic treatment of patient's suffering from migraine - a metaanalysis

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Introduction

Migraine is a primary headache disorder that can cause considerable pain and disability and has a high global load. Approximately 30% of population in the age group 18 to 65 suffer from headache disorders and about 30 percent of these individuals suffer from migraine. Calcitonin gene-related peptide (CGRP) is a 37-amino acid neuropeptide that is involved in the pathophysiology of migraine through modulation in the trigeminal vascular system. Erenumab, (AMG 334) is a first fully human monoclonal antibody that targets and blocks the canonical CGRP receptor and so approved for use in migraine. The objectives of the study were to generate statistical evidence on the basis of existing data for erenumab in terms of efficacy and safety in various treatment regimens with different dosages.

Materials & Methods

A total of 7 RCTs following PRISMA guidelines and matching inclusion and exclusion criteria were collected of erenumab vs placebo in treatment of migraine. Studies with >50% responder rate from baseline in terms of migraine days per month at 12 weeks was chosen as primary clinical outcome measure. Secondary outcomes chosen were mean migraine days from baseline and safety outcomes in terms of adverse events. 5.3 software was used for the calculation of Relative Risk(RR). P value less than 0.05 was considered significant.

Results

Data of 3615 patients were included. The use of Erenumab was associated with increased rates of achieving >50% responder rate as compared with placebo. (RR= 1.591; 95% CI =1.322 to 1.915; P <0.001). Both 70mg and 140 mg of erenumab were associated with increase in responder rate. Reduction in mean migraine days from baseline was observed in erenumab as compared to placebo, (SMD= 7.348; 95% CI= 4.733 to 9.963; P <0.001). Treatment related adverse events (RR = 0.974; 95% CI = 0.901 to 1.052; P= 0.496) were not significant in erenumab as compared to placebo.

Conclusion

Erenumab 70 mg or 140 mg subcutaneous once monthly was the most efficacious treatment regimen and was not associated with a significant risk for treatment related adverse events.

Efficacy and Safety of Upadacitinib in rheumatoid arthritis patients with inadequate response to disease modifying anti-rheumatoid drugs(DMARDs): A Meta Analysis

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Introduction

Rheumatoid arthritis (RA) is a chronic systemic autoimmune disease, etiology of RA is still unknown, however, the role of inflammation and various cytokines released among which one is Janus activated Kinases (JAKs). They are intracellular tyrosine kinases, that function as mediators to downstream the signal of multiple cytokines and growth factors that are involved in pathogenesis of inflammation and autoimmune disorders. Targeted synthetic drug therapy in form of small molecule JAK inhibitors are being developed clinically for the treatment of RA. Upadacitinib, an oral JAK kinase inhibitor recently approved for treatment of RA. The objective were to generate statistical evidence on the basis of existing data for upadacitinib in terms of efficacy and safety in various treatment regimens and with different dosages in patients with active rheumatoid arthritis.

Materials & Methods

A total of 6 RCTs following PRISMA guidelines and matching inclusion and exclusion criteria were collected of upadacitinib versus placebo in treatment of rheumatoid arthritis. Studies with treatment response rate, 20% improvement in the American College of Rheumatology score(ACR20) response at 12 week was chosen as clinical outcome measure. Safety in terms of any Investigator-reported adverse events, development of any hepatic disorder, any infections, any serious infection and herpes zoster infection was considered. RevMan 5.3 software was used for the calculation of Relative Risk(RR). P value less than 0.05 was considered significant.

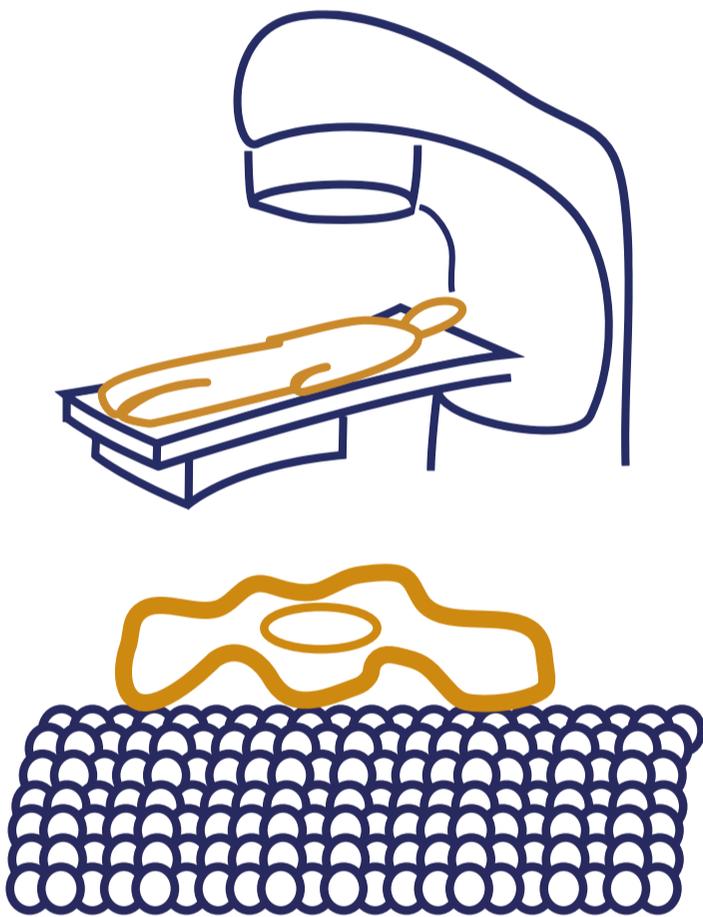
Results

Data of 3233 patients were included. The use of upadacitinib was associated with increased rates of achieving ACR20 response compared with placebo. Random effect RR was 1.912 and 95% CI 1.760-2.077. P value in random effect was <0.001 and in fixed effect was <0.001. Maximum effect was seen at 30 mg daily dose. Treatment related adverse events (RR=1.19, P=0.004) and occurrence of any infections (RR=1.292, P=0.004) were seen in patients taking upadacitinib. Maximum adverse events were at 12 mg twice daily dose. Other adverse events did not show a significant difference.

Conclusion

Upadacitinib at 30mg once daily in combination with Methotrexate was the most efficacious treatment regimen and was not associated with a significant risk for treatment related adverse events. Maximum adverse events were seen at 12 mg twice daily dose.

Biomaterials and Technical Medicine



Presenters:

Mangan, A. (Anna)
Ajmal, A.A (Abdul Azees)
Kersten, M.V. (Valerie)
Hurtado Ortiz, K (Katia)
Wang, J (Ji)

Biofabrication Of The Optimal Intra-articular Microneedle System for Enhanced Drug Delivery To Prevent Post-Traumatic Osteoarthritis After Knee Injury

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Introduction

Post-traumatic osteoarthritis (PTOA) is a subtype of osteoarthritis that occurs subsequent to knee injury. Due to the increasing prevalence and the associated mobility-induced disability, PTOA is a global burden, which necessitates a novel treatment method. Dissolving microneedle (MN) drug-delivery systems offer an innovative, cost-effective treatment potential to alleviate the burden of PTOA. Applying the MN system directly to the synovial tissue within the intra-articular capsule following knee injury enables targeted drug-delivery, provided the MN system has sufficient mechanical strength to successfully penetrate the tissue. Thus, the aim of this research is to determine the optimal design of dissolving alginate-based MN systems to provide maximal delivery of therapeutic agents directly to the synovial tissue of the human knee joint.

Materials & Methods

Biofabrication of alginate-based dissolving MNs of various compositions and geometries were fabricated and assessed in-vitro on synovial cells and explant synovium tissue under physiologically relevant conditions. Mechanical testing and advanced imaging analysis were performed to assess the mechanical, structural and degradational properties of the various MN systems. Biocompatibility of MNs were assessed following cell-culture of the hydrogels with the osteoblast precursor cell line-MC3T3.

Results

Preliminary findings have successfully fabricated dissolvable alginate-based MN drug-delivery systems (hyaluronic acid-alginate or chondroitin sulfate-alginate hybrids) with ample mechanical and structural properties to penetrate the synovium tissue, and excellent degradation capabilities. Penetration depth varied according to MN composition and geometry, with the smaller arrays achieving significantly greater penetration depths than the larger MN arrays ($p=2.87 \times 10^{-15}$). The alginate-based microneedles were deemed biocompatible, with a significant increase in Col I expression over the course of 7-days in culture ($p=0.005033$). However, advanced imaging analysis revealed that the particular composition of these alginate-based copolymers were not capable of inducing sufficiently sharp needle formation, and so modifications of the MN compositions, will be assessed to determine the effects on the mechanical stability and sharpness of MNs. The results of this subsequent follow-on research will be deduced over the coming months.

Conclusion

The utility of various dissolving alginate-based microneedle systems are assessed, to determine the optimal design to produce maximal efficacy of targeted drug-delivery to the human synovium tissue to prevent the progression of PTOA.

Non Invasive Screening Tool to Detect Anemia

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Introduction

Hemoglobin concentration is a vital parameter which can be used to detect anemia and polycythemia. Currently, invasive techniques are used for hemoglobin measurement despite their many disadvantages including discomfort and potential complications for the pregnant, elderly and pediatric patients. This project proposes a method for the non-invasive measurement of Hemoglobin level.

Materials & Methods

The non-invasive measurement based on the absorption of light by oxyhemoglobin and deoxyhemoglobin and the analysis of the resulting photoplethysmograph (PPG) signals. PPG wave is analysed using the modulation ratio (R) which is defined as the ratio of AC to DC components of the PPG signal obtained from two different wavelengths of 660nm and 940nm. A linear relationship ($Hb = -3.626 * R + 15.84$) was obtained between hemoglobin concentrations (Hb) measured using the invasive technique and the modulation ratio (R) calculated by analyzing PPG signal using the measurements from 106 patients.

Based on the mathematical model developed, a non-invasive screening tool was developed. A probe is used to transmit and record the IR and red light through the fingertip. The recorded PPG waveform is analysed using a microcontroller-based processor built into the device. The device subsequently predicts the risk of anemia in patients. This device operates in three modes. Mode 1 is a standalone device. In mode 2, the device is connected to a desktop application that displays real-time PPG waveforms and can generate a medical report. In mode 3, the device can be connected to a mobile application that facilitates the continuous monitoring of hemoglobin concentration remotely.

Results

The device was evaluated using 22 subjects using the deviation percentage defined as the percentage difference between the actual and measured hemoglobin concentrations. An average deviation of 4.41%, a maximum deviation of 9.4% and a minimum percentage of 0.36% was observed for the tested patients.

Conclusion

The state of the art hemoglobin measuring techniques do not facilitate continuous and remote monitoring. The proposed device has this main advantage in addition to the benefits of non-invasive measurement including the prevention of infections, physical pain, and the lack of operational or maintenance costs while being portable

Melt electrowriting as a tool to engineer a 3D renal tubular vascular interface

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Introduction

Kidney disease is a global issue with increasing prevalence. Haemodialysis treatment alone is incapable of removing small protein-bound molecules. In healthy circumstances proximal tubule epithelial cells (PTEC) actively transport these uremic toxins from the microvasculature into the proximal tubule (PT). Restoration of PT function complementary to haemodialysis would improve the 5-year survival rate in patients with end stage renal disease (ESRD).

Melt electrowriting (MEW) is a technique for controlled deposition of thin fibers on a rotating mandrel and was used to create mechanically stable, porous PCL tubules.

Here, we developed a renal-vascular interface consisting of conditionally immortalised PTEC (ciPTEC) and endothelial cells (EC) seeded on a PCL MEW tubule for studying the reabsorption and excretion of uremic toxins in vitro.

Materials & Methods

MEW tubules with specific geometric designs for ciPTEC and EC on the inside and outside respectively, were fabricated from PCL. Tubules were coated with L-DOPA for cell adhesion and were optimised using a process of biofunctionalization. Immunofluorescent stainings, inulin-FITC migration assays, and inhibitor assays were used to assess monolayer integrity and transporter functionality.

Results

A geometric design of highly porous PCL tubules with 30° winding angles was optimised for ciPTEC contact guidance, while EC preferred smaller pores. Cells deposited ECM proteins and formed their own polarised monolayer expressing a range of physiological influx- and efflux transporters, confirmed by immunostaining and functional assays. We showed how geometrical contact guidance is sufficient for 3D tubular polarised monolayer formation of ciPTEC and EC.

Conclusion

We created a highly porous 3D tubule for in vitro study of the renal-vascular interface of the PT. Optimisation of this model will aid in studying active renal secretion and reabsorption, and could form a basis for development of an additional filtration unit for haemodialysis.

Correlation between biventricular function and myocardial fibrosis assessed by T1 Mapping Cardiac Magnetic Resonance in patients post-operated of Fallot Tetralogy correction

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Introduction

Myocardial fibrosis is a progressive and heterogeneous process linked to adverse outcomes in patients after a Tetralogy of Fallot repair (rTOF) (1-2). Cardiac Magnetic Resonance allows the characterization of the myocardial tissue composition by the assessment of the extracellular volume with T1 mapping techniques, which correlates near to 0.7-0.9 with de collagen volume fraction in histology (3-4). The objective was to quantify myocardial fibrosis by T1 mapping in patients post-rTOF and to evaluate its relationship to the localization in the right and left ventricles that determine the level of biventricular systolic dysfunction.

Materials & Methods

Twelve rTOF patients with a mean age of 28 years old were evaluated assessed by CMR and T1 mapping a mean of 21 months after the surgical repair, using an Argus software (Siemens, Erlangen, Germany) by an experienced observer. To characterize the distribution of scars, separate quantifications were performed for right ventricular outflow tract (RVOT) scar, septal scar, and scar elsewhere in RV / LV, allowing the measurement of the scars with high-resolution late gadolinium enhancement (LGE) and T1 mapping. Descriptive statistics were used for all variables, applying central tendency, dispersion, frequency, and percentage, as appropriate. The normality was evaluated using the Shapiro-Wilk test or quantile comparison graphs. A bivariate analysis was performed using Student's t-test for continuous variables and Fisher's exact test for categorical variables. A value of $p < 0.05$ was considered significant and 2-tailed values were reported. Two statistical models were designed to explain the clinical and T1 mapping factors associated with patients with rTOF.

Results

Assessing by T1 mapping, no correlation between the systolic biventricular dysfunction level and the amount of fibrosis was found. A relationship between the compromise of LGE in three of the LV and a greater systolic dysfunction of the LV was found with an average of 31%.

Conclusion

The T1 mapping discriminated precisely the degree of pulmonary insufficiency (area under the curve 0.85, $p=0.042$), the best cut-off point for this variable was 1011.50 (sensitivity 85%, specificity 60%). Therefore, and contrasting with the left ventricle values, >1000 is a possible value of T1 mapping in the right ventricle outflow tract to determine fibrosis.

automated explainable multi-dimensional deep learning platform on retinal images for retinopathy of prematurity screening

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Introduction

Retinopathy of prematurity (ROP) diagnosis currently still relies on indirect ophthalmoscopy assessed by experienced ophthalmologists. Deep learning algorithm based on retinal image could facilitate the early detection and timely treatment of ROP to improve visual outcome.

Materials & Methods

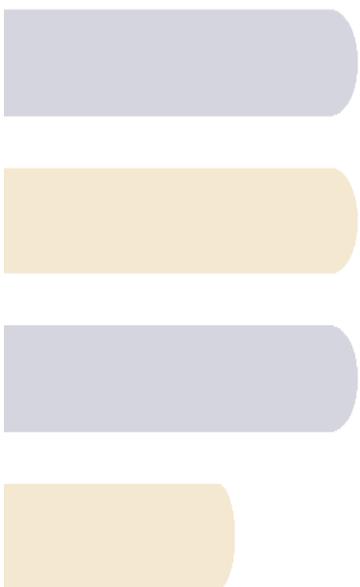
Total 14 108 eyes of 8 652 preterm infants received ROP screening from 4 centers were included, and total 52 249 retinal images was randomly split into training, validation and test sets. Four major dimensional independent classifiers, including image quality, any stage of ROP, intraocular hemorrhage and pre-plus/plus disease, were developed. Referral-warranted ROP was automatically generated by integrating the results of four classifiers in image-, eye- and patient-level. DeepShap was adopted as the heat-map technology to explain the predictions. The performance of the platform was further validated as compared to the experienced ROP experts. The performance of each classifier includes true negative (TN), false positive (FP), false negative (FN), true positive (TP), F1-score, sensitivity, specificity, receiver operating characteristic (ROC), area under curve (AUC) and Cohen's unweighted K.

Results

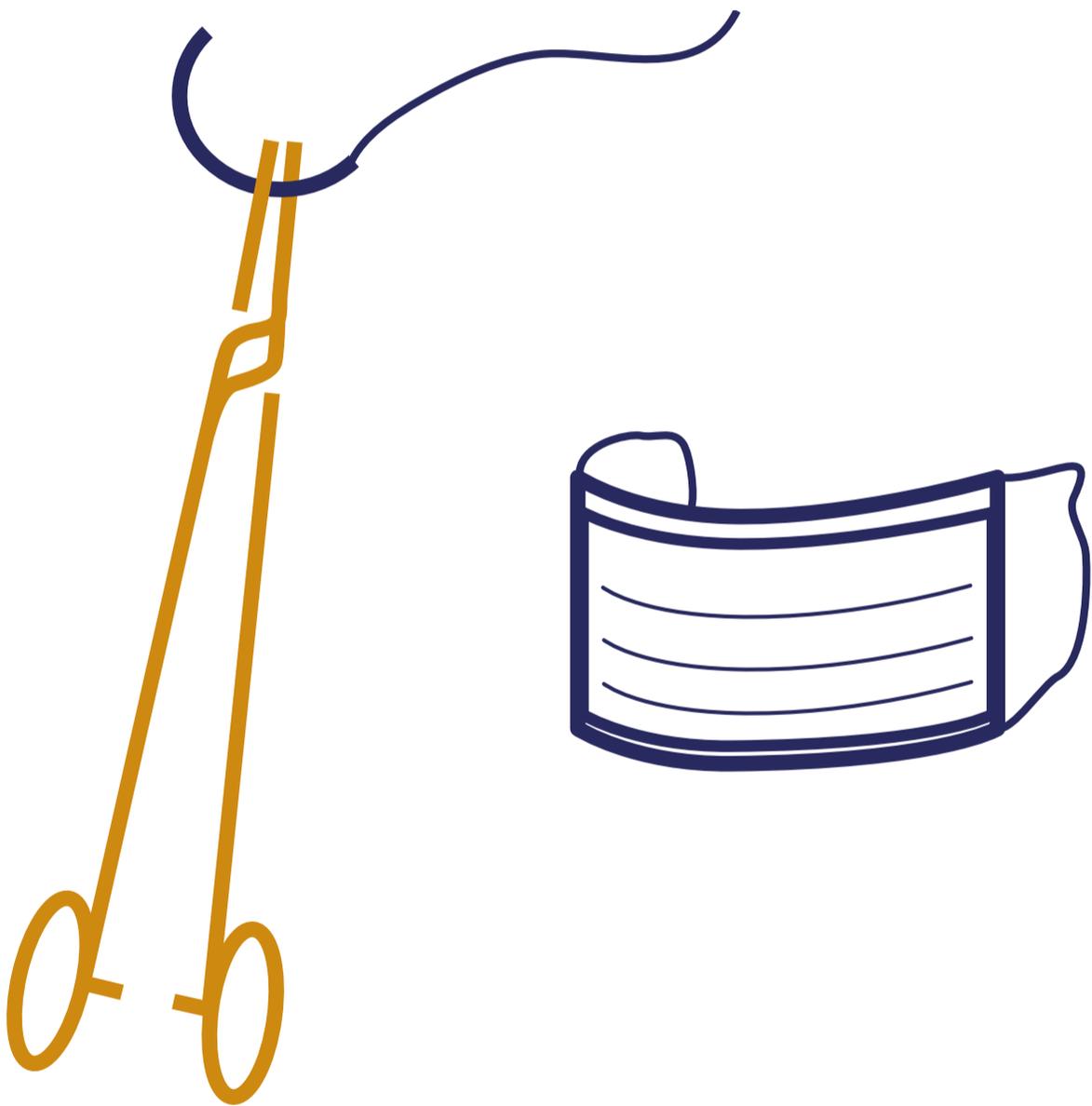
The performance of all classifiers achieved F1-score of 0.718–0.981, sensitivity of 0.918–0.982, specificity of 0.949–0.992 and AUC of 0.983–0.998, whereas that of the referral system achieved F1-score of 0.898–0.956, sensitivity of 0.981–0.986, specificity of 0.939–0.974 and AUC of 0.9901–0.9956. Fine-grained and class discriminative heat-maps were generated by DeepShap in real time. Our platform achieved K of 0.86–0.98, compared to 0.93–0.98 by the ROP experts.

Conclusion

Our automated ROP screening platform could identify and classify multi-dimensional pathological lesion in the retinal images. Our platform is opened and feasible to assist routine ROP screening in general and children hospitals.



Anaesthesiology & Surgery



Presenters:

Tawfik, G.M.T. (Gehad)
Forrest, C. (Clara)
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Zhong, G (Guoqing)
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Does the combined use of topical and intravenous tranexamic acid offer better surgical field quality during functional endoscopic sinus surgeries: a double-blind, randomized placebo-controlled trial

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Introduction

Intraoperative bleeding during functional endoscopic sinus surgery (FESS) poses a challenge to both surgeon and the anesthetist. Therefore, our primary aim was to evaluate the effectiveness of local, intravenous (IV), and combined use of tranexamic acid (TA) in improving surgical field quality during FESS. Besides, to evaluate other secondary end-points as; total fentanyl, esmolol consumption, postoperative complications, operative, and recovery time.

Materials & Methods

We conducted a double-blinded randomized controlled trial by recruiting 120 ASA I-II patients from June 2019 till January 2020, aged 18–50 years, who were scheduled for elective FESS at Department of Otorhinolaryngology at Ain Shams University Hospital. We excluded patients with uncontrolled medical diseases, pregnant, or had a known allergy to any of the used drugs in the study. IRB ethical approval (FMASU R27/2019) was obtained from all participating patients, besides, registering protocol on clinicaltrials.gov (NCT03965767). Patients were equally randomized via computer into one of four groups –30 patients–; IV TA, local TA, combined IV and local TA, and placebo. The surgical field was assessed immediately at end of surgeries by the same surgeon using a 5-point Boezaart scale. Statistical analyses were performed with SPSS Statistics software.

Results

The combined TA group was significantly had the least and best surgical field score, the lowest total fentanyl consumption, the least mean operative, and recovery time, comparing to other groups; [($p < 0.001$), ($p < 0.001$), ($p = 0.025$), ($p < 0.001$)], respectively. No statistically significant differences were found in mean arterial pressure and heart rate decline in four groups. No statistically significant differences were found in the change of hemoglobin, hematocrit, prothrombin time, and partial thromboplastin time over time in four groups. None of the patients in the four groups required esmolol administration.

Conclusion

The combined use of topical and IV TA provided the least and best surgical field in functional surgical sinus surgeries, least fentanyl consumption, least operative, and recovery time. Mean arterial pressure and heart rate decreased significantly after induction of anesthesia as compared to baseline values without significant differences between all groups. No statistically significant differences were found in the change of hemoglobin, hematocrit, prothrombin time, and partial thromboplastin time over time in all groups.

Temporal Trends in Traumatic Brain Injury at a Tertiary University Hospital Intensive Care Unit

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Introduction

Traumatic brain injury (TBI), often dubbed the 'silent epidemic', has extensive personal, societal and economic consequences. It is the leading cause of mortality and morbidity amongst young people. This study examines the demographics, injury characteristics, management and outcome of patients with TBI admitted to an intensive care unit (ICU) in a hospital with a neurosurgical department. Parameters were examined to see if they had changed over a six-year period.

Materials & Methods

A retrospective review of all patients admitted with TBI to the ICU between 2013 and 2018. Data was collected from an electronic health-record system. Pearson Chi-squared test and Fisher's Exact test were utilised for categorical data. For continuous variable without a normal distribution, Kruskal-Wallis test was used. Post-hoc pairwise comparisons were carried out. A $p < 0.05$ was considered statistically significant.

Results

224 patients in total were admitted with 77% being male and the mean age being 46 (± 20). Alcohol involvement was reported in 42% of all injuries. Alcohol was more likely to be involved in assaults and falls from a low height compared to road traffic accidents (RTA) ($p < 0.001$). Overall, the most common mechanism of injury was a fall from a low height (30%). The proportion of injuries due to RTA increased over the study period ($p = 0.008$). The overall average ICU admission was 9.7 days (± 7.5). Furthermore, it increased over the study period ($p = 0.034$). Over half (52%) of patients underwent neurosurgery with a further 23% receiving intracranial pressure (ICP) monitoring alone. The average duration of ICP monitoring, advanced ventilation and inotropic therapy increased over the 6 years ($p = 0.041$, $p = 0.012$, $p < 0.001$). ICU mortality was 22%.

Conclusion

TBI requiring ICU admission commonly involves younger males. Alcohol is a factor in a large number of injuries. RTAs have become increasingly responsible for injuries despite widespread road-safety awareness campaigns. However, falls are the most common mechanism of injury and receive a fraction of the publicity. These findings could inform public preventative measures. Duration of ICU admission and of a number of interventions increased over the six-year period. This has significant consequences for resource consumption.

Doctor, how much weight loss should I expect? – external validation of weight loss prediction models after sleeve gastrectomy.

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Introduction

Bariatric surgery is proven to be the most effective treatment of obesity. However, the extent of weight loss varies considerably among patients and not all of them achieve desired outcome after surgical intervention. Effort has been made to identify predictive factors of weight loss after bariatric surgery resulting in various individualized prediction models proposed to optimize presurgical assessment of patients and facilitate follow-up evaluations. We aimed to validate the performance of available risk prediction models for body weight reduction 1 year after sleeve gastrectomy (SG).

Materials & Methods

The retrospective analysis included consecutive patients who underwent laparoscopic SG between 2009 and 2017 in a single tertiary referral center and completed 1-year follow-up. Weight loss predicted by 12 different models were calculated for each patient. The correlation between predicted and actual weight loss was assessed using linear regression. Accuracy of each model was evaluated by adjusted squared Pearson's correlation coefficient (adjusted R²) and paired sample t test between estimated and observed BMI. Goodness of fit was assessed by standard error of estimate (SE).

Results

Out of 501 patients enrolled in our study 347 (69.00%) were women whereas 154 (31.00%) were men with median age 40 years. Mean BMI decreased from 45.81 kg/m² to 32.42 kg/m² after 1 year. %EWL after surgery amounted to 65.55%.

All models presented significant relationship with weight loss in linear regression analysis (correlation coefficient between 0.21 and 1.22). The best predictive model explained 23% variation of weight reduction (adjusted R²=0.23). Most models significantly overestimated the amount of weight loss achieved by patients with SE varied from 5.18 kg/m² to 5.49 kg/m².

Conclusion

Although available risk prediction models had reasonable correlation with weight reduction after SG, none of them presented acceptable accuracy. The majority of tools tend to overestimate the outcome after surgical procedure. There is a need to develop accurate model for predicting weight loss after bariatric procedure to define realistic expectations and enhance preoperative patient assessment.

Biomechanical evaluation of prophylactic lag screw fixation for benign femoral neck lesion - a finite element analysis and cadaveric experimental study

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Introduction

Objective: Femoral neck is a common site of benign bone tumors and tumor-like lesions. After curettage of the lesion in the surgical treatment, the strength of the femur is further decreased so that prophylactic internal fixation is often imperative. The aim was to explore the strength of different curettage area and prophylactic fixation with two lag screws of the femoral neck when treating benign tumors and tumor-like lesions.

Materials & Methods

Methods: Four groups, the intact group, 25% defect group, 50% defect group, and 50% defect + screw group, were created to simulate the curettage and two lag screws fixation of the operation in the femoral neck both in finite element analysis (FEA) and cadaveric biomechanical test. The maximum displacements and von Mises stress of the femoral neck in FEA were evaluated, while the stiffness and failure load in the cadaveric biomechanical test were assessed.

Results

Results: There was a significant linear correlation between maximum displacements of FEA and the stiffness of the cadaveric test ($P=0.04$). In the FEA, the 50% defect model revealed higher von Mises stresses on the inferior aspect of the femoral neck than the intact model ($P=0.003$). In the cadaveric test, the failure load in the 50% defect group decreased 50.8% than the intact group (1.12 ± 0.41 vs 2.28 ± 0.36 kN, $P=0.005$). The 50% defect + screw group could partially but not significantly enhance the failure load than the 50% defect group (1.73 ± 0.86 vs 1.12 ± 0.41 kN, $P=0.11$).

Conclusion

Conclusion: The strength decreased 50% when the defect involved 50% of the femur neck after curettage of benign tumors and tumor-like lesions of the femoral neck. Prophylactic fixation with two lag screws could partially restore the strength of the 50% defect of the femur neck, which the strength recovered to 75% of the intact femur. Before bone healing in the defect, the patients are not encouraged to engage in vigorous physical activity. Further studies with a larger group of patients are necessary.

Preconditioning with troxerutin modulates the activity of TLR-4/NF- κ B signaling pathway and mitochondrial KATP channel in myocardial ischemia-reperfusion injury in a Rat model

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Introduction

Herbal medicines have been proposed as an alternative therapy in treating various medical conditions, especially cardiovascular diseases, because of their multifactorial characteristics. The present study set to establish a further understanding of troxerutin's impact on inflammatory responses following myocardial ischemia/reperfusion injury (MIRI) in a rat model and investigation the role of mitochondrial potassium (mitoKATP) channels in this scenario.

Materials & Methods

Sixty Wistar healthy rats were randomly divided into the following six groups (Control (C), C+I/R, C+I/R+5-HD, TXR, TXR+I/R, and TXR+I/R+5-HD). Isolated hearts from all groups were perfused with Krebs-Henseleit solution in the Langendorff heart apparatus. Isolated hearts underwent 30 min regional ischemia through the LAD coronary artery, followed by 45 min of reperfusion. Ischemic left ventricular samples were used to assess the activities of nuclear factor kappa B (NF- κ B), lactate dehydrogenase (LDH), tumor necrosis factor (TNF- α), toll-like receptor 4 (TLR-4), interleukin-1beta (IL-1 β) using ELISA and Western blotting techniques, and histopathological studies. The study logistics complied with the National Institutes of Health Guide for the Care and Use of Laboratory Animals and approved by the Ethics Committee. A level of $P < 0.05$ was considered statistically significant.

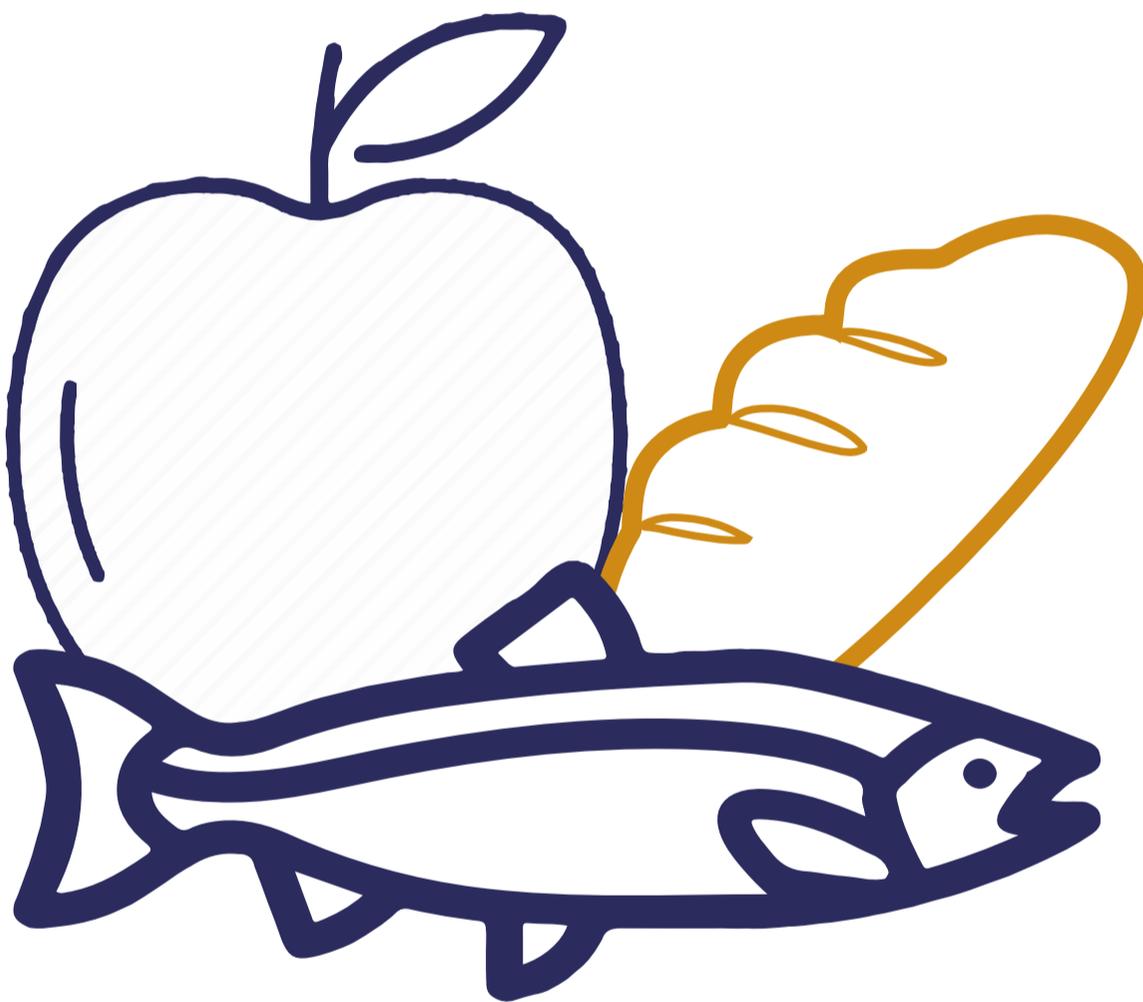
Results

The troxerutin-receiving groups (TXR, TXR+I/R, and TXR+I/R+5-HD) diminished levels of LDH, IL-1 β , TNF- α , TLR-4, and NF- κ B and infarct size compared with other groups ($P < 0.05$). Moreover, troxerutin's beneficial effects were significantly decreased by inhibiting the mitoKATP channels using 5-hydroxydecanoate, as a mitoKATP channel blocker ($P < 0.05$). Myocardial infarct size (IS) and area at risk (AAR) ratio in the C+I/R+5-HD group was the highest ratio compared with other groups ($P < 0.05$).

Conclusion

The results demonstrated that troxerutin's presence might reveal cardioprotective mechanisms through anti-inflammatory effects and involving mitoKATP channels against MIRI. The implications of different experiments suggest that more clinical research for MIRI treatment should be suggested because troxerutin has a significant effect on fundamental MIRI mechanisms. To our knowledge, no previous studies have investigated the role of troxerutin on the TLR-4/NF- κ B signaling pathway as it was not previously used in MIRI.

Nutrition



Presenters:

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(Ridhwanah)
Yuan, X.L. (Xiang-Ling)
Repa, C.R. (Chindy)
Singh, R. (Rhea)
Prizão, V. M. P. (Vitória)
Fathi Jouzdani, A. (Ali)

The Effect of non-fermented and fermented soy milk (*Glycine max*) on Aortic Malondialdehyde Levels in Hyperlipidemic Rat (*Rattus norvegicus*)

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Introduction

Malondialdehyde (MDA) is often used as a biomarker to detect oxidative stress due to lipid accumulation. Various studies have shown that fermented soybean (*Glycine max*) extract can decrease MDA accumulation. Decreased MDA accumulation, especially in the aorta, indicating a decrease in fat accumulation and increased blood pressure stability. This research aimed to compare the effect of non-fermented and fermented soy milk (*Glycine max*) on aortic MDA levels of hyperlipidemic rats.

Materials & Methods

The subjects were male Wistar (*Rattus norvegicus*) strain rats 2-3 months with body weight 200-300 grams divided into 4 groups (K+, K-, P1, and P2). Group of K+, P1, and P2 were given quail egg yolk for 2 weeks with a dose of 5 ml/200 gr while the group of K- were only given fed ad libitum. For the next 2 weeks, group of K+ and K- were only given fed ad libitum while the P1 group was given non-fermented soy milk (5 ml/200 gr), and fermented soy milk (5 ml/200 gr) for the P2 group. All rats terminated then the aorta has been taken to measure the level of MDA. All data were statistically analyzed with one-way ANOVA. Values were considered significant at $p < 0,05$.

Results

Mean of aortic MDA (nmol/gr) levels were 9.43 ± 0.11 (K+), 1.21 ± 0.16 (K-), 4.36 ± 0.14 (P1), 2.87 ± 0.38 (P2). The results showed significant differences between all groups in aortic MDA levels after the intervention of non-fermented and fermented soy milk ($p = 0,00$).

Conclusion

Both types of soy milk have the potential to reduce aortic MDA levels, but fermented soy milk more significantly reduces aortic MDA levels compared to non-fermented soy milk.

Green tea extract enhances retinal ganglion cell survival and axonal regeneration in rats after optic nerve injury

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Introduction

Optic nerve (ON) injury leads to progressive retinal ganglion cell (RGC) loss and axonal degeneration, causing irreversible visual dysfunction. Green tea extract (GTE) was shown to possess the anti-inflammatory, anti-angiogenic, anti-oxidative and neuroprotective properties. We previously demonstrated that GTE could ameliorate RGC death in rats after ischemic injury. Here we aimed to determine the prophylactic and therapeutic effects of GTE on RGC survival and axonal regeneration in rats after optic nerve crush (ONC) as well as their underlying mechanisms.

Materials & Methods

ON injury was induced in adult Fischer 344 rats by the ONC surgery. GTE (275 or 550 mg/kg) was administered intragastrically 7 days before or 14 days after the surgery, and the rats were sacrificed at two weeks after surgery. RGCs, regenerated axons and microglia activation were evaluated by the immunofluorescence analysis. Moreover, retinal function was examined by the pupillary light reflex, and the activation of the Stat3, Akt and Erk pathways were determined by the immunoblotting analysis.

Results

The rat retina expresses the receptor for green tea catechin EGCG (67-kD laminin receptor). The rats with pre-treatment or post-treatment of 275 mg/kg GTE showed significantly higher numbers of RGCs at 14 days after ON injury, compared to the saline-treated group. Meanwhile, significantly more regenerated axons were observed in rats with pre-treatment or post-treatment of 275 mg/kg GTE. Yet, the pupillary light reflex was only significantly improved in rats post-treated with 275 mg/kg GTE. Compared to the saline-treated rats, significantly higher expressions of phosphorylated Akt and Erk p42/44 were found in rats with pre-treatment of 275 mg/kg GTE, whereas higher expression of phosphorylated Stat3 was found in rats with post-treatment of 275 mg/kg GTE. In addition, less activated microglia were observed in rats with pre-treatment of 275 or 550 mg/kg GTE.

Conclusion

This study revealed the prophylactic and therapeutic treatment effects of GTE on RGC survival and axonal regeneration in rats after ON injury, indicating a potential alternative treatment strategy for traumatic optic neuropathy.

Effects of synbiotics of Green Bean (*Vigna Radiata*) With Isolate of *Lactobacillus* sp. on Acute Diarrhea in rat model : a post-test only randomized control group design

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Introduction

EPEC causes acute infection in children by directly attaching to intestinal cells and modulating signaling pathways that cause cell damage and leakage of tight junctions. Synbiotics have been shown to affect intestinal histopathological changes. The purpose of this study was to determine the synbiotic effect of a mixture of green beans and probiotics of *L. casei*, *L. plantarum*, and *L. acidophilus* on histopathological features of intestine tenue (*Rattus norvegicus*) with acute diarrhea.

Materials & Methods

This study uses a quasi-experimental with a post-test only randomized control group design. Twenty-five rats were divided into five groups. All groups fed ad libitum for one month. The first group was K1 as positive control (not induced EPEC). The second group was K2 as negative control (induced EPEC). The third group was given synbiotic drink with a dose of 8 ml / 200 gr / BW (P1). The fourth group was given synbiotic drink with a dose of 3.6 ml / 200 gr BW (P2). The fifth group was given synbiotic drink with a dose of 5.4 ml / 200 gr (P3). Groups K2, P1, P2, and P3 were induced EPEC 1×10^{10} CFU / mL. After diarrhea, groups P1, P2, and P3 were given synbiotic intervention for 7 days. Data analysis was performed by assessing changes in histopathological features of intestine tenue, goblet cell count, intraepithelial lymphocytes, and polymorphonuclear leukocytes.

Results

There were significant changes with the increase of synbiotic doses from the histological picture including repair of the mucosal epithelium, villi, and crypts in line with the decrease in the number of inflammatory cells between the intervention group. Group P1 showed the mildest mucosal damage. Group K2 had a worse histopathological picture than group P3. The One-way Anova test also showed significant results between the intervention groups on the assessment of the number of goblet cells and the number of intraepithelial lymphocytes and the number of intramucosal leukocytes showed a value of $p=0.004$, $p=0.000$, and $p=0.000$, respectively.

Conclusion

Synbiotic drinks of green bean extract (*Vigna radiata*) with *L. casei*, *L. plantarum*, and *L. acidophilus* isolates influence the repair of intestine tenue tissue in rats with acute EPEC diarrhea.

Pathological changes in the mucous membrane of the small intestine due to prolonged consumption of palm oil

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Introduction

Although palm oil is a very widely consumed commodity, health concerns have arisen regarding its safety over the past few decades, due to its high saturated palmitic acid content. Aim of this experimental study was to evaluate the effect of prolonged palm oil consumption on the morphology and function of the small intestine (SI) as well as features of proliferation in these cells.

Materials & Methods

Ten WAG male rats, separated randomly into two equal groups were given 10g/kg of sunflower oil (control group) and palm oil (main group) respectively in their food rations for 5 months. Microscopic investigation and morphometric studies were done on small intestine cells after staining with Periodic Acid Schiff and Einarson's (Halocyanin-chromalum) stain. Quantitative enterocyte Ki-67 expression was assessed immunohistochemically. Lipid profile and serum level of proteins were evaluated to assess the degree of dysfunction of the small intestine.

Results

A significant amount of dysfunction and intense destructive enteritis of the mucous membrane was revealed in SI of the rats orally exposed to palm oil. Moreover, Ki-67 expression was decreased in the group of palm oil rats despite significant damage. The biochemical analysis showed a decrease in the serum levels of total proteins and phospholipids possibly due to damage to the SI epitheliocytes, which led to their decreased absorptive function. Increase in the levels of total lipids and triglycerides was found due to the high level of the saturated fatty acid content of the palm oil.

Conclusion

Prolonged consumption of excess palm oil results in intensified destructive enteritis, accompanied by reduced function and regenerative capability of the intestinal epithelium.

In vitro evaluation of the anti-leishmanial activity of crude extract and fractions of *Matricaria chamomilla* (L.)

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Introduction

Leishmaniasis is one of many neglected tropical diseases. Caused by different species of protozoa of the genus *Leishmania*, it affects millions of people worldwide. The available treatments have limitations linked to high toxicity, route of administration and low efficacy. Thus, the search for new substances with good activity and fewer side effects to patients is necessary, and natural products are promising candidates. The floral buds of *Matricaria chamomilla* L. have several activities already described in the literature. Therefore, the aim of this study was to produce an *M. chamomilla* crude extract and fractions to evaluate their activity against the evolutionary forms of *L. amazonensis*.

Materials & Methods

Floral buds of *M. chamomilla* were preserved in 95% ethanol for 12 days and lyophilized to obtain the crude extract (EB); with the aid of a separating funnel and organic solvents, hexane (FHE), ethyl acetate (FAE) and hydromethanolic (FHM) fractions were obtained. EB and the three fractions were tested in vitro against the macrophage cell line J774A.1 by the MTT cell viability assay; *Leishmania* promastigote forms by an antiproliferative assay; and the intracellular amastigote, through Giemsa staining and counting on an optical microscope. The IC₅₀ was determined in relation to the untreated control. The results were expressed as mean ± standard deviation of at least three independent experiments.

Results

EB yield was 2.82%, and through EB partitioning, FHE (50.6%), FAE (21%) and FHM (26%) were obtained. In tests against macrophages, EB and FAE were more cytotoxic, with CC₅₀ values of 74.4 and 84 µg/mL, respectively. FHM was the least cytotoxic, with a CC₅₀ of 734.16 µg/mL. In terms of activity against the evolutionary forms of *L. amazonensis*, FHE presented the best results, with an IC₅₀ for promastigotes of 14.2 µg/mL and a selectivity index (SI) of 8.15; indicating that FHE is 8.15 times more selective for the protozoan than for host macrophages. Against *Leishmania* amastigotes, FHE again had the best result, with an IC₅₀ of 53.84 and SI of 2.13.

Conclusion

Overall, FHE demonstrated better anti-*Leishmania* activity, thus being an interesting candidate to investigate further in order to elucidate its activity against the evolutionary forms of *L. amazonensis*.

Evaluation of the effect of *Lactobacillus Acidophilus* on Zearalenone toxicity in mice brains

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Introduction

Zearalenone (ZEN) is an estrogenic mycotoxin produced by a specific species of *Fusarium* fungus. This fungus contaminates various foods, including corn, wheat, barley, and other grains. ED 50 is 0.2 µg / kg for ZEN mycotoxin. studies showed ZEN caused damage in the brain and hippocampus. Recent investigation has used different species of bacteria to detoxify mycotoxins. Therefore, in this study, we aimed to evaluate the detoxification effect of *Lactobacillus acidophilus* in the brain tissue of mice on ZEN toxicity using various parameters of oxidative stress, gene expression, and histopathology examination in mice.

Materials & Methods

In this experimental study; mice randomly divided into five groups of 7, which received normal saline, olive oil, ZEN (soluble in olive oil), *L.acidophilus*, and *L.acidophilus*+ZEN through gavage. Blood samples collected from the heart and also brain tissue separated and homogenized in a phosphate buffer. After centrifugation, the supernatant is stored in a -80 °C freezer for biochemical tests; also, brain mitochondria were extracted for assessment viability. For biomarkers of oxidative stress in blood and tissues and mitochondria, lipid peroxidation (LPO) and antioxidant capacity (TAC), and thiol groups (TTG) are measured by the colorimetric method. The catalase enzyme activity is performed by the Abi method; also, the superoxide dismutase enzyme activity is measured in the samples with the Kia Zist kit. The expression of SOD, FOXO 1a, and FOXO 3a genes was also examined with Real-time PCR. For histopathological studies, each group's brain tissue was immediately isolated, and; Tissues incised, and the incisions stained and fixed with hematoxylin-eosin.

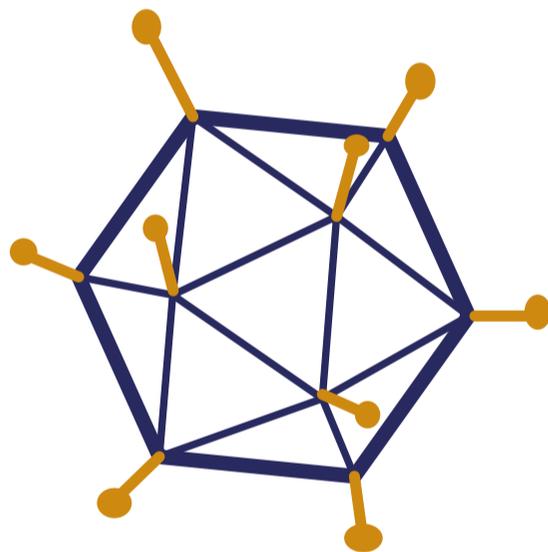
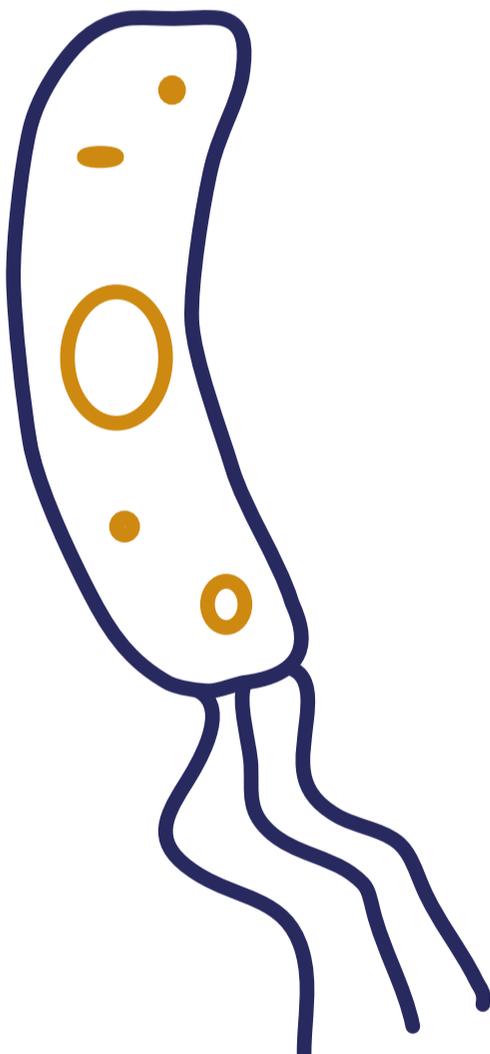
Results

Significant decrease in TAC (P-value<0.001) and increased LPO level (P-value<0.001) in brain tissues ZEN toxified animals compared to the control group proved that ZEN caused oxidative stress. Most of the parameters in the *L.acidophilus* treatment group are maintained close to the control mice group levels. The effect of *L.acidophilus* alone or together with ZEN on the evaluation of oxidative and antioxidative parameters is revealed as the safe and protective effect of ZEN-induced brain injury.

Conclusion

According to the results, *L.acidophilus* can be used as a useful probiotic to combat zearalenone toxicity, especially in contaminants related to cereals and its products.

Infectious Disease



Presenters:

Lopera, TJ (Tulio)

Tasbakan, S.E. (Selin)

Mangat, H.A.M (Hammad)

Sadegh doust, E.S (Ebtesam)

Sahani, SS (Saaz)

Evaluation of a rapid antigen detection test as a predictor of contagiousness in SARS-CoV-2 infection in Medellín, Colombia

Lopera, TJ (Tulio) Student¹, Rugeles, MT (María Teresa) MSc, PhD¹, Díaz, FJ (Francisco Javier) MD, PhD¹, Alzate-Angel, JC (Juan Carlos) MD, MSc¹, Aguilar-Jimenez, W (Wbeimar) MSc, PhD¹

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Introduction

The rapid expansion and clinical heterogeneity of COVID-19 (caused by SARS-CoV-2) makes necessary to increase the diagnosis capacity of the countries to improve the case detection rate and public health strategies. However, the SARS-CoV-2 diagnosis gold standard is a molecular test that requires a very complex and professional infrastructure. Rapid antigen detection tests have recently been developed, cheaper, more comfortable, and with good sensitivity and specificity characteristics. We aimed to evaluate the performance of a quick antigen detection test approved for use in Colombia to determine the relationship between RT-PCR and the antigen detection test's concordance with the viral isolation as a contagion predictor.

Materials & Methods

A cross-sectional analytical observational study included 312 patients with suspected COVID-19 by clinical criteria, epidemiological, or presented associated symptoms or exposure to SARS-CoV-2. A nasopharyngeal swab was taken from each patient and performed RT-PCR, antigen detection test, and viral isolation. Cohen's Kappa coefficient was used to assess concordance between tests, and the antigen detection test sensibility and specificity were estimated using GraphPad Prism V.8.

Results

In the 312 patients, 178 positive cases were diagnosed, of which 73 were positive in the antigen detection test, and 53 were contagious in viral culture. The antigen detection test identified those who have a higher viral load, inferred as a $CT < 21$ in RT-PCR test having a sensitivity of 96% to predict contagion (viral culture-positive and $CT < 19$) in patients with suspected COVID-19 and a specificity of 92% to rule out contagion ($P < 0.0001$). Furthermore, the antigen detection test and the viral isolation had a 92% agreement, with a Cohen's Kappa index of 0.76 (95% CI 0.674 to 0.852). More sophisticated analyses about the clinical and epidemiological characteristics involved are running.

Conclusion

The preliminary results showed that antigen detection tests, despite not having a good sensitivity to detect SARS-CoV-2 infection, meet acceptable sensitivity and specificity parameters to identify contagious patients. Therefore, implementing this test in people with suspected COVID-19 can improve the detection of possible contagion sources and avoiding infection dissemination.

The Effect of Pneumococcal Vaccine on Clinical Course of Covid-19: A retrospective cohort study

Tasbakan, S.E. (Selin) Medical Student¹, Yaman, E. (Ekin) Medical Student² (both authors contributed equally)

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Introduction

COVID-19 characteristically affects the lungs, causing pneumonia which in worst cases can be lethal. Even though the pneumococcal vaccine shouldn't be effective on viral pneumonia such as COVID-19, multiple studies suggest a link between them. Based on those, we've composed our study to determine if and how the pneumococcal vaccine affects COVID-19 patients' clinical courses.

Materials & Methods

We've assembled a retrospective cohort study consisting of 6301 PCR+ COVID-19 patients. Information about patients' clinical course and whether they had the pneumococcal vaccine in the past 5 years is collected. The collected data was uploaded to Excel and patients were grouped by their characteristics. The probable association between the severity of COVID-19 and the pneumococcal vaccine was analyzed.

Results

407 unvaccinated (mean age 55-65, %55 male) and 49 vaccinated (mean age 60-69, %51 male) PCR+ patients were randomly selected and analyzed for the preliminary studies. The mortality rate was %5.3 for the unvaccinated group, while it was strikingly %0 for the vaccinated group. Also, overall mortality rate was found %3.70 (235/6301). Though these are the preliminary results, it's safe to say that after the completion of the study, being vaccinated with the pneumococcal vaccine will be determined as a key factor in reducing the mortality of COVID-19. Another difference found among the two groups was the length of hospitalization (LOH). The rate of whose LOH > 15days was %2,4 for the unvaccinated group, and half of those patients' LOH was over 20 days, while the same rate was lowered to only %2 for the vaccinated group (and none from the vaccinated group had LOH > 20days).

Conclusion

Those who had the pneumococcal vaccine in the past five years had significantly lower mortality rates than who had not. Also, the vaccinated group's length of hospitalization was shortened. Providing that at the end of the study, similar results will be obtained, the pneumococcal vaccine can be advised as a valuable method of improving prognosis.

A DNA based optical biosensing platform for the detection of pathogenic bacteria *Staphylococcus aureus* in clinical samples

Mangat, H.A.M (Hammad) Mr.¹, Sami, A.J.S (Amtul) Professor², Alam, S. A (Sadaf) Ms², Bilal, S.B (Sehrish) Ms²

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² University of the Punjab, Biochemistry and Biotechnology, Lahore, Pakistan

Introduction

Staphylococcus aureus is one of the major causes of bacteremia. It can cause endovascular complications and metastatic infections, leading to high morbidity and mortality. The objective of the study was to develop of a biosensing platform for the direct and swift detection of pathogenic bacteria in the clinical samples.

Materials & Methods

For preliminary studies two target elements (i). genomic DNA and (ii) microbial cell, were immobilized on a novel fabricated sensing layer, on a glass slide. The single-stranded DNA probe was based on elongation factor encoding *tuf* gene. Binding of the labelled probe was optimized with the genomic DNA and the surface proteins of *S. aureus*. The probe was labelled with MFP488 fluorophore. The fluorescent labelled probe was hybridized with immobilized denatured genomic DNA from nasal samples. The fluorescence intensity was measured by a fluorescence microscope and samples containing *S. aureus* could be effectively identified based on fluorescent signals. To check the efficiency of the sensing technique a bacterial colony was also immobilized on the platform and binding efficacy was determined.

Results

Robust signals were detected for *S. aureus* colony, perhaps due to the moonlighting effect of elongation factor Tu (Ef-Tu). To test the effectiveness of the optical sensing technique 40 clinical samples were tested, out of which sixteen samples showed positive signals for staph. Precision and efficiency of the optical biosensing technique were confirmed randomly tested by qPCR.

Conclusion

The results confirm that the designed biosensing platform could be used for the fabrication of an optical Biosensor for the direct detection of pathogenic bacteria *S. aureus* from the clinical samples by immobilizing the single-stranded DNA probe based on of elongation factor Tu (Ef-Tu). The biosensing approach allows sensitive, rapid and specific detection of *S. aureus* in routine analysis, however, optical biosensing approach provides rapid, on-site, and easy detection of pathogenic bacteria.

the effect of statins on clinical outcomes and morbidity rate of COVID-19 patients: a retrospective cohort study

Sadegh doust, E.S (Ebtessam) Dr.¹, Sadeghdoost, A.S (Adel) Dr.², Aligolighasemabadi, N.A (Neda) Dr.³

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Introduction

Coronavirus disease (COVID-19) is an infectious disease with a significant mortality rate which was declared a global pandemic in March 2020. COVID-19 may progress to a severe fatal form called acute respiratory distress syndrome, an uncontrolled systemic inflammatory response ARDS caused by the release of proinflammatory cytokines. Statins are lipid-lowering drugs that have anti-inflammatory and antioxidant effects. So, we designed this research to find the effect of statin on mortality rate in patients with COVID-19.

Materials & Methods

Patients with confirmed COVID-19 who were discharged from our hospital (Dezful city, Iran) or had died, were included in our retrospective study based on inclusion and exclusion criteria. Propensity match score method was used to reduce the effects of confounding factors. Demographic, clinical treatment, and laboratory data were recorded. Lung CT scan images were analyzed by a radiologist in random order. The association between statin use and mortality rate was estimated by Cox proportional-hazards regression models

Results

Two hundred five COVID-19 patients were included in this study. Atorvastatin (89.5%), simvastatin (5.2%), rosuvastatin (4.1%) were used by 96 of our patients. Statistical analysis revealed that use of statins (n=96) reduced the chance of being subjected to mechanical ventilation [OR=0.89, 95% CI= (0.73–3.15), P=0.89]. Also, patients on statins had a more normal computed tomography (CT) scan result [OR=0.39, 95% CI= (0.09–2.19), P=0.29]. Although patients who received statins had lower risk of death [(HR= 0.69; 95% CI= (0.21, 3.55), P=0.65)] and morbidity [HR=0.79, 95% CI= (0.11, 4.03), P=0.71], they were not statistically significant.

Conclusion

This research revealed that using statins might improve clinical outcomes of patients with COVID-19. In addition, there is no relationship between the use of statins in COVID-19 patients and reduction in mortality rate. Further randomized controlled trials are highly recommended to evaluate the beneficial effects of statin treatment in COVID-19 patients.

Co-infection by DNA viruses in patients after kidney transplantation

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Introduction

Polyomaviruses (JCPyV and BKPyV) and cytomegaloviruses (hCMV) are the main viral pathogens affecting recipient outcomes after allogenic kidney transplantation. It was previously found that an infection with two viruses has a greater impact on kidney graft function than a single infection. The main aim of this project was to investigate DNA virus co-infections in post-renal transplant patients and their possible impact on clinical outcomes.

Materials & Methods

Our study consisted of a total of 180 patients (120 recipients and 60 donors). Blood and urine samples were collected 1-year post-transplantation (between 2017 and 2020). BK Polyomavirus (BKPyV) positive patients were included and subsequently screened for the presence of hCMV and JC polyomavirus (JCPyV). The PCR was performed via the RotorGene instrument. Patients with coinfections were evaluated for clinical outcomes.

Results

36 patients developed BKPyV positivity during the first year after kidney transplantation. 3 patients expressed co-infection by BKPyV and JCPyV and 3 patients with co-infection by BKPyV and hCMV. In total 5, patients developed BK nephropathy and in 1 case it was associated with a co-infection (BKPyV+JCPyV coinfection). No acute graft rejection was noted.

According to Assis et al.2017, the co-infection by BKPyV and JCPyV was found in 6.8% of transplant patients. In our research, the incidence of both co-infections was 8.5%.

In the 3 patients with BKPyV and JCPyV, significant BKPyV enhancement was seen in both blood ($10^4 - 10^5$ c/ml) and urine ($10^9 - 10^{10}$ c/ml) samples. The co-infections did not affect the long-term survival of grafts. Further research must be done to define their role in acute transplant rejection.

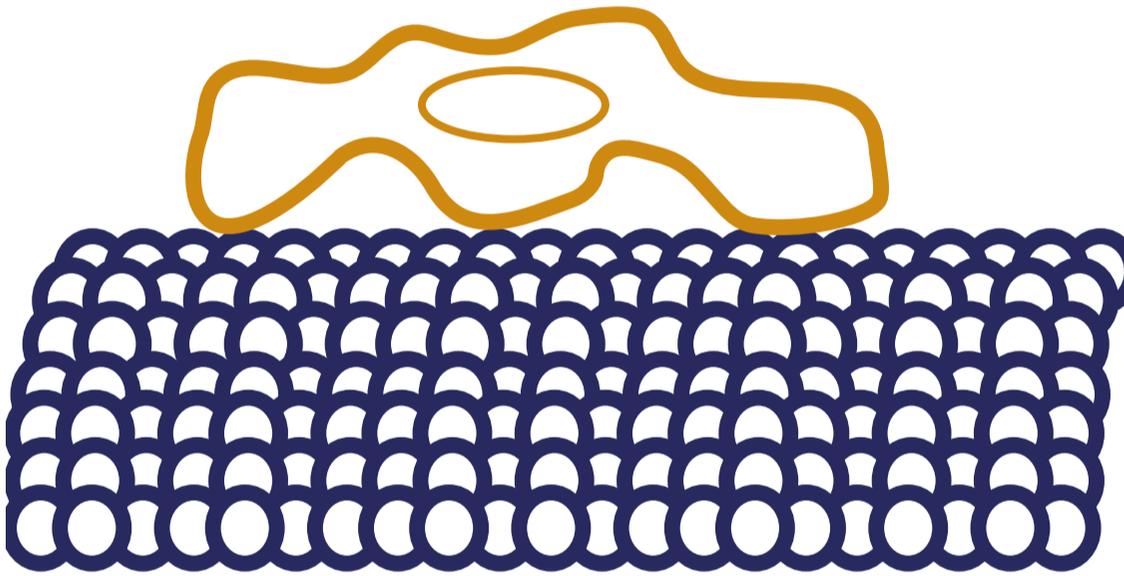
Conclusion

BK virus nephropathy is a serious complication of kidney transplantation. 10%–30% of recipients have BK viremia and nephropathy occurs in approximately 2% (Sawinski 2018). BKPyV reactivation is possibly enhanced in JCPyV co-infection and must be monitored carefully for 12 months post-transplantation. There are currently no antiviral treatments for Polyomaviruses, and reduction or revision in immunosuppressant regime pose threats to both graft and recipient. This further highlights the importance of screening and risk-stratification based on serology.

Poster Sessions



Biomaterials



Presenters:

Shahriari, M. (Mahsa)

Khachatryan, H. (Hamlet)

Self-targeted polymersomal co-formulation of doxorubicin, camptothecin and FOXM1 aptamer for efficient treatment of non-small cell lung cancer

Shahriari, M. (Mahsa)^{1,2}, Taghdisi, S.M. (Seyed Mohammad) Dr³, Abnous, Kh. (Khalil) Dr^{1,4}, Ramezani, M. (Mohammad) Dr^{1,2}, Alibolandi, M. (Mona) Dr^{1,2}

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Introduction

In spite of huge developments in cancer treatment, versatile combinational formulations of different chemotherapeutic agents to enhance anticancer cytotoxicity while reducing systemic toxicity still remains a challenge.

Materials & Methods

In this regard, in the current study, an amphiphilic hyaluronic acid-b-polycaprolactone diblock copolymer was synthesized using “click chemistry”. The synthesized copolymer was self-assembled to form polymersomal structures for co-encapsulation of hydrophilic doxorubicin (DOX) and hydrophobic camptothecin (CPT) in their interior aqueous compartment and their bilayer, respectively with 1:10 and 1:1 ratios. The prepared polymersomal combinational formulation surrounded by hyaluronic acid brush as hydrophilic segment, could provide active targeting of the system against CD44 marker expressed on the surface of cancerous cells. The hyaluronic acid shell could also provide flexible chemistry for the conjugation of therapeutic DNA aptamer FOXM1 (against transcription factor FOXM1) on the surface of polymersomes in order to further suppress cancerous cell proliferation.

Results

The obtained results demonstrated that the prepared co-formulation provided sustained, controlled release of the entrapped drugs during 200 h. In vitro cytotoxicity experiments on non-small cell lung cancer, A549 and SK-MES-1 cell lines, demonstrated that the co-formulation of DOX and CPT provided synergistic effect and significantly higher cytotoxicity in comparison with DOX-formulation, CPT formulation and free drugs. The cytotoxicity experiment also indicated that the aptamer conjugation on the co-formulations surface significantly increase the cytotoxicity and induce apoptosis in combination therapy on both A549 and SK-MES-1 cell lines while aptamer conjugated blank NPs did not show any cytotoxicity which emphasizes on the sensitization capability of the FOXM1 DNA aptamer against non-small cell lung cancer. Furthermore, it was shown that the co-formulation with or without aptamer renders the formulation specific tumor accumulation in vivo 24 h post-administration, assisting the combination synergy observed in vitro to be translated to in vivo antitumor efficacy.

Conclusion

This combinatorial delivery platform strongly offers a novel approach for synergistic controlled transportation of several chemotherapeutics for treatment of non-small cell lung cancer.

The comparison of different gelatin/alginate ratios in bioinks for cartilage tissue bioprinting via syringe based microextrusion technology

Khachatryan, H. (Hamlet)^{1,2}, Ghandilayan, E. (Emmanuel)^{1,3}, Grigoryan, V. (Vahan)^{1,3}, Yeritsian, S. (Sevan)¹, Keshishbanous, P. (Piunik)⁴

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² Yerevan State University, Institute of Pharmacy, Yerevan, Armenia

³ Institute of Physiology after L. Orbeli, Tissue Engineering Laboratory, Yerevan, Armenia

⁴ Islamic Azad University, Biochemistry, Tehran, Iran, Islamic Republic of

Introduction

Rapid technological and scientific development has solved many problems in human life. However, healthcare remains the most challenging field for the scientific community. The lack of donor transplant tissues remains a global problem. A solution to this problem can be 3D bioprinting technology, which allows printing viable tissue samples in in vitro conditions. This technology is a combination of tissue engineering, biomaterial engineering and 3D printing. The aim of this study was the development of cartilage tissue bioink with an optimal gelatin/alginate ratio.

Materials & Methods

For bioink preparation, sodium alginate and gelatin powders, purchased from Sigma Aldrich, have been used. Powders have been sterilized under UV. For preparation of 10% solutions, different ratios of gelatin and alginate (9:1; 7:3; 5:5; 3:7; 1:9) were used.

For chondrocyte isolation bovine auricular cartilage has been utilized. Under sterile conditions, the ear was cut into small pieces. Thereafter, samples incubated at 37°C in 0.3% Collagenase solution. After the full dissolution of samples, suspension of chondrocytes passed through a 100-µm or 153-µm cell-strainer. Afterwards, the cells were seeded in the tissue culture flasks and incubated in DMEM supplemented with 10% NCS and antibiotics.

Bioink and cells have been mixed at 6000000 cell/ml concentration in a syringe and then placed into the extruder. Foldink syringe-based 3D bioprinter has been used. As a model, a 1.5cm/1.5cm/0.5cm cube with 30% grid infill has been prepared. For the crosslinking, Ca²⁺ solution and cooling of the printbed have been done. To evaluate cell viability in the printed tissue H&E staining was employed.

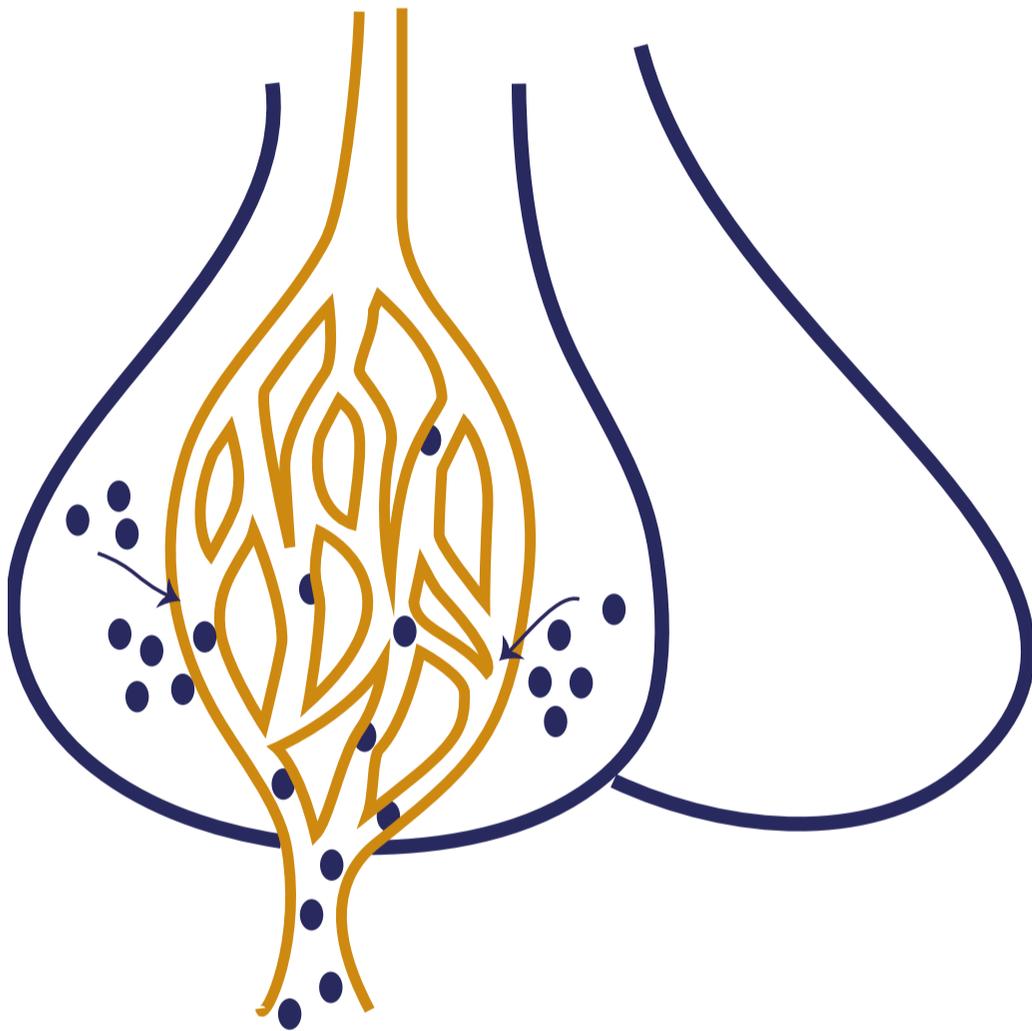
Results

As a result of the study, it was revealed that at a high value of the gelatin/alginate ratio (9:1) in bioinks, the printed and crosslinked structures had unstable shapes due to the difficulties of in situ thermal crosslinking. In contrast, at lower values of the gelatin/alginate ratio (1:9, 3:7, 5:5), the printed model keeps the specified shape, but cell viability decreases.

Conclusion

The most optimal Gelatin/alginate ratio in bioink for cartilage bioprinting, according to this study, was 7:3, in which high cell viability and printing quality of samples were optimal.

Endocrinology



Presenters:
Parmar, V.P. (Vinendra)
Mehta, A. (Aryan)

Efficacy and Safety of Tenzeligliptin as Add on Therapy in Indian Type 2 Diabetes Mellitus Patients having hypertension

Parmar, VP (Vinendra) Ph. D¹, GOSWAMI, GS Dr (SUNITA) Ph.D M.Pharm¹

¹ L M College of Pharmacy, Department of Pharmacology, Ahmedabad, India

Introduction

Diabetes mellitus, a chronic metabolic non-communicable disease (NCD) has attained epidemic proportions worldwide. Tenzeligliptin is a novel, highly selective dipeptidyl peptidase-4 (DPP-4) inhibitor. The purpose of this study was to investigate the efficacy and safety of tenzeligliptin, in type 2 diabetes mellitus (T2DM) patients having hypertension who are inadequately controlled by relevant conventional therapy in India.

Materials & Methods

Study protocol was approved by Institutional Ethics Committee. Diabetic patients having hypertension (male/female) were randomized to receive treatments in two groups, namely conventional therapy [treatment (A)] and add on tenzeligliptin 20 mg with conventional therapy [treatment (B)] for 24 weeks. Predesigned case report form (CRF) was used to collect information from the prescribing physicians regarding the efficacy and safety of tenzeligliptin. Efficacy variables included change in serum glycaemic, blood pressure, and cytokines (IL-6, TNF- α and adiponectin) levels from baseline to week 24. Treatment-emergent adverse events (TEAEs) were also assessed.

Results

Total 120 T2DM patients having hypertension were analysed using graph pad prism. Tenzeligliptin, as add on therapy to conventional therapy significantly reduced serum glycaemic parameters (HbA1c, FBG, and PPBG) along with significant rise in serum adiponectin levels as compared to conventional therapy ($P < 0.05$).

Conclusion

Add-on therapy with tenzeligliptin was found superior over conventional therapy in terms of significantly reduced glycaemic parameters. Blood pressure was also improved in patients with concomitant hypertension.

Correlation between vitamin D and microvascular complications of type 2 diabetes mellitus: A cross sectional study.

Mehta, A. (Aryan) Dr.¹, Kaur, S Dr. (Sukhraj) Dr.¹, Grewal, U. S, Dr. (Udhayvir Singh) Dr.²

¹ Government Medical College, Amritsar, Punjab 143001, India, Department of Biochemistry, Amritsar, India

² Louisiana State University Of Health Sciences (LSUHS), Department of Internal Medicine, Shreveport, United States

Introduction

The disease burden related to type 2 diabetes mellitus (DM) is increasing globally which can be attributed to unhealthy lifestyles worldwide. Most of the people living with diabetes develop one or more complications with time. The microvascular complications of diabetes present as a triopathy of diabetic neuropathy, nephropathy and retinopathy. Vitamin D has many pleiotropic functions in our body, one of which is regulation of insulin secretion. We aimed to correlate the levels of vitamin D with microvascular complications of diabetes. We also compared the relationship of different complications amongst each other.

Materials & Methods

The current cross sectional study included 100 patients with type 2 diabetes mellitus being treated at an outpatient clinic of a tertiary care hospital. Patients with known medical conditions and on medications affecting vitamin D levels were excluded. Estimation of vitamin D was done using ELISA based on principle of competitive binding. Patients were screened for diabetic retinopathy, neuropathy and nephropathy via fundoscopy, monofilament test and urine microalbuminuria respectively. The data was analyzed using t test and comparison of mean was done with ANOVA (SPSS 21 version).

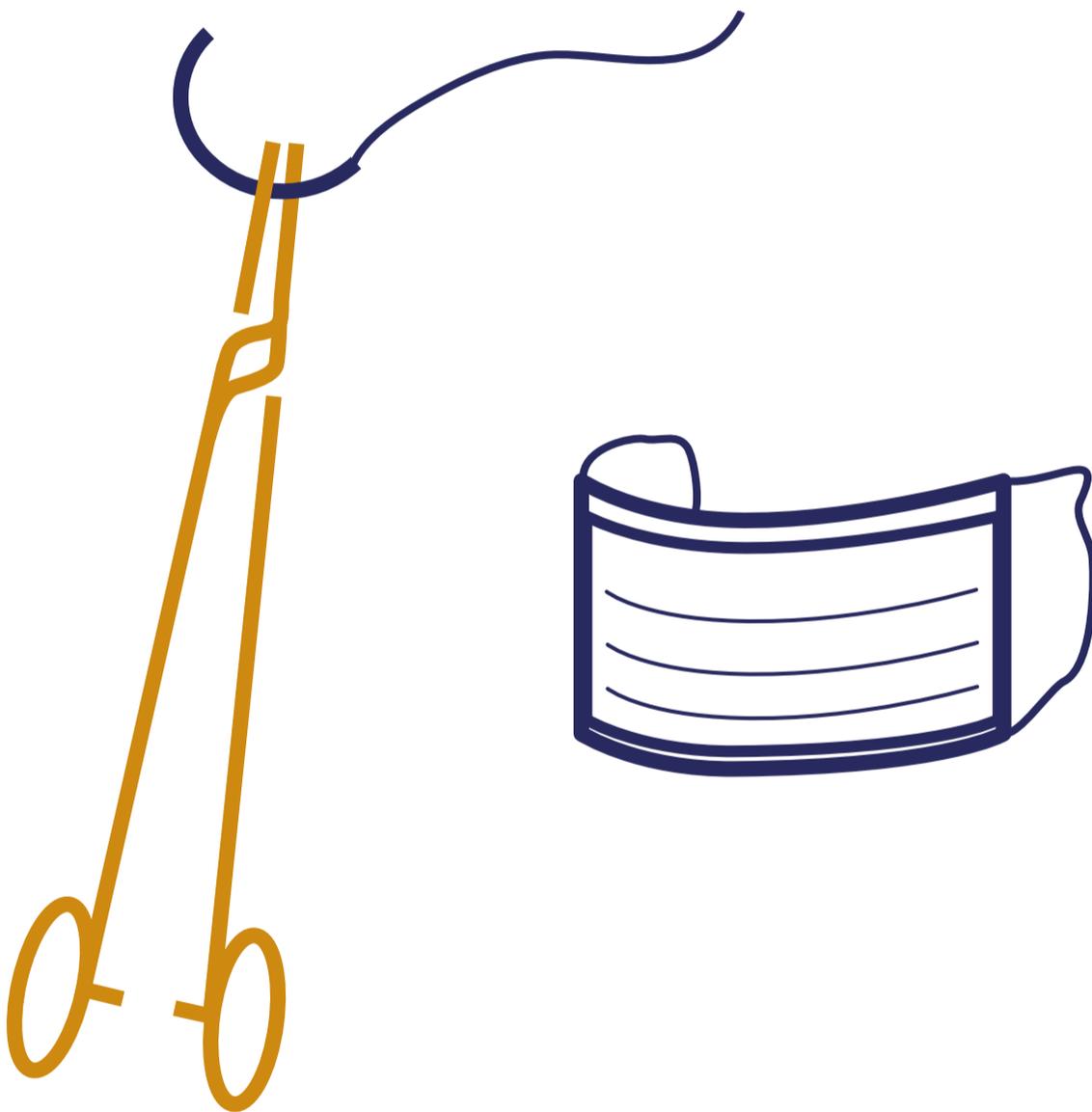
Results

Out of 100 diabetic patients in the study, 70 patients were having diabetic complications. 27% had a single complication, 27% had two complications and 16% had all three complications. They did not show any significant correlation with vitamin D levels ($r = -0.057$, $p = 0.568$). Retinopathy had significant positive correlation with neuropathy and highly significant correlation with nephropathy ($r = 0.214$ and 0.465 , $p < 0.03$ and $p < 0.000$ respectively). Neuropathy correlated positively and significantly with nephropathy ($r = 0.244$ and $p < 0.05$).

Conclusion

The results of the study show that majority of the patients were having one or more microvascular complications. It can also be concluded that no statistical correlation exists between vitamin D and microvascular complications of type 2 DM. Significant correlation was found amongst different complications indicating that more than one complication might occur together in an individual.

General Surgery



Presenters:

de Vries, R.P.H. (Roelof)
Supranoto, Y.T.N. (Yehuda)
Goodijk, D. (Dagmar)

The use of Indocyanine Green Fluorescence Imaging in preventing postoperative bile leakage of the hepaticojejunostomy in robot-assisted pancreatic surgery

de Vries, R.P.H. (Roelof)¹, Gijzen, A.F. (Anton) M.D.¹, Lips, D.J. (Daan) M.D.,Ph.D.¹

¹ Medisch Spectrum Twente, Surgery, Enschede, Netherlands

Introduction

Postoperative bile leakage (POBL) due to hepaticojejunostomy (HJ) insufficiency after pancreaticoduodenectomy (PD) is associated with high morbidity and mortality. The incidence is reported to be in the range of 2,2-8.0%.

Indocyanine green (ICG) is a water-soluble molecule that, after intravenous injection, is eliminated by the liver and is visible peroperatively due to its fluorescent characteristics. The aim of this study was to determine the clinical value of ICG in preventing POBL of the HJ in robot-assisted surgery.

Materials & Methods

In this prospective cohort study, all robot-assisted constructed HJ anastomoses in conjunction with peroperative ICG administration in 2019 and 2020 were included. All anastomosis were created by a single surgeon, end-to-side, using the da Vinci X, with polydioxanone (PDS) 5.0 interrupted sutures. ICG was administered before or at finishing the HJ. Biliary leakage was objectified with near infrared (NIR) technology (Firefly mode). In case of a intraoperative leakage the anastomosis was revised. Postoperative HJ-insufficiencies were classified according to the International Study Group of Pancreatic Surgery (ISGPS) classification.

Results

A total of 28 patients were included of which 14 male, with a mean age of 70 (SD ± 8). All patients underwent a PD. In 27 cases the indication for surgery was a malignancy and in 1 case a pancreatic cyst. All patients were given ICG without side effects and bile was adequately illuminated. In 4 cases (16,7%) an intra-operative HJ insufficiency was observed and a revision was successfully performed. Postoperatively, two (50%) of these patients developed a grade B HJ-insufficiency with one patient having a simultaneous grade C pancreatojejunostomy (PJ) insufficiency. In the other 25 cases 3 patients (12%) developed a HJ insufficiency. One patient developed a grade B and two patients developed a grade C HJ-insufficiency. One patient had a concomitant grade C PJ insufficiency.

Conclusion

Our study shows that bile illumination with ICG in robot assisted HJ construction enabled us to prevent two anastomotic insufficiencies. As POLB does not solely depend on technical insufficiency, peroperative revision does not guarantee postoperative success> However ICG is a useful and simple tool in observing peroperative HJ-anastomosis insufficiencies.

Postoperative Complication and Hospital Length of Stay As Efficacy Indicators of Interval and Emergency Appendectomy for Appendiceal Mass Management: A Systematic Review and Meta-analysis of Cohort Studies

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² Soebandi General Hospital, Faculty of Medicine University of Jember, Department of General Surgery, Jember, Indonesia

Introduction

Inflammation in appendicitis can sometimes lead to the formation of an phlegmon appendix or limited abscess, often appearing as palpable mass. Management method in patients with appendiceal mass is surrounded with controversy. There is no consensus on the ideal management of whether emergency appendectomy is better than conservative treatment followed by interval appendectomy or vice versa.

This systematic review and meta-analysis of cohort studies aimed to compare the efficacy of emergency appendectomy and conservative treatment followed by interval appendectomy based on postoperative complication and postoperative hospital length of stay (LOS) in patients with appendiceal mass.

Materials & Methods

This meta-analysis was reported based on criteria from Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA). A literature search was conducted with multiple electronic databases, such as PubMed, CINAHL, Google Scholar, ScienceDirect, and Scopus using Boolean operator. Risk Ratio (RR) with confidence interval (CI) of 95% were used to determine the association between postoperative complication in emergency appendectomy and conservative treatment followed by interval appendectomy. Mean Difference (MD) and Standard Deviation (SD) with CI of 95% were used to know whether hospital LOS of patients correlated with type of management method underwent. Fixed and Random Effect Model was used based on heterogeneity level and p value <0.05 was considered statistically significant. Risk of biases were assessed for each study using Risk Of Bias In Non-randomised Studies-of Interventions (ROBINS-I) tool.

Results

We identified 3209 studies from all databases. A total of 15 cohort studies were included in the qualitative synthesis and 11 cohort studies were included in the quantitative meta-analysis. The current study showed that postoperative complication significantly tends to occur in favours emergency appendectomy compared with interval appendectomy (Pooled RR=0.40, 95% CI (0.24-0.66), p=0.0004, I²=64%). The postoperative Hospital LOS also strongly associated with the management method and tends to be longer in patients who have undergone emergency appendectomy compared to interval appendectomy (Pooled MD= -2.10, 95% CI (-2.61-1.60), p<0.00001, I²=0%).

Conclusion

This review provides valuable evidence showing conservative treatment followed by interval appendectomy tends to be more recommended than emergency appendectomy for patients with appendiceal mass based on the postoperative complication occurrence and hospital LOS.

Vascular Calcification and the Association with Frailty Prevalence in Kidney Transplant Recipients

Goodijk, D. (Dagmar)¹

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Introduction

Frailty is defined as a state of diminished strength, endurance and reduced physiologic function. Chronic inflammation is believed to play a central role in the pathogenesis of frailty. Frailty is a major risk factor for post-operative complications and mortality after kidney transplantation, as is vascular calcification. In accordance with the pathophysiology of frailty, chronic inflammation also plays a central role in the pathophysiology of vascular calcification. It remains unknown to what extent vascular calcification is related to the state of frailty in kidney transplant recipients. A pre-transplantation frailty assessment will help to predict the risk of adverse cardiovascular events after kidney transplantation more accurately.

Given the overlap in aetiology and interplay between vascular calcification and frailty, we have formulated the following research question: Is there an independent association between the severity of pre-operative aorto-iliac atherosclerosis and frailty in kidney transplant recipients?

Materials & Methods

This study is a retrospective analysis of a prospective kidney transplant recipient cohort, focusing on frailty and vascular calcification. Patients who received a kidney transplant between 2013 and 2018 at the UMC Groningen will be included in this study. Inclusion criteria are pre-operative frailty assessment by means of the Groningen Frailty Index (GFI), and pre-operative aorto-iliac calcification measurement by means of the aorto-iliac calcium score (CaScore).

For the statistical analysis, we will use SPSS to perform a multivariable regression analysis to investigate whether there is an independent association between frailty and the severity of aorto-iliac atherosclerosis, after adjusting for potential confounders like sex, age, type of dialysis, duration of dialysis, BMI, hypertension and comorbidities.

A statistical power analysis was performed for sample size estimation, based on data from Korada et al. "Frailty and subclinical coronary atherosclerosis", comparing the CAC-score >0 rate in frail versus non-frail patients: 82.1% and 49.1% respectively. With an alpha =.05 and power =0.80, the estimated sample size is approximately N=32 frail patients.

Results

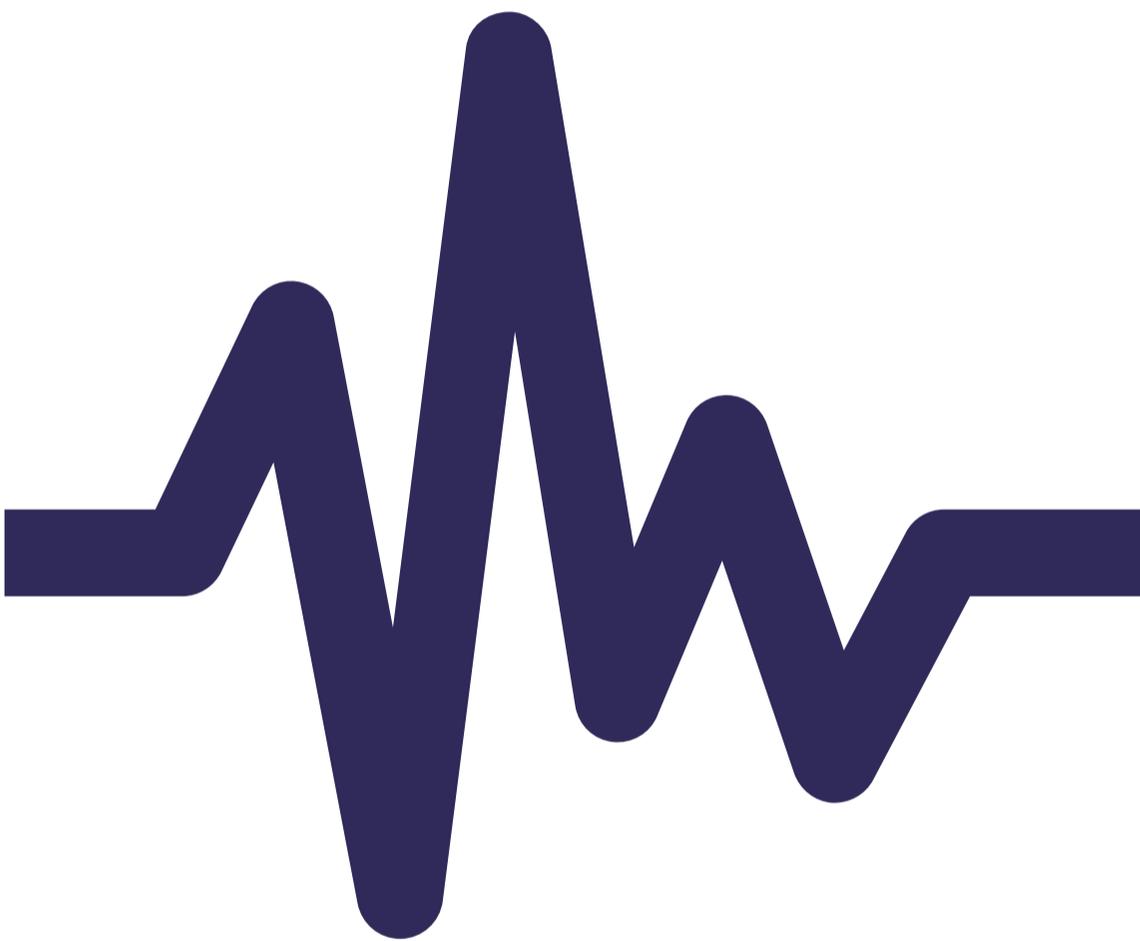
Given the overlap in aetiology between atherosclerosis and frailty, we have formulated the following hypothesis: There is an independent association between frailty and the severity of aorto-iliac atherosclerosis, as determined by the adjusted Agatston score (CaScore).

Results are expected in March 2021.

Conclusion

-

Medical Physiology



Presenters:

Masruroh, Y.A.M. (Yoni)

Puerta González, A. (Andrés)

Shah, J. N. (Jugal)

THE EFFECT OF PHYSICAL ACTIVITY ON MALONDIALDEHID (MDA) LEVELS OF SPRAGUE DAWLEY RATS IN TRIMETHYLTIN INDUCTION

Masruroh, Y.A.M (Yoni)¹

¹ Indonesian Islamic University, Physiology, Yogyakarta, Indonesia

Introduction

Trimethyltin which enters the body has a toxic effect on the testicular organs. TMT can increase the number of free radicals which have an effect on testicular tissue damage. The increase in ROS causes an increase in lipid peroxidation so that it will produce the final product, namely Malondialdehyde (MDA). Moderate intensity physical activity can lower MDA levels and increase endogenous antioxidants such as superoxide dismutase. This study aims to determine the effect of physical activity as a protective factor against TMT-induced sperm MDA levels.

Materials & Methods

The research method used was pure experimental with the method of post test only control group. There were 20 male Sprague Dawley rats divided into 4 groups, namely the normal group (N), the induction group (I), the exercise group without induction (O), and the induction and exercise group (IO). Group I and IO were induced by TMT at a dose of 8 mg / kgBB on the 79th day of treatment. Groups O and IO received moderate intensity treadmill activity intervention for 12 weeks at intervals of 5 times a week. Measurement of sperm MDA levels used the thiobarbituric acid reacting substances (TBARS) method.

Results

The results showed that the average MDA level of sperm N was $1.92 + 0.88$, I was $3.70 + 1.06$, IO was $3.00 + 0.06$, O was $2.90 + 0.74$. The results of the one-way ANOVA analysis showed that there were significant differences between all groups for MDA levels ($p = 0.03$). Then, continued with the Bonferroni post hoc test, the p value = 0.024 was obtained between group N and group I.

Conclusion

Moderate intensity physical activity has a protective effect against increased oxidative stress and has the potential to prevent TMT-induced damage.

Characterization of the Relationship Between the Allostatic Load Index, the Gut Microbiota, and Resting Brain Connectivity in Young Healthy Men

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Introduction

The allostatic load index (ALI) can be used to quantify the multisystemic physiological impact of chronic stress and it has shown to predict physical and mental disorders. We seek to determine the relationship between ALI, the gut microbiota, and the functional connectivity of the brain in the resting state in healthy men.

Materials & Methods

The study was conducted on 63 healthy men between the ages of 21 and 40. We calculated ALI by cluster analysis. Comparative analyzes were performed between ALI and the following measurements: subjective evaluation of stress with scales; characterization of the intestinal microbiota with amplicons of the hypervariable V3/V4 regions of the 16S rRNA gene; quantification of short-chain fatty acids (SCFAs) to evaluate the metabolic activity of the microbiota; and brain connectome analysis of resting-state functional magnetic resonance data.

Results

Using cluster analysis we established two continuous phenotypes: Heart Rate Variability (HRV) and Cortisol Awakening Response (CAR) and three categorical stress level phenotypes: high (HSL), medium (MSL) and low (LSL). We found a positive and slight correlation between CAR and the anxiety STAI-S scale. Amplicon Sequence Variants (ASV, *Paenibacillus* sp., *Roseibacillus* sp., *Chitinophagales* sp., *Oscillospiraceae*, *Gammaproteobacteria* sp., *Bacilli* sp., *Burkholderiales* sp.) with significant differences in abundances between LSL and HLS were found ($p < 0.05$ fold change). HSL and MSL did not show significant differences in their abundances. Acetic acid had a higher concentration in the LSL group compared to the other two groups. Continuous phenotypes had a strong and positive correlation with global brain connectivity strength (BCS) ($R^2 = 0.6$). HSL and MSL show a higher abundance of ASVs, with a tendency to be related to a higher global BCS.

Conclusion

The differential bacterial community composition observed among the groups constitute a useful substrate towards the construction of a stress microbiome profile, given that these differences are between specific taxa. Finally, there was a strong and significant correlation between stress phenotypes, ASVs, and global BCS.

Day-time readers vs Night-time readers: Who reads, focuses and sleeps better?

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Introduction

Medical students tend to reduce their sleep, in an effort to adjust and cope with their workload and stressful environment. Day-readers are defined as students who on average begin to study in day time after waking up from a night's sleep whereas Night-readers are those who prefer to study after the evening and sleep after studying. According to Oxford Learning, students who are day readers can absorb more information can study comfortably under natural light and this pattern doesn't affect their sleeping schedule. However, in the evening fewer distractions and a clearer mind occur.

There is a dearth of such studies, we decided to link sleep quality with attention span and reading hours among medical students.

Materials & Methods

An observational, cross-sectional study conducted on 296 medical students. Comparison between attention span and quality of sleep of day-time readers vs night-time readers was done using Moss Attention Rating Scale (MARS) and Pittsburgh Sleep Quality Index (PSQI), respectively. On basis of scoring, attention span was graded into Good, Average, Poor, and Impaired. On assessing PSQI scores, the level of impairment in Sleep Quality was graded into Least, Mild, Moderate and Severe.

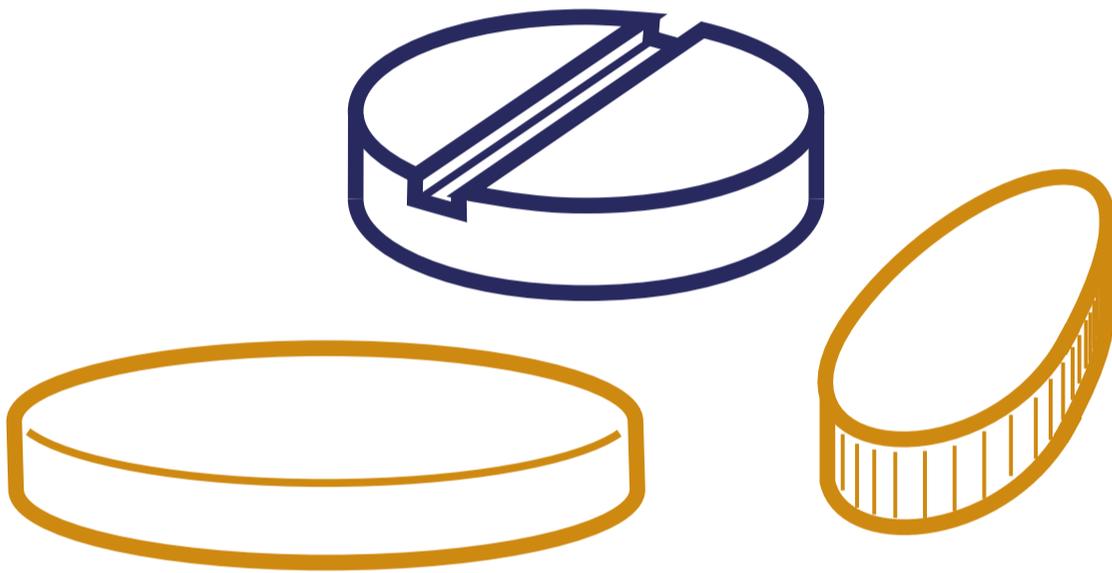
Results

Out of 296 subjects, 202 were day-time readers and 94 were night-time readers. Females preferred the day-time reading schedule, while males preferred night-time reading schedule. Females studied a significantly higher number of hours, while males had significantly higher attention span. Average study hours were significantly higher in Day-time readers (6.04 ± 1.2 hours/day) vs Night-time readers (4.72 ± 1.42). Significantly higher number of Night-time readers had attention span in Good (p-value is 0.002) & Average category (p-value is 0.01) as compared to Day-time readers. Significantly higher number Night-time readers fell in categories Moderate (p-value is 0.032) and Severe (p-value is 0.0006) impairment in Quality of Sleep as compared to Day-time readers.

Conclusion

Night-time readers had more attention span but fewer study hours and poor sleep quality. While day-time readers had good sleep quality and more study hours but had less attention span. Higher the attention span, lesser the number of study hours required, and lesser the attention span, higher the number of study hours required.

Pharmacology



Presenters:

Jannesar, K.J. (Kosar)
Fathi Jouzdani, A. (Ali)
Monakova, A.O. (Anna)
Su, B.N. (Beyza Nur)
Rowaiye, A.B.

cardioprotective effects of memantine in myocardial ischemia: ex vivo and in vivo studies

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Introduction

Myocardial infarction (MI) refers to the loss of cardiomyocytes due to inadequate coronary blood flow and subsequently a reduced oxygen supply. Activation of N-methyl-D-aspartate (NMDA) receptor has been linked to myocardial infarction. The aim of the present study was to determine the cardioprotective effects of memantine, in myocardial infarction both in ex vivo and in vivo models.

Materials & Methods

Effects of memantine on the electrocardiogram (ECG) pattern, cardiodynamic parameters, infarct size and lipid peroxidation were evaluated in the isolated perfused rat heart. Moreover, in in vivo studies in rats, the protective effects of memantine on isoproterenol-induced myocardial infarction model (administration of 100 mg/kg isoproterenol subcutaneously for 2 consecutive days) was evaluated by measuring ECG pattern, mean arterial pressure, malondialdehyde (MDA) levels, myeloperoxidase (MPO) activity, cardiac tumor necrosis factor alpha (TNF- α) level and cardiac remodeling.

Results

The results from the ex vivo isolated perfused heart showed that memantine treatment increased heart rate, left ventricular systolic pressure and left ventricular maximal rate of pressure increase, and decreased cardiac arrhythmia, MDA level and infarct size in comparison to ischemia/reperfusion (IR) group. The isoproterenol-induced MI (Iso) as used in the in vivo model demonstrated that MDA levels and MPO activity were decreased in memantine groups. Memantine treatment reduced the expression of cardiac TNF- α in comparison to Iso group. Cardiac fibrosis and hypertrophy were lower in memantine groups.

Conclusion

In conclusion, memantine exerts cardioprotective effects in models of myocardial infarction, which may be attributed to reduction of pro-inflammatory and oxidative stress factors and subsequently a decrease in cardiac remodeling.

Protective effects of N-acetylcysteine niosomes on paraquat-induced nephrotoxicity in male rats

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Introduction

Paraquat (PQ) as a bipyridyl compound is widely used as an effective herbicide that produces reactive oxygen species (ROS), affecting the unsaturated lipids of cell membranes leading to cell mortality. N-acetyl cysteine (NAC) is a medication that has a beneficial role in reducing the intoxication of kidneys caused by PQ. Niosomes are bilayer vesicles that increase the bioavailability of drugs. After formulating NAC niosome nanoparticle (NACNP), the aim of this study was to compare the effects of NAC and niosome of NAC (NACNPs) against PQ-induced kidney toxicity concerning its antioxidant activity.

Materials & Methods

In this experimental study, after formulating NACNP, 30 Wistar male rats weighed 180 to 250 gr were classified into five groups: Control group with normal saline, all following four groups poisoned with 35mg/kg/day of PQ intraperitoneal and respectively treated with 25mg/kg/day NAC, 25mg/kg/day niosome and 25 mg/kg/day NACNP by gavage. Then oxidative stress biomarkers such as total antioxidant capacity (TAC), catalase activity (CAT), lipid peroxidation (LPO), and total thiol groups (TTG), and also Blood Urea Nitrogen (BUN) and Creatinine levels were evaluated in kidney tissue homogenate and also examined histopathologically.

Results

The results showed that TTG increased significantly in NAC & NACNP groups than in the PQ group. Also, in the PQ group, LPO increased significantly compared with the control, NAC, and NACNP groups, and in the NAC and NACNP group, LPO decreased compared with the PQ group. There was no significant difference in TAC between groups. Blood Urea Nitrogen (BUN) and Creatinine levels decreased in NACNP compared with the PQ group and the free drug group (NAC). Histological studies also approved PQ induced damage and the protective effect of NACNP.

Conclusion

The results showed that NACNP could modulate oxidative stress status and kidney function against the PQ toxicity.

Cellular mechanisms of mesenchymal stromal cells (MSC) secretome regenerative effects for treating male infertility

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Introduction

Male infertility becomes a serious medical challenge worldwide. Most of cases are idiopathic and are treated with low efficacy. Thus, to discover and develop effective and safe ways to restore male fertility is an important task. Due to the complex nature of idiopathic cases, an optimal drug should be able to act on multiple targets possibly responsible for persistence of infertility. Among promising approaches one can consider cell-based therapy, particularly MSC-based, due to their proved capacity to recover function and structure of a tissue mostly through secretion of paracrine factors and extracellular vesicles. We assumed the regenerative effects of the MSC secretome are mainly implemented via supporting cells of the spermatogonial stem cell (SSC) niche: Leydig cells and/or Sertoli cells.

Materials & Methods

We modelled a 2-week bilateral abdominal cryptorchidism in rats to damage the SSC niche substantially. The animals had MSC secretome injection and were analyzed 30 and 90 days after injection using histological methods.

The cultures of Leydig cells, Sertoli cells and SSCs isolated from healthy rat testes were stimulated by MSC secretome. Then, ELISA, test with alkaline phosphatase and migration analysis were performed.

Results

We discovered that animals had higher number of normal tubules after MSC secretome injection compared to untreated group ($p < 0,05$). MSC secretome promoted the secretion of testosterone by Leydig cells, as well as the secretion of GDNF by Sertoli cells in vitro. Leydig cells treated with MSC secretome stimulated the migration of Sertoli cells. MSC secretome maintained the viability of SSC colonies in the absence of supporting niche components.

Conclusion

The use of the MSC secretome for restoring male fertility might be promising. Our future goal is to detect specific secretome components, which could mediate MSC effects on components of SSC niche.

The study was supported by RSF (#19-75-30007, in vivo and in vitro experiments) and the State assignment of Lomonosov MSU using the equipment provided within the Program of Development of Lomonosov MSU (MSC isolation and MSC secretome manufacturing).

Effects of fondaparinux against doxorubicin-induced cardiotoxicity in rats

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Introduction

Chemotherapy-induced cardiotoxicity is the leading cause of morbidity and mortality in patients diagnosed with malignancy. Reactive oxygen species involve in chemotherapy-induced cardiotoxicity. Therefore, we investigated the possible antioxidant effects of fondaparinux (FDX), an antithrombotic agent, on doxorubicin (DOX)-induced cardiotoxicity.

Materials & Methods

Twenty-eight male Wistar Albino rats were randomized into three groups (n=8 for the control, n=10 for other groups). Control group: Rats were given only vehicle. DOX group: Rats were given DOX (2,5 mg/kg/day, intraperitoneally) for 6 consecutive days. FDX+DOX group: Rats were given DOX for 6 consecutive days and FDX (3 mg/kg, sc.) for 12 days. ECG and hemodynamic parameters (heart rate, systolic, diastolic, and mean blood pressure) were analyzed. Also, malondialdehyde (MDA), superoxide dismutase (SOD), catalase (CAT), reduced glutathione (GSH), from the heart and vascular tissue samples; troponin I (Tnl), creatinine kinase (CK), cardiac muscle-specific creatinine kinase (CK-MB), myoglobine, blood urea nitrogen (BUN), creatinine (Cr), and lactate dehydrogenase (LDH) from blood samples levels were determined.

Results

A decrease in hemodynamic parameters was observed in the FDX+DOX group when compared to the DOX group ($p > 0.05$). Arrhythmias (AV block, ST depression, T negativity) were observed in the DOX group when compared to the control group. These detrimental changes were significantly reduced in the FDX+DOX group ($p < 0.05$). There was a decrease in the PR interval in the DOX and FDX+DOX group than in the control group. QRS and QT intervals were decreased in DOX, and FDX+DOX groups when compared to the control group. CK, LDH, myoglobin, and Tnl values increased in the DOX group when compared to the control group ($p < 0.05$). A significant decrease in these parameters was observed in the FDX+DOX group ($p < 0.05$) however no significant difference was obtained between the groups in terms of BUN and Cr values ($p > 0.05$). CAT and MDA levels were statistically higher in the DOX group whereas SOD and GSH levels were significantly lower in the DOX group ($p < 0.05$). Interstitial edema in the cardiac tissue samples was significantly reduced in the FDX+DOX group when compared to the DOX group ($p < 0.05$).

Conclusion

FDX might provide clinical benefit on DOX-induced myocardial damage. Further molecular studies are needed to better understand the exact mechanisms of FDX on DOX-induced cardiotoxicity.

In silico identification of the potential natural inhibitors of SARS-CoV-2 Guanine-N7 methyltransferase.

Rowaiye, A.B.^{1,2}, Onuh, O.A.², Oladimeji-Salami, J.A.², Bur, D.², Njoku, M.³, Ifedilichukwu, N.H.², John, C.O.², Binuyo, O.², Pius, F.U.²

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Introduction

The outbreak of the COVID-19 pandemic caused by the SARS-CoV-2 has triggered intense scientific research into the possible therapeutic strategies that can combat the ravaging disease. One of such strategies is the inhibition of an important enzyme that affects an important physiological process of the virus. The enzyme, Guanine 7 Methyltransferase is responsible for the capping of the SARS-CoV-2 mRNA to conceal it from the host's cellular defence. The study aims at computationally identifying the potential natural inhibitors of the SARS-CoV-2 Guanine-N7 methyltransferase binding at the active site (Pocket 41).

Materials & Methods

A library of small molecules was obtained from edible African plants and were molecularly docked against the SARS-CoV-2 Guanine-N7 methyltransferase (QHD43415_13. pdb) using the Pyrx software. Sinefungin, an approved antiviral drug which had a binding score of -7.6 kcal/mol with the target was chosen as a standard. Using the molecular descriptors of the compounds, a virtual screening for oral availability was performed using the Pubchem and SWISSADME web tools. The online servers PKCSM and Molinspiration were used for further screening for pharmacokinetic properties and bioactivity respectively. The molecular dynamic simulation and analyses of the Apo and Holo proteins was performed using the GROMACS software on the Galaxy webserver.

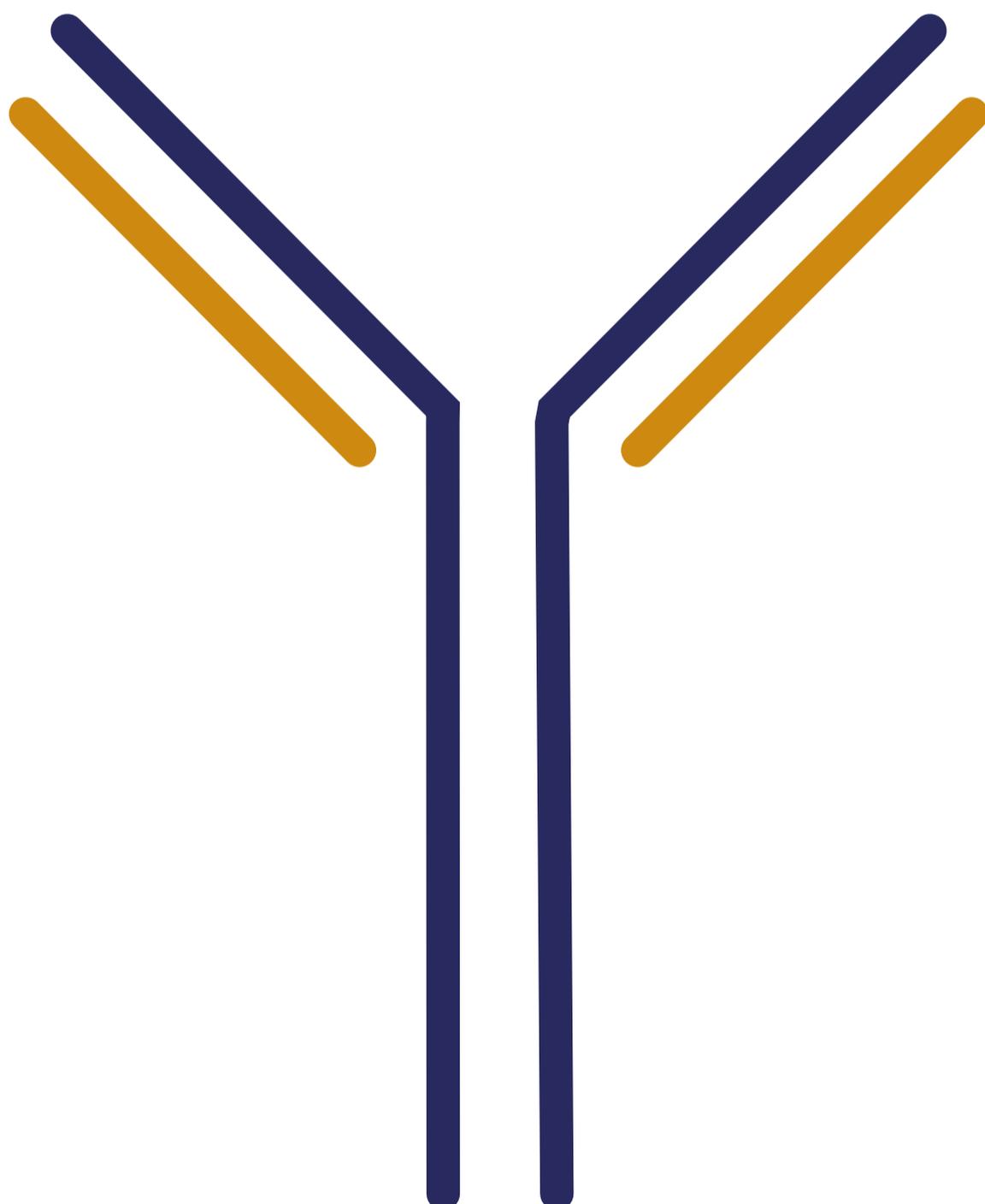
Results

The lead compounds are Crinamidine, Marmesin and Sinensetin which are obtained from waterleaf, mango, and orange plants respectively. The binding scores of the lead compounds with the target are -8.5, -7.9, and -7.7 kcal/mol respectively. The average RMSD values are 3.70, 3.16, and 3.67 respectively. The average RMSF at pocket 41 are 1.91Å, 1.24Å, and 1.42Å respectively. The average B Factor values at pocket 41 is 696.14Å², 154.53Å², and 260.06Å². respectively.

Conclusion

All the lead compounds performed better than the standard. Crinamidine is predicted to show the greatest inhibitory activity. Further tests are required to further investigate the inhibitory activities of the lead compounds.

Rheumatology



Presenters:

Joyce, A.J. (Aonghus)

Soto, J.F.S.R. (Juan)

Muhammad, A.R.M. (Akbar)

Suffering for Your Art: Playing-Related Musculoskeletal Disorders among Classical and Irish Traditional Music Students in Ireland: A Comparative Study

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³ Cork University Hospital, Neurophysiology Department, Cork, Ireland

Introduction

The estimated lifetime prevalence of playing-related musculoskeletal disorders (PRMDs) among classical musicians ranges from 62-93%. Body regions affected include the neck and shoulders. Risk factors include female gender, playing a string instrument and a history of previous PRMDs. 34.2% of Irish traditional musicians have a history of PRMDs. The prevalence of PRMDs among classical musicians in Ireland has not been reported to date. This study aims to assess and compare the prevalence, risk factors and consequences of PRMDs among classical and traditional third level music students in Ireland.

Materials & Methods

All Irish third level music departments were invited to participate in this study. Questionnaires were distributed to the four participating institutions. Analysis utilised a combination of frequency distributions and contingency tables. Hypotheses were tested using a combination of chi-square and Fisher's exact tests.

Results

A total of 120 participating students responded, 85 (71%) of whom were female. One hundred and three (86%) participants were classical and 17 (14%) Irish traditional musicians. The median age was 19 years (range 18-28).

Classical cohort:

The most common instruments were keyboard and string. The lifetime prevalence of PRMDs reported was 61%, with a one-week prevalence of 36%. String instrumentalists were more adversely affected than keyboardists. Females reported a higher prevalence than males. The anatomical site affected varied by instrument and gender, with string players and female instrumentalists carrying a higher burden of disease. A history of PRMDs was associated with playing difficulty and restricted practice time.

Traditional cohort:

Twelve (71%) of this cohort were female. Twelve different instruments were reported. Nine (53%) respondents had experienced PRMDs.

No statistically significant difference in PRMDs prevalence was found between classical and traditional musicians.

Conclusion

High PRMD rates were reported by participants, with increased prevalence among string instrumentalists. PRMDs resulted in substantial negative consequences for musicians. The extent of the reported PRMDs indicates the need for targeted interventions.

Autoantibodies as a possible biomarker of immune-related adverse events of cancer immunotherapy.

Soto, J.F.S.R (Juan) Medical student¹, Urrego, T (Tomas) Medical student¹, Sandoval, S (Simon) Medical student¹, Gomez, R (Rodolfo) MD, Oncologist², Medina, M (Mateo) Medical student¹, Vasquez, G (Glota) MD, PhD^{1,2}

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² Universidad de Antioquia, Internal medicine, Facultad de medicina, Medellin, Colombia

Introduction

One of the most promising strategies in cancer treatment are the immune checkpoint inhibitors (ICI). However, the loss of immune tolerance against the tumor by blocking CTLA-4 and PD-1 / PD-L1 is responsible for a variety of specific immune-related adverse events (irAEs) which span nearly every system and can range from mild organ involvement to life-threatening compromises. These irAEs became a challenge for physicians and oncologists because of the poor ability to predict them. A possible biomarker for this could be the presence of autoantibodies (AA), which are not frequently evaluated in these patients.

Materials & Methods

Patients diagnosed with cancer and under ICI were recruited. Sera were evaluated with commercial kits to determine the presence of autoantibodies. irAEs was evaluated according to the definitions proposed in the guidelines of the American Society of Clinical Oncology.

Results

Of the twenty-four patients evaluated, fifteen presented with at least one adverse immunological event, where dermatological and musculoskeletal were the most prevalent, some were extremely rare like sarcoid-like reaction and skin and hair repigmentation. Autoantibodies were obtained from the serum of 22 patients. five presented one antibody, eight presented two autoantibodies and six presented three or more. The most found autoantibodies were ANA: seventeen patients tested positive (77.2%), ten with titers of 1/80 (58.8%), four with titers of 1/160 (23.5%), and three with titers of 1/320 or higher (17.6%).

Conclusion

Our findings suggest that it is important to search for autoantibodies when an irAE develops because such autoantibodies could explain the presence of the adverse event but, the higher seroprevalence of autoantibodies found in our study suggests that it may be useful to explore the presence of basal autoantibodies before starting treatment or they possibly could be useful as a biomarker of the irAEs presence. Positive autoantibodies titers and clinical manifestations could be followed, providing clues about any association between the two.

The Severity of Rheumatic Heart Disease affected by Patient Treatment Adherence: A Cross-Sectional Study in Indonesia

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Introduction

Rheumatic Heart Disease (RHD) has still become a disease with significant morbidity and mortality in children worldwide. RHD events are often caused by recurrent acute rheumatic fever (ARF) due to inadequate treatment. However, non-adherence to medication is a problem that often poses a risk of treatment failure and becomes severe mitral valve and/or aortic valve abnormalities. By utilizing secondary prophylactic therapy Benzathin penicillin-G (BPG), this study aims to determine the severity difference of valve abnormalities between adherent and non-adherent RHD patients.

Materials & Methods

This research is analytical observational research using a cross-sectional study design. A total of 47 pediatric patients with RHD diagnosis were into three groups, namely mild, moderate and severe degrees based on echocardiographic examination. Adherence level was measured after 1-year treatment of intramuscular BPG injection. Measured Variables were study subjects' characteristics include age, sex, body weight, nutritional status, ARF severity, one-year recurrence of acute rheumatic fever, total recurrence of acute rheumatic fever, and Wilkins score. We used the Independent t-test as bivariate analysis and the Chi-square test as different tests on research subjects. The Significant data from the bivariate test will continue by multivariate analysis.

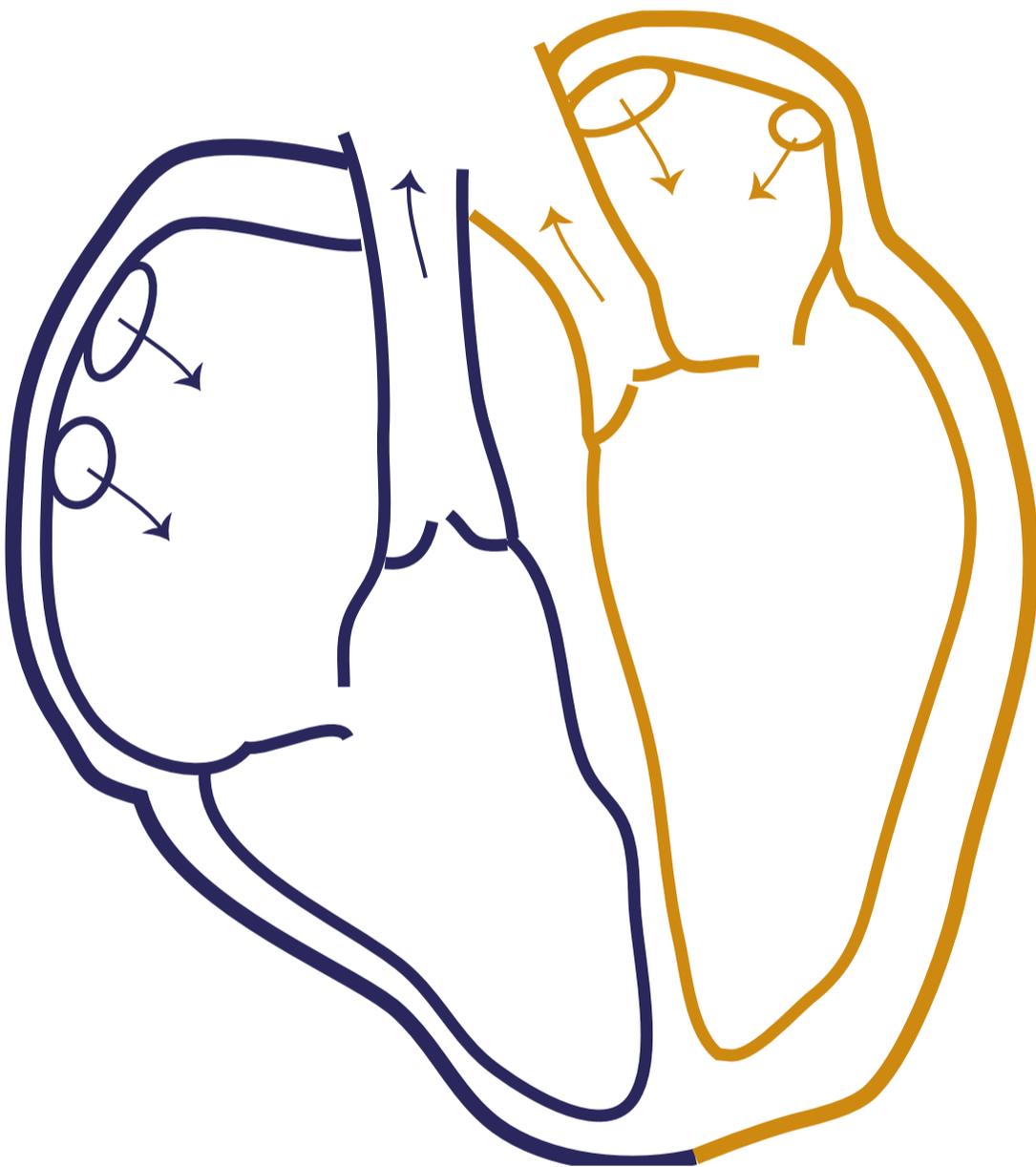
Results

This study showed a significant difference in the mean of treatment adherence compared with non-adherence in the severity of RHD with p-value = 0.016 ($p < 0.05$). Other results showed a significant difference in the DRA severity from total recurrence frequency ($p = 0.003$) and the Wilkin score ($p = 0.000$). Furthermore, treatment adherence rates, Wilkins scores, and ARF recurrence rates, which were bivariate significant for RHD severity, were then followed up in the multivariate analysis. We found that adherence had the greatest influence on the degree of RHD with a p-value = 0.049 (OR = 7.20), which means that patients who do not adhere to treatment have a 7.2-fold risk of developing more severe rheumatic heart disease.

Conclusion

In conclusion, adherence to prophylactic treatment of Benzathin penicillin-G (BPG) can affect the severity of rheumatic heart disease and further repair damaged heart valves, so that it is expected to reduce the mortality and morbidity rates of RHD, especially in children.

Cardiology



Presenters:

Waked, D.W. (Dunia)
Patil, S. (Samruddhi)
Zarębiński, M.Z.
Van den Eynde, J. (Jef)
Leekhaphan, Miss (Pondfah)
Holtjer, J.C.S. (Judith)
Lysenko, V.A. (Vladyslav)

effect of chronic exposure to fine particulate matter on cardiac tissue in nzbwf1 mice (predisposed to lupus)

Waked, D.W (Dunia)¹, Yariwake, VY (Victor)¹, Veras, M M.V (Mariana) PhD¹

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Introduction

Epidemiological and toxicological studies have shown that the inhalation of particulate matter (PM), one of the main components of air pollution, is associated with the development of cardiovascular diseases (CVD). Long-term exposure to excess PM increases the risk of cardiovascular events and can reduce life expectancy by a few years. Tests of CVD molecules caused by PM cause direct toxicity to the cardiovascular system or indirect damage through inflammation and systemic oxidative stress. Systemic lupus erythematosus (SLE) is a chronic inflammatory disease of an autoimmune nature, characterized by the production of autoantibodies that affect various organs including the heart. Hormonal and environmental factors are directly associated with the development of diseases and air pollution, being evidenced as an important environmental factor. In this context, air pollution can be a determining factor for the progress of the disease and cardiovascular impairment. This study aims to investigate whether exposure to air pollution promotes increased inflammation in the cardiopulmonary system and cardiac remodeling in animals with systemic lupus erythematosus.

Materials & Methods

NZBWF1 female mice were used, exposed or not to PM, using an environmental particle concentrator. Aspects related to cardiac remodeling, morphological changes in vascular and pulmonary tissue, inflammation and oxidative stress in the myocardium of the groups will be evaluated. So far, the groups' body weight gain during the exposure period, cardiac trophism by post-euthanasia heart / body weight ratio, relative area of cardiomyocytes and fibrotic area in cardiac tissue have been evaluated.

Results

The animals that were exposed to PM_{2.5} showed an increase in the area of cardiomyocytes, as well as the relative area of fibrosis. There was no difference in the weight gain of the groups during exposure as well as the weight of the heart at the time of euthanasia.

Conclusion

The findings of this study suggest that exposure to fine particulate matter has a hypertrophic effect on cardiac cells and promotes increased collagen deposition in the heart of animals with lupus, requiring further investigation to assess other aspects related to cardiac remodeling and inflammatory mechanisms, which will be carried out throughout the project.

A cross sectional study of effects of organophosphorus pesticides on cardio respiratory parameters among farm labourers of North Maharashtra.

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Introduction

The increasing use of Organophosphorus pesticides in farming has increased yield of farm produce all over the world but improper handling of pesticides can cause serious health problems. We aimed to assess the cardio respiratory parameters of subjects exposed to pesticides as compared to those who were not. The study also aims to promote the use of Personal Protective Equipment.

Materials & Methods

A total of 99 subjects in each group, case and control, were taken according to sample size calculation. The case group had subjects exposed to OP pesticides for at least 6 hours a day since at least 6 months. The control group had subjects without OP exposure. Individuals with genetic disorder, COPD, etc. were excluded. The investigations performed were Peak Expiratory Flow Rate (PEFR), Vital Capacity (VC), Timed Vital Capacity (TVC), Heart Rate (HR), Blood Pressure (BP) and the mean values of both groups compared using unpaired t- test.

Results

Significant difference ($p < 0.05$) in Forced Expiratory Volume 1 (FEV1), FEV1/FVC, PEFR, MVV, was observed between the cases and the controls. The Mean Forced Vital Capacity (FVC), in the cases (3.0723) is slightly lower than that of the controls (3.2615). The Mean FEV1 in the cases (2.6713) is lower than that of the controls (3.1002). The FEV1/FVC ratio in cases (82.3731) is lower than that of the controls (94.7041). The Mean PEFR in cases (5.9639) is lower than that of the controls (7.6078). The Mean MVV in cases (93.9495) is lower than that of controls (123.5455). Systolic blood pressure and pulse rate shows significant difference in cases and controls.

Conclusion

The FEV1, FEV1/FVC ratio, PEFR, MVV are significantly reduced ($p < 0.05$) in cases as compared to controls. Systolic blood pressure and pulse rate shows significant difference in cases as compared to controls. Thus the study helps to identify significant differences in cardio respiratory parameters in farmers exposed to pesticides as compared to the unexposed control group.

C-reactive Protein Response and 5 Years of Follow-up after Elective Percutaneous Coronary Intervention Using Bare-metal, Drug-eluting, or Drug-eluting with Biodegradable Polymer Stents

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Introduction

There are numerous reports investigating the inflammatory response in vascular wall after stent implantation, although the results are still inconclusive when it comes to choosing the best type of stent, technique of stenting and also the time when C-reactive protein (CRP) reaches peak value and then returns to normal range. The aim of this study was to compare long-term outcome and changes in circulating CRP after implantation of 3 types of stents: bare-metal stents (BMS), drug-eluting stents (DES), and DESs with a biodegradable polymer (DES-B) in patients who underwent percutaneous coronary intervention (PCI).

Materials & Methods

124 consecutive patients with stable coronary artery disease who underwent an elective PCI were included in this study. Participants were divided into 3 cohort groups depending on which type of stent was used. Patients' blood plasma CRP levels were assessed before PCI, 24 h and 72 h after PCI. 5-year follow-up in terms of the need for re-revascularization was carried out.

Results

Statistical analysis was possible in 32 patients with BMS, 55 with DES, and 19 with DES-B implanted. It was recorded that 24 h after PCI, the level of CRP increased in 96% patients with BMS implanted ($p < 0.05$), 83% patients with DES ($P < 0.05$), and 58% with DES-B (ns). After 72 h the results were 90% ($p < 0.05$), 79% ($p < 0.05$), and 67% (ns) accordingly. The results showed that implantation of BMS was associated with the greatest exacerbation of inflammatory response between 24 h and 72 h after PCI ($p < 0.01$). There is a positive correlation between duration of PCI and CRP concentration 72 h after that procedure ($p < 0.05$). Implantation of DES-B was connected with the lowest impact on inflammation, especially when compared to BMS. Follow-up proved that DES-B was connected with a low risk of future revascularization, and DES was not superior to BMS in the long-term outcome.

Conclusion

The implantation of DES-B may be correlated with weak immune response and low risk of the future need of revascularization, therefore choice of new generation DES-B in invasive cardiology is reasonable.

Strategies to Prevent Acute Kidney Injury after Pediatric Cardiac Surgery: Network Meta-Analysis of Randomized Controlled Trials

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Introduction

Acute kidney injury (AKI) is a common complication after pediatric cardiac surgery and has been associated with increased morbidity and mortality. We aimed to compare the efficacy of available pharmacological and non-pharmacological strategies to prevent AKI after pediatric cardiac surgery.

Materials & Methods

PubMed/MEDLINE, Embase, Cochrane Controlled Trials Register (CENTRAL/CCTR), and reference lists of relevant articles were searched for randomized controlled trials (RCTs) published by August 2020. Bayesian network meta-analysis was performed.

Results

Twenty RCTs including 2,339 patients and 11 preventive strategies met the eligibility criteria. Dexmedetomidine and fenoldopam significantly decreased the risk of AKI compared to control (odds ratio [OR] 0.39, 95% confidence interval [CI] 0.12;0.91 and OR 0.69, 95% CI 0.48;0.96, respectively) and hydroxyethyl starch (HES) (OR 0.30, 95% CI 0.09;0.77 and OR 0.54, 95% CI 0.32;0.89, respectively). Significantly lower risk of AKI was seen in remote ischemic preconditioning (RIPC) when compared to corticosteroids (OR 0.68, 95% CI 0.49;0.95), control (OR 0.58, 95% CI 0.47;0.71), and HES (OR 0.46, 95% CI 0.30;0.70). No significant differences were observed among the other examined treatments, including acetaminophen, aminophylline, levosimendan, milrinone, and normothermic cardiopulmonary bypass. Surface under the cumulative ranking curve (SUCRA) probabilities showed that milrinone (79.3%) was most likely to result in the lowest risk of AKI, followed by dexmedetomidine (74.2%), levosimendan (70.3%), and RIPC (62.0%).

Conclusion

Current evidence from RCTs only supports the efficacy of dexmedetomidine and RIPC in the pediatric population. The optimal protocol for prevention of AKI after pediatric cardiac surgery should be further investigated.

Prevalence and associated factors of electrographic left ventricular hypertrophy in a rural community, central Thailand

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Introduction

Left ventricular hypertrophy (LVH) is considered to be a cardiac condition with life-threatening complications. Detected LVH is a strong predictor of cardiovascular diseases and death. This condition is normally diagnosed at the hospital level. However, only limited information is available on factors potentially responsible for LVH among adults in a remote rural community. We aimed to determine the prevalence and associated factors of electrocardiography-LVH (ECG-LVH) among adults in Thai rural community.

Materials & Methods

A cross-sectional study was conducted in Na-Yao rural community of Thailand in 2020. A total of 638 individuals aged ≥ 20 years were interviewed using standardized structured questionnaires related to demographic information, risk behaviors, comorbidities and anthropometric measurements. LVH was determined by Sokolov-Lyon and Cornell criteria based on the collected electrocardiograms.

Results

The prevalence of ECG-LVH among adults was 6.6%. The independent risk factors associated with ECG-LVH were being male (AORs 2.04, 95%CI; 1.05–3.98), history of diabetes mellitus (AORs; 1.01, 95%CI; 1.01–1.02), and hypertensive crisis $\geq 180/110$ mmHg (AORs 7.24, 95%CI; 1.31–39.92). However resting heart rate was negatively associated with ECG-LVH ($p < 0.05$).

Conclusion

Our data emphasized that LVH was one of the significant health problems among adults in a rural community. This condition could lead to severe complications. So effective detection and public health interventions should be provided at the community level. Moreover, modifiable risk factors for diabetes mellitus and hypertension should be attenuated to inhibit the progression of cardiovascular diseases and their complications.

Causal effects of heart rate variability on hypertension: A Mendelian Randomization study

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Introduction

Hypertension is a leading cause of disability adjusted life years and a risk factor for the development of health disorders of the heart, brain, and kidney. Hypertension is associated with lower heart rate variability (HRV), an indicator of poor autonomic nervous system functioning. In this study, we examined the potential causal relationship between HRV and blood pressure.

Materials & Methods

We used a two-sample Mendelian Randomization (MR) approach. For this, summary data from two Genome-wide association studies (GWAS) were used: one that identified independent, genome-wide significant single-nucleotide polymorphisms (SNPs) for HRV traits (n= 28,700), and one for blood pressure (n=757,601). Three HRV traits were used as exposure and analyzed separately: the standard deviation of normal to normal RR intervals (SDNN), the root mean square of the successive differences (RMSSD), and the peak-valley respiratory sinus arrhythmia or high frequency power (pvRSA/HF). We conducted inverse variance weighted (IVW) MR analyses and various MR sensitivity analyses robust to violation of SNP pleiotropy assumptions. Outcomes were systolic (SBP) and diastolic blood pressure (DBP), and were analyzed separately.

Results

We found statistically significant effects of all three HRV traits on DBP. Per standard deviation (SD) higher SDNN, the IVW estimate was -1.94 mmHg (95%CI -2.86,-1.01, p=3.90x10⁻⁵). Per SD higher RMSSD, this was -1.29 mmHg (95%CI -1.90,-0.67, p=3.97x10⁻⁵), while for pvRSA/HF it was -0.61 mmHg (95%CI -1.03,-0.18, p=5.45x10⁻³). MR sensitivity analyses yielded consistent effects. Heterogeneity analyses indicated potential pleiotropic SNP effects. However, no evidence for directional pleiotropy was observed. Effects of HRV traits on SBP were not significant.

Conclusion

Our results suggest a causal relationship between better autonomic function (i.e. higher HRV) and lower DBP, and thus a potential avenue for intervention towards preventing hypertension.

Markers KIM-1 and NAG in urine, NGAL in serum in the diagnosis of tubulointerstitial injury of kidneys in patients with CHF

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Introduction

Kidney injury molecule-1(KIM-1), N-acetyl- β -D-glucosaminidase(NAG), and neutrophil gelatinase-associated lipocalin(NGAL) are novel biomarkers of tubulointerstitial injury, which is the subject of the vast majority of studies in patients on acute kidney injury. However, there is a lack of scientific data on investigation of these markers in patients with chronic heart failure (CHF). Objective: To determine the diagnostic capabilities of markers of renal tubulointerstitial injury in patients with CHF of ischemic origin.

Materials & Methods

Enzyme-linked immunoassay of KIM-1, NAG in urine, NGAL in serum was performed in 50 patients with CHF, II-IV FC. The critical value of KIM-1, NAG, NGAL was established by ROC-analysis depending on the cumulative endpoint (death, ACS, stroke, decompensated HF).

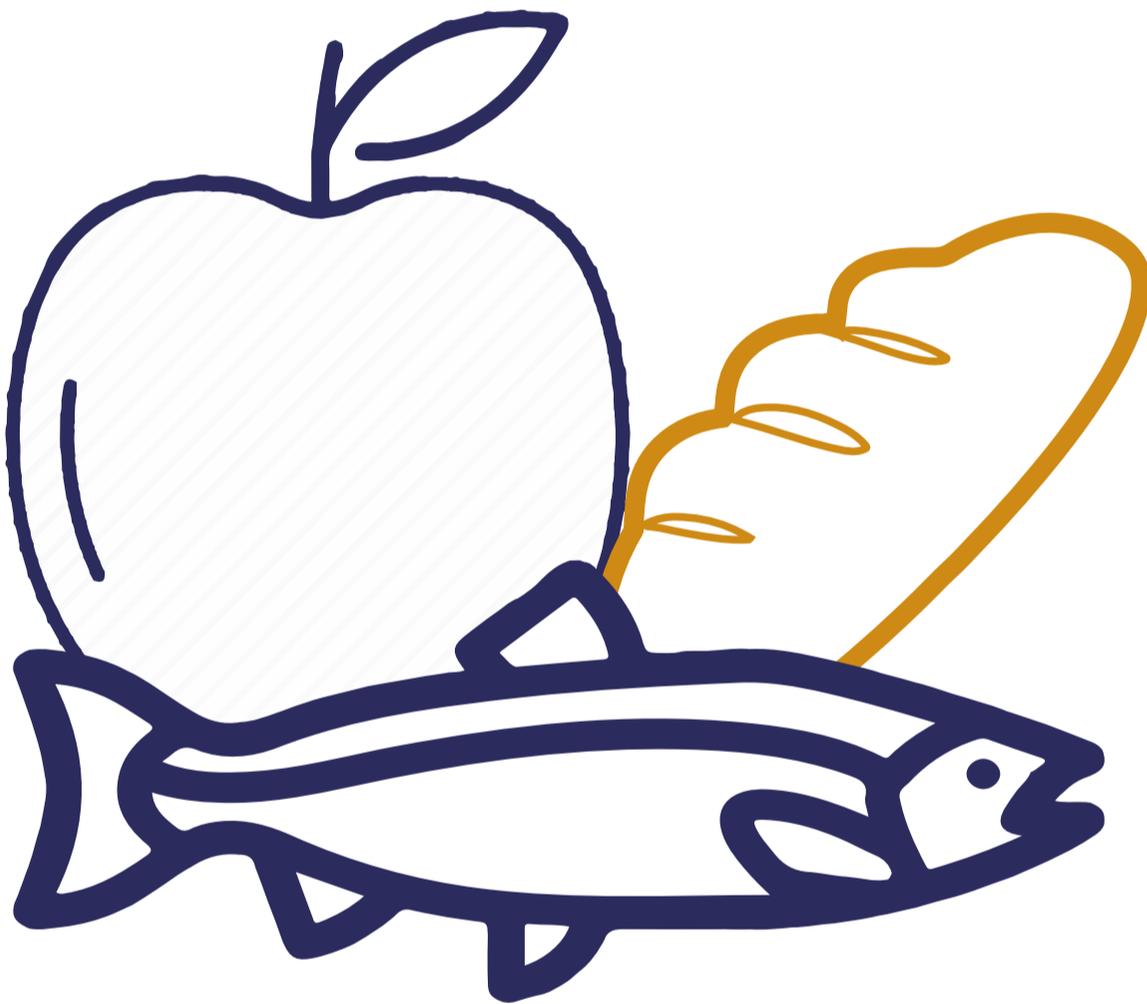
Results

For the level of KIM-1 in urine, the cut-off point was > 2316 pg/ml (area under the ROC curve 0.545; $p = 0.652$), for NAG in the urine - > 37.7 ng/ml (area under the ROC curve 0.649; $p = 0.133$), for NGAL in serum - > 168 ng/ml (area under the ROC curve 0.505; $p = 0.964$). Elevated serum NGAL levels were observed in 72.5%, urinary KIM-1 in 52%, and urinary NAG in 42% of patients with CHF. A statistically significant difference was found between the proportion of patients with CHF with elevated serum NGAL and the percentage of patients with CHF with elevated KIM-1 in urine (72.5% vs. 52%, $p = 0.035$), NGAL in serum and NAG in urine - (72.5% vs. 42%, $p = 0.003$). The frequency of detection of renal tubulointerstitial injury according to KIM-1 and NAG in urine didn't have a significant difference (52% vs. 42%, $p = 0.319$).

Conclusion

The most sensitive marker of tubulointerstitial renal disease in patients with CHF of ischemic origin was NGAL in serum.

Nutrition



Presenter:

Palasantzas, V.E.J.M. (Victoria)

Coffee antioxidants protect against liver damage in Non-alcoholic Fatty Liver Disease (NAFLD)

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Introduction

The increasing epidemic of obesity and type II diabetes causes non-alcoholic fatty liver disease (NAFLD) to become the leading liver pathology in the world, with an estimated prevalence of 25% in the general global population. The spectrum of NAFLD varies from steatosis (lipid accumulation in the liver) to steatohepatitis, liver fibrosis and life-threatening end-stage liver disease. However, there is no current pharmacological therapy yet, to control NAFLD development and progression.

It is known that hepatic lipid accumulation, specifically the accumulation of saturated fatty acids (SFAs), triggers oxidative stress (OxS) and exhausts antioxidant defenses in the liver. This causes lipotoxicity via mechanisms such as ER stress, mitochondrial dysfunction and the activation of cell death pathways. Therefore, antioxidant compounds could be useful against lipotoxicity and as a potential therapy for NAFLD.

Epidemiological studies indicate that coffee consumption protects against chronic liver diseases, including NAFLD, but the molecular mechanisms involved remain unclear. Part of this protective effect can be explained by the high antioxidant potential of coffee due to the presence of compounds such as caffeine and chlorogenic acids (CGA). Moreover, CGA has demonstrated protection against lipotoxicity-induced ER stress and apoptosis. It remains unknown whether CGA's antioxidant properties are related to the molecular mechanisms which explain the protective effects of CGA against lipotoxicity.

Materials & Methods

Primary rat hepatocytes of male specified pathogen-free Wistar rats, were exposed to the SFA Palmitate (PA: 1 mmol/L during 8-24 h) to induce lipotoxicity in the presence and absence of chlorogenic acid. After treatment, necrotic cell death was determined by SYTOX Green staining. Also, ER stress markers and antioxidant response gene markers were checked by qPCR. To assess mitochondrial function, JC-10, MitoSOX and MTT assay was performed.

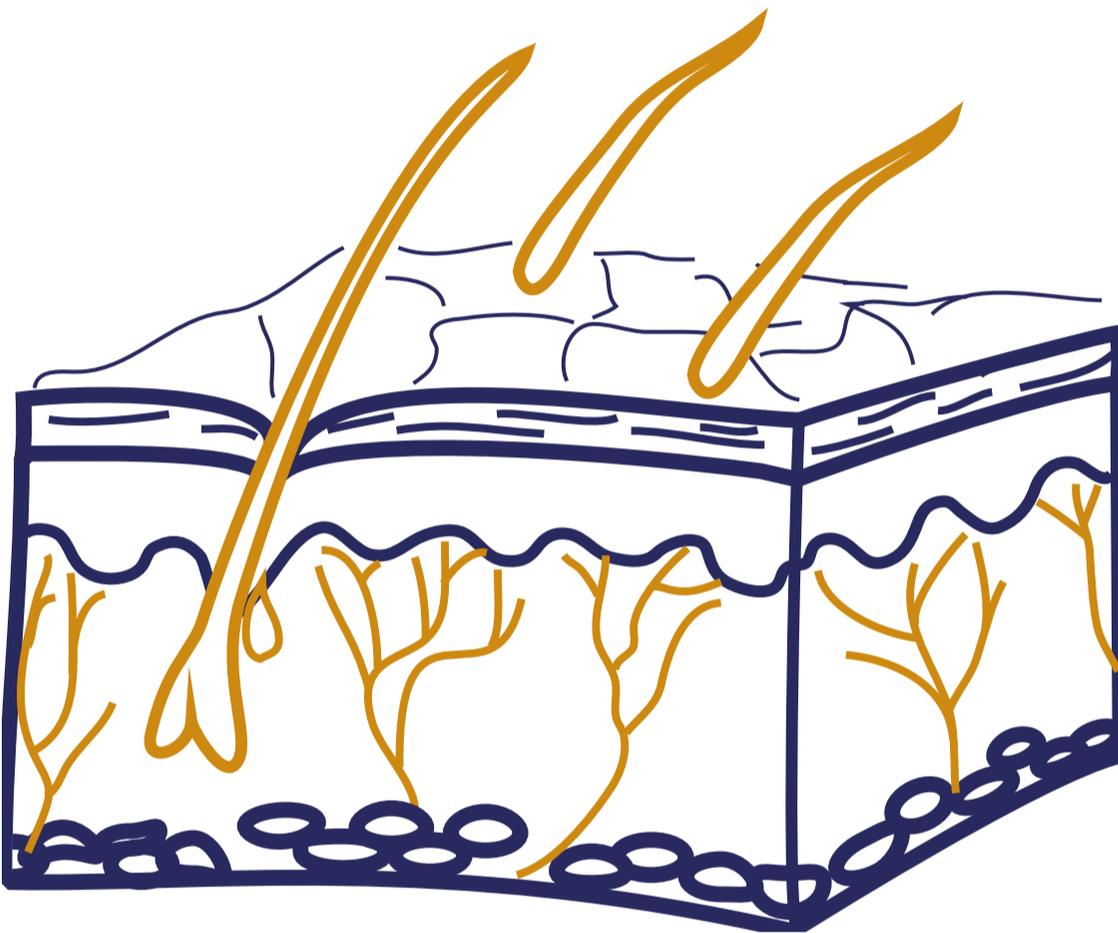
Results

Preliminary results indicate that CGA at 2.5-10 μ M protects against PA-induced lipotoxicity, as demonstrated by reduced necrosis in primary rat hepatocytes after 24h. Moreover, we expect to relate the protective effect of CGA to its antioxidant response and protection against ER stress and mitochondrial damage.

Conclusion

Antioxidant compounds such as CGA in coffee may be a natural remedy against lipotoxicity described in NAFLD and its associated pathologies.

Dermatology



Presenter:
Masoud, F.M. (Farid)

The novel herbal solution might be an alternative treatment in patients with androgenetic alopecia? A double-blind, randomized controlled trial study

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Introduction

The most common type of hair loss, androgenetic alopecia (AGA), is mostly caused by the miniaturization of androgen-sensitive hair follicles. Conventional therapy for AGA presents many side effects and disadvantages due to long-term treatment. However, herbal compounds are characterized by more significant adaptation to the patient, fewer side effects, and more action mechanisms. This study aimed to evaluate the efficacy of topical herbal solutions (THS) in patients with AGA and comparison with 5% minoxidil.

Materials & Methods

In this randomized, double-blind, clinical trial study, 24 volunteer male patients (aged 23–43 years) with mild to moderate AGA selected from patients referred to the dermatology clinic. Participants were randomly assigned (1:1) into two groups. Group A received 5% minoxidil topical solution (MTS), and group B received 5% minoxidil + the topical herbal solution (MTS+THS). Participants received 1 mL of solutions at morning and evening intervals for nine months. Primary outcomes were measured hair diameters at baseline and repeated at weeks 12, 24, and 36. Secondary outcomes included the patient's self-assessment questionnaire, and each follow-up visit, adverse events recorded. All statistical tests were 2-sided and performed at a significance level of $P < 0.05$. The study logistics complied with the Declaration of Helsinki and approved by the Ethics Committee. (The article of this study published = <https://doi.org/10.1111/dth.14467>)

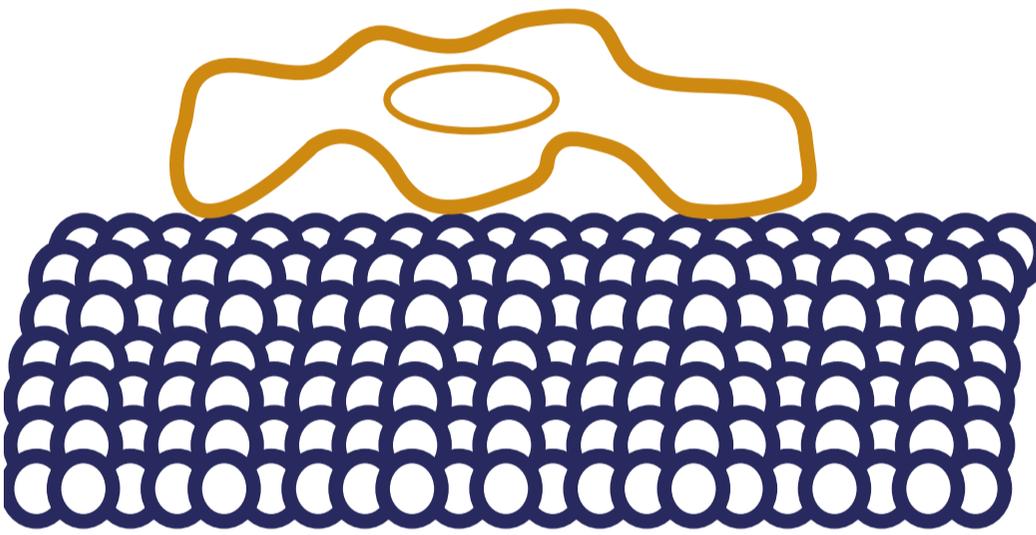
Results

The MTS+THS group was significantly superior to the MTS group in terms of change from baseline in hair diameter and treatment benefit after 36 weeks of therapy ($P < 0.05$). At week 36, compared to baseline, the mean hair diameter of the MTS + THS group increased compared to the MTS group ($P = 0/001$), and hair loss decreased in MTS + THS group versus MTS group ($P < 0/001$). In both groups, neither all-cause mortality nor serious adverse events reported.

Conclusion

This study's results establish that THS has a significant improvement in AGA with a high degree of patient satisfaction and the development of their quality of life. The application of this new herbal solution for the treatment of AGA should be recommended. Because THS in humans is safe and THS beneficially affects AGA's known fundamental mechanisms, it should, therefore, be used clinically to prevent or treat AGA.

Cell Biology



Presenters:

Flores Espinoza, E.F.E. (Emmanuel)

Sabaghzadeh, S. (Sahar)

Kochetkova, A. (Alina)

Mosiagina, A.I. (Angelina)

Effects of homologous and heterologous desensitization in the Free Fatty Acids Receptor 4 subcellular localization.

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Introduction

Free Fatty Acids receptor 4 (FFA4) is a G protein-coupled receptor expressed in many cell types, as intestinal epithelium, where its activation modulates glycemia by inducing gut incretin (glucagon-like peptide-1) release that stimulates insulin secretion by the pancreas. Moreover, FFA4 mediates bronchodilation in lung and regulates macrophages immune function. Despite the abundant information about the physiological role of this receptor, little is known about the mechanisms of regulation of its activity. Desensitization of GPCRs, followed by internalization and intracellular processing, are one of the main aspects in the regulation of this type of receptors. FFA4 can be desensitized after agonist binding (homologous) and Protein Kinase C activation (heterologous). Here, we tracked the FFA4 subcellular localization by analyzing its interaction with endosome-associated Rab proteins, after homologous and heterologous desensitization.

Materials & Methods

HEK293 cells were co-transfected with FFA4-mCherry and Rab4,5,7,9 or 11-eGFP constructs. Transfected cells were stimulated with docosaenoic acid (DHA, 30 μ M), phorbol myristate acetate (PMA, 1 μ M) or insulin (0.1 μ M) and fixed at different times post-stimulation. FRET images were obtained by confocal microscopy and FRET Index was measured through a "pixel-by-pixel" method.

Results

The FFA4 agonist, DHA, and the protein kinase C activator, PMA, induced similar and very rapid receptor internalization of these receptors; insulin also induced FFA4 receptor internalization, which was slower to a certain extent. Interaction of FFA4 with each Rab protein indicates presence of the receptor in the intracellular compartment which that Rab is associated with. FRET analysis showed distinct FFA4-Rab4,5,7,9 and 11 association patterns when receptor desensitization is induced by DHA (homologous), PMA or insulin (heterologous).

Conclusion

Our data indicate that the kinetics and the endocytic pathways involved in FFA4 receptor internalization depend on the agent that induces such a process. The phosphorylation bar-code hypothesis has suggested that such covalent modification could define the different actions observed and the receptor's transit within the cell. The present work is consistent with such a hypothesis, but the specific residues involved remain to be determined.

Immunological assessment of HIV-1 Nef-MPER-V3 harboring LDP12 penetrating peptide in BALB/c mice

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Introduction

In spite of the improvements in developing antiretroviral treatments, there are no approved HIV vaccines. To achieve an effective vaccine against HIV-1 requires induction of strong humoral and cellular immune responses. The objective of this study was the immunological assessments of HIV-1 Nef-MPER-V3 harboring LDP12 penetrating peptide in BALB/c mice in order to induce effective immune responses.

Materials & Methods

In the current study, presenting 55 female mice were utilized for immunization with LDP12-Nef-MPER-V3. The mice were divided into 11 groups of 5. Immunizations were performed three times at three week intervals and subcutaneously in a volume of 100 µl per mouse. Two weeks after final injection, humoral and cellular immune responses were evaluated in blood serum and splenocytes respectively, by using different types of ELISA method. Finally, the data analysis was performed, using Mann-Whitney U test.

Results

Although the level of total antibody production was observed in all main groups with different titrations, but the total antibody level was higher in the mice group that injected with the LDP12 antigen with Hp91 adjuvant immunity than in the control group ($p=0.042$). Also, IgG2a was the predominant isotype (Th1-based response) in mice immunized group that had LDP12 antigen with Hsp27 adjuvant. On the other hand, significant increase in IFN- γ (Th1-based response) was observed in the groups which immunized with LDP12 antigen and mentioned adjuvants. But an increase of approximately 1100 pg/ml which showed a difference of $p=0.005$ to control group was determined in the mice group immunized with the LDP12 antigen and Hp91 adjuvant simultaneously, that the ratio of IFN- γ /IL-10 in this group was 11 ($p = 0.006$). Alongside, by evaluation of Granzyme B secretion and cell proliferation ELISA BrdU, the highest cellular immune responses were observed in LDP12-Hp91 immunized groups.

Conclusion

The data indicated LDP12-Nef-MPER-V3 antigen could stimulate humoral and cellular immune responses either alone or formulated with adjuvants. Also in Various formulations, utilizing of Hp91 adjuvant was effective in increasing cellular immune stimulation in mice, and it is hoped through using other formulations and more extensive studies in other animal models could achieve an effective vaccine against HIV.

Variation of Poly(ADP-Ribose)polymerase 1 level has little effect on the status of DNA Base Excision Repair in human cells

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Introduction

Base excision repair (BER) is a cellular mechanism aimed at correcting damaged DNA bases. Defects in BER system lead to oncogenesis and many scientists are focused on studying the pathway and its regulation to search for new methods of cancer therapy. Poly(ADP-ribose)polymerase 1 (PARP1) is considered to be an important BER regulator and perspective therapeutic target. Many evidences have implicated that its function in DNA repair is to search for DNA lesions and initiate the assembly of a complex for their elimination through the synthesis of an ADP-ribose polymer, while others results indicate PARP1 suppresses the activity of the main BER enzymes. In this work, we choose PARP1 knockdown and knockout model cell lines to investigate the impact of PARP1 level on the efficiency of the key steps of BER.

Materials & Methods

mRNAs and the whole-cell extracts were isolated from human cell lines HEK-293T or HEK-293FT: wild-type, PARP1 knockdown (achieved by RNA interference) and PARP1 knockout (generated via CRISPR/Cas9) cells. The change in the expression at levels of mRNA, encoding proteins involved in BER: PARP1, PARP2, UNG, APEX1, Polb, Lig3 was estimated by RT qPCR. Using 32P-labeled DNA substrates imitating BER intermediates and the whole-cell extracts we tested the efficiency of the major BER stages.

Results

RT-qPCR assay showed negligible change in the expression of UNG, APEX1, Polb, Lig3 in PARP1 knockdown and knockout cells in comparison with wild-type ones. Remarkably, PARP1 knockdown resulted in PARP2 mRNA level decrease by 2 times, while PARP1 knockout did not lead to it. Using model DNA and protein extracts, we have demonstrated that varying PARP1 level in cell extracts has little impact on the efficiency of removing uracil from DNA, abasic site processing, gap filling and ligation.

Conclusion

It was shown in our study that knockdown and knockout of PARP1 do not lead to a noticeable change in BER status and has no significant effect on the kinetics of the pathway. Obtained results is another step towards understanding the crucial role of PARP1 in BER regulation.

The research was supported by RSF grant № 19-14-00204.

Activation of GPR81 lactate receptors stimulates mitochondrial biogenesis in cerebral microvessel endothelial cells

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Introduction

Cerebral endothelial cells express monocarboxylate transporters (MCT1) for the transfer of lactate through the blood-brain barrier (BBB) as well as GPR81 lactate receptors (HCAR1). MCT1 transporters are regulated by CD147 activity. Metabolism and intercellular transport of lactate are important mechanisms for regulating the functional activity of BBB cells.

This study aimed to determine the effect of GPR81 receptors in cerebral endothelial cells on the expression of MCT1, CD147 and mitochondrial dynamics, which will allow explaining the effect of local lactate production by perivascular astrocytes on angiogenesis in the brain.

Materials & Methods

We used the cell culture of cerebral endothelial cells isolated from the brain of 15–17 day old Wistar rat embryos. Assessment of the mitochondrial biogenesis of cerebral endothelial cells was conducted according to the standard protocol “MitoBiogenesis In-Cell ELISA Kit” (Abcam). Chemical hypoxia was formed by incubation under the exposure of 50 μM iodoacetate for 30 minutes. We used 3CI-5OH-BA (Calbiochem) as lactate receptor GPR81 agonist at the following concentrations: 5, 50, and 500 μM , - for 24 hours. The number of cells expressing GPR81, CD147, and MCT1 was evaluated using double indirect immunofluorescent staining.

Results

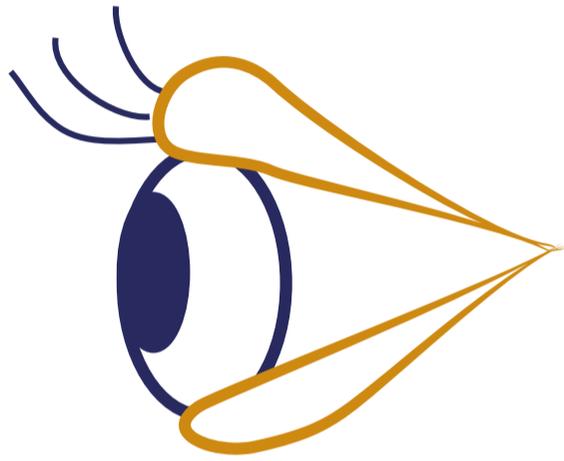
It was first discovered that prolonged stimulation of the GPR81 receptors by 3CI-5OH-BA in a dose-dependent manner leads to the intensification of mitochondrial biogenesis (up to 1.5 times, $p < 0.05$). At the same time, a statistically significant ($p < 0.05$) inhibition of the expression of monocarboxylate transporters MCT1 was recorded in the experimental group compared to the control group (from $81 \pm 1.6\%$ to $40.7 \pm 4.4\%$). The same effect was registered for their linked protein CD147 (from $57.4 \pm 3.3\%$ to $48.3 \pm 2.9\%$) in cerebral endothelial cells.

Conclusion

The obtained data expand the range of possible applications of GPR81 agonists to modulate intercellular interactions in the neurovascular unit and to control the functional activity of cerebral microvessel endothelial cells.

This study was supported by the Russian Science Foundation, project no. 14-25-00054.

Ophthalmology



Presenters:

Yuan, X.L. (Xiang-Ling)

Lin, A.L. (Aidi)

Corneal curvature-associated MTOR variant differentiates mild myopia from high myopia in Chinese population

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Introduction

Myopia is the most prevalent ocular disorder in the world, and corneal parameters have been regarded as key ocular biometric parameters determining the refractive status. Here we aimed to determine the association of genome-wide association study-identified corneal curvature (CC)-related gene variants with different severity of myopia and ocular biometric parameters in Chinese population.

Materials & Methods

Total 2,101 unrelated Chinese subjects were recruited, including 1,649 myopia and 452 control subjects. Five previously reported CC-associated gene variants (PDGFRA, MTOR, WNT7B, CMPK1 and RBP3) were genotyped by TaqMan assay, and their association with different myopia severity and ocular biometric parameters were evaluated.

Results

MTOR rs74225573 variant was found to be associated with mild myopia ($P = 0.010$) and RBP3 rs11204213 variant with extreme myopia ($P = 0.027$) in male subjects. Moreover, MTOR rs74225573 ($P = 0.021$) and WNT7B rs1043441 variants ($P = 0.016$) showed different frequencies between mild and moderate myopia. Critically, mild myopia subjects had significantly higher frequency in MTOR rs74225573 C allele than high myopia subjects ($P = 0.003$), especially in male subjects ($P = 0.001$, odds ratio = 0.49). High myopia subjects carrying MTOR rs74225573 C allele have significant flatter CC ($P = 0.035$) and longer corneal radius ($P = 0.044$) than those carrying TT genotype.

Conclusion

This study revealed that male high myopia subjects are more prone to carry CC-related MTOR rs74225573 T allele, whereas mild myopia subjects are prone to carry the C allele. MTOR rs74225573 variant could be a genetic marker to differentiate mild from high myopia in risk assessment.

Improved Automated Foveal Avascular Zone Measurement in Cirrus OCTA Using the Level Sets Macro

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Introduction

Quantification of foveal avascular zone (FAZ) metrics is essential for the diagnosis and follow-up of retinal vascular diseases. Optical coherence tomography angiography (OCTA) is a fast and non-invasive imaging technique to quantify FAZ. It has been proved that the reliability of the automated embedded algorithm for FAZ metrics on Cirrus OCTA was low. Some automated customized methods have been reported in other OCTA machines but few for Cirrus 5000 OCTA. Thus, a new image processing method should be explored for more reliable measurement in Cirrus 5000 OCTA. We evaluated the automated measurements of FAZ using the Level-Sets Macro (LSM) program in ImageJ, compared with the Cirrus inbuilt algorithm and the reported Kanno-Saitama macro (KSM) program in literature.

Materials & Methods

The eyes of healthy volunteers were scanned four times consecutively on the Zeiss Cirrus HD-OCT 5000 system. The FAZ metrics (area, perimeter, and circularity) were measured manually and automatically by the Cirrus inbuilt algorithm, the KSM, and the LSM. The accuracy and repeatability of all methods and agreement between automated and manual methods were evaluated.

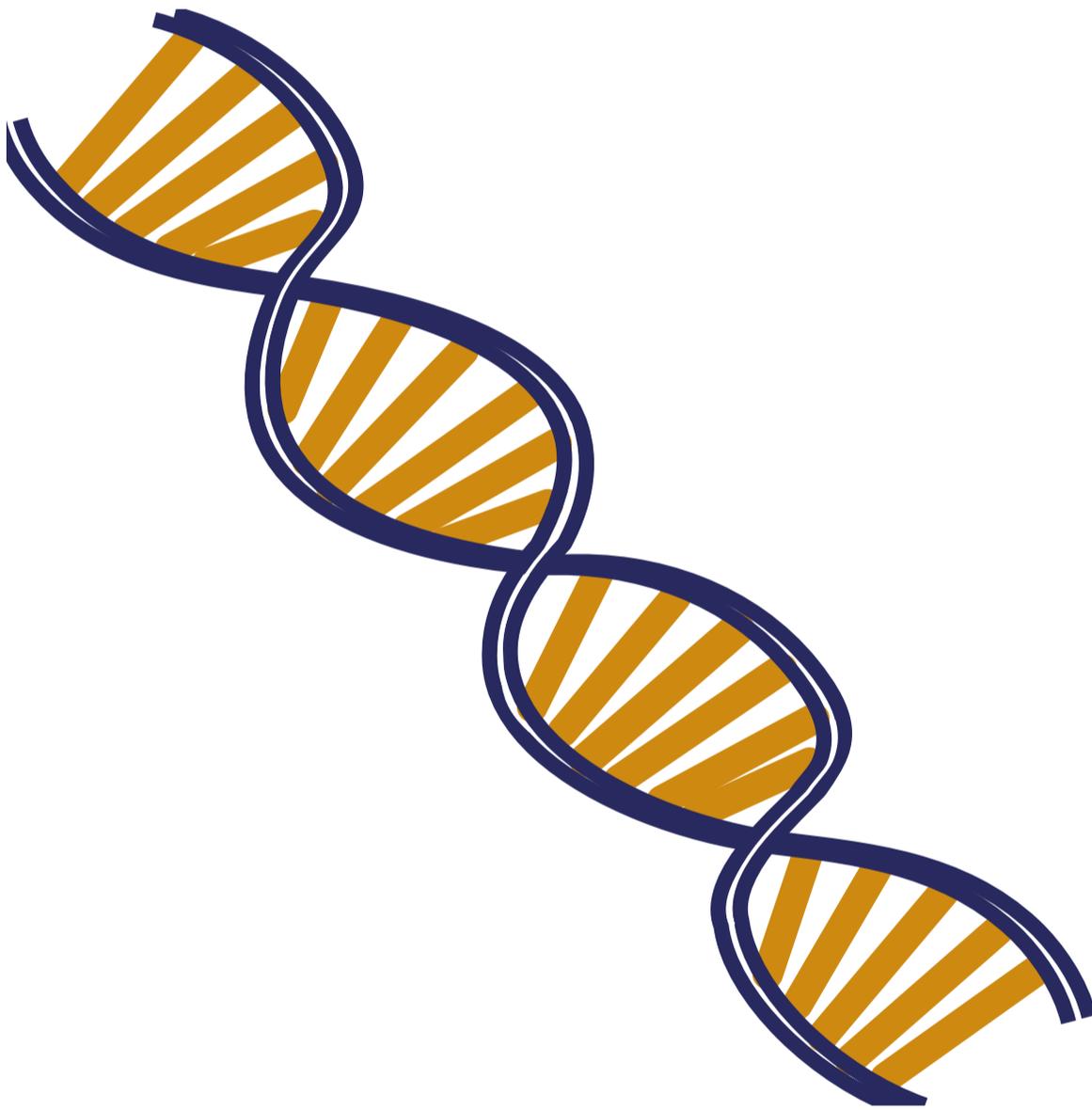
Results

The LSM segmented the FAZ with an average Dice coefficient of 0.9243. Compared with the KSM and the Cirrus inbuilt algorithm, the LSM outperformed them by 0.02 and 0.19, respectively, for Dice coefficients. Both the LSM (intraclass correlation coefficient [ICC] = 0.908; coefficient of variation [CoV] = 9.664%) and manual methods (ICC \geq 0.921, CoV \leq 8.727%) showed excellent repeatability for the FAZ area, whereas the other methods presented moderate to good repeatability (ICC \leq 0.789, CoV \geq 15.788%). Agreement with manual FAZ area measurement was excellent for both the LSM and KSM but not for the Cirrus inbuilt algorithm (LSM, ICC = 0.930; KSM, ICC = 0.928; Cirrus, ICC = 0.254).

Conclusion

The LSM exhibited greater accuracy and reliability compared to the KSM and inbuilt automated methods and may be an improved and accessible option for automated FAZ segmentation.

Genetics



Presenters:

Bařinka, J. (Jan)

Pessotto, Vict3rio, A. (Anne)

Britton, K.N. (Kelcie)

RNAseqCNV: analysis of large-scale copy number variations from RNA-seq data

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Introduction

Large-scale copy number variations (CNVs) play an important role in many malignancies, especially in acute lymphoblastic leukemia (ALL), the most common pediatric cancer. Transcriptome sequencing (RNA-seq) is widely used to detect chromosomal rearrangements and evaluate gene expression, but its utility and accuracy in identifying CNVs has not been well described. For this purpose, we present an R package to infer, visualize, and interactively review large-scale (chromosomal and arm level) CNVs from RNA-seq data (RNAseqCNV).

Materials & Methods

RNAseqCNV requires the per-gene read count and mutant allele frequency (MAF) information called from RNA-seq to generate easily interpretable figures and to automatically evaluate CNVs. We used a Random Forest model to identify bona fide diploid chromosomal arms, which are subsequently used to adjust normalization bias that may be present in samples with many large-scale CNVs. A second Random Forest model is used to infer CNVs based on normalized gene expression and MAF distribution.

Results

The RNAseqCNV model classified arm level CNVs with high accuracy (99.4 % and 95.9 % for non-diploid chromosome arms) and it was further validated with an acute myeloid leukemia dataset (accuracy 99.6 % and 93.4 % for non-diploid chromosome arms).

Conclusion

RNAseqCNV outperforms alternative RNA-seq based algorithms in calling CNVs in the ALL dataset, especially in samples with high proportion of CNVs. The CNV calls were highly concordant with DNA-based CNV results and more reliable than conventional cytogenetic-based karyotypes.

DNA Repair Genetic polymorphism as a predict to silicosis development

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Introduction

Silicosis, a lung fibrosis due to the inflammatory response to crystalline silica, is the most prevalent pneumoconiosis in the world and it is an important and frequent cause of disability. This inflammatory disease is correlated with development of chronic obstructive pulmonary failure and lung cancer. Molecular biomarkers may be a relevant tool to predict the disease development in exposure workers to silica. This study aimed to evaluate genetic polymorphism from DNA repair (XRCC1, XRCC3 and XPD) and xenobiotic metabolizing enzymes (GSTP1, GSTM1 and GSTT1) genes in an occupational respiratory disease case control study.

Materials & Methods

A total of 240 subjects exposed to silica were included in this study, of which 94 workers developed silicosis and 146 participants did not. The single nucleotide polymorphisms XRCC1 (rs25487 and rs1799782), XRCC3 (rs861539), XPD (rs13181), GSTP1 (rs1695), and the copy number variation of GSTM1 and GSTT1 were determined by TaqMan qPCR. The Odds Ratio (OR) and 95% Confidence Interval (CI) were calculated considering the genotype polymorphisms frequencies among the groups.

Results

This is the first study that investigated molecular biomarkers for lung fibrosis silica-related. The risk of silicosis increased among individuals who presented the polymorphic homozygous genotype of XRCC3 rs861539 (OR 3.9; 95%CI 1.38-10.53), while others polymorphisms evaluated showed no association with silicosis development.

Conclusion

The mutated allele in homozygous genotype might be a molecular biomarker of severity silicosis. This find would be applied as a surveillant tool for people who are occupationally exposed to silica dust.

Functional and Genetic Analysis of Esterase Genes Involved in Synthesis of Ergot Alkaloids

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Introduction

Ergot alkaloids are lysergic acid containing compounds associated with significant human and animal toxicoses and produced by several species of fungi. Despite their toxicity, modified and appropriately dosed ergot alkaloid derivatives are effective pharmaceutical treatments for dementia, migraines, and hyperprolactinemia. Biochemical pathways to some ergot alkaloids have been studied, but critical steps in the synthesis of lysergic acid amides remain elusive. These gaps are significant because many of the pharmaceutically relevant ergot alkaloids are derived from lysergic acid amides. Lysergic acid α -hydroxyethylamide (LAH) is the main ergot alkaloid produced by the fungus *Metarhizium brunneum* and is the predominant terminal end product of the lysergic acid amide branch. We hypothesize two genes, named *easP* and *estA*, encode esterases involved in the final step of LAH biosynthesis.

Materials & Methods

CRISPR mutants were created targeting *easP* alone and both *easP* and *estA* together in *M. brunneum*. Once genetic confirmation of each gene mutation was established, samples were analyzed for ergot alkaloid by high performance liquid chromatography (HPLC). The quantity of LAH and other relevant alkaloids produced in mutant strains were normalized to ergosterol, as a surrogate for fungal biomass, as measured by liquid chromatography-mass spectrometry (LC-MS). The function of *EasP* was tested by expressing it using recombinant protein technology in *Escherichia coli*, and the activity was analyzed using carboxylesterase assays.

Results

The product of *easP* has a significant effect on the production of LAH; the *easP* mutant only accumulated half of the LAH measured in wild type ($p=0.0051$). The double mutant of *easP* and *estA* has been prepared and will be analyzed for ergot alkaloids. *EasP* has been successfully expressed in *E. coli* for carboxylesterase assay.

Conclusion

The phenotype of our CRISPR mutant demonstrates that *easP* is an integral part of the biosynthetic pathway to LAH.

Paediatrics



Presenters:

Straathof, E.J.M. (Lilian)

Voorhoeve, M.C. (Maaïke)

Ewald, J. (Jannika)

Mohammed, Siraj (Ammas)

Ferrarelli, D.N.F. (Dominique)

Patterns of atypical muscle tone in the general infant population: prevalence and associations with perinatal risk and neurodevelopmental status

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Introduction

Muscle tone is an important element in motor development. Its assessment forms an integral part of the infant neurological examination. Knowledge on the prevalence and clinical implication of atypical muscle tone in infancy is lacking. The aim of this study was to assess the prevalence of atypical muscle tone in the general infant population and of the most common atypical muscle tone patterns, and to investigate associations between atypical muscle tone and perinatal risk and neurodevelopmental status.

Materials & Methods

In this cross-sectional study, 1 100 infants (585 boys; gestational age 39.4 weeks) between 6 weeks and 12 months corrected age, representative of the Dutch population, were assessed. Muscle tone and neurodevelopmental status were assessed with the neurological and developmental scale of Standardized Infant NeuroDevelopmental Assessment (SINDA). Perinatal information was obtained by parental questionnaire and medical records. Univariable and multivariable statistical analyses were performed with Statistical Package for the Social Sciences (SPSS), version 23 (SPSS IC., Chicago, IL).

Results

Ninety-two infants (8%) had atypical muscle tone in 3-4 body parts (impaired pattern), while atypical muscle tone in 1-2 body parts was observed in 50%. Isolated leg hypotonia and isolated arm hypertonia were most common. Isolated arm hypertonia and the impaired pattern were moderately associated with perinatal risk. These patterns were also most clearly associated with lower neurological scores. Only the impaired pattern was associated with lower developmental scores.

Conclusion

Atypical muscle tone in one or two body parts is common in infancy and has in general little clinical significance, except for isolated arm hypertonia which is modestly associated with perinatal risk and less optimal neurological condition. Eight percent of infants show atypical muscle tone in 3-4 body parts. This clinically relevant pattern is associated with perinatal risk and less favourable neurodevelopmental status.

A Mixed-Method Evaluation of a Screening Guideline for Paediatric Non-Alcoholic Fatty Liver Disease

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Introduction

Non-alcoholic fatty liver disease (NAFLD) is defined by hepatic fat accumulation not due to secondary causes and is strongly associated with obesity. The current screening guideline advises to screen obese children using alanine transferase (ALT), repeat testing after 6 months in case of an elevated ALT (≥ 30 IU/l) and refer to a paediatric gastroenterologist in case of persistently elevated ALT. However, a majority of paediatricians indicate that the guideline does not provide enough guidance. Therefore, study evaluates its use in clinical practice.

Materials & Methods

We retrospectively evaluated medical files of children with adiposity at the outpatient obesity clinic of a Dutch hospital between November 2017 and March 2020 ($n = 695$). Data was collected on baseline characteristics, BMI-z scores, laboratory measurements, reasons for not adhering to the guideline and referral to a paediatric gastroenterologist. In addition, two focus group discussions (FGDs) were held with paediatricians and specialized obesity nurses to identify barriers and improvements for the guideline.

Results

At baseline, 59% of the children was male, median BMI-z score was 3.66 and most were of Moroccan, Turkish or Surinamese-Indian descent. Initial screening for NAFLD was in accordance with the guideline in 601/695 (86%) cases. 94/695 (14%) children were not screened according to the guideline; in 44 (47%), the reason for this was related to the physician. Repeated ALT testing was not performed in 52/134 children (39%); in 31 (60%), the reason was based on physician's decisions.

In the FGDs, several barriers were identified, such as the term between screening and follow-up and the lack of treatment and scientific evidence. Also, there was a lack of practical guidance on the follow-up of children with no liver abnormalities and a lack of knowledge about NAFLD.

Conclusion

The majority of children was screened according to the guideline. Nonetheless, physician's decisions play a role in non-adherence in both screening and follow-up and health care workers experience several barriers in their use of the guideline. Therefore, adaptations are required to increase integration of the guideline with clinical practice.

State Anxiety, Pain Catastrophizing and Distress Promoting Behaviours: A Model about Parent-Infant Interactions during Vaccinations

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Introduction

Research shows that parent's behaviour during painful medical procedures and in day-to-day life has an influence on how well children and infants cope with pain, how much distress they experience and their somatic symptom proneness later in life. Parent's state anxiety and catastrophizing about their child's pain have been found to influence how parents interact with their child in pain. The aim of this study is to assess the relationships between parent's state anxiety before their infant's vaccination as well as parent's catastrophizing about their infant's pain and parent's distress promoting behaviours during the vaccination. It is hypothesized that the more anxious the parent, the more likely they are to catastrophize about their infant's pain and to exhibit distress promoting behaviours.

Materials & Methods

This study is part of a project within the TRAILS Next study and includes 3- and 11- month-old infants and their parents. They were filmed before, during and after routine vaccinations. Parents filled out six items of the state subscale of the State Trait Anxiety Inventory (STAI-6). Catastrophizing will be assessed by comparing the infant's pain score on the Face, Legs, Activity, Cry and Consolability (FLACC) scale to the parent's rating of their infant's pain. Moreover, to assess parent's behaviours a combination of standardized scales, including the Measure of Adult and Infant Soothing and Distress (MAISD) and the Child-Adult Medical Procedure Interaction Scale (CAMPIS), will be used. To analyse the data linear regression analyses will be conducted.

Results

At present we have filmed the vaccinations of 11 3-months-old infants and 11 11-months-old infants and collected data of their parents. We expect to reach our aim of including at least 30 to 40 infants in the next few months.

Conclusion

This study aims to further advance efforts to help parents behave supportively when interacting with their infant in pain. If the hypotheses hold true this would support an increased focus of interventions on parent's mental state by addressing their anxiety and catastrophizing.

Treatment Outcomes and Associated Factors among Children Hospitalized with Acute Bacterial Meningitis in Eastern Ethiopia: A Cross-Sectional Study

Mohammed, Siraj, Mr (Ammas)¹

¹ Haramaya University, Clinical Pharmacy, Harar, Ethiopia

Introduction

Bacterial meningitis is a common central nervous system infection that is associated with high morbidity and mortality in pediatrics. In Ethiopia, little is known about treatment outcomes of acute bacterial meningitis and associated factors among hospitalized children.

Materials & Methods

A retrospective cross-sectional study was conducted at the pediatric ward of Hiwot Fana Specialized University Hospital, eastern Ethiopia. Relevant data were collected using a structured data-collection tool from patients' medical charts. Bivariate and multivariate logistic regression analyses were done to identify predictors of treatment outcomes. OR with 95% CI and $P \leq 0.05$ was used for statistical significance.

Results

A total of 200 children with acute bacterial meningitis were included in the study, of which 92% were aged ≥ 2 months and the majority (128, 64%) had delayed (≥ 72 hours) presentation to the hospital. At admission, 181 (90.5%) were febrile, 92 (46%) had depressed level of consciousness, and 40 (20%) had had seizures. Most (126, 63%) had documented medical comorbidities. The antibiotic combination of ampicillin and gentamycin had been frequently administered in children aged < 2 months while ceftriaxone was commonly prescribed for those aged > 2 months. Of the total study participants, 154 (77%) showed successful treatment outcomes, while 46 (23%) experienced poor treatment outcomes (died or "self"-discharged). Level of consciousness (AOR 3.25, 95% CI 1.21-8.75), duration of illness before admission (AOR 3.74, 95% CI 1.76-7.98), and antibiotic-regimen change (AOR 4.7, 95% CI 2.4-10) were predictors of treatment outcomes.

Conclusion

The majority of study participants experienced good treatment outcomes. Unconsciousness, antibiotic-regimen change, and duration of illness before hospitalization were significantly associated with treatment outcomes. Early treatment, linkage of primary-health facilities to tertiary health-care centers, and availability of diagnostics should be promoted to improve patient outcomes.

A Systematic Review and Meta-Analysis of Case-Control Studies Assessing the Association between Breastfeeding and Childhood Cancer Incidence

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Introduction

There is an association between breastfeeding and reduced risk of disease in children. In particular, several studies have evaluated the role of breastfeeding in reducing incidence of childhood cancer; however, findings are inconsistent. Therefore, the aim of this study was firstly, to examine the relationship between breastfeeding and childhood cancer incidence, specifically for leukaemia, lymphomas, and brain tumours, and secondly, to analyse the correlation between shorter versus longer breastfeeding durations and childhood cancer incidence, by completing a systematic review and meta-analysis.

Materials & Methods

Studies that provided data on the association of breastfeeding and childhood cancer incidence were obtained by searching the PubMed and Google Scholar databases. All English-language articles up to December 30, 2020 were reviewed: studies reporting odds ratios (ORs) with 95% confidence intervals (CIs), the length of breastfeeding, and the incidence of leukaemia, lymphoma, and brain tumours, were included.

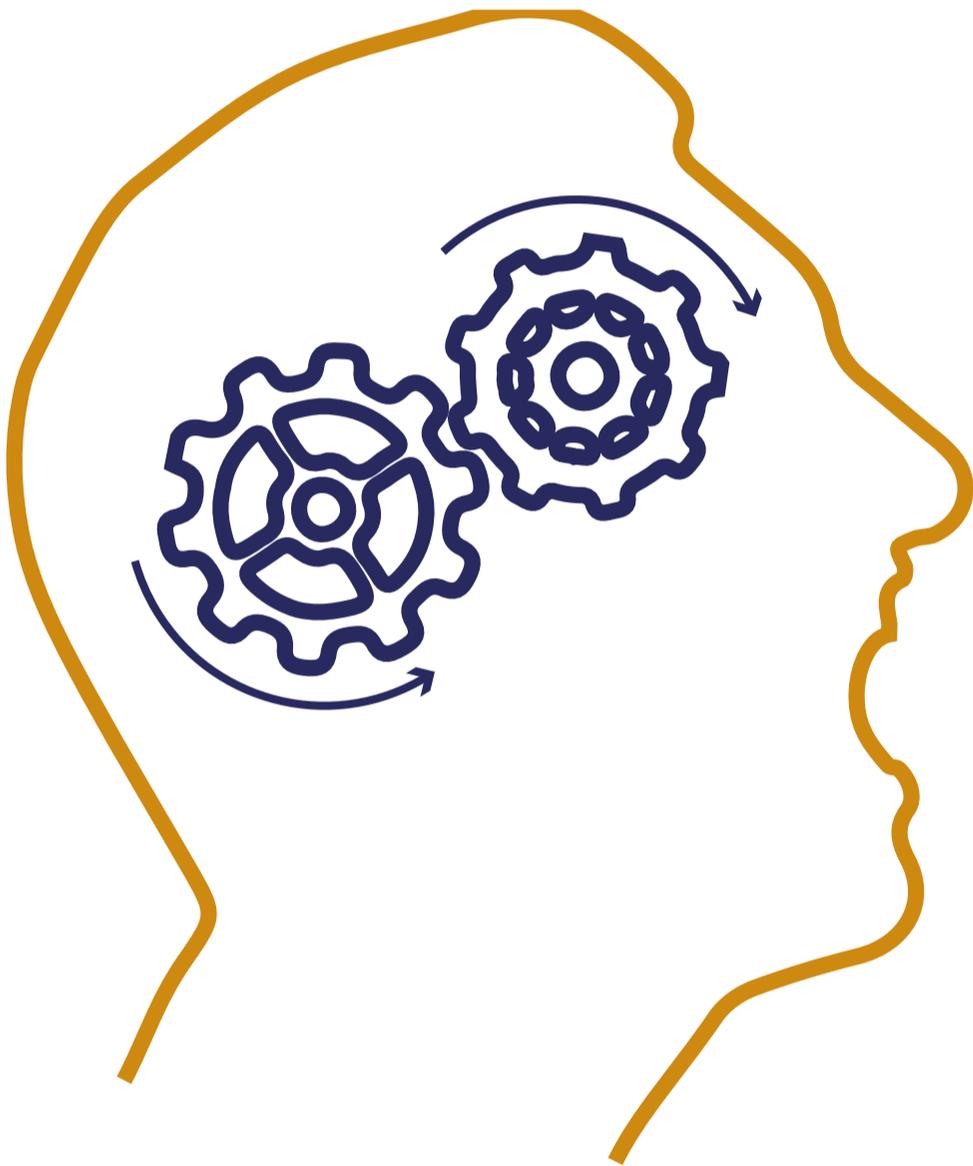
Results

A total of nine case-control studies were used. Overall, there was a significant association between breastfeeding and reduced incidence of childhood cancer, comparing breastfed children of any duration to children that were never breastfed (OR=0.4; 95%CI, 0.231-0.692; p=0.001), and a significant association between breastfeeding and reduced incidence of childhood cancer, comparing breastfed children of longer than six months to children breastfed for less than six months (OR=0.56; 95%CI, 0.429-0.731; p=0.000019).

Conclusion

This data suggests that breastfeeding, and furthermore, for longer durations, may be associated with reduced risk of childhood cancer. However, this evidence could be strengthened by prospective studies and more data reporting breastfeeding duration and childhood cancer incidence.

Psychiatry



Presenters:

Dodiya, H. (Hardik)
Druiven, S.J.M. (Stella)
Isaradisakul, S.K. (Suwicha)
Gupta, P.G. (Parth)
Xu, W.F. (William)

Aceclofenac versus Fixed-Dose Combination of Aceclofenac and Serratiopeptidase in Patients with Mild to Moderate Depression: An Assessor-Blind, Active-Controlled, Randomized Trial

Dodiya, H (Hardik) Student¹, Goswami, S (Sunita) Associate Professor¹

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Introduction

Globally more than 264 million people of the all ages suffer from depression. As per National Mental Health Survey (NMHS) in India (2015-2016), every sixth Indian needs help for mental health. Various nonsteroidal anti-inflammatory drugs (e.g. celecoxib, aspirin, etc.) which act via the inhibition of cyclooxygenase (COX), have shown antidepressive effects. Therefore, we aimed to compare the efficacy and safety of alone aceclofenac with fixed-dose combination (FDC) of aceclofenac and serratiopeptidase in patients with depression.

Materials & Methods

A total of 45 outpatients with mild to moderate depression participated in the trial and underwent 12 weeks of treatment with either aceclofenac (100 mg twice daily) or FDC of aceclofenac and serratiopeptidase (100 mg + 15 mg, twice daily). Participants were investigated using the Hamilton Depression Rating Scale (HDRS). The primary outcome measure was to compare the antidepressant effects of aceclofenac and FDC of aceclofenac and serratiopeptidase using HDRS score.

Results

Fixed-dose combination of aceclofenac and serratiopeptidase group showed statistically significant reduction in HDRS score than the alone aceclofenac group (4.9 versus 3.8, $p < 0.05$). The patients in the FDC of aceclofenac and serratiopeptidase group also experienced more remission rate when compared with the aceclofenac alone group (37.5% versus 21.4%, $p < 0.05$). The FDC of aceclofenac and serratiopeptidase group showed marked reduction in serum interleukin-6 & serum cortisol concentrations at week-12. Both treatments were well-tolerated.

Conclusion

Fixed-dose combination of aceclofenac and serratiopeptidase seems to have superior antidepressive effects as compared to alone aceclofenac in patients with mild to moderate depression.

A change towards an earlier chronotype is associated with a decrease in depressive symptoms in a seven year follow-up

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Introduction

Chronotype is an individual's preferred timing of sleep and activity, and is used to categorize individuals into being a morning-type, intermediate-type, or evening-type. Having an evening chronotype is associated with having more severe depressive and anxiety symptoms. In previous research, chronotype has been suggested to be a stable construct that is associated with vulnerability to develop depressive or anxiety disorders. However, longitudinal research on chronotype and the association with depressive and anxiety symptoms is limited. We aim to test the stability of chronotype over seven years, and its longitudinal association with the change in severity of depressive and anxiety symptoms.

Materials & Methods

Data of 1417 participants with a depressive and/or anxiety disorder diagnosis and healthy controls assessed at the two and nine-year follow-up waves of the Netherlands Study of Depression and Anxiety (NESDA) were used. Chronotype (Munich Chronotype Questionnaire), severity of depressive (Inventory of Depressive Symptomatology) and anxiety (Beck Anxiety Inventory) symptoms were assessed at both follow-ups. Stability of chronotype was analyzed by comparing mean scores between assessments and calculating the correlation coefficient. Generalized estimating equation analyses were used to analyze whether a change in severity of depressive and anxiety symptoms was associated with a change in chronotype.

Results

On average, chronotype advanced (i.e. became earlier) with 10.8 minutes over seven years ($p < 0.001$) and was found to be moderately stable ($r = 0.53$). Controlling for possible confounders, a decrease in severity of depressive symptoms was associated with an advance in chronotype ($B = 0.008$, $p = 0.003$). A change in severity of anxiety symptoms was not associated with a change in chronotype.

Conclusion

Chronotype was found to be a stable, and therefore trait-like construct, while showing a minor level advance over a period of seven years. The change in chronotype was associated with a change in severity of depressive, but not anxiety, symptoms. Our findings suggest a close relationship between these two constructs which could be used in future research and is supportive for the use of chronobiological interventions in psychiatry.

Impact of COVID-19 Pandemic on Happiness and Stress: Comparison of Preclinical and Clinical Medical Students

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² Undergraduate Student of Faculty of Medicine, Chiang Mai University, Chiang Mai, Thailand

Introduction

The COVID-19 pandemic has caused intense global impact. The impact of COVID-19 on medical education has affected both preclinical and clinical learning environments. Changes in all academic activities aimed to decrease the risk of disease exposure. The lack of adequate knowledge of medical students could cause exaggeration of the situation and an increase in stress and anxiety. The study aimed to compare differences in happiness and stress and related factors between pre-clinical and clinical year medical students during the first outbreak of COVID-19.

Materials & Methods

A cross-sectional study was conducted in the Faculty of Medicine, Chiang Mai University (CMU), Thailand. All undergraduate medical students were requested to voluntarily respond to an electronic survey. Demographic data, related factors of happiness and stress, scores from the Thai stress questionnaire, and Thai version of the Oxford Happiness Questionnaire were collected.

Results

There were 369 responses, 64.8% from preclinical students and 35.2% responses from clinical students, 53.9% were women. The mean age of the participants was 20.62 ± 1.81 years. The most frequent platforms that the students used to track COVID-19 information were from Facebook 43.9%, Twitter 43.4%. Both groups had a low level of stress. There was no difference in the happiness and stress levels between preclinical and clinical year CMU medical students. With multivariate analysis, two factors significantly related to the happier students (higher Thai-OHQ score) included higher health satisfaction scores (p -value < 0.001) and maintaining an exercise program during the COVID-19 pandemic (p -value = 0.015).

Conclusion

To increase happiness, promoting awareness of health satisfaction and regularity of exercise for the medical students should be initiated. To direct the information during a disease outbreak such as the COVID-19 pandemic, Facebook, and Twitter are the primary platforms to use.

An observational study to evaluate Psychological Experience and Social stigmas in COVID patients: A Prospective study of Home Isolated patients

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Introduction

COVID 19 has caused significant distress. Apart from the evident physical symptoms in infected cases, it has caused serious damage to public mental health. The present study also assesses disease burden in home isolated patients. The present study to assess fear by using Fear of COVID-19 Scale (FCV-19S) and to evaluate perceived stigma among COVID-19 patients by using Stigma Scale.

Materials & Methods

A Prospective, observational study of 2 months began after IRB approval in diagnosed COVID 19 patients who were home isolated . Number of patients converting from asymptomatic to symptomatic and probability to spread to a family member was also recorded Fear and social stigma by Fear of COVID 19 scale (FCV-19S) and Stigma Scale was measured respectively.

Results

A total of 746 patients were included in the study (mean age: 40.2 ± 16.2). About 38.47% (287 patients) were asymptomatic while 61.53% (459 patients) were symptomatic during their home isolation period. About 105 patients (14.07%) were suffering from co-morbidities ,such as Hypertension, Diabetes, Obesity. Out of the 287 asymptomatic patients 48.78% (140 patients) became symptomatic during their period of home isolation. Out of the 287 asymptomatic patients 35.19% (101 patients) did spread infection to their family members and out of the 459 symptomatic patients 34.85% (160 patients) did spread to their family member. The mean score of the patients for fear and stigma in our study was 14.74 ± 5.13 and 35.13 ± 8.48 respectively.

Conclusion

Non-severe COVID-19 patients can transmit the disease regardless of their symptomatic status. This was the first time we had used a stigma scale in patients affected by COVID 19 infection who were home isolated. Total score on the FCV-19S are comparable across both genders and all ages. A considerable proportion of home isolated patients in this exploratory study experienced COVID-19-related stigmatization, mainly from their neighbours and others they interacted with in the community during the COVID-19 pandemic.

AI Depression Detection in Adolescent and Young Adult During the Time of COVID-19

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Introduction

Depression rates increase dramatically during the middle and high school years with prevalence rates for adolescents at 7.5%. During the COVID-19 pandemic, depression rates increased by over 60%. Evidence shows that young adults are most vulnerable to the mental health effects of the pandemic. Compared to children in higher-income households, those in lower-income households have a higher rate of depression, but less access to health care providers. The delayed detection and intervention process leads to the drop of the recover rates. We aimed to develop an AI system to detect depression earlier and be accessible by low-income families. We targeted early onsite emotional symptoms before they progress to neurovegetative and neurocognitive symptoms, according to the mental disorder symptoms taxonomy.

Materials & Methods

We analyzed the performance of non-verbal emotional expressions and natural language sentiment features in face videos and contextual content from survey results (500+ adolescent and young adult surveyees during COVID-19 time period), public datasets, and social media content (50,000+ entries before and after COVID-19 as comparison). We utilized Convolutional Neural Network to conduct multi-class classification on non-verbal cues, applied Bag-of-Words and Term Frequency-Inverse Document Frequency on text vectorization, logistic regression on natural language features, and sentiment analysis on social media data.

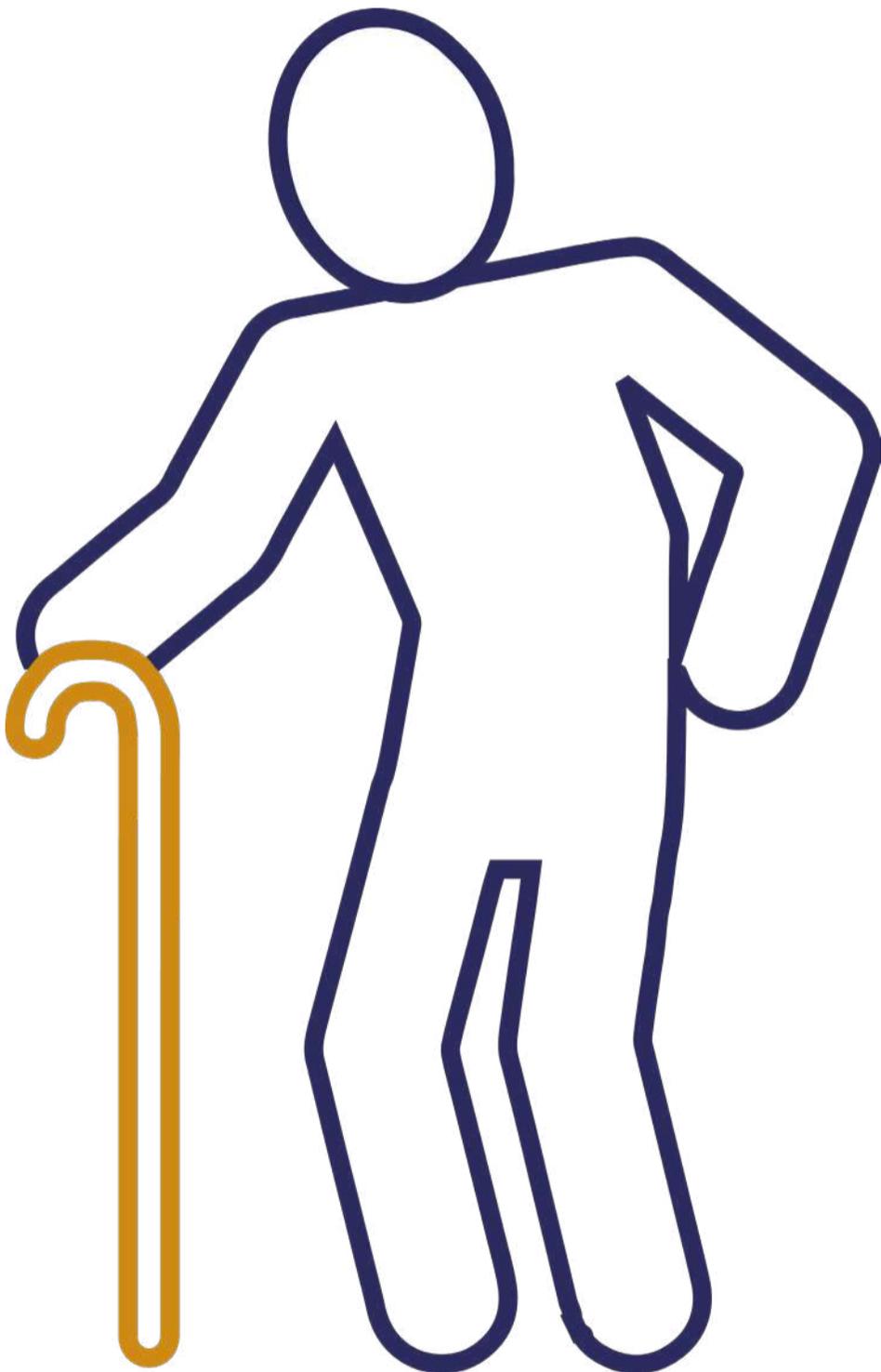
Results

The model accuracy rate reached 83% when the set of hyper-parameters were turned and epoch set to 80. The correlation coefficient reached 0.86 when comparing the AI prediction to the current clinical detection approaches (CESD-R, PHQ-2).

Conclusion

We concluded that there is a large correlation between emotional signals discovered by AI tools and depression emotional symptoms identified by the current clinical approaches. Therefore, AI tools can play a big role in detecting depression emotional symptoms. It can be used as an early screen outreach tool to raise awareness in young adults and reveal complementary cues in clinical depression practices.

Geriatrics



Presenters:

Rodríguez Rocandio, K.E. (Karla)

Ramachandran, S.P.R. (Sai)

Pawaskar, R.S.P. (Rachhanaa)

Goulas, K. (Kyriakos)

Prevalence and associated risk factors of “Cognitive Frailty” in older adults

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Introduction

Physical frailty is known as a loss of reserve and resistance to external stressors and cognitive impairment as a state of reduced cognitive reserve. There is a new entity that was introduced in 2013 by a consensus group, “cognitive frailty”, which is defined as the presence of both, physical frailty and cognitive impairment, excluding dementia. We aimed to find the prevalence of cognitive frailty in a sample of older adults and identify those risk factors associated.

Materials & Methods

Older adults aged over 60 years were included in this cross-sectional study. Cognitive impairment was defined using the Mini-Mental State Examination. Frailty was assessed using Fried/ Cardiovascular Health Study criteria that include slow gait velocity, weight loss, low physical activity, weakness and fatigue/exhaustion. Additionally, nutritional status was measured by the Mini-Nutritional Assessment and a clinical questionnaire was examined. Univariate and multivariate analyses by logistic regression were used, the odds ratios (95% confidence intervals and p-value) of the model were calculated. Statistical analyses were performed using SPSS (v25.0, IBM Corporation).

Results

Nine hundred nine older adults were evaluated, (mean age 68.4 years, SD 5.9). According to Fried’s criteria, 68.9% were prefrail and 15.1% frail. The prevalence of cognitive impairment was 15.6% and 13% were affected by cognitive frailty. In logistic regression analysis, we found conditions that presented elevated risks associated with cognitive frailty.

Patients at risk of malnutrition or malnourished (OR 2.6 [95%CI 1.4-4.9] p=0.002), an age over 67 years (OR 1.8 [95%CI 1.1-2.8] p=0.01), presence at least, of one comorbidity (OR 1.9 [95%CI 1.1-3.2 p=0.01] and two or more comorbidities (OR 1.8 [95%CI 1.1-2.8] p=0.01), this model adjusted by sex.

Conclusion

The prevalence rates we found are similar to the rates that have been reported in the literature. In those older adults with an altered nutrition state, presence of comorbidities and advanced age, we can see increasing risk to present cognitive frailty. This entity has been proposed, not only as a dementia predictor but also of other geriatric syndromes that affect the older adult’s functionality, quality of life and predisposes to adverse outcomes. Identification of modifiable risk factors is important and preventive interventions to risk factors are needed.

Assessment of knowledge, attitude and practices of doctors regarding Palliative Care

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¹ Armed Forces Medical College, Department of Internal Medicine, Pune, India

Introduction

Over the years, the Indian healthcare scenario has been changing by leaps and bounds. However, the decline in mortality and morbidity from communicable diseases unmasks the incidence of many non-communicable ones. Palliative Care is specialized medical care which is focused on providing relief from the symptoms and stress of such serious, complex illnesses. However, less than 2% of those who need it receive palliative care in India. This study explores the knowledge, attitude and practices towards palliative care among doctors in the Indian setting.

Materials & Methods

A 14-item questionnaire was developed based on a review of the literature. It was tested for content validity by a team of experts, and pilot-tested for feasibility and clarity. The questionnaire was developed in English. It constituted general information of doctors, their knowledge, attitudes and practice regarding palliative care. While knowledge was assessed through 4 multiple choices, the attitude and practice of doctors were measured using a 5-item Likert scale (ranging from strongly agree to strongly disagree).

Results

A total of 368 doctors completed the questionnaire. Only 51% of respondents had been educated about palliative care during the course of their training. While just 13% believed that by referring to palliative care, doctors were giving up on their patients, 50% said they were uncomfortable in discussing death and dying with their patients. 67% of respondents believed it was extremely important to educate themselves regarding palliative care apart from their routine practice. 84% responded that lack of discussion in medical programmes made them less confident to deal with these issues.

Conclusion

Our results reveal that although the attitude of most doctors regarding palliative care was positive, most of them were unaware of the need and scope of palliative care. The doctors also reported a relative lack of teaching about palliative care, which may affect the quality and timing of these discussions conducted with patients and families. This study, thus findings emphasizes the need for the initiative to address common shortcomings in medical training and practice regarding the need to incorporate palliative care in medical education, and develop the primary palliative care skills of all clinicians.

Quality of life among elderly in a village in Southeastern Maharashtra: On our way to achieve the Sustainable Goal 3.

Pawaskar, R.S.P. (Rachhanaa) Dr.¹, Velhal, G.D.V. (Gajanan) Dr.¹

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Introduction

Sustainable Development Goal (SDG) 3 is about ensuring healthy lives and promoting well-being for all, at all ages. Quality of life (QOL) is defined as an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. QOL among elderly is a cardinal domain of solicitude which reflects their health status and well-being; and is a neglected issue especially in rural India. This study was designed with the aim to determine the quality of life among the elderly in a village in Southeastern Maharashtra, as a very basic attempt for achieving the SDG 3 among the elderly living in the study area.

Materials & Methods

This observational cross-sectional community based study, spanning for a month's duration, included 349 elderly (age >60 years). Data collection was done after Institutional Ethics Clearance. Informed consent of every study participant was taken. A pretested questionnaire enquired about socio-demographic factors and chronic co-morbid conditions. The World Health Organization Quality of Life-BREF (WHOQOL-BREF) was used to determine the QOL. Statistical analysis was done using IBM SPSS version 26.0. Unpaired t test was applied and results were considered significant if p value < 0.05. Sociodemographic parameters associated with a low QOL score were determined by applying multiple linear regression.

Results

Out of the 349 elderly, 61% (n=212) were in the 60-69 years age group. Overall mean score of QOL was 49.21 ± 10.69 . Mean score of the social relationships domain was least (40.98 ± 18.61). Males scored higher in all domains than females. Older age ($p=0.002$), without spouse ($p<0.001$), diabetes mellitus ($p=0.002$), musculoskeletal disorder ($p=<0.001$), low vision ($p=0.043$) and hearing impairment ($p=0.007$) were associated with low QOL score.

Conclusion

The elderly have an average QOL score, with a low QOL score in the social relationship domain. With mere nine years left to 2030 deadline to achieve the SDGs, we must inject a sense of urgency, immediately accelerate our actions at individual and community level.

An Investigation of the Association Between Environmental Risk Factors and Alzheimer's Disease: Systematic Review and Meta-analysis

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² American College of Thessaloniki, Division of Science and Technology, Thessaloniki, Greece

Introduction

Alzheimer's disease (AD), the most common form of dementia having affected more than 40 million people in 2020, is the 5th leading cause of death worldwide. An increase in the number of people with AD has been reported, not only due to a significant increase in life expectancy, but also due to a change in the environment in which we live. This study aimed to explore the relationship between the most significant environmental factors and the occurrence of AD, as well as to evaluate the most accurate diagnostic and prognostic biomarkers.

Materials & Methods

Online scientific literature databases, including Cochrane Library, Elsevier, PubMed, Scholar and JSTOR, were used for finding relevant research papers. A meta-analysis was conducted after setting the criteria for inclusion of individual papers and assessing the quality of the included information implying GRADE criteria. We calculated the full-adjusted Odds Ratios (OR 95% Confidential Interval) for Air pollution, Heavy metals, Electromagnetic fields (EMFs) and Pesticides and also for their subgroups. In addition, an attempt for introducing a diagnostic algorithm based on the biomarkers, indicating the highest sensitivity and specificity for Alzheimer, also occurred.

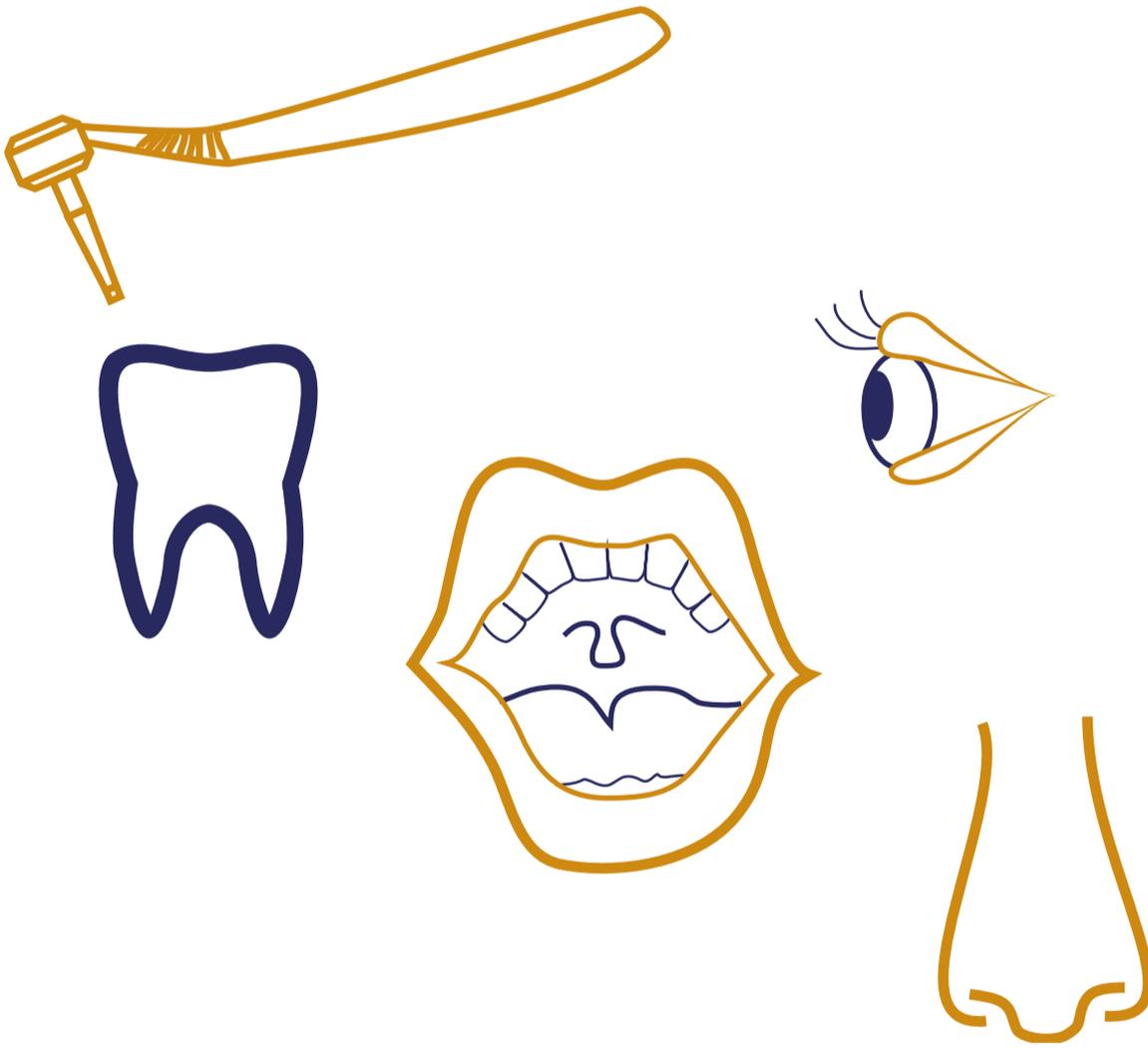
Results

From a total number of 29,263 studies, 78 were considered suitable for inclusion. The OR for the 9 studies of air pollution was equal to 1.27 (95% CI, 1.08-1.49). Thirty four studies for heavy metals indicated an OR= 1.40 (95% CI, 1.08-1.83) regarding the risk for AD. The OR of 21 studies for EMFs and 14 for Pesticides was equal to 1.36 (95% CI, 1.16-1.59) and 1.50 (95% CI, 1.19-1.90) respectively. Regarding the results on AD biomarkers, it was found that the combination of clinical examination with cerebrospinal fluid (CSF) measurements of T-tau and P-tau concentrations, plasma A β 42/A β 40 ratio and amyloid positron emission tomography (PET) can lead to a diagnostic accuracy ranges from 80% to 95%.

Conclusion

The results of the present meta-analysis demonstrated the existence of a correlation between environmental factors and the occurrence of AD. The biomarkers results could provide evidence toward -more accurate diagnostic procedures, suggesting that plasma P-tau could serve as a screening blood test in primary care.

ORL & Dental Surgery



Presenters:

Tawfik, G.M.T. (Gehad)

Meier, M.A.M. (Melina Anna-Maria)

Efficacy and safety of voice prosthesis in voice rehabilitation for 11918 laryngectomees: a systematic review and network meta-analysis

Tawfik, G.M.T. Dr. (Gehad Mohamed) MBBCh¹, Makram, O.M.M. Dr. (Omar Mohamed) MBBCh², Zayan, A.H.Z.. Dr. (Ahmad Helmy) MBBCh³, Ghozy, S.G. Dr. (Sherief) MBBCh⁴, Eid, P.S.E. Dr. (Peter Samuel) MBBCh¹, Mahmoud, M.H.M. Dr. (Mona Hanafy) MBBCh¹, Abdelaal, A.A. Mr. (Abdelaziz) MBBCh Candidate⁵, Abdelghany, S.M.A. Mr. (Seif Mahmoud) MBBCh Candidate⁶, Sayed, A.M.S. Mr. (Ahmed M.) B Pharm⁷, Sang, T.K.S. Dr. (To Kim) MD⁸, Mahmoud, M.K. Dr. (Kassem) MBBCh, MSc⁹, Ho, Q.L.M.H. Mr.. (Quoc Le Minh) MBBCh Candidate¹⁰, Eltanany, H.H.E. Ms. (Heba Hussien) MBBCh Candidate¹¹, Ali, A.F.A. Ms. (Amira Farghaly) MBBCh Candidate¹², Sweiny, O.G.S. Mr. (Osama Gamal) MBBCh Candidate¹³, Elsherbiny, K.K.E. Mr. (Khaled Essam) MBBCh Candidate¹⁴, Shafik, A.G.S. Prof. (Amr G.) MD, PhD¹⁵, Hirayama, K.H. Prof. (Kenji) MD, PhD¹⁶, Huy, N.T.H. Dr. (Nguyen Tien) MD, PhD¹⁷

¹ Faculty of Medicine, Ain Shams University, Intern Doctor, Cairo, Egypt - ² Faculty of Medicine, October 6 University, Department of Cardiology, Giza, Egypt - ³ Menoufia University, Department of Otolaryngology, Menoufia, Egypt - ⁴ El Sheikh Zayed specialized hospital, Department of Neurosurgery, Giza, Egypt - ⁵ Faculty of Medicine, Tanta University, Undergraduate, Gharbia, Egypt - ⁶ Faculty of Medicine, Fayoum University, Undergraduate, Fayoum, Egypt - ⁷ Faculty of Pharmacy, Al-Azhar University, Postgraduate, Cairo, Egypt - ⁸ Ho Chi Minh City Oncology Hospital, Department of Oncology, Ho Chi Minh City, Viet Nam - ⁹ The Ohio state university Wexner medical center, Research Assistant, Ohio, United States - ¹⁰ University Medical Center of Ho Chi Minh city, Undergraduate, Ho Chi Minh city, Viet Nam - ¹¹ Faculty of Medicine, AL Azhar University, Undergraduate, Cairo, Egypt - ¹² Faculty of Medicine, Minia University, Undergraduate, Minia, Egypt - ¹³ Faculty of Medicine, South Valley University, Undergraduate, Qena, Egypt - ¹⁴ Faculty of Medicine, Port-Said University, Undergraduate, Port-Said, Egypt - ¹⁵ Faculty of Medicine, Ain Shams University, Department of Otorhinolaryngology, Cairo, Egypt - ¹⁶ Institute of Tropical Medicine (NEKKEN), Nagasaki University, Department of Immunogenetics, Nagasaki, Japan - ¹⁷ Institute of Tropical Medicine (NEKKEN), Nagasaki University, Department of Clinical Product Development, Nagasaki, Japan

Introduction

Total laryngectomy is accompanied by a mandatory loss of voice. Therefore, the gold standard voice rehabilitation approach is tracheoesophageal puncture with voice prostheses (VPs). We aimed to assess different VPs to detect the best one between all sub-types reported types in literature, besides, to assess factors that influence these VPs quality.

Materials & Methods

In September 2017, 15 databases were searched with the inclusion of all randomized controlled trials, then a new search term was done in May 2019 to include all study design articles as not to miss new VPs sub-types in market stores. Network meta-analysis (NMA) was applied and 27 outcomes were reported. NMA partial order setting was done by using Hasse scatter plots, depending on P-scores, where the best VPs nearer to one and the least nearer to zero. Meta-analysis was done for rest outcomes which could not be included in NMA.

Results

We detected 201 articles eligible for our inclusion criteria, and 123 articles were eligible for our analysis. Provox-2 was significantly the best device with the most preference [OR 33.88 (0.65, 1762.24) (P-score = 0.92)], the least dislodgement [RR 0.27 (0.13, 0.57) (P-score = 0.79)], the least airflow resistance [RR 0.42 (0.08, 2.11) (P-score = 0.84)], the least VPs inaccurate size [RR 0.77 (0.23, 2.61) (P-score = 0.66)], and the least granulation formation [RR 0.73 (0.02, 26.32) (P-score=0.60)]. Heat and moisture exchanger (HME) addition showed a significant increase in maximum phonation time (MPT) and breathing experience, with P-scores (1 and 0.59) respectively. While HME addition showed a significant decline in stoma cleaning frequency, coughing frequency, forced expectoration, sputum production, sleeping problems, and loosening of adhesive, with P-scores (0.99, 0.72, 0.69, 0.96, 1, and 0.96), respectively.

Conclusion

Provox-2 is considered the best choice as being the most preferable for patients, the least dislodgement, airflow resistance, VPs inaccurate size, and granulation formation. The addition of HME on top of VPs increased MPT and breathing experience, declined VPs complications as; stoma cleaning frequency, coughing frequency, forced expectoration, sputum production, sleeping problems, and loosening of adhesive. Groningen LR and Nijdam were considered the worst VPs in comparison to the rest VPs.

Influence of polyphenol and stannous ions on the protective properties of the In-situ pellicle

Meier, M. A. M. (Melina Anna-Maria)¹, Flemming, J. F. (Jasmin) Dr. med. dent.¹, Hannig, C. H. (Christian) Prof. Dr. med. dent.¹, Hannig, M. H. (Matthias) Prof. Dr. med. dent.², Hille, K. H. (Kristin)¹, Basche, S. B. (Sabine)¹, Kölling-Speer, I. K. S. (Isabelle) Dr.³, Speer, K. S. (Karl) Prof. Dr.³

¹ Medical Faculty Carl Gustav Carus, Technische Universität Dresden, Clinic of Operative Dentistry, Dresden, Germany

² University Hospital, Saarland University, Clinic of Operative Dentistry, Periodontology and Preventive Dentistry, Homburg, Saar, Germany

³ Technische Universität Dresden, Special Food Chemistry and Food Production, Dresden, Germany

Introduction

The present in situ study aims to examine the influence of a combination of polyphenols and stannous ions on the initial oral bioadhesion and erosion protective properties.

Materials & Methods

Initial biofilm formation was performed on bovine enamel slabs, carried by 10 subjects intraorally. The subjects rinsed for 10 minutes with the different rinsing solutions (tannic acid (13,6mg/8ml), stannous(II)-chloride (23,7mg/8ml), stannous fluoride (16,5mg/8ml), combination (50:50) of tannic acid (6,8mg/4ml) + stannous(II)-chloride (11,85mg/4ml), combination (50:50) of tannic acid (6,8mg/4ml) + stannous fluoride (8,25mg/4ml)) after 1 minute of intraoral pellicle formation. As a negative control, bovine slabs were carried intraorally without previous rinsing.

The investigations took place at different days, thereby a 48 hours wash out time was conducted. Bacterial adhesion and glucan formation (8h oral exposition) were examined with the DAPI-, ConA- and BacLight- fluorescence methods.

Further, the pellicle ultrastructure and expectorate samples were visualized with TEM. In addition, bovine slabs were incubated in HCl (pH2; 2.3; 3) for 120 s and kinetics of calcium- and phosphate release were measured photometrically after oral exposition; representative samples were analysed by TEM and EDX. Statistical evaluation was performed with the Kruskal-Wallis- ($p < 0.5$), Mann-Whitney U-test ($p < 0.5$) and Bonferroni-Holm-correction.

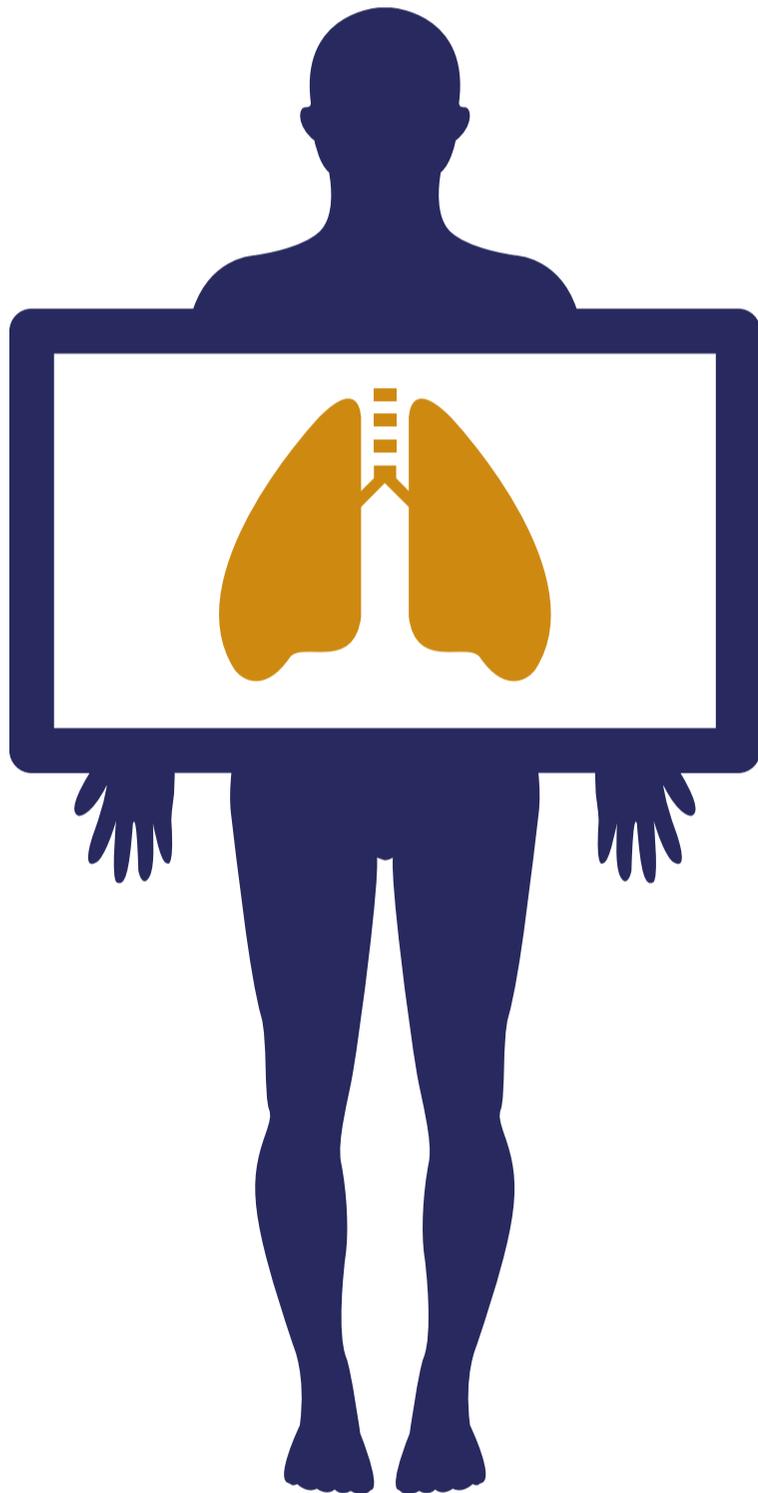
Results

Rinsing with the different test solutions lead to a reduction of initial bacterial colonization and glucan formation. Thereby, the combination of tannic acid and stannous fluoride showed superior results. Additionally, an erosion protective effect was observed. Considerable alterations of the pellicle's ultrastructure manifested by an increase in thickness and electron density resulted from rinsing with the tested solutions.

Conclusion

Tannic acid, stannous(II)-chloride and stannous fluoride showed antiadherent and antierosive effects and are therefore promising adjuvants for oral prevention.

Imaging



Presenters:

Kaur, R.K. (Ravinder)
Jhaveri, S. (Sharan)

Quantification of global cerebrovascular reactivity in the principal feeding arteries of the human brain.

Kaur, R.K, Miss (Ravinder) Miss¹

¹ *University of Nottingham, School of Life Sciences, Nottingham, United Kingdom*

Introduction

Global cerebrovascular reactivity (CVR) mapping is a promising clinical assessment for stress-testing the brain using physiological challenges, such as CO₂, to elicit changes in perfusion. It enables real-time assessment of cerebrovascular integrity and health.

Conventional imaging approaches solely use steady-state parameters, like cerebral blood flow (CBF), to evaluate the integrity of the resting parenchyma and can erroneously show healthy brain at rest, despite the underlying pathogenesis in the presence of cerebrovascular disease.

Conversely, coupling CO₂ inhalation with phase-contrast MRI neuroimaging interrogates the capacity of the vasculature to respond to changes under stress. It shows promise in providing prognostic value as a novel health marker to measure neurovascular function in disease and to detect early brain vasculature dysfunction.

Materials & Methods

This exploratory study established to:(a) quantify the CBF response to CO₂ in hypocapnia and hypercapnia,(b) evaluate disparities in CVR between internal carotid (ICA) and vertebral artery (VA) and (c) assess sex-specific variation in CVR.

Phase-contrast MRI was employed to measure the cerebrovascular reactivity to CO₂ (± 10 mmHg). The respiratory interventions were presented using the prospectively end-tidal targeting RespirAct Gen3 system. Post-processing and statistical analysis was conducted.

Results

In 9 young healthy subjects, the CBF increased from hypocapnia to hypercapnia in all vessels (4.21 ± 0.76 to 7.20 ± 1.83 mL/sec in ICA, 1.36 ± 0.55 to 2.33 ± 1.31 mL/sec in VA, $p < 0.05$).

The CVR was quantitatively higher in ICA than VA (slope of linear regression: 0.23 vs 0.07 mL/sec/mmHg, $p < 0.05$). No statistically significant effect was observed in CVR between male and female (0.25 vs 0.20 mL/sec/mmHg in ICA, 0.09 vs 0.11 mL/sec/mmHg in VA, $p > 0.05$), however the carbon dioxide reactivity was comparatively higher in male compared to female participants.

Conclusion

The principal finding in this investigation validated the modulation of CBF by CO₂. Moreover, it has indicated regional heterogeneity in haemodynamic response exists in the brain.

This study provides scope to standardise the quantification of CVR prior to its clinical translation.

Performance of Non-Invasive Techniques in Staging Liver Fibrosis- A Meta-Analysis

Jhaveri, S (Sharan) Final year M.B.B.S.^{1,2,3}, Patel, R (Rudra) Final Year M.B.B.S.^{1,2}, Patel, J (Jigar) Associate Professor²

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² SVP Institute of Medical Sciences and Research, Department of Gastroenterology, Ahmedabad, India

³ Subir Jhaveri Spine Hospital, Department of Research, Ahmedabad, India

Introduction

The standard for diagnosing and staging liver fibrosis has traditionally been liver biopsy. Sampling errors, observer discrepancies, patient acceptability are unresolved hurdles. Noninvasive methods like Transient elastography (TE) and Acoustic Radiation Force Impulse (ARFI) have shown considerable promise. We conducted this meta-analysis to review current evidence regarding both and compare their diagnostic accuracies to establish which one is superior.

Materials & Methods

All language search was conducted on MEDLINE, COCHRANE, EMBASE and GOOGLE SCHOLAR databases from January to October 2020. Only studies with Area Under Receiver Operating Characteristic (AUROC) scores were included in this meta-analysis. Weighted means for ROCs of TE and ARFI were measured to calculate individual diagnostic accuracies. Liver Biopsy results were used as the gold standard. Unpaired t-test was applied to check for significant difference between them. p-value <0.05 was considered significant. IBM SPSS 20 and Revman v5.3 were used for statistical calculation.

Results

A total of 65 studies (9788 patients) were included in the meta-analysis. 48 studies were used to assess TE accuracy, 6 for ARFI, and 11 were used to assess heterogeneity between the two. For TE, ROC scores for F2=0.827(95%CI0.794-0.861), F3=0.873(95%CI0.8469-0.9), F4=0.912(95%CI0.899-0.924). For ARFI, ROC scores for F2=0.813(), F3=0.875() and F4=0.89(). Using the aforementioned 11 studies, unpaired t test was applied for comparison and the p values were calculated as follows: F2 = 0.914, F3= 0.32 and F4=0.313. Sensitivity (SN) and Specificity (SP) for TE for stage F2-F4 were also measured. SN: F2= 71.9%, F3=82.12% and F4=91.07%; SP: F2=82.86%, F3=86.21% and F4=87.99%

Conclusion

Both TE and ARFI were considerably accurate in diagnosing liver fibrosis as inferred from their respective AUROC scores. Both tests showed significantly elevated AUROC scores for stage F4 (liver cirrhosis). No significant difference was found amongst them as far as assessing and staging of liver fibrosis was concerned.

Obstetrics



Presenters:

Sabas, R.R. (Romani)

Rudzinski, P. (Patryk)

Bhatt, M.V. (Miti)

Paternal characteristics associated with low birth weight among singleton births: a hospital-based birth cohort study in northern Tanzania

Sabas, R.R (Romani) Mr.¹, Nyange, N.N (Noreen) Ms.², Mayala, A.M (Andrea) Mr.³, Mahande, M.J (Michael) Dr.⁴, Amour, C.A (Caroline) Ms.⁴, Mboya, I.B (Innocent)^{4,5}

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Introduction

Low birth weight (LBW) remains to be a devastating adverse pregnancy outcome in low- and middle-income countries (LMICs). There is a pile of evidence showing that maternal demographic and pregnancy related characteristics are associated with low birth weight. While studies mostly done in the developed countries have shown the association of some paternal characteristics and LBW little has been documented in LMICs including Tanzania. We aimed to assess the effect of paternal characteristics on low birth weight among singleton births at KCMC referral hospital, Kilimanjaro region, northern Tanzania.

Materials & Methods

This was a secondary analysis of a hospital-based cohort study from maternally linked medical birth registry data at the Kilimanjaro Christian Medical Centre (KCMC) between the years 2000-2018. A total of 47035 singleton deliveries were included in this study. Data analysis was performed using Statistical Package for Social Sciences (SPSS version 20). Relative risk and corresponding 95% confidence intervals were used to determine association between low birth weight and paternal characteristics using log-binomial regression models, with robust standard errors to account for clustering of deliveries within mothers.

Results

The proportion of LBW during the study period was 9.6%, which is slightly higher than the national estimate. After adjusting for maternal characteristics, higher risk of LBW was among fathers with low education level (RR=1.72, 95%CI 1.22, 2.41, p=0.002), young aged ≤ 24 years old (RR=1.37, 95%CI 1.21, 1.55, p=0.001), and to those unemployed (RR= 1.11, 95%CI 1.01, 1.21, p=0.04). Lower risk of LBW was among fathers aged ≥ 40 years old (RR=0.97, 95%CI 0.88-1.08, p=0.69), but this association was not statistically significant

Conclusion

This study is probably the first to confirm some paternal characteristics as predictors for low birth weight in Tanzania and Sub-Saharan Africa (SSA).

Current evidence on the effect of paternal characteristics on LBW might suggest that programs and policies should target their engagement as a key strategy for improving birth outcomes during the perinatal period.

The influence of younger paternal age on LBW is, however not clear, future studies should assess how paternal factors are associated with the risk of LBW.

Low rates of maternal and neonatal complications in vaginal birth after cesarean and elective repeat cesarean delivery

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¹ Duchess Anna Mazowiecka Public Teaching Hospital, 2nd Department of Obstetrics and Gynecology, Warsaw, Poland

Introduction

Cesarean section rates are constantly rising worldwide, and so is the number of women with a prior cesarean that consider a delivery mode for their next labor. We aimed to compare maternal and neonatal outcomes in vaginal birth after cesarean (VBAC) versus elective repeat cesarean delivery (ERCD).

Materials & Methods

This was a retrospective cohort study of women delivering vaginally or by a cesarean section at a tertiary center in Warsaw, Poland between 2016 and 2018. Files of patients with one past cesarean delivery and a subsequent second delivery were reviewed. Singleton spontaneous vaginal deliveries and singleton elective repeat cesarean deliveries that resulted in a live birth were included. Maternal and neonatal characteristics and outcomes were compared between the groups.

Results

355 deliveries matched the inclusion criteria, from which 121 women delivered vaginally (VBAC group) and 234 women delivered through a cesarean (ERCD group). Neonates born by cesarean delivery were more likely to have higher birth weight ($p < 0.0001$), higher weight at discharge ($p < 0.0001$), macrosomia ($p = 0.040$), lose $> 10\%$ of their body mass ($p = 0.001$), be hospitalized longer ($p = 0.002$), and be fed by breast and formula ($p = 0.0002$). Children born vaginally were more likely to be exclusively breastfed ($p = 0.0001$).

Women undergoing VBAC were more likely to deliver preterm ($p < 0.0001$) and post-term (at 40 or more weeks of gestation) ($p < 0.0001$), present with PROM ($p < 0.0001$), experience intrahepatic cholestasis of pregnancy ($p = 0.048$), postpartum anemia ($p < 0.0001$), and birth injury ($p < 0.0001$). The incidence of anemia during pregnancy was higher in the ERCD cohort ($p = 0.004$).

Conclusion

Both VBAC and ERCD are associated with maternal and neonatal complications, but the rates of each are low. Efforts should be made to encourage women to deliver vaginally after a prior cesarean as it is a safe option.

Effect of early maternal-newborn skin to skin contact in labour room on third stage of labour and success at breastfeeding

bhatt, M.V. (Miti)¹, Agrawal, SP (Siddharth)¹

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Introduction

Immediate postpartum period and birth pose many challenges for the mother and the newborn. India, though being a fast developing country, still has very high maternal and neonatal mortality rates. It is the need of the hour to find out cost effective, easy and reliable ways to decrease these rates. In our study, we hence try to prove the statistical significance of giving early skin to skin contact(SSC) in labour room on 1)third stage of labour and 2)success at breastfeeding.

Materials & Methods

Randomized control trial conducted over a period of 7 months in a tertiary care centre enrolling 400 labouring women.200 in the control group were given routine care. In the 200women in the study group, the newborn was given immediate skin to skin contact by placing him/her on the mother's chest.

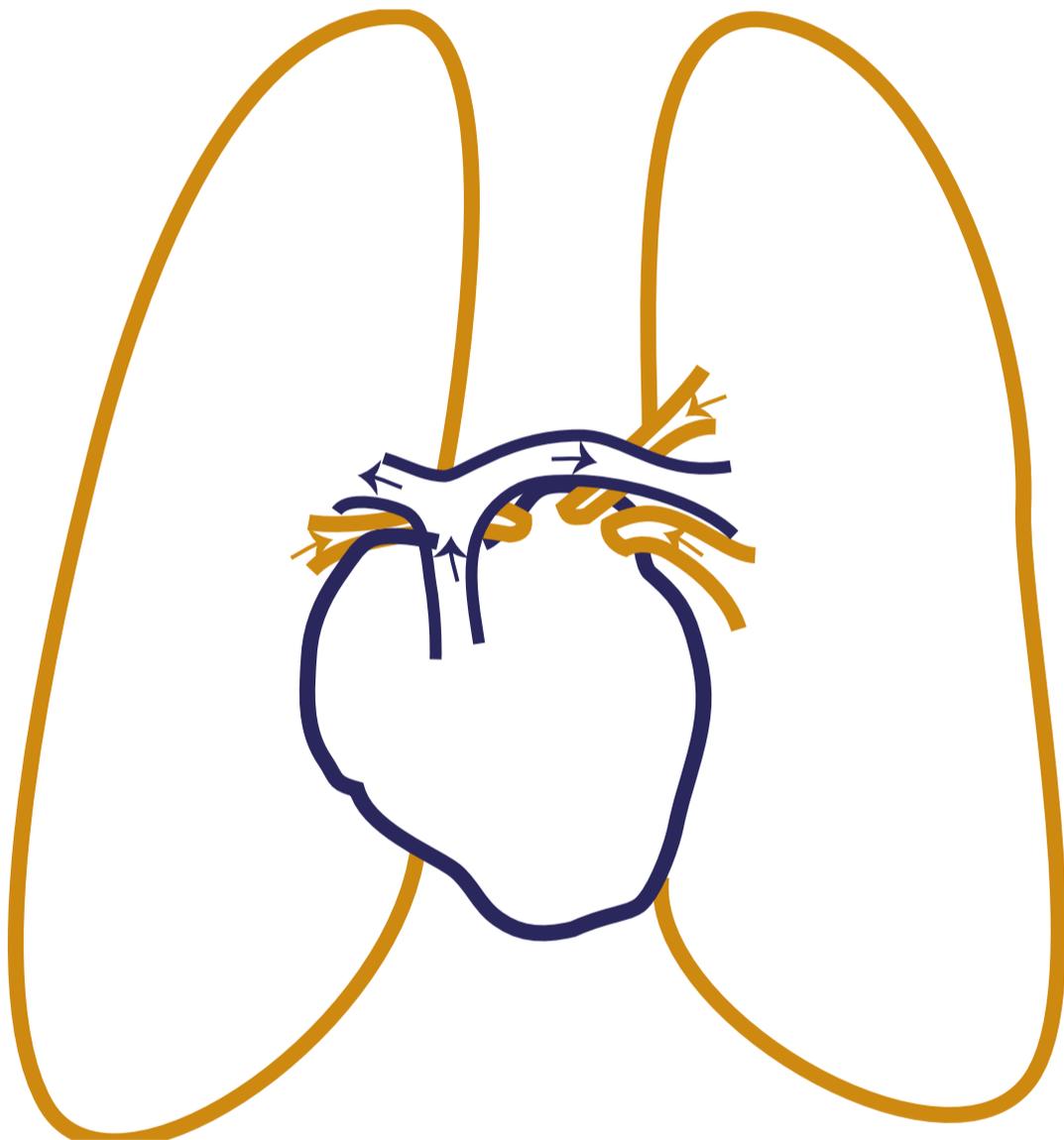
Results

Duration of third stage of labour was less than 10 minutes in 95%women of study group compared to 56% women in the control group($p < 0.01$).Placenta was expelled as a whole in 98% cases in the study group compared to 81% in the control group. Successful breastfeeding was observed in 88% women in study group compared to 54%in the control group($p < 0.01$).Breastfeeding was initiated within 30 minutes of birth in 96%women in the study group compared to 41% in the control group.

Conclusion

Uterus could contract faster with the complete expulsion of placenta and shortening of the third stage of labour with early skin to skin contact. The newborn showed early initiation and success at breastfeeding and longer first breastfeeding with early skin to skin contact.

Pulmonary Medicine



Presenters:

Vargas Restrepo, F.V.R. (Felipe)

Šakytė, K. (Karolina)

Kiełbowski, K. (Kajetan)

Tuberculosis attributable to healthcare work in Colombia

Vargas Restrepo, FVR (Felipe)¹

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Introduction

Tuberculosis infection and disease are frequent in healthcare workers due to their daily exposure to *M. tuberculosis* in healthcare settings. In this research, it was intended to estimate the incidence of active tuberculosis in healthcare workers in Colombia and calculate the fraction attributable to work in healthcare between 2011 and 2015.

Materials & Methods

We used consolidated data in official Colombian information sources, annual rates of tuberculosis incidence in the general population and in healthcare workers were calculated. Through a spatio-temporal analysis (Poisson distribution), the regions with the highest incidence of active tuberculosis in healthcare workers were located. We estimated the attributable fraction of healthcare work (using Levin's classical formula) and it was with an alternative formula for attributable fraction that includes the reproductive number, which varied from 0.025 to 3.025 for Colombia and some regions prioritized by the spatio-temporal analysis.

Results

A total of 715 cases of healthcare workers with active tuberculosis were registered in Colombia between 2011 to 2015, the highest incidence was 39.3/100,000 healthcare workers in 2011 (95% CI 31.3-47.2). The incidence of more than 50 cases of tuberculosis per 100,000 healthcare workers were located in Atlantico and Choco, and capital city of Bogota had low incidence (<25/100.000). The spatial analysis grouped (cluster) the regions of north and western central region of Colombia ($RR > 1$) as risk regions for tuberculosis in healthcare workers. An attributable fraction (Levin's formula) was estimated for Colombia of 0.45% in 2014, and 2.3% in the region of Sucre. The magnitude of the alternative attributable fraction was greater when the reproductive number approached to 1.

Conclusion

A fraction of the tuberculosis burden in Colombia is due to healthcare work, where there were higher incidences of active tuberculosis in some Colombian regions compared to general population. For this reason, studies oriented towards the construction of the differential profile of active tuberculosis in health workers with active disease in Colombia are necessary, with differentiation by risk groups and working conditions.

Sudden Death from Pulmonary Artery Fat Embolism. Retrospective Study.

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Introduction

Pulmonary fat embolism is a common complication of a traumatic injury that is rarely diagnosed by a clinical examination and may lead to a sudden death. The gold standard of a pulmonary embolism diagnosis remains an autopsy with a histological examination.

Materials & Methods

Retrospective analysis of Lithuanian State Forensic Service autopsy data, period 2013-2019. A total of 6132 cases were reviewed. Pulmonary fat embolism was histologically confirmed in 19 cases when fat emboli occupied >20% of the vascular lumen of large pulmonary arteries. The following data was collected: location of death, age, sex, height, thickness of subcutaneous fat, bone fractures, blood alcohol level, the cause of death, Abbreviated Injury Scale, and Injury Severity Score. Statistical analysis was performed using SPSS v. 25.0.

Results

Sudden death from pulmonary fat embolism occurred in 7 (36.8%) women and 12 (63.2%) men. Mean age was 61.92 ± 17.82 y. The average age of women was 75 ± 14.57 y. and was higher than that of men - 54.33 ± 15.23 y. ($p = 0.01$). No traumatic injury was found in one case (5.58%) when the patient was diagnosed with compartment syndrome after carbon monoxide poisoning. The average Injury Severity Score was 25.05 ± 12.47 . The victims of traffic accidents were 6 (31.6%) cases with higher rates of on the Injury Severity Score (35.5 ± 3.33) ($p=0.012$). A co-morbidity of fatty liver disease was found in 15 (78.9%) cases.

Conclusion

Pulmonary fat embolism in almost all cases occurred after traumatic injuries containing bone fractures. Dominate middle-aged men. Injury Severity Score is significantly higher in cases of traffic accidents. The risk of developing a fat embolism after injury may be increased by fatty liver disease but further researches including more cases are needed.

Extracorporeal life support in lung transplantation.

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¹ Pomeranian Medical University, Student Scientific Society, Szczecin, Poland

Introduction

Lung transplantation (LuTx) is a life-saving surgery for patients who do not respond to conventional treatment. Indications for LuTx include chronic obstructive pulmonary disease, cystic fibrosis, pulmonary fibrosis, pulmonary hypertension etc. During the transplantation patient might develop severe hypercapnia or pulmonary hypertension that are life-threatening conditions. Intraoperative use of extracorporeal life support: cardiopulmonary bypass (CPB) or extracorporeal membrane oxygenator (ECMO) allows to successfully complete the procedure. However, these two support machines have different impact on the organism of the patient. Verifying which method of extracorporeal life support provides better outcomes is crucial to increase the survival rate after lung transplantation.

Materials & Methods

77 lung transplantations that were performed at the Department of Thoracic Surgery and Transplantation were included. 37 (48%) patients did not require the use of extracorporeal life support and 40 (52%) patients did require the use of circulatory support. In this group, 8 (10%) patients needed the use of CPB and 32 (42%) required ECMO. In the ECMO group, 14 (22%) needed the peripheral ECMO and 18 (23%) required central ECMO. 30-days, 1-year and 5-years survival rates were reviewed using Kaplan-Meier curves.

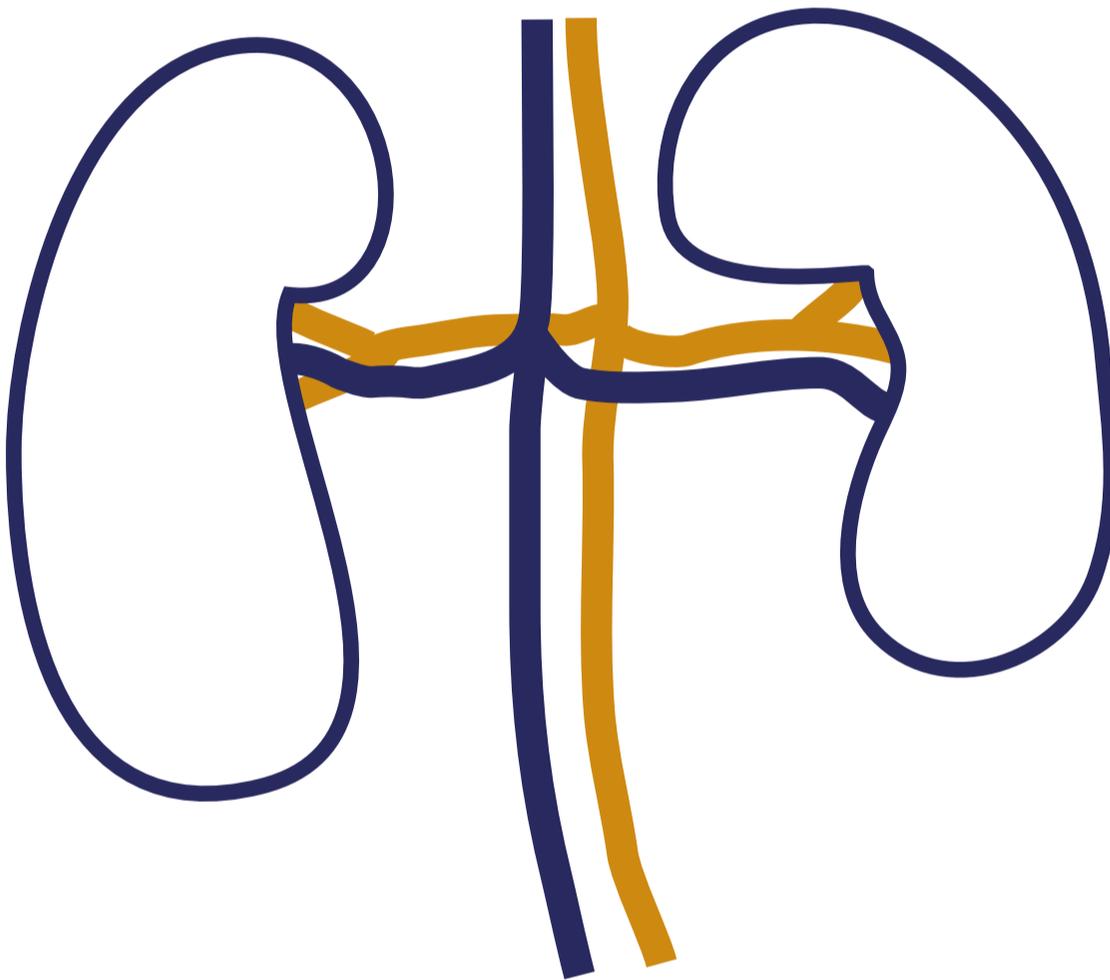
Results

Among 37 patients that did not require circulatory support, 30-days, 1-year, 5-years survival rates were: 83%, 65% and 44%. In the CPB group, 75%, 50% and 38% accordingly. In the peripheral ECMO group survival rates were 50%, 41% and 33% respectively. In the central ECMO 30-days survival rate was 78% while 1-year and 5-year survival rates were 66%. In the time period between 1 year and 5 years after LuTx death has not occurred in this group.

Conclusion

The long-term survival after LuTx with the use of central ECMO was better than in the rest of the groups. Thus, this type of extracorporeal life support is preferred. However, careful consideration for the circulatory support is required due to its strong impact on the organism. Lung transplantation is a challenging surgery for both patient and surgical team and further research is essential to achieve the best possible outcomes.

Nephrology



Presenters:

Cordeiro, M.S.C. (Marina)

Freitas Mascotte Sanches, F.F.M.S.
(Felipe)

Evaluation of nephroprotective potential of the Hydrolysed Rutin in a renal injury animal model induced by doxorubicin

Cordeiro, M.S.C. (Marina) graduate student¹, Priolli, D.G.P. (Denise) Associate Professor¹, Zecchiini, M.Z. (Marina) B.Sc.¹, Manprin, G.R.M. (Gustavo) B.Sc.¹, Santana, M.G.S (Maycon) B.Sc.¹

¹ Sao Francisco University, Health Sciences post graduation program, Bragança Paulista, Brazil

Introduction

Doxorubicin is an antineoplastic agent commonly used in Oncology. Disadvantages during its use includes tissue damage and systemic adverse effects, like Renal Injury development, which depends on Doxorubicin doses and exposure time. Prevention of renal toxicity to Doxorubicin is important to ensure a good response to treatment for cancer patients and reduce their comorbidities. Flavonoids have antioxidant, anti-tumoral and cytoprotective properties. Associated with antineoplastic agents, they may have renal protective effects. Hydrolyzed Rutin is a modified Rutin flavonoid with better bioavailability, allowing an optimized biological action. The objective of this study is evaluate the potential nephroprotection to Doxorubicin by Hydrolyzed Rutin in a kidney injury model.

Materials & Methods

The study followed the laws and management guidelines for Animal Experimentation. It was approved by the Research Ethics Committee of São Francisco University (# 002.09.2015). Balb/c-nu mice (n= 17) were used to obtain a Doxorubicin-induced kidney injury model. Animals were treated or not with Doxorubicin, with doses ranging from 7.5 to 20 mg/Kg, associated or not, to Hydrolyzed Rutin (0,078 g / Kg), according to the groups: Control, RH, DOX 7.5, DOX 7.5 + RH, DOX 20, DOX 20 + RH. The animals were monitored daily for clinical signs of toxicity. Structural renal lesions were assessed by conventional histopathological analysis (Hematoxylin & Eosin).

Results

Clinical signs of toxicity and renal histological changes like glomerular congestion were found in animals treated with Doxorubicin. Glomerular congestion was found in all animals from DOX 20 and DOX 20 + RH . Animals from groups DOX 7,5 and DOX 7,5+ RH did not develop renal structural lesions and did not manifest clinical toxicity too.

Conclusion

Doxorubicin is nephrotoxic. Hydrolyzed Rutin does not protect the kidney in Doxorubicin-induced kidney injury model. When Doxorubicin is used in lower doses it does not generate kidney damage or clinical toxicity.

AKI: Incidence, risk factors and outcome in severe COVID-19 patients at São Paulo, Brazil

Freitas Mascotte Sanches, F.F.M.S (Felipe)¹

¹ *UNIVERSIDADE FEDERAL DE SÃO PAULO - UNIFESP, Nephrology Division Federal University of Sao Paulo - UNIFESP, São Paulo, Brazil*

Introduction

COVID-19 represent a multisystemic and hyperimmune disorder and frequently causes acute kidney injury (AKI). However, the precise clinical and biochemical variables associated with AKI evolution in COVID-19 patients remain not investigated. In this study we performed a retrospective cohort study with 278 hospitalized COVID-19 patients between March-June of 2020 at University Hospital in São Paulo, Brazil.

Materials & Methods

We evaluated AKI incidence, several clinical variables, medicines, risk factors and outcomes in two groups: i) COVID-19 patients who developed AKI (n=80, Cov-AKI) and ii) patients who not had renal impairment (n=198, non-AKI). Patients younger than 18 years, with chronic kidney disease, in dialysis, with kidney transplant, with viral disease, users of immunosuppressants and with malignancies were excluded. AKI was defined according to KDIGO criteria.

Results

In general, we found elevated AKI incidence (71.2%, n=198) which was distributed in 31.8% for KDIGO stage 1, 20.7% for stage 2 and 47.5% for stage 3. Additionally, it was observed during admission elevated creatinine, CRP, leucocytes, neutrophils, monocytes and NLR (neutrophil-to-lymphocyte ratio) indexes in the Cov-AKI group.

Univariate logistical analysis revealed that AKI in COVID-19 patients was associated with older age (>62), hypertension, CRP, MCV, leucocytes, neutrophils, NLR, combination of hydroxychloroquine and azithromycin treatment, use of mechanical ventilation and vasoactive drugs. In addition, the Multivariate Logistic Regression showed that higher AKI risk was independently associated with hypertension, neutrophils counts and use of vasoactive medications. Finally, we detected an anemic and inflammatory profile in Cov-AKI group at hospital discharge.

Conclusion

In conclusion, our study documented that AKI development in severe COVID-19 patients was significantly associated with inflammatory blood markers, hypertension, mechanical ventilation and therapy with vasopressors or hydroxychloroquine+azithromycin. Thus, attention to medicines should be considered for COVID-19 patients with AKI and markers of inflammation and anemia in blood test may be useful to predict AKI development.

Immunology



Presenters:

Valdés, J. F. V. L. (Juan)

Paramita, I.H.P. (Isanawidya Hikmah)

Shapovalenko, N. (Nataliia)

Chikungunya virus infection promotes monocytes differentiation into M2 macrophages; perspectives of antiviral response as a marker of macrophage polarization

Valdés, J. F. V. L (Juan)¹

¹ *University of Antioquia, corporation of basic biomedical sciences-, Medellin, Colombia*

Introduction

Persistent polyarthralgia induced by Chikungunya virus (CHIKV) infection has been correlated with high serum levels of IL27 and the persistent CHIKV-infection of synovial macrophages. Recently, we reported that monocytes are target cells of CHIKV infection. Since the role of CHIKV infection in monocytes differentiation to macrophages is unknown. In this study we evaluated the polarization and inflammatory and antiviral response of macrophages differentiated in presence of CHIKV.

Materials & Methods

Healthy human monocytes were enriched from peripheral blood mononuclear cells by adherence to the plastic. Then, monocytes were cultured with or without CHIKV (MOI 10) and differentiated for 6 days to obtained MDM-CHIKV, and MDMs respectively.

MDMs features were analyzed by phase-contrast microscopy. Expression of MDMs markers, reactive oxygen species (ROS) production, size and granularity of cells were measured by flow cytometry. MDM response to TLR agonists was determined by quantification of cytokines by ELISA and RT-qPCR.

To select M1 and M2 markers, we analyzed the published RNA-seq (GSE117040), where MDMs were polarized to M1 and M2 profiles with IFN- γ and IL4+IL13, respectively, and then stimulated with LPS.

Results

MDM-CHIKV presents changes in cell morphology and cellular granularity vs MDMs. Additionally, MDM-CHIKV down-regulated the production of TNF α /IL6 (M1 cytokines) and up-regulated expression of IL10/TGF α /TGF β 1, (M2 cytokines) in response to TLRs activation. Furthermore, M2 macrophages and MDM-CHIKV expressed higher levels of interleukin (IL)- 27 (IL27) and antiviral proteins (AVPs) than M1 macrophages, suggesting a differential antiviral response dependent of macrophage polarization profile.

Additionally, MDM-CHIKV expressed higher levels of phagocytic receptors [CD206 (MMR) and FC γ RIIIA (CD16A)], both M2 markers, and an increased capacity of ROS production in response to opsonized zymosan.

Conclusion

We show an important role for CHIKV in induction of monocytes differentiation into macrophages with a M2 cytokines profile in response to TLR activation. However, MDM-CHIKV express higher level of IL27, AVPs and ROS, like M2 macrophages, suggesting that M2 characteristics induced by CHIKV infection could be associated in persistent of inflammatory response in CHIKV infected patients.

Peripheral Blood Immunophenotyping in Patients with Early Rheumatoid Arthritis to Identify B Cell Signatures for Predicting Clinical Response to DMARDs Treatment

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Introduction

Rheumatoid arthritis (RA) is a systemic inflammatory disease which mainly affected joints. The medication for RA has a heterogeneity of treatment response rendering a reduce quality of life in patients. Since early effective therapy could enhance the opportunity of remission, a baseline biomarker that can predict treatment outcome is urgently needed. The role of B cell in RA pathogenesis is well-known through the production of rheumatoid factor autoantibody. A growing evidence revealed the alteration in B cell phenotypes in peripheral blood in RA, but little is known whether the signature can predict the clinical response to DMARDs. This led us to examine a potential B cell signatures at baseline which serve a baseline predictor for DMARDs treatment response. Specifically, we try to identify a distinct B cell signatures in Early RA patients compared healthy control, evaluate the B cell subsets evolution over 12 months, and assess the association between the B cell signatures and treatment outcome.

Materials & Methods

Peripheral blood sample were collected from Scottish Nested Arthritis Progression Study, a nested study of The Scottish ERA inception cohort. To characterise B cell phenotype, deep-immunophenotyping is used, using a multi-centre harmonised multi-parameter surface and intracellular flow cytometry protocol. Twenty-six ERA patients were recruited at baseline. Only 18 and 24 patients returned for 6 and 12 months follow up, respectively.

Results

Our result shows a distinct B cell signatures in ERA compared to control, with a higher frequency of total B cells, pSTAT3, and pCBL signalling. Also, a lower frequency in pre-switch memory B cells, double negative B cells, and IgM-only memory B cells, pJNK, pSTAT1, and pPLCg phosphorylation in ERA. Those subsets and phospho-protein alter over 12 months after treatment, indicating their critical role in RA pathogenesis. However, the B cell signatures is not associated with DAS28 score at 12 months.

Conclusion

In this research, we did not find the baseline B cell signatures which can be used to predict therapeutic response. Nonetheless, this study sheds light on the potential use of B cells immunophenotyping to define RA molecular signatures at baseline which may serve markers of disease progression and clinical response to DMARDs therapy.

Effect of seminal plasma on markers of cytokine release syndrome

Shapovalenko, N (Nataliia) Laboratory staff¹

¹ Institute of Pediatrics, Obstetrics and Gynecology, Laboratory of Immunology, Kyiv, Ukraine

Introduction

Multiple studies proved the immunosuppressive effect of Seminal plasma on NK cells via prostaglandins E1 and E2. Hence, it is assumed that the use of components of Seminal plasma may help control Cytokine release syndrome. We aimed to assess this hypothesis by controlling three markers: NK-cytotoxicity - the ability of NK-cells to destroy Calcein-AM (Sigma) labelling K562; release of CD69 - an early marker of T-lymphocytes and NK-cells activation; and production of IL-6 - a sign of cytokine release syndrome.

Materials & Methods

A laboratory study ascertained 39 healthy women with mean levels of NK-cytotoxicity of 36.0, CD69 expression of 4.99, and IL-6 production of 5.03, measured by FACScan flow cytometer using CellQuest software (BD Bioscience, San Jose, USA). This data was used as control. Then we ran whole-blood stimulation with 1% of seminal plasma and polycytidylic acid (poly I:C). PolyI:C is structurally similar to double-stranded RNA, which is present in some viruses and is a "natural" stimulant of TLR3 that plays a fundamental role in pathogen recognition and activation of innate immunity.

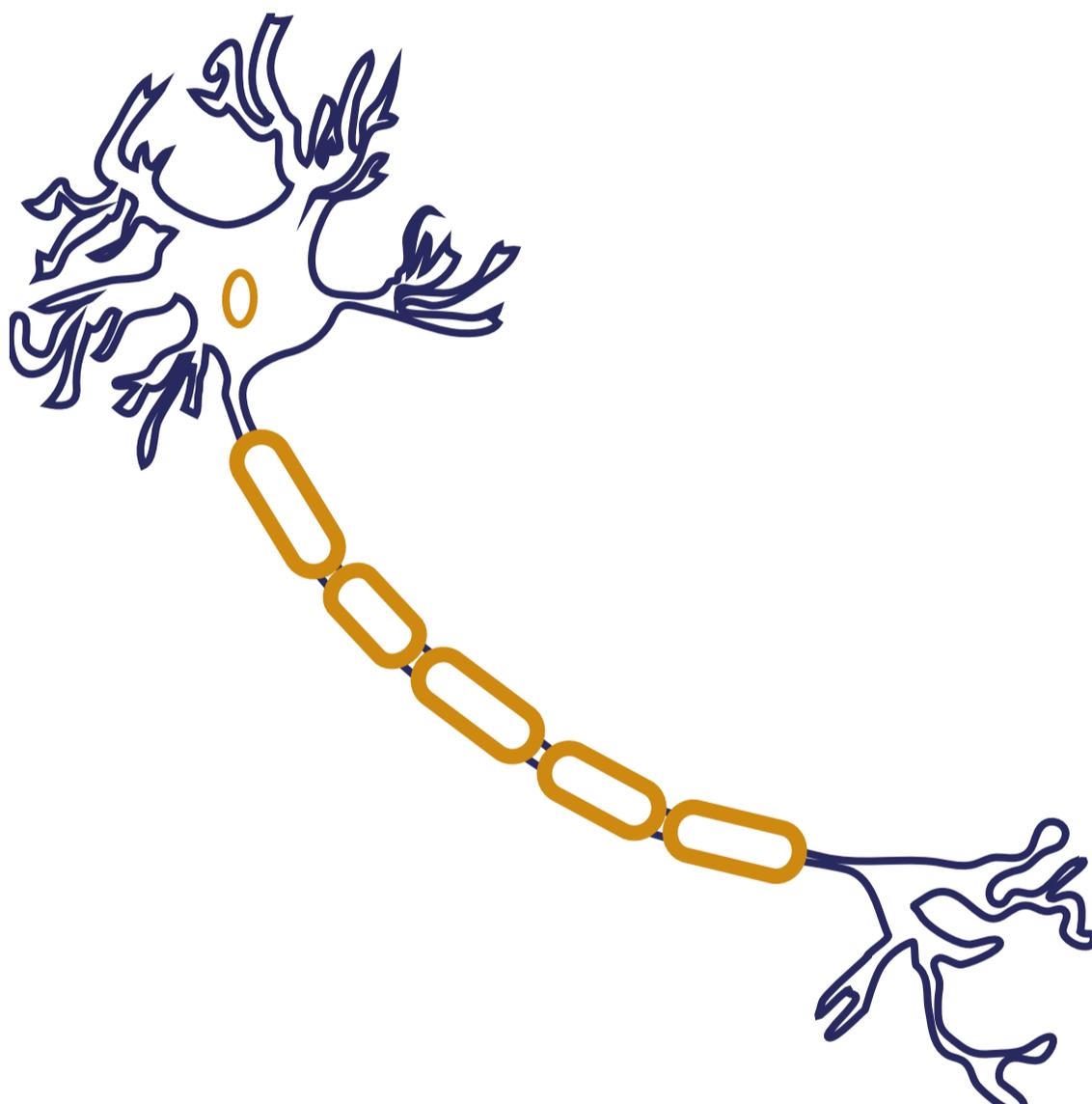
Results

The use of 1% of seminal plasma decreased all three markers validating the initial hypothesis of a positive impact of Seminal plasma on the markers of Cytokine release syndrome. Seminal plasma filtered through a 10kDa filter has the same inhibitory effect as native ($p=0,00004$). First, the use of Seminal plasma lowered NK-cytotoxicity from 36.0 (normal) to 14.3 (95%CI 3.8-32.1; p value = 0.0095; t Stat = 2.94). Second, it lowered CD69 expression from 57.3 (with PolyI:C) to 17.65 (95%CI 0.8-45.8; p value = 0.04; t Stat = 2.42). Finally, it decreased the production of IL-6 from 93.1 (with PolyI:C) to 50.4 (95%CI 15.4-113.5; p value = 0.00004; t Stat = 4.9).

Conclusion

If our results are confirmed by others, it may signify new possibilities for influencing the pathogenesis of the cytokine storm. This is especially relevant in cases when the cytokine storm is caused by agents that act via TLR3 (e.g., viral agents).

Neurology



Presenters:

Herings, P.M.R. (Pieter)

Ng, A. (Alexander)

González-Johnson, L.P. (Lucas)

González-Johnson, L.P. (Lucas)

Jani, R.J. (Ruchi)

Iqbal, H.

Training a neural network with gait data to predict cognitive impairment from patients in the early stage of dementia

Herings, P.M.R. (Pieter)¹

¹ *Trinity College Dublin, Mechanical, Manufacturing and Biomedical Engineering, Dublin, Ireland*

Introduction

With the ageing of Western Societies, we need to anticipate for an absolute increase in dementia occurrence over the years to come [1]. Early detection of patients that develop dementia is therefore important to improve our still limited understanding of this disease. Diabetes Mellitus Type II is a well-known risk factor for developing dementia. It can thus be interesting to study those patients as a high risk dementia group. Secondly, novel research has concluded that early cognitive impairment, another marker for developing dementia, can be identified with alterations in gait patterns [2, 3]. This research aims to use machine learning to predict cognitive impairment based on gait data by comparing the prediction accuracy of a trained neural network to a prediction with standard gait derived parameters, such as stride time, step length etc.

Materials & Methods

Gait data of 139 adults was acquired; middle-aged adults with uncomplicated Midlife Type 2 Diabetes Mellitus (N = 89; 52 ± 8.1 years, 47% female) and matched healthy controls (N = 50; 52 ± 8.3 years, 59% female). Gait data consists of inertial moment sensor data (Shimmer 3™) obtained while the subjects carried out a series of walking tasks. Cognitive assessment was carried out using the Montreal Cognitive Assessment (MoCa) and Cambridge Neuropsychological Test Automated Battery (CANTAB). 110 of the 139 patients will be employed to train the neural network, the remaining subjects will be used to assess the prediction accuracy of the network. Prediction accuracy of the network will be compared to the prediction accuracy of a regression model from standard gait parameters (e.g. stride time, step length). The neural network will be developed in Python TensorFlow 2™. Prediction accuracies will be compared with a chi-square test in GraphPad Prism 9™ (alpha=0.05).

Results

Expected in April/May 2021.

Conclusion

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Large Vessel Disease (LAD) in Ischaemic Stroke and Prognostic Implications

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Introduction

Ischaemic stroke is a major health issue. I constructed a database of stenoses across arteries in the cerebral circulation with their severity and distribution included. I explore differences in prognosis in patients from different subgroups and investigate the role of collateralisation and anatomical aberrances in the cerebrovascular system. Preliminary results of this ongoing study are presented.

Materials & Methods

This study utilises a cohort of 1004 patients admitted with cerebrovascular symptoms. Magnetic resonance angiography (MRA) images of the Circle of Willis and neck arteries are examined for any signs of focal narrowing/occlusion and abnormal anatomy. Stenoses are graded by NASCET Criteria. Significant LAD is defined as bearing stenosis > 50% in any artery analysed. Diffusion-weighted imaging (DWI) identifies patients with symptomatic lesions. DWI+ lesions are any region of hyperintensity larger than 15mm across the longest diameter. Arterial Spin Labelling (ASL) is utilised for the functionality assessment of collateralisation. The primary outcome is major adverse cardiovascular/cerebrovascular events (MACE), compared across the following subgroups: Significant LAD versus non-significant LAD; significant intracranial arterial stenoses [ICAS] only, significant extracranial arterial stenoses [ECAS] only and both. Secondary outcomes include variations in stenotic distributions, anatomical aberrances and collateralisation efficacy.

Results

The cohort includes 1004 (valid=947) patients during 2010-2014. 505 (53.3%) patients have significant LAD; 427 (46.7%), without. 193 (20.4%) patients have ICAS only. 166 (17.5%) have ECAS only. 145 (15.3%) have both ICAS and ECAS. 95 (10.0%) patients are identified with total occlusion(s). Patients with significant LAD have higher MACE than those without (n=111 vs 76, 22.0% vs 17.2%, p=0.37). Patients with both ICAS and ECAS have higher MACE than those with ECAS/ICAS only (26.2% vs 23.3% vs 16.8%, p=0.37). The right Middle Cerebral Artery is the most affected intracranial artery (n=72; 14.3%). Right Vertebral Artery is the most affected extracranial artery (n=79, 15.6%). Anatomical aberrances include artery of Percheron (n=1) and vertebrobasilar dolichoectasia (n=9).

Conclusion

Following this, variations in MACE, cardiovascular-related mortality and all-cause mortality in patients with specific arterial disease will be compared to the aforementioned subgroups. Collateralisation will be assessed by arterial spin labelling (ASL). Reviewing the prognostic implication of anatomical aberrances requires validation by a larger cohort.

Positive association between Amyloid- β pathology and UPDRS in patients with parkinsonism: a case control study

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Introduction

Parkinsonism is defined by association of bradykinesia, extrapyramidal rigidity, tremor at rest, and postural instability. There are multiple causes of parkinsonism, among the primary ones are idiopathic parkinson's disease (PD) and within the atypical parkinsonism, secondary or parkinson-plus are considered: progressive supranuclear palsy, multisystemic atrophy, corticobasal degeneration, secondary to drugs, among others. Since there are no diagnostic tests to distinguish PD from other forms of parkinsonism in vivo, the diagnosis of PD is eminently clinical. There is pathological overlap of different proteinopathies in different clinical phenotypes of neurodegenerative diseases. In this study We aimed to analyze clinical-epidemiological data and determine the potential use of Amyloid- β Precursor Protein (ABPP) ratio and tau ratio biomarkers as predictors of intensity of symptoms measured by Unified Parkinson's Disease Rating Scale (UPDRS) in patients with parkinsonian syndrome.

Materials & Methods

A consecutive case-control study which included a total of 88 volunteers treated at the neurology polyclinic of University of Chile Clinical Hospital, we considered cases: patients with PD, (+) controls: patients with atypical parkinsonism and (-) controls: healthy volunteers (without neurological disease). We measured epidemiological variables, physical examination with UPDRS, neurocognitive tests and complementary studies (including peripheral biomarkers: ABPP ratio and tau ratio). For statistical analysis we used χ^2 , t-student, Analysis of variance (ANOVA) with Bonferroni correction and linear regression.

Results

In a total of 88 volunteers, we enrolled 59 patients with parkinsonism: 29 for PD group and 30 for (+) controls; and 29 healthy volunteers for (-) controls. Coffee consumption is a protective factor for PD (OR=0.24 95%CI 0.07-0.79). A significant correlation was found between the sum of UPDRS parts 1,2,3 and ABPP ratio between case group and (-) control ($R^2 = 0.58$, $p < 0.001$). This result was evidenced by including the 3 groups ($R^2 = 0.37$, $p < 0.01$). We found a lower correlation between UPDRS and tau ratio ($R^2 = 0.26$, $p < 0.001$).

Conclusion

These results are consistent with literature indicating the association between Amyloid- β pathology and movement disorders measured by UPDRS. Tau and ABPP are able to distinguish (-) controls from PD patients. More studies are needed to validate these serum biomarkers for inclusion in routine clinical practice.

Differences on local recurrence and survival in patients with single brain metastasis treated with Surgical Resection or Stereotactic Radiosurgery: a meta-analysis

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Introduction

Brain metastases (BM) are the main direct neurological complication of cancer and are the most frequent intracranial tumours in adults. Approximately 30% of these intracranial tumours are single. In patients with solitary brain metastasis, surgical resection (SR) or stereotactic radiosurgery (SRS) can be performed but there is limited evidence comparing one treatment over the other. We aimed to compare SR versus SRS on patients with small solitary brain metastases, regarding local recurrence (LR) and overall survival (OS) conducting a meta-analysis.

Materials & Methods

Systematic review of literature following PRISMA guidelines, using the databases of Medline, Clinicaltrials.gov, Embase, Web of Science, Scindirect, CINAHL, Wiley Online Library, Springerlink and LILACS until May 2020. Following study selection based on inclusion and exclusion criteria, data extraction and a critical analysis of the literature was performed according to the GRADE scale. For quantitative analysis a random effects model was used. Data was synthesized and evaluated on a forest plot and funnel plot model.

Results

Two randomized clinical trials, four cohort studies and one case-control study met our inclusion criteria for the qualitative analysis. None was excluded subsequently. Overall, 664 patients with single metastasis were included. Studies had high heterogeneity (with or without Whole Brain Radiotherapy in each arm and different tumor size) that limited comparison. Multiple significant variables affecting the outcome were signaled. Meta-analysis showed no significant differences for survival (HR 1.1; 95% CI, 0.64-1.56) or local recurrence (HR, 0.81; 95% CI, 0.30-1.31).

Conclusion

According to current evidence, in patients with a single small metastasis there is no statistically significant difference in OS or LR among the chosen techniques (SR or SRS). Multiple significant co-variables may affect both outcomes. Different outcomes better than OS should be evaluated in further randomized studies. Neuro-oncology committees should consider their local experience and individualized approach for each patient and also this current evidence.

Outcomes of patients presenting with Guillain - Barre Syndrome at a tertiary care center in India.

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Introduction

The Guillain-Barre syndrome (GBS) also known as acute idiopathic polyneuritis, is an acute acquired condition associated with preceding nonspecific infection or triggering factors like trauma, surgery, or vaccination. GBS is currently the most frequent cause of acute flaccid paralysis in India. This study evaluates the short term and in-hospital outcomes in different subtypes of GBS.

Materials & Methods

A prospective observational study was conducted at V.S. Hospital, Ahmedabad, from September-2015 to December-2017. Patients above the age of 12 were included. Patients with other underlying neurological conditions as well as immunodeficiency disorders were excluded. The patients were classified into different subtypes of GBS and functional outcomes were recorded on admission and discharge according to Hughes Scoring System (HSS). All statistical analyses were performed by using SPSS software.

Results

Out of 50 patients, 35 (70%) were males. The mean age was 37.18 +/- 18.35 years. 25 (50%) patients had a preceding infection. 88% of patients who presented with cranial nerve involvement had HSS of ≥ 3 ($p= 0.0087$). They had less improvement of HSS on discharge (0.13 +/- 0.04) as compared to the patients without cranial nerve involvement (0.38 +/- 0.08) ($p=0.008$). Respiratory involvement was associated with higher HSS ($p=0.005$) on admission. 85% of patients diagnosed with an axonal subtype of GBS had an HSS of ≥ 3 ($p= 0.06$) compared to 74% of patients with demyelinating subtype. Axonal subtype required double time period (11 +/- 2.34) to show improvement as compared to demyelinating subtype (6 +/- 1.2) ($p=0.020$). Irrespective of the subtypes, there was no difference in improvement based on the treatment modalities including Intravenous Immunoglobulins (IVIG) or Therapeutic Plasma Exchange (TPE). ($p=0.89$).

Conclusion

Early cranial nerve or respiratory involvement in patients presenting with GBS is associated with poor outcomes warranting timely intervention with TPE or IVIG. In our study, amongst all the subtypes, the axonal subtype had poor clinical outcomes. Further clinical trials on the Indian subpopulation will help us evaluate the impact of different treatment modalities on this disease.

The impact of high-intensity exercise on the vestibular-oculomotor screening (VOMS) in sedentary individuals.

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Introduction

VOMS was created as part of a comprehensive concussion assessment, however the correct timing of assessment has yet to be established with some studies proposing it as a pitch-side assessment tool. VOMS is a measure of two functions of the vestibular-oculomotor system - the vestibular-spinal reflex (VSR) and the vestibular-ocular reflex (VOR). Symptoms of concussion include loss of balance, visual disturbances and nausea, all of which are clinically significant findings of VOMS. The impact of exercise on VOMS must be examined to determine its effectiveness as a side-line concussion assessment tool.

Materials & Methods

A repeated methods design was implemented. 30 sedentary participants (17 female and 13 male) aged 24.5 ± 4.8 (ranged 19-35) were assessed for vestibular-oculomotor function using the VOMS. VOMS was assessed for each participant at baseline and following a 5-minute high intensity treadmill run a maximum of three times to assess for changes in performance. Chi-square calculations and binomial linear regression analysis evaluated the influence of different variables on the outcome.

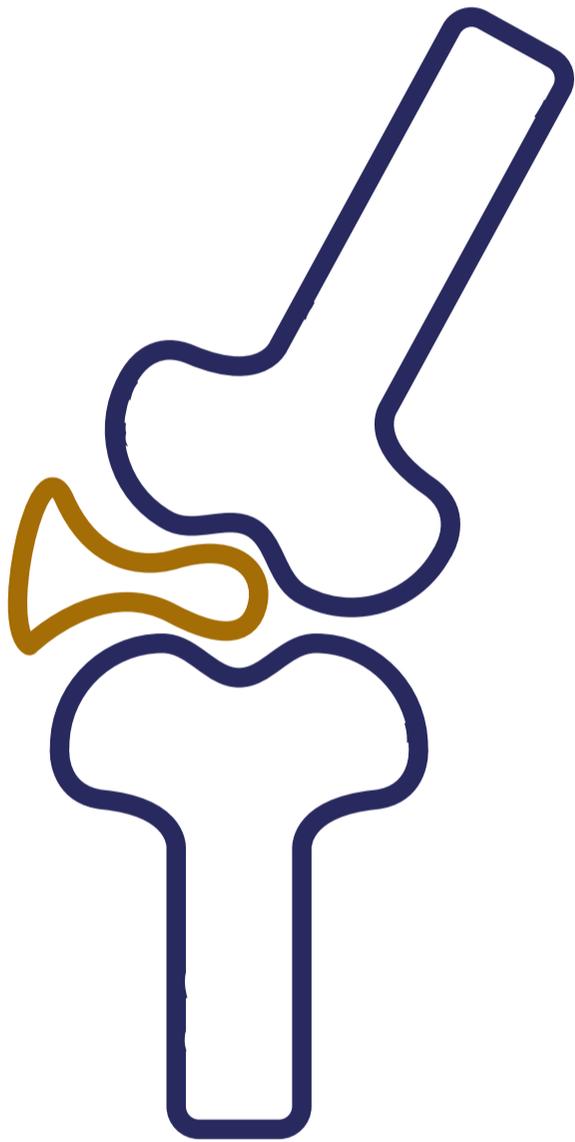
Results

77% (n = 23) of participants experienced clinically significant post-exercise symptoms ($P < 0.00001$). Females were 5.4 times more likely to experience clinically significant dizziness than males ($P < 0.05$), and 13.5 times more likely to experience dizziness due to vertical saccades ($P < 0.05$). Horizontal and vertical vestibular-ocular reflexes were most deficient, provoking 42/98 (43%) of symptoms, whilst dizziness provoked 47/92 symptoms (48%).

Conclusion

There is strong evidence to suggest that exercise leads to deficiencies in the vestibular-oculomotor function even in the absence of a head injury, and that prior exertion needs to be considered before use of VOMS. The efficacy of VOMS as a side-line concussion assessment tool needs to be further investigated.

Orthopaedics



Presenters:

Slevin, Z. (Zack)

Jhaveri, S. (Subir)

Gopinath, B.G. (Bhargav)

Immediate effect of kinesiology tape on ankle stability

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Introduction

Lateral ankle sprain is one of the most common musculoskeletal injuries, particularly among the sporting population. Due to such prevalence, many interventions have been tried to prevent initial, or further, ankle sprains. Current research shows that the use of traditional athletic tape can reduce the incidence of sprain recurrence, but this may be at a cost to athletic performance through restriction of motion. Kinesiology tape, which has become increasingly popular, is elastic in nature, and it is proposed by the manufacturers that it can correct ligament damage. Kinesiology tape, therefore, may be able to improve stability and reduce ankle sprain occurrence while overcoming the problems of traditional tape.

Materials & Methods

27 healthy individuals were recruited, and electromyography (EMG) measurements were recorded from the peroneus longus and tibialis anterior muscles. Recordings were taken from the muscles of the dominant leg during induced sudden ankle inversion perturbations using a custom-made tilting platform system. This was performed with and without using kinesiology tape and shoes, creating four different test conditions: barefoot(without tape), shoe(without tape), barefoot(with tape) and shoe(with tape). For each test condition, the peak muscle activity, average muscle activity and the muscle latency were calculated.

Results

No significant difference ($p > 0.05$) was found by using the kinesiology tape on any of the measured variables while the wearing of shoes significantly increased all the variables.

Conclusion

Kinesiology tape has no effect on ankle stability and is unable to nullify the detrimental effects that shoes appear to have.

Minimal Invasive Discectomy vs. Primary Fusion in Large Lumbar Disc Prolapse

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Introduction

Recent literature has advised Primary Fusion for treating patients with “large” or “massive” prolapsed lumbar intervertebral discs (PID), citing increased recurrence rates and back pain following only lumbar discectomies. However, Primary Fusions pose greater restrictions on day-to-day activities of patients, and also subject them to a potential second surgery early on in life; The objective of this paper is to identify the best methodology to treat “large” lumbar disc herniations.

Materials & Methods

From a total of 279 patients (168M,111F) who underwent MIS Discectomy using tubular discectomy system, 68 patients were identified as having “large” PIDs (Group A), and 211 patients were identified as having “non-large” PIDs (Group B). ODI & VAS scales for back and leg pain were noted pre-op, post-op at 6 months, and at last follow-up. Mean follow-up was 38.5(6–129) months.

Results

VAS (Back) improved from 7.27 to 1.03 (Group A, $p < 0.00$) & from 5.04 to 1.43 (Group B, $p < 0.00$); and VAS(Leg) improved from 8.53 to 0.86 (Group A, $p < 0.00$) & 8.20 to 0.90 (Group B, $p < 0.00$). Mean ODI improved from 71.6 to 8.44 (Group A, $p < 0.00$) & from 62.77 to 10.68 (Group B, $p < 0.00$). 10(14.70%) patients in Group A had recurrent PID, of which, 7 were treated non-operatively, while 3 underwent revision discectomy. Comparatively, only 5(2.37%) patients in Group B had recurrent PID, of which, only one required revision discectomy. None of the patients in either group demonstrated a second recurrence. Group A had a slightly higher degree of the residual disc but was not significant statistically ($p = 0.09$). Only two patients in Group B had post-operative discitis and underwent lumbar fusion. The difference in improvement between Groups A (median=6.75) & B (median=3.0) was significant ($p < 0.00$), inferring greater improvement in back pain following surgery in Group A, thus invalidating primary lumbar fusion as an option.

Conclusion

14.70% of patients having “large” PID, developed recurrent PID. VAS and ODI scores correlated well with “non-large” group but showed significant difference regarding improvement in back pain. No patient required lumbar fusion surgery for recurrent PID. We strongly recommend primary lumbar microdiscectomy as the first line of approach for all disc prolapses, including “large” ones.

2D:4D Length Ratio of the Hand and Predisposition to Knee Osteoarthritis.

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Introduction

Osteoarthritis (OA) is a debilitating condition affecting a large portion of the population. Limited disease-modifying treatment is available for OA, hence it becomes crucial to shift the paradigm from palliative management towards prompt diagnosis and treatment.

Although many imaging and biochemical markers aid in the assessment of pre-osteoarthritic states, they cannot be utilised for primary prevention.

Recent research shows that the index to ring finger (2D:4D) ratio shows correlations with numerous physical and psychological characteristics. However, there is seldom research examining this ratio as a prospective risk factor for OA.

Materials & Methods

This case-control study was conducted in Government Wenlock Hospital, Mangalore. The total number of subjects was 288 of which 96 were cases with knee OA and 192 age and gender matched controls without OA. Owing to the pandemic, subject communication was via phone. Digital photos of the patients' hands were obtained using controlled photography guidelines and 2D:4D ratios were calculated by digital calipers. Data was then divided into 3 groups. Type 1 (2D:4D ratios < 1), type 2 (2D:4D ratios = 1) and type 3 (2D:4D ratios > 1). Statistical Package for Social Sciences was used for data analysis. Odds ratio was calculated and independent t-test was used to compare cases with controls. Chi-square test was used to determine the association between 2D:4D ratio and knee OA. A p value < 0.05 was considered as statistically significant.

Results

Among controls, type 2 (37%) and type 3 (35%) morphologies were more prevalent than type 1 (28%). In addition, type 3 and type 1 patterns were more frequently seen in males and females respectively. In patients with knee OA, the majority displayed type 3 (70%) morphology as compared to type 1 (18%) and type 2 (12%).

Conclusion

Limited disease-modifying treatment is available for OA due to its insidious onset and late stage diagnosis. Hence management should be targeted towards primary prevention.

This study demonstrates a non-invasive modality to screen individuals at a higher risk of developing OA. Individuals with type 3 morphology can be counseled to avoid risk factors such as obesity and mechanical overload to reduce their susceptibility to OA.

Oncology



Presenters:

Alrabadi, N.N.A. (Nasr)

Helmich, L.P. (Lucca)

Boers, J. (Jorianne)

Badripour, A. (Abolfazl)

Machado, A.B. (Ana)

Michaelides, P.S.M. (Panikos)

Patsalias, A. (Athanasios)

Foda, A.A.R.M. (Abd Al Rahman)

Efficacy and Safety of Immune Checkpoint Inhibitors in Advanced Melanoma Patients with Anti-PD-1 Progression: A Systematic Review and Meta-analysis

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Introduction

More than half of melanoma patients taking first-line anti-PD-1 therapy either express transient or no response at all. Efficacy and safety of secondary treatments for these patients are still not well-established. Here, we evaluate the efficacy and safety of different melanoma FDA approved ICI modalities used in post-anti-PD-1 refractory settings

Materials & Methods

We searched the PubMed database and the ASCO meetings library for studies on advanced melanoma patients with cancer progression on anti-PD-1 therapy and were then treated with ipilimumab, nivolumab/ipilimumab combination or retreated with anti-PD-1. Primary and secondary endpoints were efficacy (Objective Response Rate - ORR and Median Overall Survival - mOS) and toxicity (Immune Related Adverse Events - irAE), respectively. Pooled estimates for each treatment group were obtained using a random or fixed effects model according to detected heterogeneity

Results

Fourteen studies, of which 10 included ipilimumab, 2 included anti-PD-1 treatment, and 6 included combination therapies, were included, involving a total of 1460 patients. As for ORR, some patients experienced a response that was inferior compared to the same therapy in treatment-naïve patients, with combination therapy having the best ORR of a pooled 23.08% (95% CI: 16.75% to 30.03%), followed by anti-PD-1 treatment with an ORR that ranges from 19% (a pooled analysis study on 500 patients) to 25% (a study on 12 patients), and lastly ipilimumab with a pooled ORR of 8.19% (95% CI: 5.78% to 10.92%). Survival data though poorly reported, was inferior in the ipilimumab cohort compared to ipilimumab in anti-PD-1 naïve patients (mOS: 5.1 to 7.4 months) As for grade 3/4 irAEs occurrence, the ipilimumab cohort showed an estimate of more than 43.8% (95% CI, 22.6% to 66.2%). Interestingly, grade 3/4 irAEs after combination therapy in anti-PD-1 progressed patients were almost equal or remarkably less than those after both anti-PD-1 or combination therapies in treatment naïve patients, respectively.

Conclusion

Our findings provide the best current evidence that patients who progress on anti-PD-1 can still respond to different ICI modalities (ipilimumab with or without nivolumab, and retreatment or continuation beyond progression with anti-PD-1) with tolerable grade 3/4 irAEs. More prospective clinical trials are needed to confirm these results

Differential expression of the lncRNA IGFL2-AS1 in uterine cervix cancer cell lines

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Introduction

Data obtained by our research group revealed that the long non-coding RNA (lncRNA) IGFL2-AS1 is more expressed in cervical squamous cell carcinoma tissue samples than cervical adenocarcinoma samples. Thus, this study has three objectives: the first is to evaluate the differential expression of lncRNA IGFL2-AS1 in a representative cell line for uterine cervical adenocarcinoma (HeLa) and a representative cell line for squamous cell carcinoma (SiHa). Secondly, we aimed to investigate whether DNA methylation could explain the observed difference in gene expression. Finally, we assessed the effects of artificially increased expression of IGFL2-AS1 in cancer cell proliferation and migration.

Materials & Methods

IGFL2-AS1 gene expression was evaluated through real-time quantitative PCR (RT-qPCR) after total RNA extraction and conversion to cDNA performed through reverse transcription. Quantification was achieved through $\Delta\Delta C_t$ analysis, normalized with GAPDH expression. For the treatment with 5-Aza-2'-deoxycytidine, HeLa cells were treated for 7 days with an optimal dose of 5 μ M, determined through a cytotoxicity assay. IGFL2-AS1 was upregulated through a CRISPR activation system called Synergistic Activation Mediators (CRISPR-SAM). Cell proliferation and wound healing assays were performed in activated cells and controls transduced with an empty guide RNA.

Results

The expression of IGFL2-AS1 in SiHa is markedly higher than in HeLa (fold change = 14.4) and treatment with 5-Aza-2'-deoxycytidine increases its expression (fold change = 3.5, $p < 0.001$) in HeLa cells. Wound healing was significantly impaired in cells with IGFL2-AS1 upregulation. There was no statistically significant difference in cell proliferation.

Conclusion

The difference in IGFL2-AS1 expression between SiHa and HeLa suggests it is a biomarker capable of differentiating the two main histological types of cervical cancer. It is possible that its low expression in HeLa is partially attributable to transcriptional repression through DNA methylation, since there is an increase in expression after treatment with 5-Aza-2'-deoxycytidine. Furthermore, IGFL2-AS1 could be involved in the regulation of cell migration behavior, a potential theme for future research.

Value of 18F-FES-PET to solve clinical dilemmas in breast cancer patients: a retrospective study

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Introduction

Breast cancer (BC) is a heterogeneous disease, in which estrogen receptor (ER) expression plays an important role in the majority of breast tumors. A clinical dilemma may arise when a metastasis biopsy to determine the ER status cannot be performed safely or when ER heterogeneity is suspected between tumor lesions. Whole-body ER imaging, such as 16 α -18F-fluoro-17 β -estradiol (18F-FES) positron emission tomography (PET), may have added value in these situations. However, the role of this imaging technique in routine clinical practice remains to be further determined. Therefore, we assessed the value of 18F-FES-PET by evaluating if the physician's clinical dilemma that remained after standard workup was solved by the 18F-FES-PET scan.

Materials & Methods

In this retrospective study, 18F-FES-PET scans, performed in patients with (suspected) ER+ metastatic BC with remaining clinical dilemma after standard workup, at the University Medical Center of Groningen between November 2009 and January 2019, were included. We investigated whether the physician's clinical dilemma was solved, defined as 1) 18F-FES-PET provided a solution for the clinical dilemma, and/or 2) a treatment decision was based directly on the 18F-FES-PET. In addition, category of clinical dilemma, and rate of 18F-FES positive or negative PET scans were reported, and related to frequency of solved dilemmas.

Results

One hundred 18F-FES-PET scans were performed in 83 patients. Clinical dilemma categories were: 1) inability to determine extent of (suspected) metastatic disease with standard workup (n=52), 2) unclear ER status of the tumor (n=31), and 3) inability to determine which primary tumor caused metastases (n=17). Dilemmas were solved by 18F-FES-PET in 87/100 cases (87%). In 81/87 cases a treatment decision was made based directly on the 18F-FES-PET (treatment change: n=51 cases; continuance: n=30 cases). The frequency of solved dilemmas was not related to the clinical dilemma category (p=0.334). However, the frequency of solved dilemmas was related to whether scans were 18F-FES positive (n=63) or negative (n=37; p<0.001).

Conclusion

For various indications, the 18F-FES-PET scan can help to solve the vast majority of clinical dilemmas that may remain after standard workup. Therefore, the 18F-FES-PET scan has added value in BC patients presenting with a clinical dilemma.

Dapsone attenuates intestinal inflammation via shifting M1/M2 macrophage polarization in rat model of pouchitis: Possible role of the NF- κ B signaling pathway

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Introduction

Ulcerative colitis (UC) is known as a gastrointestinal inflammatory condition which is yet considered challengeable. Almost 50% of UC patients undergo surgical intervention in their life time. Ileal Pouch-Anal Anastomosis (IPAA) is a known intervention for UC patients. Unfortunately, 30 to 40 % of patients would experience pouchitis after IPAA surgery and there is no definite treatment known yet against pouchitis. It has been demonstrated that macrophage phenotyping plays as a key role in the pathogenesis of inflammatory bowel disease(s). However, therapeutic targeting focusing on macrophage polarization has remained unclear. Dapsone is well known for its antibiotic and anti-inflammatory effects in various conditions. It has been hypothesized that Dapsone could also alter tissue inflammatory redox via regulation of NF- κ B. Herein we have aimed to investigate role Dapsone in pathogenesis of pouchitis focusing on the role of macrophage polarization.

Materials & Methods

Twenty-four male Wistar rats were assigned to 3 groups randomly. Sham group underwent laparotomy procedure. IPAA following proctocolectomy were performed in other groups. Seven days after the operation, pouchitis was induced using 4% acetic acid rectal enema. Control group received DMSO 1% while other group was treated with Dapsone 12.5 mg/kg + DMSO 1 % orally for 5 days. Eventually, intestinal tissue samples were obtained for further histopathological analysis including H&E (ulcer size and macrophage infiltration), IHC (TNF- α , CD86 and CD206) and RTPCR (NF- κ B).

Results

Intestinal H&E study revealed ulcer size and macrophage infiltration enhancement in treated group ($p < 0.001$). IHC analysis of the pouch demonstrated that Dapsone could attenuate expression of TNF- α ($p < 0.001$). Moreover, Dapsone could also reduce intestinal M1(CD86)/M2(CD 206) polarization expression ratio ($p = 0.006$). Also, qRT-PCR illustrated that Dapsone could decrease expression of intestinal NF- κ B ($p = 0.002$).

Conclusion

In this study, it has been shown that acetic acid induced pouchitis could represent that intestinal macrophage polarization is altered. Oral administration of Dapsone could enhance intestinal inflammation. However, precise mechanism of orchestration in localized redox requires further investigation.

The impact of ionizing radiation on macrophage iron metabolism and on macrophage-cancer cell crosstalk

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Introduction

Radiotherapy is a widely used cancer treatment. Although the effects of ionizing radiation (IR) on cancer cells are well-known, it is crucial to also understand the response of tumor-associated host cells, such as macrophages. Our group demonstrated that human macrophages present increased expression of transferrin receptor (TfR), a major regulator of iron import, upon IR exposure (5x2Gy). It is known that macrophages can present an iron retention phenotype, limiting tumor growth, or an iron release phenotype, contributing to cancer cell proliferation and survival. This project aims at understanding the impact of IR on macrophage iron metabolism and how that influences macrophage-cancer cell crosstalk.

Materials & Methods

The expression of macrophage iron metabolism-related proteins was evaluated by Western Blot. Macrophage intracellular and released iron levels were measured by spectrometry (ICP-AES). The levels of lipocalin-2 (LCN2) were measured on the conditioned media of irradiated macrophage-cancer cell co-cultures, through ELISA, and by gene expression analysis, through RT-qPCR. Immunohistochemistry was performed for TfR and F4/80, a macrophage marker, in mouse breast tumor tissue.

Results

Our results show that human irradiated macrophages present an upregulation of TfR and divalent metal transporter 1 (DMT1) protein levels, suggesting increased iron uptake and trafficking into the cytosol. Lack of changes in ferritin (FTL) or ferroportin (FPN) expression indicate no alteration in iron storage nor in ferroportin-dependent iron release. However, irradiation led to a significant rise in iron release, without affecting intracellular iron levels.

Additionally, IR tends to increase the secreted protein levels of LCN2, a pro-tumorigenic iron transporter, in SW1463-macrophage co-cultures. The colorectal cancer cells are the main LCN2 producers in this system, which is stimulated by macrophages and further exacerbated by IR exposure.

Finally, we observed that IR tends to upregulate TfR in macrophages in a mouse breast cancer model, supporting the translatability of our results.

Conclusion

Overall, irradiated macrophages seem to acquire an iron recycling phenotype, characterized by high iron uptake and release levels, through what seems to be ferroportin-independent iron export. Further studies are required to determine the exact macrophage iron export mechanism upon IR exposure and how this phenotype can influence cancer progression, possibly contributing to better radiotherapy efficacy.

A Study to Assess the Frequency and Survival Effect of EGFR Amplification in High--grade Oligodendrogliomas

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Introduction

This study aimed to evaluate the prognostic significance of epidermal growth factor receptor (EGFR) amplification in high-grade gliomas. EGFR is expressed at high levels in various cancer types due to its trophic and proliferative effects and thus serves as an overwhelming indicator of tumour malignancy and aggressiveness. Furthermore, examination of loss of heterozygosity (LOH) of 1p/19q loss, isocitrate dehydrogenase 1 (IDH1) mutation and Ki67 expression were also introduced into the study to gain a better picture of the biological make up of the tumour types.

Materials & Methods

In a series of 39 gliomas (11 anaplastic oligodendroglioma III - AO III, 16 anaplastic oligodendroglioma IV - AO IV and 12 glioblastoma multiformae-small cell - GBM-SC), EGFR amplification and LOH of 1p/19q were detected by fluorescence in situ hybridisation (FISH). DNA sequencing was done for IDH1 gene along with immunohistochemical technique for Ki67 expression. Log-rank analysis and COX regression methods were used to compare Kaplan-Meier plots and identify factors associated with worse prognosis.

Results

The mean age of survival for AO III was 4.99 ± 3.26 (median= 5.54), AO IV was 1.74 ± 1.26 (median= 1.44) and 1.29 ± 1.04 (median= 1.09) for GBM-SC, which was of statistical significance $P = .000$. 53.8% of AO IV tumours were EGFR positive and the frequency of EGFR positive tumours was significantly higher in the grade IV gliomas than in the grade III gliomas ($P = .001$; table 2). On the other hand, there was no significant difference in EGFR amplification frequency between AO III, AO IV and GBM-SC ($P = .062$; table 2). The only statistical significant factor in the univariate analysis of survival for all tumours was histological type. There was just over a 1.2 times increase in median survival for patients with no EGFR amplification, but was found to not be significant

Conclusion

AO IV subgroup of glioma is associated with shorter OS and larger frequency of EGFR positive tumours compared to AO III.

The role of ALDH1 in multidrug resistance of human colorectal cancer cells

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Introduction

Recent evidence in cancer research, developed the notion that malignant tumors consist of different sub-populations of cells, one of them, known as cancer stem cells, being attributed many important properties such as enhanced tumorigenicity, proliferation potential and profound multidrug resistance in chemotherapy. The role in multidrug resistance of different isoforms of Aldehyde dehydrogenase 1 (ALDH1) enzyme, in cells lines of human colorectal adenocarcinoma and colorectal cancer stem cells is the main scope of this study.

Materials & Methods

The effect of pharmacological inhibition of ALDH activity by diethylaminobenzaldehyde (DEAB) and also effect of molecular inhibition by specific siRNA was evaluated in vitro in cultures of human colorectal cell lines. The expression level of different isoenzymes of aldehyde dehydrogenase was determined using qPCR. Changes in cell biology were evaluated by expression analysis, western blot and apoptosis assay. The efficiency of cytotoxic treatment in the presence of different chemotherapeutic drugs was analyzed by fluorimetric assay. Tumorigenicity of cells with specific ALDH1A1 siRNA was tested in xenograft model in vivo.

Results

The augmentation in efficacy of chemotherapeutic treatment after silencing of ALDH1 isoform expression is evident, in the respective experiments with colorectal cancer cells. The reversion of drug resistance in cancer cells with induced chemoresistance after siRNA silencing of ALDH1 isoform expression was also observed in results. Additional verification, was provided by experiments with a chemical inhibitor of ALDH enzymes, known as N,N-diethylaminobenzaldehyde, proving cytotoxicity and synergy with other chemotherapeutic agents. The role of ALDH1 in tumorigenicity and tumor progression was determined by experiments with tumor xenografts in athymic, nude mice.

Conclusion

This research, verifies the significance of the Aldehyde dehydrogenase 1 isoforms in multidrug resistance of human colorectal cancer cells and its potential as a cancer stem cell marker. This provides the basis for the development of new approaches regarding the treatment of patients with colorectal adenocarcinoma and potentially the treatment of other tumor malignancies.

Expression of CA19-9 and CEA in mucinous and non-mucinous colorectal carcinoma and relation to clinicopathological features and prognosis.

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Introduction

Colorectal carcinoma is considered the third most prevalent carcinoma worldwide and is considered the fourth-leading cause of cancer-related death globally. Carcinoembryonic antigen (CEA) and Carbohydrate antigen CA 19-9 are used in evaluating patients with gastrointestinal tumors as both are adhesion molecules that play a role in the proliferation and survival of cancer cells.

Materials & Methods

From 2007 to 2011, 150 case files of colorectal carcinoma were revised. 75 cases were mucinous colorectal carcinoma (19 of which were signet ring colorectal carcinoma) and 75 cases were non-mucinous colorectal carcinoma. Cases were excluded from the analysis if the tissue core was lost in processing or if there was no recognizable tumor in the core. Tissue Microarray blocks were constructed using the modified mechanical pencil tip method and they were stained using mouse anti-human CA19-9 Ab and monoclonal mouse anti-human CEA Ab.

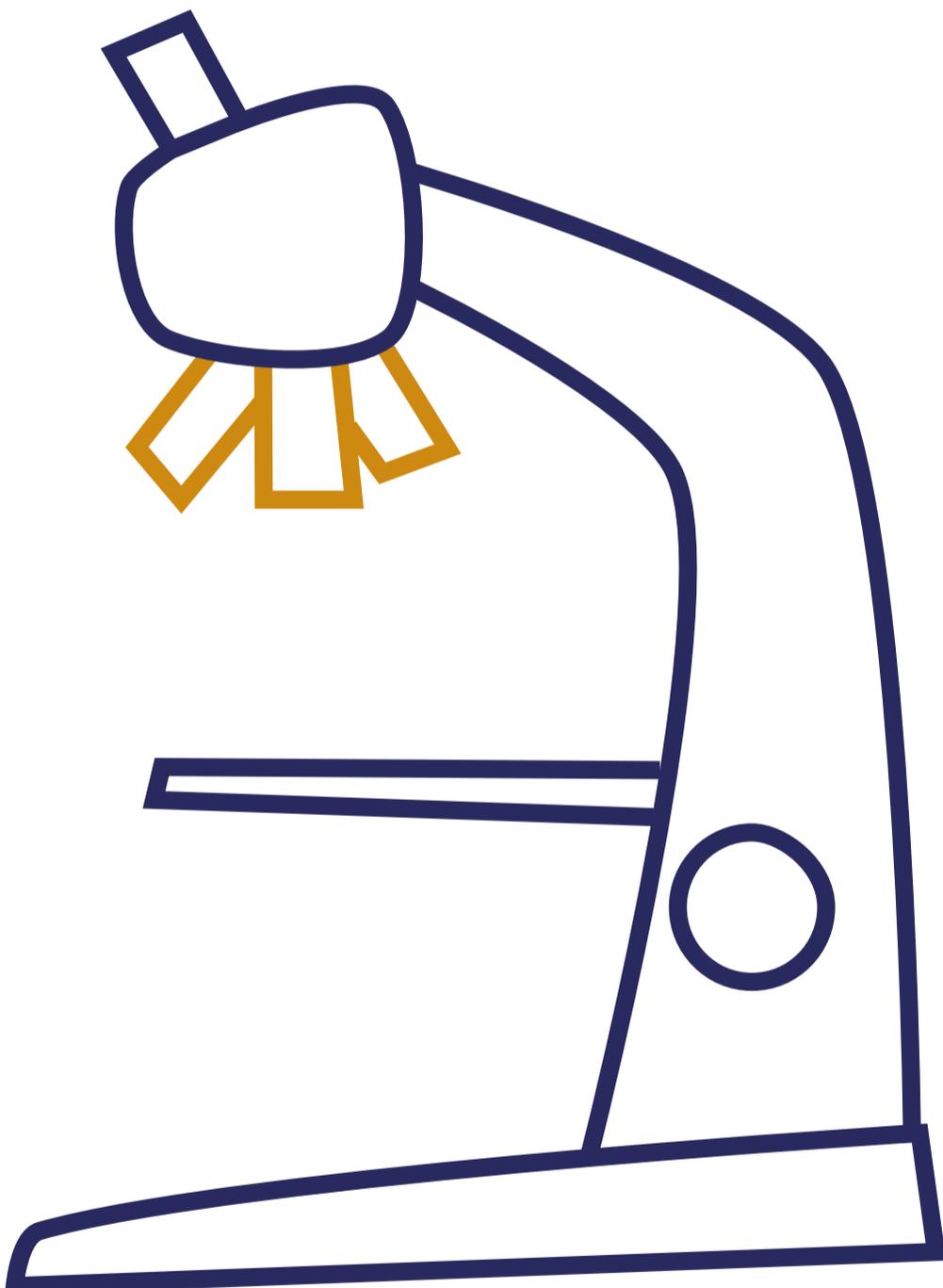
Results

CEA expression was positive in 56 cases (78.9%) of mucinous colorectal carcinoma (MA) and in 47 cases (64.4%) of non-mucinous colorectal carcinoma (NMA). CA 19-9 Expression was positive in 23 cases (32.9%) of mucinous variety and 32 cases (45.1%) of non-mucinous variety. NMA was associated with more positive CEA expression than MA, however, this relation approached but didn't reach significance ($p=0.054$). On the other hand, no significance was found between NMA and MA in CA19-9 expression. Increased expression of CEA was associated with younger age groups, schistosomal infection and prevalent lymphovascular invasion. On the other hand, CA 19-9 was associated with small tumor size (less than 6 cm) and significant lymphovascular invasion. Co-expression of CA-19-9 and CEA was found to be significant ($p=0.033$) in MA. More than one-half of the cases of MA showed co-expression of both markers, unlike NMA.

Conclusion

CEA and CA 19-9 expressions play an important role in the prognosis of colorectal carcinoma. CEA expression is associated with NMA, younger ages, and schistosomiasis. CA 19-9 expression is associated with smaller tumors and lymphovascular invasion. Both are co-expressed and significantly interrelated in MA, and not NMA. Positive CEA expression is associated significantly with better DFS and OS only in MA cases.

Pathology



Presenters:

Malkov, D.I. (Danil)

Vaibhav, A. (Ayush)

Prokhoniuk, A. (Alina)

Hatab, I.

Analysis of production MOTS-c peptide in adipose tissue and blood serum of obesity patients

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Introduction

The mitochondrial-derived peptide MOTS-c is involved in the regulation of lipid and carbohydrate metabolism. It also plays a protective role against obesity and metabolic syndrome. MOTS-c has auto-, para- and endocrine effects in insulin-dependent tissues.

Changes in the level of MOTS-c can lead to a decrease in fatty acid metabolism and the development of inflammatory processes observed in obesity, which indicates the therapeutic potential of this peptide.

The study aims to assess the level of MOTS-c in adipose tissue and serum in obese patients.

Materials & Methods

Obesity patients (BMI > 30 kg/m², n=84) were studied. The control group consisted of conventionally healthy donors with normal anthropometric and biochemical parameters (BMI < 30 kg/m², n=21). The study's material was biopsies of adipose tissue of various localization (Great omentum (GO), Subcutaneous tissue (ST), Mesentery (MS)) and blood serum. Semi-quantitative determination of proteins by immunoblotting was performed using specific monoclonal antibodies (ThermoFisher, USA), Mini-PROTEAN® Tetra Cell Systems and Mini Trans-Blot® Turbo blotting systems (BioRad, USA) and ELISA method (MOTS-c ELISA kit, MyBioSource, USA) were also used. Densitometry was calculated using the ImageLab software (Bio-Rad, USA). Since the data did not comply with ordinary distribution law, the differences in parameter values were assessed using the nonparametric Mann-Whitney U-test.

Results

It was shown that the level of the MOTS-c in the adipose tissue of GO 0.02(0.008-0.05) y.e. and ST 0.06(0.008-0.17) y.e. is reduced in obese people compared with control (p=0.02, p=0.002). No significant changes were found in the MS (p=0.38).

On the contrary, the peptide level in blood serum increased in obese patients 160.3(104.4-205.4) ng/ml as compared to the control group (p=0.021)

Conclusion

The MOTS-c decreases in GO and ST, but not in the Mesentery in obese patients relative to the control group. The MOTS-c level in the serum of obese patients is increased compared to the control group. MOTS-c in serum increases compensatory in obese patients, and its effects in adipose tissue are reduced. Therefore, the peptide is not useful enough for obese patients.

The tissue-specific effects of the peptide in insulin-dependent tissues and the auto-, paracrine properties require further study.

Estimation of Stature and Determination of Gender from Cephalo-facial dimensions in a South Indian Population.

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Introduction

Estimation of stature and gender is considered as an important parameter in forensic examinations. When advanced, mutilated dead bodies and fragmentary remains are brought for autopsy, it becomes difficult to identify the deceased. In major cases skeletal remains are brought in for forensic examination. In such a situation, estimation of stature and gender becomes equally important along with other parameters like age, race. The present study attempts to estimate stature and gender from various anthropometric measurements of cephalo-facial region of individuals belonging to South Indian origin.

Materials & Methods

A cross-sectional study will be done in the Department of Forensic Medicine and Toxicology, Kasturba Medical College, Mangalore [Affiliated to MAHE, Manipal, Karnataka, India] to obtain correlation between twenty-one cephalo-facial (CF) measurements with stature and gender based on regression equation and discriminant function analysis. The study population will consist of 100 medical students, which includes 50 male and 50 female subjects of KMC, Mangalore, ranging in age from 18-26 years of which 11 subjects, measurements have been recorded.

Results

Initial pilot study findings suggest that all the CF measurements are significantly correlated with stature and gender ($P < 0.01$) and also with gender. The CF measurements arranged in descending order based on their r value is Horizontal Circumference of Head > Maximum Head Length > Maximum Head Breadth > Morphological facial length > Bigonial diameter followed by the rest of the CF measurements for stature. In Males, Gender Biocular breadth gives best reliable results with 99.9% accuracy using logistic regression and in females, physiognomic facial height gives accuracy of 67.1% using discriminant function.

Conclusion

In general, cephalic measurements show lower values of standard error of estimate (SEE) compared to facial measurements in the pilot study conducted for determination of stature. Among both sexes, Horizontal head Circumference shows the least and Bigonial diameter shows the highest SEE value when compared to all the other CF measurements for estimation of stature. The regression analysis also showed that the cephalic measurements give better prediction of stature. For gender multivariate discriminant function gives precise results for females with 80.9% and logistic regression gives 92% defined results in males. This metrical approach is more purposeful and less reliant on the observer's skills.

DISORDERS OF CENTRAL NERVOUS SYSTEM FUNCTION IN EXPERIMENTAL TRAUMATIC BRAIN INJURY

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Introduction

Violation of Central Nervous System (CNS) function after traumatic brain injury (TBI) isn't fully studied problem. The search for neurotropic drugs, including carbacetam - the endogenous modulator of the GABA-benzodiazepine receptor complex, are promising.

Materials & Methods

The experiment was performed on 30 white male Wistar rats, in which TBI was reproduced according to the model of V.M. Yelsky, S.V. Ziablitsev (2005) with a free-falling load on a fixed animal's head. The impact energy was 0.425 J. Groups with TBI consisted of 15 animals: experimental - with the injection of carbacetam (5 mg / kg body weight), control – with the injection of 1 ml of saline intraperitoneally for 10 days after experimental brain injury. Violations of CNS function were studied by open field method, mink reflex, eight-sleeved labyrinth in 1, 3, 7, 14 and 30 days after injury. The content of vasopressin in the plasma was determined by enzyme-linked immunosorbent assay(ELISAs).

Results

In the control group there was a sharp decrease in the number of crossed squares and inspected holes – indicated a complete lack of motivation, curiosity and cognitive abilities. A sharp increase in the latency time of the rat to the dark chamber showed us the disorientation and inability to find the hole (cognitive impairment). Only the mink reflex spontaneously recovered within 30 days. In the experimental group, the indicators of approximate motor activity began to recover in a week. A month later, a probable ($p < 0.05$) increase in the number of successful measures to the sleeves in relation to the control group.

The level of vasopressin in the experimental group a day after trauma was 1.5 times lower ($p < 0.05$) than the control-indicated inhibition of primary post-traumatic activation of the neurosecretion process under the action of carbacetam. Hormone level in the experimental group returned to baseline, in the control group – decreased sharply.

Conclusion

The data indicated a probable recovery of CNS function in rats with experimental TBI under the action of carbacetam for 30 days of observation, that could be mediated by the restoration of neurosecretion of vasopressin.

Phenotypic changes in 3D cultivated ATGL-deficient lung carcinoma cell line A549

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Introduction

Tumors undergo angiogenesis and metabolic adjustments in response to their rapid growth and hypoxic microenvironment. Reduced level of adipose triglyceride lipase (ATGL) – an enzyme involved in lipolysis - was reported in lung cancer cells.

The aim of this study was to further understand the effect of reduced levels of ATGL on tumor behavior of non-small cell lung cancer (NSCLC) cell line A549.

Materials & Methods

The lung adenocarcinoma cell line A549 wild type (WT) and ATGL knockout (KO) were cultivated in 3-dimensional (3D) cell culture. 3D grown WT and ATGL-KO cells were placed on a chick embryo chorioallantoic membrane (CAM) and underwent histological analysis to evaluate tumor growth and proliferation. Furthermore, label free quantitative (LFQ) proteomic analysis was performed on the collected spheroids. Observation of angiogenic changes was done by using supernatants of the spheroids in the chick-embryo CAM angiogenesis assay. Neovascularization was estimated with angiogenesis index. Data analysis of the proteomic analysis was carried out with MaxQuant software. Statistical analysis of the CAM assay was performed with SPSS Statistics software.

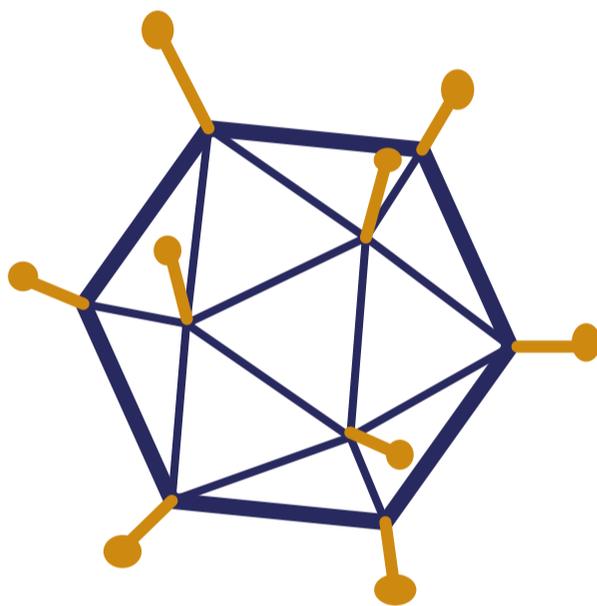
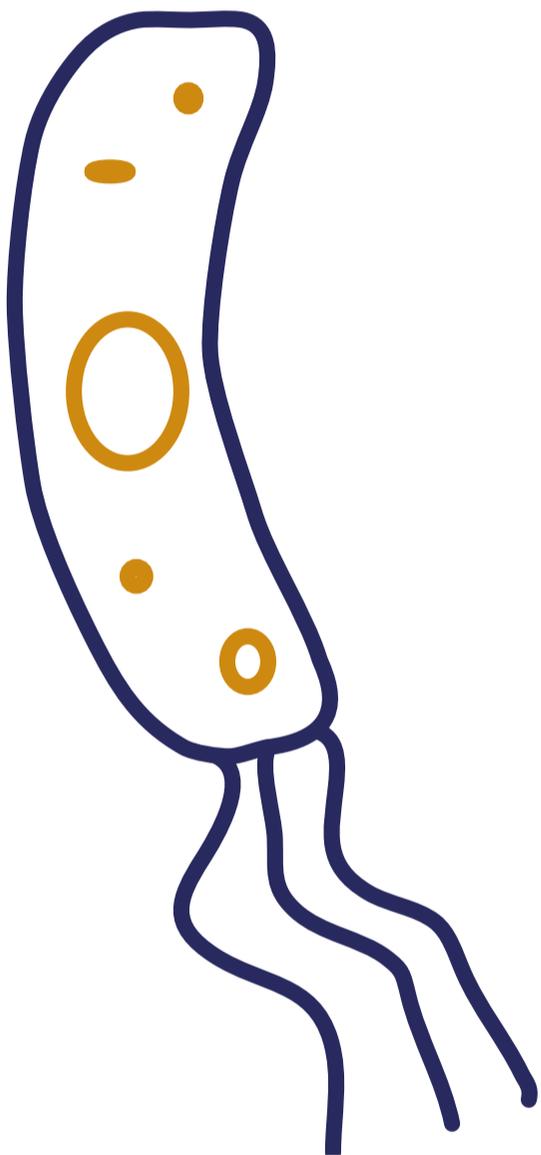
Results

Our results revealed increased growth of ATGL-KO spheroids compared to WT spheroids. Furthermore, upregulation of glycolytic, lipid and protein anabolic pathways were observed in the 3D cultivated ATGL-KO cells. In the CAM assay, we observed significant angiogenic changes in the A549-WT group versus ATGL-KO.

Conclusion

In conclusion, the loss of ATGL promotes metabolic adjustments and proliferation of lung tumor cells and could be used as a potential prognostic and therapeutic marker. ATGL displays proangiogenic features, yet its signaling pathway is still unclear and requires further investigation.

Infectious Diseases



Presenters:

Gebremedhin, K.B.G. (Ketema Bizuwork)

Gebremedhin, K.B.G. (Ketema Bizuwork)

Mandakhbayar, O.M. (Oyunbolor)

López, M.C.L. (Maria-Camila)

Lumawag, F.A. (Fortuna)

Miranda Brand, Y.M.B. (Yaneth)

Sadeghdoust, M. (Mohammadamin)

Epidemiology of Asymptomatic Bacteriuria, Causal Agents, and Antimicrobial Susceptibility among Pregnant Women in Addis Ababa, Ethiopia

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Introduction

Asymptomatic bacteriuria (ASBU) is an important health problem among pregnant women particularly in low income countries. This study aimed to estimate prevalence of ASBU, to identify causal bacterial pathogens and their antimicrobial susceptibility among pregnant women attending antenatal care centers in Addis Ababa, Ethiopia.

Materials & Methods

Health facility based cross-sectional study was conducted from March to May, 2019, where 281 pregnant women with no symptom of urinary tract infection were examined using standard microbiological techniques. Women whose urine sample carried greater than or equal to 10⁵ colony forming unit (cfu) of bacteria per milliliter was considered to have ASBU. Antimicrobial susceptibility of isolates was investigated using Kirby-Bauer disk diffusion method on Muller-Hinton agar plates.

Results

Out of 281 pregnant women examined, 44 (15.7%) had ASBU and none of the factors tested in the current analysis were significantly associated with occurrence of ASBU ($p < 0.05$). The most frequently isolated bacterial species were *Escherichia coli* 17(30.2%), *Proteus*, 13(23.2%) and *Enterococcus* 11(19.6%). All of the *E. coli*, *Citrobacter* and *Klebsiella* isolates and 84.6% of *Proteus* species were resistant to ampicillin. All bacterial isolates were resistant to at least one of antimicrobial agents tested. Resistance to three or more antimicrobials was detected in 15 (88.2%) of *E. coli*, 10 (76.9%) of *Proteus*, and 6 (54.6%) of *Enterococcus* isolates. Resistance to as high as 7 antimicrobials among *E. coli* and *Proteus* isolates and 9 antimicrobials among *Enterococcus* isolates be detected.

Conclusion

Routine screening for ASBU during antenatal visit is likely to result in early treatment and minimize complication to the mother and fetus. Assess sensitivity of isolates to commonly prescribed antimicrobials rather than treating empirically is recommended.

Maternal complications and adverse pregnancy outcomes among pregnant women with asymptomatic urinary tract infection in Addis Ababa, Ethiopia

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Introduction

Urinary tract infection may result in a number of pregnancy related complication and unfavorable birth outcomes. However, published evidence on the magnitude of these negative effects are limited. In this study, we aimed to document adverse pregnancy outcomes and maternal complications among pregnant women with confirmed asymptomatic urinary tract infection in Addis Ababa.

Materials & Methods

We used hospital based prospective study design in which we followed 44 pregnant women with urinary tract infection confirmed by urine culture result of $\geq 10^5$ cfu/ml of urine. We documented adverse pregnancy outcomes and maternal complications. We used frequency, percentage, mean and standard deviation to descriptively summarize variables of interest.

Results

Of the 44 pregnant women enrolled in the study, complete data was collected from 43 participants, one was lost to follow-up. Six (14%) women were developed fever and treated with antibiotic during pregnancy, 26 (60.5%) delivered with cesarean section, two (4.3%) perinatal deaths befall within seven days of delivery, one miscarriage was documented and 4 (9.3%) newborns were found underweight. The mean birth weight of the newborns was $3.1\text{kg} \pm 0.60$, 21 (48.8%) were born before 37 weeks of gestational age, 14 (32.6%) newborns were born asphyxiated, and 22 (51.2%) newborns were developed early neonatal fever within 48 hours of delivery.

Conclusion

In the current cohort of women, the occurrence of unwanted pregnancy outcomes were frequent and substantial number of pregnant women developed maternal complications during their perinatal periods. Therefore, it is crucial to screen each pregnant women attending prenatal clinic for infectious disease like urinary tract infection and treat as soon as possible, which reduces the possible maternal complications and adverse pregnancy outcomes. Additionally, as the outcomes were recorded only among pregnant women with ASBU, other causes of unwanted pregnancy outcomes couldn't be excluded. Hence, further study where follow up includes pregnant women without ASBU and larger sample size is recommended.

Impact of COVID-19 Pandemic lockdown on Mental Health of Medical school students in Mongolia

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Introduction

Student mental health in higher education has been an increasing concern. Mental illness can affect students' motivation, concentration, and social interactions—crucial factors for students to succeed in higher education. In Mongolia, the early-stage response to the COVID-19 outbreak was the closure of all educational institutions, at all levels, throughout the country, with traditional teaching replaced by distance learning approaches. All educational institutions in both the public and private sectors were initially closed until March 2, 2021.

Materials & Methods

An online interview survey was conducted among 395 undergraduate students recruited from the Mongolian National University of Medical Sciences. This cross-sectional survey was conducted from 12 December to 22 January 2021. During the survey, these students stayed at home with their parents or relatives across the country. The survey consisted of two standardized scales—the Patient Health Questionnaire-7 for depression and anxiety, and additional multiple-choice and open-ended questions. The data were analyzed through quantitative and qualitative methods.

Results

Of the 395 medical students, 100 are under 19 years old (25.3%), 274 cases at the age 20-24 (69.3%), and 21 cases at the age over 25 years (5.3%). Of the 395 students, 48.6% (n=192) indicated increased stress and anxiety due to the COVID-19 outbreak. A total of 395 responses were collected, including 340 (n=86%) from female respondents. Multiple stressors were identified that contributed to the increased levels of stress, anxiety, and depressive thoughts among students. These included difficulty in concentrating 76.4% (n=302), disruptions to sleeping patterns 63.9% (n=258), decreased social interactions due to physical distancing 75.1% (n=297), and prefer to be alone 11.9% (n = 48) want to be with people 68.1% (n = 275), decreased motivation to do something 11.9% (n = 48), behavior changes as a to be anger 68.1% (n = 275).

Conclusion

In this survey of medical school students in Mongolia, acute stress, anxiety, and depressive symptoms are prevalent during the COVID-19 pandemic. Multiple epidemics and psychosocial factors, such as senior year were associated with an increased risk of mental health problems. Psychosocial support and mental health services should be provided to those students at risk.

Hepatitis C Virus infection in individuals with history of blood transfusion before 1996 in Colombia

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Introduction

The Hepatitis C Virus (HCV) infection is an important public health problem. Indeed, 60-80% of HCV cases develop chronic infection with risk of end-liver disease. One of the most important risk factors of HCV infection is blood transfusion. The aims of this study were to describe the prevalence of the HCV infection in individuals with history of blood transfusion before 1996 in Colombia and to identify the viral genotype and subtype.

Materials & Methods

An active case finding of individuals with history blood transfusion has been carried out since 2018 through meetings, media and social networks in four cities: Medellín, Pereira, Santa Marta and Bogotá. After signing informed consent and the interview, a blood sample was obtained from each participant. The total antibodies anti-HCV were determined using a commercial Elisa test. Viral RNA was extracted from seroreactive serum samples. After synthesis of cDNA, the 5'UTR, NS5A and NS5B viral genome regions were amplified. Phylogenetic analysis of viral sequences was done to identify the genotype and subtype. The amplified fragments were sequenced (Macrogen). Prototype HCV sequences available in GenBank, ViPR and Los Alamos were included in the analysis.

Results

Two hundred sixty individuals with history blood transfusion between 1954 and 1995 were recruited in Medellín (159), Pereira (43) and Santa Marta (58). The average age was 56,8 years old (range 24 to 99 years) and the 69,6% (181/260) of the participants were women. The transfusion was indicated in the most of cases for surgery (23%) and postpartum hemorrhage (21,1%). The antibodies anti-HCV were detected in 7/260 samples (2,69%) and the viral genome was detected in four of these samples. The HCV genotype 1b was characterized in 3 samples and the genotype 4 was characterized in one sample.

Conclusion

The frequency of antibodies anti-VHC described in the study population (2,69%) is lower than the expected one (10%). The preliminary results of viral genotype distribution are similar to the data described previously in Colombian population. The individuals with diagnosis of HCV infection will be evaluated for treatment with direct-acting antivirals.

No Association between HIV Knowledge and Acceptability of HIV Pre-Exposure Prophylaxis (PrEP) among Men who Have Sex with Men in Quezon City, Philippines in 2020

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Introduction

The World Health Organization recommended the use of HIV Pre-Exposure Prophylaxis (PrEP), which is not yet well known in the Philippines. This study aimed to determine the association between HIV Knowledge and Acceptability of HIV PrEP among men who have sex with men (MSM) who are at least 18 years old in Quezon City using the HIV-Knowledge (HIV-KQ-18 tool) and the Willingness to Use PrEP Questionnaires.

Materials & Methods

This quantitative cross-sectional study used data collected from 247 respondents who are MSM, 18 years old and above, from Quezon City. Data collected included demographics, HIV knowledge using the HIV-KQ-18 tool ($\alpha = 0.75-0.89$), and acceptability of HIV PrEP using the Willingness to use PrEP tool ($\alpha = 0.81$). Chi-square analysis was used to determine the association between each demographic category and acceptability of HIV PrEP, and the association between HIV knowledge and acceptability of HIV PrEP.

Results

Results showed no significant association between HIV knowledge and acceptability of HIV PrEP ($PR = 0.915$, $\chi^2 = 0.33697$; $p = 0.5616$). Age, education level, financial situation, and sexual orientation showed no significant association with acceptability of HIV PrEP. Relationship status had significant association with acceptability of HIV PrEP ($p = 0.04323$).

Conclusion

There is no association between HIV knowledge and acceptability of HIV PrEP. Among demographic variables analyzed, only relationship status shows a significant association with acceptability of HIV PrEP.

ZIKA VIRUS REPLICATES IN PROSTATE ADENOCARCINOMA CELLS

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Introduction

Zika virus (ZIKV) is a flavivirus that is transmitted by *Aedes aegypti* and *A. albopictus* and could be transmitted sexually. It has been determined that this virus can infect fibroblast, keratinocytes, immature dendritic cells, central nervous system cells and spermatozoa through the receptors DC-SIGN, AXL, Tyro3 and TIM-1 (1). Detection of ZIKV RNA in the semen of three vasectomized men up to day 96 after infection, suggests that the prostate is an anatomical site where the virus can replicate and persist. However, the pathogenesis and the mechanism of viral persistence of ZIKV in prostate tissue is not known. For this reason, to explore the persistence of ZIKV in prostate cell lines (PC3 and RWPE-1).

Materials & Methods

The Colombian isolate of ZIKV (passage #6) was characterized by a phylogenetic analysis. The expression of AXL receptor was detected through In-Cell Western, fluorescence microscopy and flow cytometry. Additionally, the viral growth kinetics was carried out on PC3 (human prostate carcinoma), Vero E6 y HeLa cells. Cells were infected a MOI= 0,1, 1 y 3 and the supernants were harvested at 24 y 48, 72, 96 y 120 h.p.i and then, the viral titer was determinate using the Plaque forming units assay (PFU and the viral envelope protein (E) was detected by flow cytometry.

Results

The Colombian isolate of Zika virus has similar features to the Asian-American lineage. Also, was demonstrated the expression of AXL receptor on PC3, Vero E6 and HeLa and cells.

The viral growth kinetics of ZIKV, showed that the Vero E6 cells express a low percentage of E protein viral, but produce viral particles. In contrast, in PC3 and HeLa cells, were observed more expression of E protein. However, the production of viral particles increases at 72 h.p.i. in all cell lines tested.

Conclusion

Cell lines evaluated express the AXL receptor and establish a productive infection; for this reason, are susceptible and permissive to infection by ZIKA.

Seroprevalence of rubella and syphilis among pregnant women

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Introduction

Rubella and Syphilis are two major diseases that can affect fetus during pregnancy. Rubella can cause severe complications such as Congenital Rubella Syndrome (CRS) and fetal death during pregnancy. Also, Syphilis is associated with cardiovascular, neurological, ocular and gastrointestinal complications in the fetus during the pregnancy. This study evaluates the prevalence of anti-rubella IgG, IgM and VDRL among pregnant women referred to the pathobiology laboratory in Bandar-E-Abbas city

Materials & Methods

: Pregnant women who were referred to the pathobiology laboratory were included in this study. Anti-rubella antibodies were evaluated by taking a clot sample from each patient and isolating its serum (electrochemiluminescence method, Roche kit). IgG avidity rubella were also checked in cases which IgM were positive, which indicates maternal infection before pregnancy or previous vaccination. VDRL test was also carried out to check syphilis infection. In this test, after taking a blood clot sample, the serum was isolated and examined by the latex agglutination method (Bionic Company). It was planned to re-evaluate the VDRL positive cases using the Fluorescent Treponemal Antibody Absorption test (FTA-ABS).

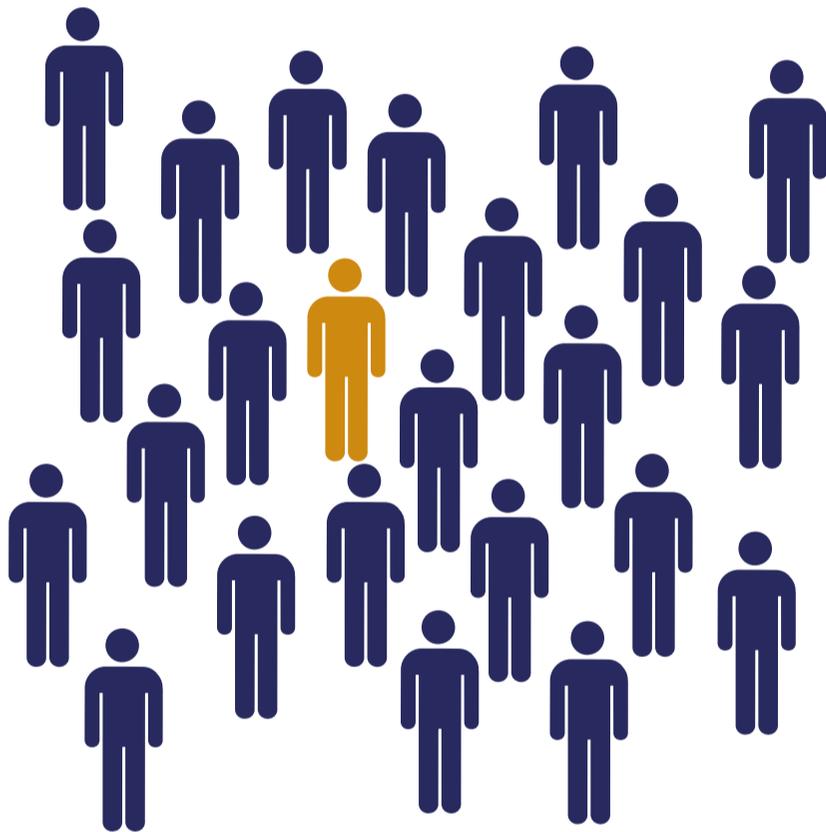
Results

Among 874 pregnant females (mean age of 28.6 ± 5.8 years), 332 (%37.9) were living in urban areas and 542 (% 61.8) in rural areas. Statistical analysis revealed that all cases had negative VDRL test. In addition, 99.5% of these cases had negative anti-rubella IgM test. In addition, %87.8 of the subjects were positive for anti-rubella IgG, indicating vaccination or pre-pregnancy infection.

Conclusion

Based on our results and also previous studies, the prevalence of rubella and syphilis during the pregnancy is very low. Due to public vaccination and health progression and also the low number of illicit sex in our country (IRAN), the prevalence of these disease have decreased. So, it seems that spending high costs for these tests might not be cost-effective anymore.

Epidemiology



Presenters:

Pandya, C.N.P. (Chirayu)

Rodríguez Solano, Rodríguez, K. (Karla
Montserrat)

Suiton, L.F.

Oliveros, J.K.N. (Joshua)

Muguwu, S.G. (Sisaskosi)

Novak, L.N. (Laura)

Haque, A.H. (Ayema)

Association between daily smartphone usage and smartphone addiction: A cross sectional study

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Introduction

Advancements in smartphone technology are replacing conventional tools like desktops and laptops. Some studies have outlined a relation between smartphone usage and psychological addiction, some even linking psychological effects such as loneliness, anxiety and depression to overt smartphone usage. These effects are particularly pronounced in post pubertal adolescents. However, the evidence linking smartphone usage in adolescence and psychological addiction has been inadequate, particularly in countries like India where access to smartphone and internet technologies has improved. This study aims to assess the relationship between smartphone usage and smartphone addiction.

Materials & Methods

A cross sectional study was conducted among school and college students of Ahmedabad city, of ages 15 to 24 years, with the help of a self-administered online/paper-based questionnaire – a modified version of Smartphone Addiction Scale (SAS), during October to December 2019. The SAS scale score was dichotomized into low addiction potential and high addiction potential based on the sample median as a cut-off. Multiple logistic regression was used to check the association between addiction potential and daily smartphone use and purpose of use.

Results

The study sample comprised of 225 participants, out of which 49.3% (n=111) were males and 50.7% (n=114) were females. 43.6% of the participants used smartphones primarily for social media. The average duration of initiating smartphone use was 46.45 months (SD=36.98 months) and the daily usage was an average of 3.99 hours (SD=2.87 hours). Preliminary results suggest that addiction potential is significantly associated with daily smartphone usage and purpose. It was found that for every 1-hour increase in daily smartphone usage, the odds of having higher addiction potential were higher, controlling for the purpose. (OR=1.364; 95% CI=1.183-1.572; p<0.001).

Conclusion

Higher addiction potential was significantly associated with higher daily smartphone usage, similar to other forms of addiction which show heightened addiction liability with greater exposure to the substance of abuse. Although the results show a quantitative association of smartphone use and addiction, it may be better to explore the relationship in terms of its psychosocial effects. This study merits more research into the causation of smartphone addiction.

Implication of duration of time to diagnosis in survival of children with central nervous system tumors: systematic review and meta-analysis.

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Introduction

Central nervous system (CNS) tumors are the most common pediatric solid tumors and the second leading cause of cancer death in children. A lot of factors has been related with a worse survival, one of these is a prolonged time to diagnosis (TtD), defined as the period of time between onset of symptoms and the diagnosis. TtD and survival seem to have no statistically significant relation or may even have an inverse relation: extended TtD associated with better outcome or increased survival, due to this controversy we want to know how TtD affects survival in paediatric patients with CNS tumors.

Materials & Methods

A systematic search was carried out in multiple databases using the keywords: "CNS tumors", "Lag-time", "Survival", "Delayed diagnosis" and its synonyms additionally filters by age (<18 years) and publication date (1998-2018). The localized articles were reviewed by two researchers independently, and by consensus were selected those that would be included in the study, applying the inclusion and exclusion criteria.

Results

A total of 758 articles were located through the search, of which 718 were eliminated after reading the titles and abstracts and duplicates, 40 articles were reviewed in extensive from which 11 were chosen for qualitative analysis and 6 for meta-analysis. In the qualitative analysis in seven of the 11 articles no relationship was found between prolonged TtD and worse survival, in the remaining 4 there was lower survival in short TtD. In the meta-analysis with cut-off point at 1 and 2 months, no difference was found between the duration greater or less than the cut-off point and survival [RR 0.95 (95% CI 0.75-1.2) and RR 1.23 (95% CI 0.77-1.97) respectively].

Conclusion

The duration of TtD in patients younger than 18 years with CNS tumors does not appear to modify 5-year survival. Survival seems to depend more on the site and extent of tumour aggressiveness. High malignant tumours appear to give serious symptoms earlier.

Therefore, we can say that while Lag-time does not appear to be related to the prognosis of survival, it is unquestionable to transmit the prompt start of treatment of these children.

Factors Affecting Decision to Test for HIV among College Students in a Non-Sectarian Private University in Quezon City: An Analytical Cross Sectional Study

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Introduction

The Philippines has one of the fastest growing rates of HIV cases in Asia and the Pacific, with the majority of affected individuals between 15-24 years old. Majority of the studies on factors affecting decision to be tested for HIV focuses on high risk populations such as sex workers and homosexuals, leaving a knowledge gap on factors that influence college students, particularly here in the Philippines. Hence, this study aimed to determine the factors associated with the decision to test for HIV among college students aged 18 to 24 years old.

Materials & Methods

Convenience sampling method was employed with a target of 298 respondents. An analytical cross-sectional study was used to determine the proportion of college students who have tested for HIV and who are/are not inclined to test for HIV, and the association of the hypothesized factors that can influence college students to undergo HIV testing. Factors that was assessed using self-administered questionnaires include (1) Sex, (2) Relationship status, (3) Household income, (4) Secondary Schooling, (5) Knowledge of transmission of HIV, (6) Knowledge of Organizations or Centers that test for HIV, (7) Knowing someone with HIV, (8) Being sexually active, (9) Perceived stigma against HIV and HIV testing, (10) Perception of risk of contracting HIV, (11) Keeping secrets from parents, and (12) Cost of HIV testing.

Results

A total of 322 students were surveyed, but only 288 answered whether or not they were inclined to test for HIV. Univariate analysis through chi-square and multiple logistic regression analysis with backward stepwise selection showed that significant predictors for HIV testing among college students were Cost of HIV testing and Knowledge of Organizations or Centers that test for HIV.

Conclusion

74.84% of college students aged 18 to 24 years old are inclined to test for HIV. Cost of HIV testing and knowledge of centers or organizations for HIV testing were found to be significantly associated with the decision to test for HIV. Initiatives must be made to make HIV testing accessible and affordable in order to increase uptake of HIV testing and hopefully prevent the increase of HIV/AIDS cases.

The Association of Nighttime Social Media Use and Poor Sleep Quality Among Undergraduate Students in Metro Manila: An Analytical Cross-Sectional Study

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Introduction

Sleep quality plays a critical role in having positive health outcomes and better physiologic function. The Philippines has a high population of students who use social media applications, posing the need to study whether such would compromise sleep quality. Thus, we aimed to determine the association between nighttime social media use (NSM) and poor sleep quality (PSQ) among undergraduate students in Metro Manila.

Materials & Methods

Analytical cross-sectional study design was utilized, and a multi-stage sampling method was used to select the respondents. A validated self-administered questionnaire (Cronbach's $\alpha=0.80$), which included social media usage assessment and the Pittsburgh Sleep Quality Index, was used to collect data. Odds Ratio (OR) was computed to determine the association between NSM use and PSQ. Probable confounders were analysed through logistic regression.

Results

Crude OR revealed that NSM users are 4.48 times (OR: 4.48; 95%CI: 2.35,8.52) more likely to have PSQ. NSM users for >60 minutes just before sleeping are 2.84 times (OR: 2.84; 95%CI: 1.68,4.80) more likely to have PSQ than those who use social media for <30 minutes just before sleeping. NSM users during both weekdays and weekends are 1.85 times (OR: 1.85; 95%CI: 0.88,3.89) more likely to have PSQ than those who use NSM during weekends. NSM users who use blue light filters are 8 times (OR: 0.92; 95%CI: 0.63,1.35) less likely to have PSQ compared to non-users of blue light filters.

Conclusion

NSM use was found to be significantly associated with PSQ regardless of different demographic variables. Specifically, NSM use for >60 minutes was significantly associated with PSQ. These findings may provide relevant information to students who are NSM users, so they can adjust certain practices to improve their sleep quality and achieve better health outcomes.

Exploring Mental Health Literacy Amongst Adolescent Students in Blantyre, Malawi

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Introduction

Few studies have been done on the topic of mental health literacy and the majority were conducted in developed countries leaving a crucial information gap in the developing countries such as Malawi. The summary of the study objectives was to explore if young people regard mental health as an essential part of their general health and if their perceptions affect their help-seeking behaviours.

Materials & Methods

This was a qualitative study that involved 12 focus group discussions involving adolescent secondary school students between the ages of 13 to 19 from 5 schools in rural and urban Blantyre. The discussions explored the participants' knowledge, attitudes and beliefs: towards mental health and illness, self-help methods and professional services, and people suffering from mental illnesses. The data was then analysed and managed through Microsoft applications, Word and Excel, and hypothesis synthesis was applied.

Results

A total number of 123 students participated. The key themes for mental health were: mental stability, nervous system, thinking capacity and capability, and peace of mind. While the key words for mental illness were: disability, disease, brain dysfunction, reduced thinking capacity and mood swings. The adolescents stated some of their thoughts of the causes of mental illness as: disease, trauma, abuse, genetics, and stress and anxiety. Their answers on recognition of mental disorders were: substance abuse, lack of concentration and self-control, mood swings, talkativeness, poor dressing and hygiene, and rude behaviour. Furthermore, they showed vast knowledge of self-help methods and majority were against professional mental health services. Lastly, they had mixed attitudes towards those who are mentally ill.

Conclusion

The study revealed that young people have an idea of what mental health is but not in its entirety. They also displayed a growing interest in learning more about mental health. However, their perceptions about mental disorders seem to be barriers to help-seeking behaviours therefore leaving room for youth-centred interventions to act as catalysts for change.

The whole life prevalence of influenza vaccination in the Czech Republic population over 45 years and selected health characteristics with the focus to diabetes population

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Introduction

Influenza infection is a global persistent health problem. Therefore, seasonal influenza vaccination is recommended for high-risk individuals, including those with diabetes mellitus. This study shows the influenza vaccination prevalence (VCP) among diabetic patients in the Czech Republic. It aims to find the correlation between patients' characteristics and lifestyle, and their adherence to be vaccinated.

Materials & Methods

The Czech Republic, branch of 2014 European Health Interview Survey (EHIS), was the source of the analyzed data in this study. Representative sample of 4441 participants of age over 45 years, consists of 710 (16%) patients with Type 2 diabetes, and the rest of 3731 (84%) non-diabetic participants forming the control group. Information regarding sociodemographic, anamnestic and lifestyle characteristics were collected through health questionnaires from EHIS. The statistical analysis was achieved by a Pearson's chi-squared test.

Results

Our study showed that the VCP in the whole study group was 30,5%, among diabetic patients, it was 37% and among non-diabetes persons 29,2%, $p < 0.001$. This relation was similar between female and male participants.

According to age analysis, in diabetic and control group, the VCPs were as follows: 27,8% and 18,6%, $p=0,168$ in the age group of 45-54 years old; 33,3% and 22,5%, $p=0,004$; in the age group of 55-64 years old; 37,2% and 34,0%, $p=0,315$ in the age group of 65-74 years old; and for the participants older than 75 years, it was 36,1% vs.20,6%, $p=0,634$.

There was no statistically significant difference within the diabetes group regarding level of education, household income, obesity parameter, smoking, frequency of alcohol drinking, self-rated health, presence of cardiovascular disease or asthma or chronic bronchitis.

Conclusion

The VCP in the diabetes group was significantly higher compared to the non-diabetes group. Regarding age, the most notable difference was found in the group 55-64 years. Surprisingly, the presence of other diseases like cardiovascular disease, asthma or chronic bronchitis did not influence the VCPs within the diabetes group. As the VCP results we found are below the European Union average, further education and more robust influenza vaccination recommendations are necessary to reduce influenza complications and deaths related to influenza in diabetic patients.

A Meta-Analysis to Estimate the Incidence of Thromboembolism in Hospitalized COVID-19 Patients

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Introduction

Coronavirus disease 2019 (COVID-19) is associated with an increased risk of venous and arterial thrombosis in patients. There are several studies highlighting the occurrence of thromboembolism in COVID-19 positive patients. However, these studies have reported varied findings. We conducted a meta-analysis to find out the incidence of thromboembolism in hospitalized patients with COVID-19 to provide more generalized results.

Materials & Methods

A systematic literature search was conducted in PubMed and SCOPUS to find observational studies reporting outcomes of interest. PRISMA flow chart summarizes our literature search. The outcomes of interest were presence of pulmonary embolism, deep vein thrombosis, stroke, and myocardial infarction (MI). Outcomes were presented as proportions. Arcsine of square root proportions and corresponding 95% confidence intervals (CI) were pooled using a random effects model. P value <0.05 was considered significant.

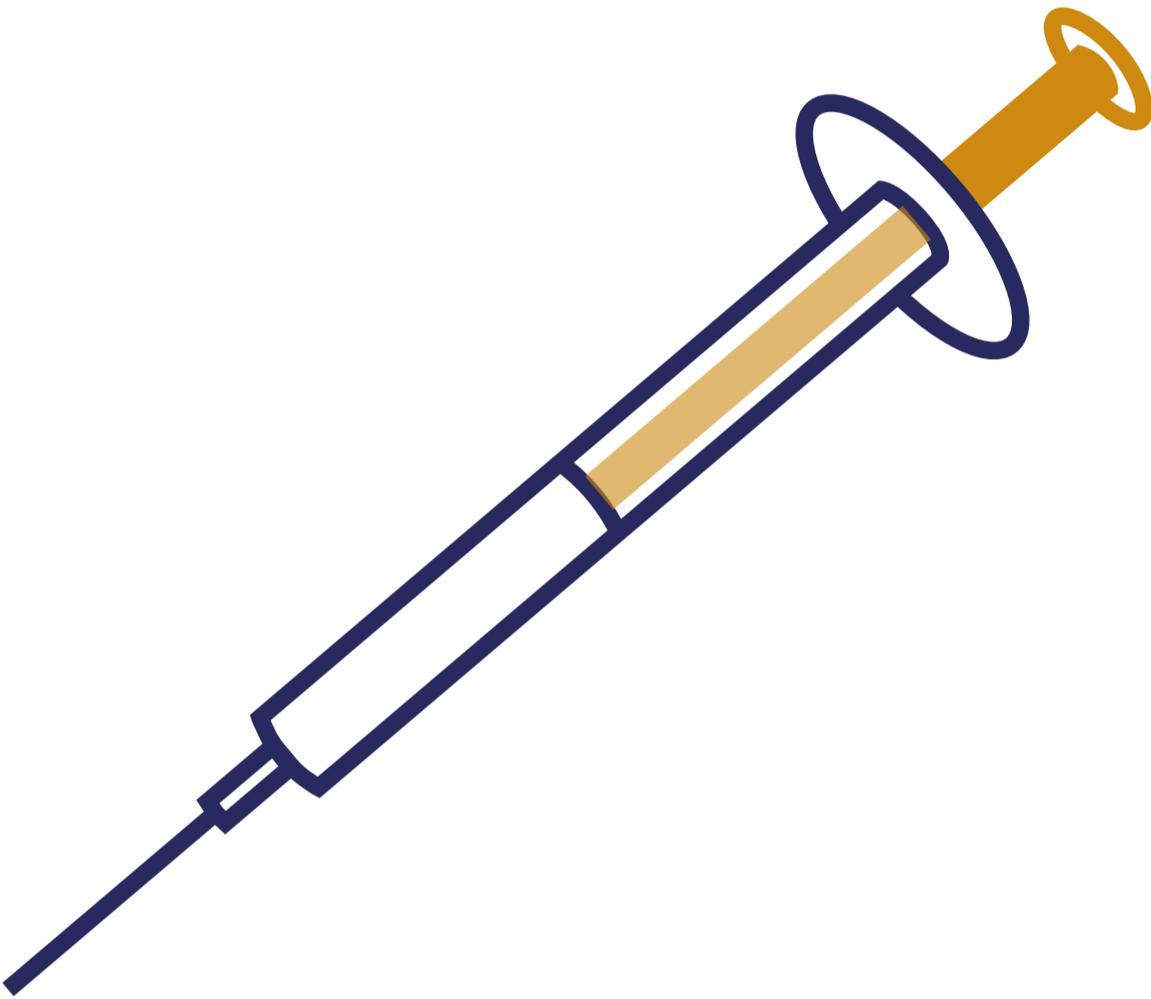
Results

The analysis includes 20 studies with a total of 15,452 patients. The incidence of venous thromboembolism was found to be greater than arterial thromboembolism. Amongst the studied thromboembolic events, the prevalence of pulmonary embolism (PP: 12.4% [7.2%, 18.6%]; I² = 97.23%) was the highest. It was followed by deep vein thrombosis (PP: 8.6% [4.2%, 14.3%]; I² = 97.52%), myocardial infarction (PP: 2.3% [0.2%, 11.2%]; I² = 99.3%), and stroke (PP: 1.2% [0.8%, 1.6%]; I² = 65.09). The Forrest plot shows the combined incidence of arterial thromboembolism including MI and stroke (PP: 2.5% [0.2%, 0.7%]; I² = 98.91%). A Forrest plot of venous thromboembolism, including pulmonary embolism and deep venous thrombosis is shown. (PP: 15.8% [10.0%, 22.6%]; I² = 98.21%).

Conclusion

Based on our results, thromboembolism may prove to be a significant factor in the pathogenesis of COVID-19. Use of thromboprophylaxis should be considered to reduce the risk of thromboembolism. Serum markers should be identified which relate to increased risk of thromboembolic complications and worse prognosis. The dose and mode of thromboprophylaxis should also be studied to improve outcomes in COVID-19 patients.

Public Health



Presenters:

Akintayo, A. D. (Abiodun)
Catubigan, J.L. (Jessiraye Luienne)
Khojasteh Zonoozi, A. (Arash)
Al-Batryni, M. (Mustafa)
Zheng, S. (Senshuang)
Priyadarshini, B. (Bhagyajyoti)
Batbold, T.B. (Tegshbuyan)
Cabujat, K.J.M. (Kurt)
Kharosekar, S.K. (Shweta)
Mukherjee, M.M. (Moyuree)
Murali, - (Mathangi)
Freitas, Rodrigues de, T. (Thais)
Prýmková, B. (Barbora)

Knowledge, attitude and practice of Nigerian medical students towards complementary and alternative medicine in covid-19 management

Akintayo, A. D. Mr (Abiodun) Mr¹, Adewale, B.A. Mr (Boluwatife) Mr¹, Oyetola, E.O. Mr (Emmanuel) Mr², Ilori, T. Dr (Temitope) Dr³

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Introduction

Complementary and alternative medicine (CAM) is commonly used, but despite its widespread use many physicians have limited knowledge of CAM. This study, therefore, sought to assess the knowledge, attitude and practice of medical students on complementary and alternative medicine in the management of COVID-19.

Materials & Methods

A descriptive cross-sectional online study was conducted among 150 medical students from three Federal Universities in South West, Nigeria. A self-administered semi-structured online google link questionnaire was used to collect information. Chi-squared and Fisher's exact test is used to analyse the bivariate relationship between KAP status and sociodemographic characteristics. Spearman's correlation coefficient matrix was computed to determine the strength of association between the knowledge, attitude, the practice of CAM, age and religiosity.

Results

The median age was 22 years (interquartile range: [IQR]: 21-23 years). Median self-rated score for religion was 4.00 (IQR: 3.00-4.25). Median knowledge score was 4.00 (IQR: 3.75-5.00), median attitude score 2.75 (IQR: 2.38-3.00) and median practice score 2.00 (IQR: 1.00-2.00). Thirty-seven respondents (24.7%) were considered to have poor knowledge about CAM use in COVID-19 while the rest (75.3%) had good knowledge. Thirty-eight (25.3%) had a poor attitude towards the use of CAM in COVID-19 and 112 (74.7%) had a good attitude.

Conclusion

Medical students have good knowledge and a positive attitude towards CAM modalities as adjunct management for COVID-19. However, their practices do not reflect wide acceptability. There is a need for clinical trials on the efficacy of CAM as an adjunct treatment for COVID-19 to inform its use further.

Factors Associated with Motivation to Work Among Hospital Workers in the National Capital Region during the 2020 COVID health crisis: A Cross-Sectional Analytic Study

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² University of the East Ramon Magsaysay Memorial Medical Center Inc., Department of Preventive and Community Medicine, Quezon City, Philippines

Introduction

In 2020, the COVID-19 pandemic overwhelmed the Philippine healthcare system and its personnel. The pandemic brought with it additional challenges and stressors which may have threatened the healthcare workers' motivation. This study aimed to determine the association between the pandemic-specific stress factors and the motivation to work of healthcare workers in NCR during the COVID-19 health crisis.

Materials & Methods

A convenient sample of 169 licensed physicians and nurses were invited to answer an online questionnaire with three parts; demographic profile, motivation, and pandemic specific stress factors. Results were analyzed via multiple logistic regression analysis and odds-ratios were calculated.

Results

Among the 169 respondents, motivation to work during the pandemic was low ($M = 37.41, \pm 6.8$). Out of the 14 independent variables, only five were found to be significant predictors of motivation. Being assigned to COVID-exclusive wards ($OR = 3.22$), lack of security ($OR = 2.17$), and poor sense of well-being ($OR = 1.44$) were significantly associated with low motivation among healthcare workers. On the contrary, infection anxiety was linked with high motivation ($OR = 0.54$).

Conclusion

The findings of the study suggested that there would be more significant effects on the healthcare workers' motivation if the interventions to be initiated were focused on establishing HCW health, safety, and financial security.

Change Management Challenge in a medical university in the context of the COVID-19 era; a competition-based learning program

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Introduction

Not only encountering or implementing various changes in the health systems is inevitable but also the pace of changes happening nowadays is rapidly increasing. Here in this study, we aimed to explain the “Change Management Challenge” as a method of teaching change management to healthcare-related students, believing it as an essential skill for healthcare practitioners, especially within the context of the COVID-19 pandemic.

Materials & Methods

We designed a competition-based learning program with a theme of health-related issues during the COVID-19 pandemic in Mashhad University of Medical Sciences, Mashhad, Iran from August to November 2020. The program consisted of three rounds: the first round was for submitting the change ideas; the second round was for learning the process of change management and submitting the change plans; and the third round was for presenting the ideas and change plans. The intervention to raise awareness about change management was carried out by providing educational materials including pamphlets, brief introductory videos, recorded workshops, and an online Q and A workshop. To assess the pedagogical effects of our training, a pre-test/post-test survey (with a scale range of 1 to 5) was conducted. All data were analyzed using SPSS v.16.

Results

Through the challenge, 164 ideas were collected from teams consisting of 2 to 4 members. Fifty-four teams passed through the idea arbitration (round 1) and submitted their change plans (round 2), while 20 ideas reached the final competition (round 3). Overall, 98 individuals filled both the pre and post-tests. Based on the analysis, participants’ familiarity with change management science and implementations of change within organizations was significantly increased (pre-test: $M=3.40$, $SD=0.98$; post-test: $M=4.18$, $SD=0.74$); $p<0.001$. The clarification of difference between “change manager” and “change leader” was also statistically significant (pre-test: $M=3.50$, $SD=1.21$; post-test: $M=4.48$, $SD=0.85$); $p<0.001$.

Conclusion

This study demonstrates that the competition-based learning program as a new method of teaching the necessary skill of change management has a significant impact on learning key points in this field among healthcare-related students.

Medication adherence of patients with selected chronic diseases in Baghdad teaching hospital: A Cross-Sectional Study.

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¹ *University of Baghdad / College of Medicine, 5th year Medical student in the university., Baghdad, Iraq*

Introduction

Medication adherence is considered one of the primary determinants to assess the success of treatment, and it is defined, according to the World Health Organization (WHO), as “the extent to which the patient’s history of therapeutic drug-taking coincides with the prescribed treatment.” The study aims to measure the adherence levels in Baghdad Teaching Hospital and assess the risk factors affecting patients’ adherence. and to determine the reliability of the Arabic version of the Morisky Medication Adherence Scale-8 (A-MMAS-8) Questionnaire in the Iraqi population.

Materials & Methods

A cross-sectional study was conducted in Baghdad’s Teaching Hospital, Medical City in Baghdad, Iraq. Patients on medication of chronic disease for at least the past 6 months were chosen from medical wards and the Arabic version of the Morisky Medication Adherence Scale-8 (A-MMAS-8) Questionnaire was used to assess adherence to medication and another one was to collect potential risk factors that could affect medication adherence.

Results

Pearson’s Chi-Square test was performed for attributed factors and the Adherence Score. Of those factors, two were found to be significant, belief ($P = 0.004$) and Administration Method ($P = 0.05$). Also, there was a weak, negative correlation between the Score and Age ($r_s = -0.139$, $P = .05$) and a weak, negative correlation between the Score, and Duration of the Illness ($r_s = -0.179$, $P = .013$). Cronbach’s alpha of the reliability analysis showed the questionnaire to reach acceptable reliability, $\alpha = 0.608$.

Conclusion

The high percentage of patients (90.5%) having poor medication adherence gives us an insight into the Iraqi patients admitted to the hospital. This creates a problem, as many of these patients will develop complications at some point in their lives that require another hospital admission and so on. Belief and administration methods are associated with better adherence so more effort must be done to better convince the patients to take their medication regularly. A-MMAS-8 is reliable to measure adherence in the Iraqi population.

Attitude of healthcare providers towards population-based cancer screening in primary healthcare institutions in China

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Introduction

In China, the primary tests of population-based cancer screening programs are performed by healthcare providers in primary healthcare institutions. We aim to evaluate the attitude to perform population-based screening among healthcare providers in primary healthcare institutions in China.

Materials & Methods

Healthcare providers of 262 primary healthcare institutions in Tianjin were invited to fill out a self-completion questionnaire consisting of demographic characteristics, workload, and knowledge of, attitudes and willingness towards breast, cervical, and colorectal cancer screening. Willingness to screening was the primary outcome. Multilevel logistic regression models were conducted to analyze the factors of the healthcare providers' willingness to perform population-based screening. In this way odds ratios (ORs) and 95% confidence intervals (95%CI) were estimated.

Results

A total of 554 healthcare providers from 244 institutions answered the questionnaire. 67.2%, 72.1%, and 74.3% were willing to perform breast, cervical and colorectal cancer screening, respectively. A negative attitude was associated with a low willingness for cervical (OR=0.27(95%CI:0.08-0.94)) and colorectal (OR=0.08(95%CI:0.02-0.30)) cancer screening, while this was not statistically significant for breast cancer screening (OR=0.30(95%CI:0.08, 1.12)). For breast, cervical and colorectal cancer screening, 70.1%, 63.8% and 59.0% healthcare providers reported a shortage of staff dedicated to screening. A perceived reasonable manpower allocation was a determinant of increased willingness to perform breast (OR=2.86(95%CI:1.03-7.88)) and colorectal (OR=2.70(95%CI:1.22-5.99)) cancer screening. However, this was not significant for cervical cancer screening (OR=1.76(95%CI:0.74, 4.18)).

Conclusion

Healthcare providers with a positive attitude have a stronger willingness to contribute to cancer screening than those with a negative attitude. This suggests that the aspects of attitudes, recognition of the importance of screening and acceptable workload should also be considered in the implementation of cancer screening.

Assessment of knowledge, attitude, and practices of Indian health care providers and medical students on COVID-19: an online cross-sectional study

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Introduction

Coronavirus disease (COVID-19) has created fear, misconceptions, and apprehensions among not just the public but also the present and future health care providers. The aim of the study was to evaluate the knowledge, attitudes & practices (KAP) towards COVID-19 among health care providers and medical students of India.

Materials & Methods

An online cross-sectional study was undertaken in India on doctors, staff nurses, ward attendants, other healthcare workers, and medical students. The questionnaire used for the study, was developed using 3-tier modified Delphi Method and it was pre-validated (Cronbach's alpha $\alpha = 0.8$) and standardized. It was circulated as a Google Form and data was collected online from the participants from 15th-25th September 2020.

Kolmogorov- Smirnov test was applied to show the nature of data distribution. Mann- Whitney U test and Kruskal Wallis H test was used for association and Spearman's rank correlation was also used to identify the association. P-value <0.05 was taken as a significant correlation.

Results

1137 medical students, 840 doctors, 126 staff nurses, 96 other health care workers, & 12 ward attendants participated in the study (Total=2211). Mean scores for knowledge (K), attitude (A) & practices (P) were 5.93 (± 1.211 S.D) out of 8, 5.20 (± 0.843 S.D) out of 6 & 2.38 (± 0.896 S.D) out of 4 respectively.

Significant and positive Spearman's correlations between knowledge-attitude ($\rho=0.273$, $p<0.0001$), knowledge-practices ($\rho=0.222$, $p<0.0001$) and attitude-practices ($\rho=0.175$, $p<0.0001$) were observed. Only profession had a significant correlation with mean K ($\rho=-0.252$, $p<0.0001$) and A ($\rho=-0.285$, $p<0.0001$), mean P ($\rho=-0.073$, $p<0.0001$) and mean KAP ($\rho=-0.240$, $P<0.0001$) of the study. Age was significantly associated with mean A ($\rho=0.096$, $p<0.0001$), mean P ($\rho=0.086$, $p<0.0001$), mean KAP ($\rho=0.115$, $p<0.0001$). State/UT of residence showed a significant correlation only with mean P ($\rho=0.060$, $p=0.005$) and mean KAP ($\rho=0.080$, $p<0.0001$).

Conclusion

There is an average to good KAP of the medical students and healthcare providers of India for the COVID-19 pandemic. Better knowledge can lead to a positive attitude and subsequently result in good practices. Among all professionals, doctors had better KAP, followed by medical students. This confirms the importance of scientific education and training through continuous medical education. Significant association of KAP score with state of residence implies that local government and community also plays an important role in determining the quality of the healthcare system.

Investigation of COVID-19 lockdown on sleep quality in university students, Mongolia

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Introduction

In Mongolia, lockdown due to COVID-19 health emergency started on 11 November and partially ended on January 3rd, 2021. There was a significant increase of psychological distress and symptoms of mental illness, and worsening of quality of sleep in the students.

Materials & Methods

Participants completed an anonymous online-based survey that include questionnaires about sleep and anxiety and depression symptoms. An online interview survey was conducted among 402 undergraduate students from 1st to 6th grade recruited from Mongolian National University of Medical Sciences and conducted from 28 December to 25 January 2021. Participants mean age was 21.3 ± 2.5 (range 19–24yrs) completed the survey. The 2-item Patient Health Questionnaire (PHQ-2) was used to measure students' sleeping disorder symptoms within two weeks.

Results

We found an increase in Bed Time hour, Sleep Latency, and Wake-Up time between before and during COVID-19 emergency and a worsening of sleep quality and of insomnia symptoms. In particular, during the lockdown, the impact of the delay in Bed Time and in Wake-Up was more pronounced in students. Of the 402 students, 48.6% (n=192) indicated increased stress and anxiety due to the COVID-19 outbreak. In students, we observed a prevalence of maintenance insomnia during COVID-19 reaching 40%. Of the 402 medical students 79.8% (N = 320) was delay in bed time, 267 (66%) sleep after 1 am, 112 (27.9%) cases mostly sleep totally 4-6 hours.

Conclusion

The impact of lockdown was common in medical students. Concerning the psycho-emotional aspects, about one-third of our sample showed depressive or anxious symptoms. The results of our study may provide support for the implementation of some interventions for well-being in pandemic condition.

Acupuncture Therapy as an Alternative Medicine Experience: A Mixed-Method Study

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Introduction

Acupuncture is gaining popularity in the Philippines because of its analgesic effect and use for the treatment of non-specific pain. The decreased efficacy of medications for chronic conditions and high consultation costs have induced patients to try complementary and alternative medicine; however, data on the outcomes of acupuncture therapy in chronic conditions is lacking. This study aimed to provide additional perspectives on patients' experiences in acupuncture therapy and general health after therapy which could serve as a reference for further research in this field of study.

Materials & Methods

A mixed-method study was conducted on 81 respondents with chronic conditions, wherein 15 respondents underwent qualitative interviews. The respondents' general health was measured using the RAND SF-36 Health Questionnaire. Individual experiences on chronic pain and acupuncture were obtained through a qualitative questionnaire. Quantitative data analysis used descriptive statistics while qualitative data analysis used Labov and Polkinghorne's model for narrative analysis.

Results

Quantitative data showed that the majority of the respondents sought acupuncture for musculoskeletal conditions and underwent 1-3 sessions lasting 30-60 minutes each. The mean scores from the questionnaire showed all dimensions indicated a better state of health. Physical functioning and pain obtained the highest scores while energy and fatigue registered the lowest scores.

Qualitative data showed chronic conditions affected the physical, psychological, social, and emotional conditions of the respondents. The desire to be healed also prompted them to seek acupuncture despite having misconceptions and doubts. Acupuncture provided pain relief, relaxation, and emotional improvement.

Conclusion

The RAND SF-36 Health Questionnaire showed all dimensions indicated an improved state of health. Mean scores were highest for physical functioning and pain while the lowest scores were for energy and fatigue. The narrative analysis showed benefits of acupuncture in the physical, psychological, and emotional well-being of individuals with chronic conditions.

Impact of COVID-19 precautionary measures on Hospital Acquired Infections in a tertiary care hospital: A Comparative Study

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Introduction

Hospital Acquired Infections are new infections contracted in the hospital within 48 hours of admission and are commonplace amongst patients admitted to intensive care units. The COVID-19 pandemic has brought in its wake stringent hygiene practices that can have a potential impact on the rate of HAIs recorded in critical care units. We aim to compare the number of HAIs recorded in a pre and during pandemic period in a tertiary care hospital and ascribe factors for the change.

Materials & Methods

The records of 194 patients in 2019 and 149 in 2020 admitted to both the Medical ICU and Surgical ICU in the months of October 2019 and October 2020 were accessed assuming the former to be the pre-pandemic period. A total of 343 patient records were studied of which 156 were patients admitted to the SICU and 187 to the MICU. All patients who developed HAIs within 48 hours of admission were included as per the WHO's defining criteria for hospital acquired infections. Additionally, the infections were classified based on the site of sample collection as ET tube exudate cultures, CVC tip cultures, Foleys catheter cultures and pus from surgical wounds.

Results

We noted a greater decline in HAI rates in the SICU which were down by 4.6% from October 2019(10.9%) against October 2020(6.7%). Similarly, we observed a decline in MICU figures by 3.5% from October 2019(15.3%) against October 2020(11.8%). Further, the etiology of the most commonly observed HAI in the ICU was Klebsiella sp. (18), Acinetobacter sp.(10), E.coli(7) and Pseudomonas sp.(6).

Conclusion

Our preliminary study shows that there has been a significant reduction in hospital acquired infections which can be attributed to more stringent hygiene practices followed in the ICU like guided hand-washing, decrease in ICU bed capacity and frequent fumigations among other measures.

This will help the hospital cut costs that are otherwise incurred to treat the morbidities that follow hospital acquired infections.

As this is an ongoing study, we wish to extrapolate our findings over a longer duration in a similar manner

On the observation of increased aggression with increased cigarette smoking

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Introduction

Heavy cigarette smoking makes a physiological, psychological and social impact by causing impairment of cognitive ability, alteration of circadian clock and sleep quality. In this study we aimed to determine the effects of cigarette smoking on another psychological factor – aggression. Aggressive adults are likelier to have poorer psychological well-being and exhibit criminal behaviour due to nicotine dependence. The association of nicotine dependence with total aggression and its four individual factors – Physical Aggression (PA), Verbal Aggression (VA), Anger (A), and Hostility (H) – were studied.

Materials & Methods

We used snowball sampling to collect self-reported nicotine dependence [Fagerström Test for Nicotine Dependence], aggression [Buss and Perry's Aggression Questionnaire; Bryant, Smith 2001], sleep pattern data from respondents using a web-based survey (n = 310). Pearson Correlation, unpaired two-sided t-test, Kruskal-Wallis and Mann-Whitney tests were used for comparison of subjects that smoked 1-10 cigarettes/day (Group I), 11-20 (Group II) and non-smokers (control).

Results

Nicotine dependence scores were positively correlated with total aggression and its four factors- PA, VA, A, and H. Total aggression score, PA, VA, and A were all significantly higher for respondents of Group II than those of Group I by 26.57%, 31.54%, 41.11% and 24.31% respectively. Group II participants not only had higher aggression than both Group I and control, but were also the only subjects that exhibited sleep impairment patterns. No significant difference was noted between Group I and control subjects in terms of aggression and sleep. It was also observed that nicotine dependence increased with number of cigarettes smoked per day and smoking history.

Conclusion

Our study highlights the association of nicotine dependence and aggression. Interestingly, only those individuals who smoked over 10 cigarettes per day had an increased level of aggression in comparison to non-smokers. The finding enables the possibility of an anti-smoking intervention strategy that may deter smokers from increasing their cigarette consumption. Our analysis also suggests sleep to be impacted by smoking, hence either indirectly insinuating the rise in aggression or being a collaterally affected factor.

A Cross-Sectional Study on the Cardiovascular Risk Associated with the COVID-19 Lockdown

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Introduction

In late December 2019, an outbreak of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV 2), emerged in Wuhan, China causing a global pandemic. Non-pharmacological interventions (NPIs) such as wearing masks, social distancing became mandatory to decrease the disease transmission, given the absence of any treatment for the disease. Stringent measures were implemented in several parts of the world and a nation-wide lockdown was declared in India to alleviate disease transmission. The lockdown has provided grounds for an altered lifestyle among the people, such as smart working, online education, and restriction of outdoor activities which contributes to a sedentary behaviour.

The present study aimed to analyse the cardiovascular risk associated with lifestyle modifications due to the COVID-19 confinement.

Materials & Methods

This cross-sectional study was conducted using an anonymous online questionnaire consisting of more than 20 questions about living habits during the COVID-19 confinement and the previous time. Convenience sampling was used for data collection and the statistical analysis (Chi-squared test and one-way ANOVA) was performed using PASW Statistics Version 18.0.

Results

A total of 432 respondents, aged between 20 and 60 years (mean age-33.39 ±10.8 years) were included in the study. The perception of weight gain was observed in 46.06% of the population; 19.90% reported an increased carbohydrate intake; a decrease in physical activity was observed in 27.08%; 62.73% reported an increase in screen time; more females complained of having sleep disturbances and stress perception was more in the population group aged between 30-50 years.

Conclusion

Quarantine has resulted in an increased cardiovascular risk in the society due to the associated unhealthy lifestyle and stress. Following quarantine, a global action supporting healthy diet and physical activity should be made mandatory to encourage people to return to a good lifestyle routine. This study would help in execution of public health interventions during the pandemic as well as in future times.

Simulation in health education: development of a simulator for peripherally inserted central venous catheter (PICC)

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Introduction

The use of simulators in health education is not recent, in many countries the practice is common and encouraged to improve skills and reduce complications when performed in real patients. Numerous studies demonstrate the effectiveness of these simulators in training students and professionals already trained, not only in health, such as aviation and military training. Despite their importance, simulators in our country are still a distant reality from most Brazilian universities, as the cost of acquiring and maintaining equipment becomes prohibitive for routine use. This project aims to develop realistic simulators capable of meeting the needs of Universities with the premises of being simulators of low cost, easy reproduction and low maintenance cost, which will enable the use in any service in the country. Specifically a simulator for training in peripheral implant central catheter (PICC).

Materials & Methods

As a first step, a need was identified followed by a financial impact survey, looking for simulators on the market to cover the demand and cost. Finally, we started customizing our own simulator: with low costs. With a prototype, we are developing protocols for training students and residents, to ascertain the efficiency of the simulator in practice. Finally, with the simulator ready, we will begin the practical use.

Results

A market research has already been carried out, where we found a simulator for the passage of PICC with a cost of \$ 800.00 dollars price without tax. In our production, we were able to produce a simulator with a price of R\$ 200.00 (approximately 36 dollars), using plastisol; tourniquet rubber; plastic tube 0.5 in diameter; an x-ray plate; cardboard box for the x-ray frame and a led light source.

The next expected results will come according to training tests, which will demonstrate the success rate of venous catheterization, the acceptance of students and professionals regarding the prototype and its reproducibility.

Conclusion

The use of simulation has shown many advantages. A low-cost simulator proved to be feasible for production. The affordable production cost enables the knowledge dissemination through all students' and residents' training services in the country that have been facing a lack of resources to innovations.

High prevalence and low awareness and control of hypertension in the Czech population of age 25-64 years among nondiabetic, prediabetic and diabetic group: a cross-sectional study

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Introduction

Hypertension is a serious medical condition with increasing prevalence all over the world. Together with diabetes it is an important risk factor for developing cardiovascular diseases. Awareness of the diagnosis along with adequate treatment and control of blood pressure are essential for prognosis of all patients with hypertension.

Materials & Methods

Data from Czech EHES (European Health Examination Survey) conducted in 2014 were used for this analysis. This was a stratified, cross-sectional, cluster, random sampling epidemiological study focused on population of age 25-64 years. The anamnestic data were collected through professional interviewer-administered questionnaires, blood pressure values were obtained during standardized medical examination. Hypertension was defined either as systolic pressure >140 mmHg or diastolic pressure >90 mmHg or undergoing antihypertensive therapy. Successful control of hypertension was defined as blood pressure value <140/90 mmHg. HbA1c level and anamnestic data were used to categorize glucose metabolism disorder, the criteria were as follows; diabetes group ≥ 48 mmol/mol or prior diagnosis of diabetes, prediabetes group ≥ 39 and < 48 mmol/mol. The statistical analysis was achieved by a one-way analysis variance (ANOVA) and an X²-test.

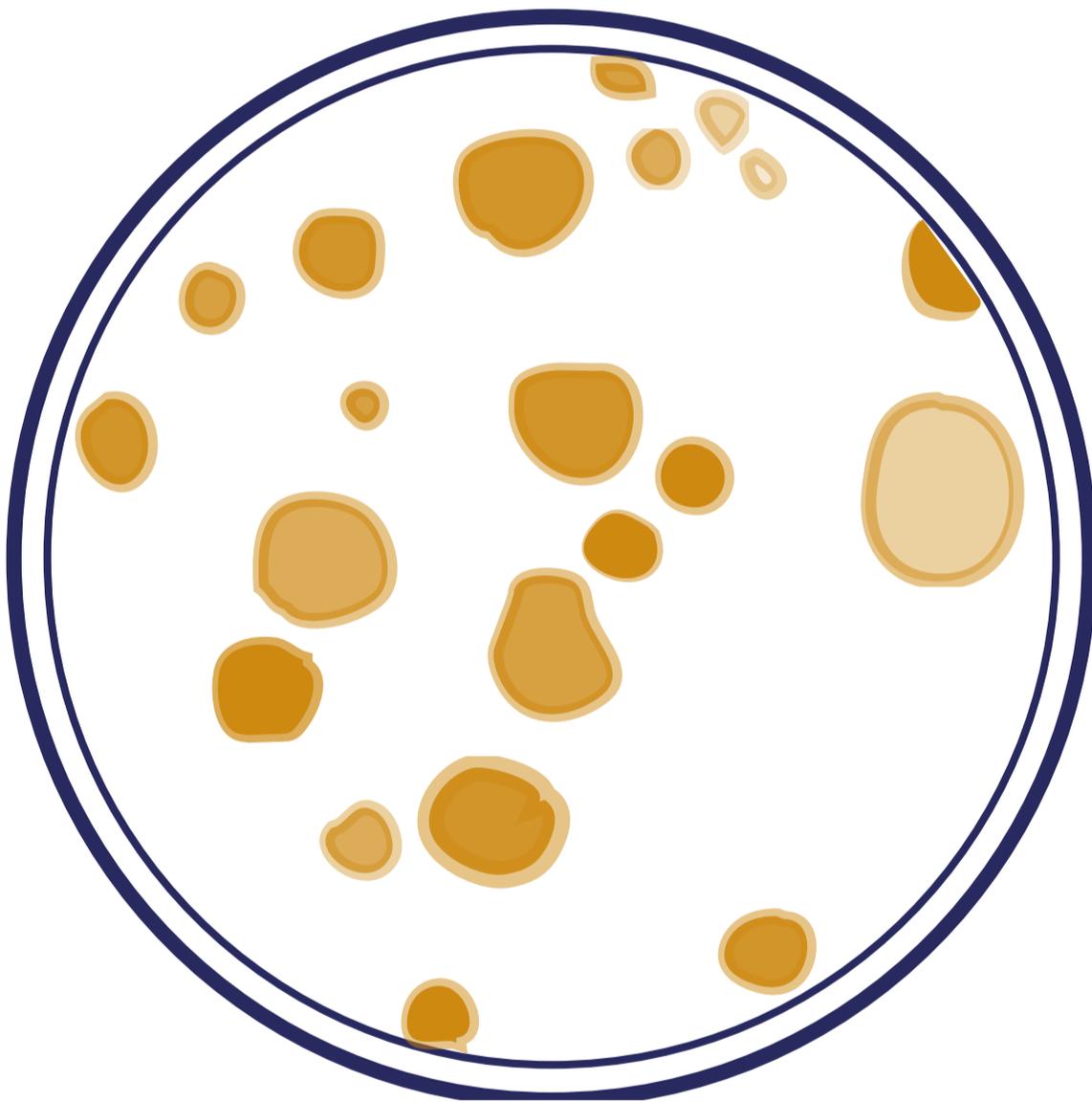
Results

Among the 1,189 participants, 452 (38%) were diagnosed with hypertension and 319 (70,6%) were aware of the diagnose. An average systolic blood pressure was 132,8 mmHg in the diabetic group, 127,3 mmHg in the prediabetic group and 121,4 mmHg among nondiabetics, $p < 0,001$. The prevalence of hypertension was significantly higher in the diabetic group (73,7%) compared to prediabetic (47%) and nondiabetic group (28,6%), $p < 0,001$. Correspondingly the awareness was markedly higher within the diabetic group (86,9%) compared to prediabetic (75,5%) and nondiabetic group (60,6 %), $p < 0,001$. Overall control of hypertension was 154 (57,9%). It was more successful among nondiabetic patients (64,1%) than in the prediabetic (56,8%) and diabetic group (50,0%), $p < 0,001$.

Conclusion

The study shows a high prevalence and overall low awareness and insufficient control of hypertension in the Czech population. Within the diabetic group it shows higher than average awareness but less successful control of hypertension. The study implies the need for reinforcement of hypertension screening in the Czech Republic since almost half of nondiabetic population is unaware of their diagnosis.

Medical Microbiology



Presenters:

Ganetskaya, G.E.A. (Elizaveta)

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Gupta, K.G. (Kritika)

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Effect of proteases of micromycete *Aspergillus alliaceus* on microbial biofilms

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Introduction

According to the Centers for Disease Control and Prevention, up to 80% of bacterial infections are caused by microbial biofilms. Proteases, produced by micromycetes, are effective in suppressing the viability of some emerging and formed biofilms.

Materials & Methods

In this research were used the strains of *Aspergillus alliaceus* 7dN1, *Escherichia coli* K12 (Gr-) and *Staphylococcus aureus* (Gr+) from the collection of the Moscow State University. A suspension of bacterial cells was applied to sterile filters. The enzymes were added to a part of the biofilms at the initial stage, all samples were incubated, then the enzymes were added to the other part of the samples. The assessing cell metabolic activity was made with MTT assay, the optical density of the extracts was measured at 590 nm. Proteinase K, trypsin and cellulase (1 mg/ml) were used as a positive control. The obtained lyophilized preparation from the *A. alliaceus* 7dN1 was used at concentrations of 1mg/ml and 5 mg/ml.

Results

Proteinase K does not affect the formation of *E. coli* biofilms, but it reduces the number of metabolically active cells in already formed biofilms by 15%. Trypsin reduces the number of metabolically active cells by 10% in both types of biofilms. Cellulase reduces the number of metabolically active cells in the emerging biofilms by 10% and by 20% in the formed ones. The *A. alliaceus* enzymes reduce the growing biofilms by 10% in any concentration. However, the suppression of the viability of *E. coli* in formed biofilms by 5% and 20% were caused by exposure 1mg/ml and 5 mg/ml respectively.

All enzymes had no effect on *S. aureus* biofilm formation, except of proteinase K (only 5%). Proteinase K and trypsin affected the formed biofilms by 2%, while cellulase by 6%. The exposure of extracellular protein preparation *A. alliaceus* decreased the number of *S. aureus* metabolically active cells by 7% and 13% in concentrations of 1 mg/ml and 5 mg/ml in the specified order.

Conclusion

These data demonstrate the great potential of using micromycete proteases against bacterial biofilms.

Effect on human hemostatic proteins of extracellular protease enzyme of *Aspergillus terreus*.

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Introduction

Proteolytic enzymes of *Aspergillus* sp. have a possibility of medical application. For example, fibrinolytic and hemostasis proteins activation is known. Nowadays there are protein C, factor X, and prekallikrein activators among aspergilli extracellular proteases exist. Besides these types of activity, some of them cause side effects, like plasma globular proteins hydrolysis. Of course, then less value of this proteolysis than better is the enzyme for medical application. *Aspergillus terreus* earlier was recognized as a promising producer of protease that can activate human prekallikrein into kallikrein and also has a plasmin-like activity with a direct fibrinolytic effect. But side activities are unstudied.

Materials & Methods

The strain of *Aspergillus terreus* 2 from the collection of the Moscow State University was used. Micromycete was cultivated on an orbital shaker (200 rpm) in shake flasks (750 ml with 100 ml of medium) at 28°C for 5 days, on a suitable nutrition medium. The enzyme was purified after precipitation from the culture fluid by ammonium sulfate, dialysis, and isoelectrofocusing (according to Vesterberg's method). Determination of fibrinogenolytic, hemoglobinolytic, albuminolytic, and total nonspecific proteolytic (caseinolytic) activity was carried on in the culture fluid with the 1% substrates based on 0.1M Tris-HCl buffer (pH 8.2).

Results

The protease of *A. terreus* was active against all studied substrates. The values of the nonspecific proteolytic and fibrinogenolytic activities of purified protease were 567.6 E/mg of protein and 347.7 E/mg. These activities were comparable with proteolysis of human serum albumin and bovine serum albumin (351.2 and 531.8 E/mg of protein, respectively). The obtained data show an approximately same action of fungal protease on plasma proteins Hemoglobinolytic activity, which was measured additionally, was 2 times higher (1244.3 E/mg of protein). That means the protease is not very suitable for therapy, but it may be useful as a diagnostic reagent for the determination of plasma kallikrein in samples.

Conclusion

In conclusion, the micromycete *A. terreus* secreted a protease-activator of prekallikrein with approximately the same levels of activity toward fibrinogen, casein, and albumin, but a little bit higher hemoglobinolysis. To take into account the data, the protease of this micromycete can be used in medical diagnostics of kallikrein.

Antibiotic resistance pattern of Multidrug resistant Acinetobacter isolates

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Introduction

Acinetobacter baumannii is an opportunistic pathogen which is responsible for nosocomial infections. These organisms are intrinsically resistant to disinfectants and antibiotics used for the treatment of gram negative organisms. Carbapenems which are the last resort of treatment in multi drug resistant organisms have lately been of no use due to the development of resistance. The present study was taken up to study the antimicrobial profile of multi drug resistant (MDR) *Acinetobacter baumannii* clinical isolates with respect to the minimum inhibitory concentration (MIC) of meropenem, colistin and tigecycline

Materials & Methods

The study was conducted in the department of Microbiology, KMC, Mangalore after the ethical committee approval. The MDR acinetobacter isolates were collected over a period of 4 months and the MIC tests done by microbroth dilution method. The clinical and microbiological profile of the infections were collected from the case sheets.

Results

A total of 34 isolates of MDR acinetobacter isolates were collected. They were found to be resistant to fluoroquinolones, cotrimoxazole, combination drugs like piperacillin tazobactam, cefaperazone sulbactam and carbapenems. In case of colistin only one isolate came as resistant with the MIC of 4 µg/ml rest 33 of the isolates were sensitive; meropenem 30 isolates had MIC of 16 µg/ml, 3 had 8 µg/ml and one was 0.5 µg/ml being the only isolate sensitive. As there is no CLSI breakpoints for tigecyclin MIC₅₀ and MIC₉₀ is considered. Both of them were below ≤0.25 µg/ml. Two isolates which came as resistant by Vitek had an MIC of 16 µg/ml by the microbroth method, one 0.25 µg/ml and rest 31 were below ≤0.25.

Conclusion

The MIC of meropenem was ≥16 µg/ml. The MIC 50 and MIC 90 of colistin and tigecycline determined that they can be used in the cases of MDR acinetobacter infections in our setup in combination depending on the clinical status of the patient. The rising MIC values in some of the isolates determines that prior invitro testing is required and individualised treatment has to be charted out to each patient.

The Detection of Systemic Disease Risk Based on Microbiome Analysis and LAMP Technology Using a Portable Device, the LifeSmile

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Introduction

Roughly 700 resident microorganisms inhabit the oral microbiome and are influenced by diet, immune health, and gender. Recent oral microbiome studies indicate these bacteria are safe at low levels, however, when present at higher levels, they become a danger to human health. More specifically, the risk for seven serious human pathologies rises significantly as specific bacterial populations increase. These “microbiome detectable diseases” include preterm labor, cardiovascular disease, Alzheimer’s disease, and four cancers (oral, esophageal, pancreatic, and gastrointestinal). The LifeSmile oral microbiome diagnostic device is proposed to assess systemic disease risk from the comfort of your home. LifeSmile utilizes LAMP DNA amplification technology to produce a LED signal to inform the user of a healthy or at-risk oral microbiome.

Materials & Methods

Tooth DNA samples were extracted from each individual for Illumina Next Generation Sequencing enhancement. The bacterial DNA was isolated using the Epicentre extraction kit, quantified with a nanodrop spectrophotometer, and the DNA integrity verified with 16S primers 341F and 806R by PCR. DNA samples were then subject to Illumina MiSeq analysis in order to identify individual oral microbiomes. Illumina MiSeq analysis on twenty million bridge amplified cluster clones were used to search the NCBI BLAST database to reveal the bacterial species name and abundance. The dataset was reduced to 53 bacterial species each representing 1% or greater of the total population. Lastly, the dataset was compared to recent meta-analysis of the seven “oral microbiome detectable diseases.”

Results

Each individual contained unique compositions of detectable bacterial species associated with the disease conditions. *Fusobacterium nucleatum*, a bacterium known to cause preterm labor and GI cancer, was most abundant in females and detected at levels as high as 31% in certain individuals. *Streptococcus sanguinis* was used as a control because it is present at consistently elevated levels.

Conclusion

Our experiment established a rationale for building a portable device (LifeSmile) to house the DNA extraction and detection technology (LAMP) for the seven microbiome detectable diseases. Our proposed sampling device is feasible based on analogous marketed rapid home testing Covid devices that utilize LAMP or CRISPR technology.

Human papillomavirus 16 E5 downregulates the expression of transcription factors associated with epithelial-to-mesenchymal transition

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Introduction

Human papillomavirus type 16 (HPV16) has a differentiation-dependent life cycle in the stratified epithelia, and it expresses oncoproteins such as E5 (16E5), E6, and E7 to evade the immune system and force host cells to express factors required for viral replication. Epithelial-to-mesenchymal transition (EMT) is a de-differentiation mechanism, where stratified keratinocytes lose cell adhesion and acquire mesenchymal characteristics for the purposes of wound healing or development. Even though EMT is associated with late stages of HPV16-induced carcinogenesis, it is unknown if this natural process could have a protective role during infection.

Materials & Methods

The cell lines derived from primary human foreskin keratinocytes (HFKs) and human foreskin fibroblasts (HFF) were used to generate organotypic raft cultures. Replicate rafts were created using combinations of at least three different donor HFF strains along with three donor backgrounds of HFK alone, HPV16+ keratinocytes, and HPV16 E5 Stop cells, which lack E5 expression. Alternatively, keratinocytes were differentiated by suspension in methylcellulose. Gene expression analyses were done using RT-qPCR.

Results

16E5 downregulates EMT-associated transcription factors TWIST1/2 and SNAIL, but viral inhibition of CDH1 and KRT6B and upregulation of CDH2 indicated an ongoing EMT-like process. Our results also suggest that HPV16 promotes some aspects of differentiation. In fact, we found that E6 and E7 upregulated the expression of K10, TGM1, and PKC η , three markers of keratinocyte differentiation, as compared to keratinocytes lacking the virus.

Conclusion

HPV16 seems to modify the host environment by expressing E5, E6, and E7. The downregulation of EMT in favor of differentiation may be significant for the viral life cycle. Future studies should elucidate the relationship between EMT and the host immune system during infection.

Extracellular serine protease produced by *Aspergillus fumigatus* induced NF-kappa B pathway apoptosis in rat's astrocytes primary culture in vitro

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Introduction

Fungi secrete numerous proteins that help to fend off competitive organisms, alter host signaling processes, act as virulence factors in pathogenic processes and also influence and regulate the fungal growth in the new environment. Exoproteins are the primary fungal components involved in host fungal interactions. The exoproteins of *Aspergillus* such as gliotoxin, hydrolases are important factors of virulence. The secretory proteins by *Aspergillus* are released during the growth, which facilitates the fungus to escape from the innate immunity of the host and attack immune and blood hemostasis systems. Combined with the induced inflammatory response of the host, fungal infection leads to the destruction of tissue, but the mechanism of neurotoxicity remains unknown.

Materials & Methods

Extracellular proteins from *A. fumigatus* DSM 790 were separated by isoelectrofocusing on a 110 mL column in a sucrose density the gradient of 0–40% by the Westerberg method. Primary cultures of astrocytes were obtained from the cortex of 1-2 day Wistar's rats. Astrocyte injury was quantified by measurement of the reduction of MTT to produce dark blue formazan product. It was performed confocal scanning microscopy for visualization translocation NF-kappa B p65 in the nucleus. Using Western Blott assay has been proven phosphorylation of IKK after exposure to the extracellular serine protease of *A. fumigatus*.

Results

According to MTT assay tested from 46 µg / ml to 50 mg/ml of protein produced by *A. fumigatus* induced a significant dose-dependent effect of cytotoxicity on the astrocytes after 24 h of exposure. It was demonstrated phosphorylation IKK after exposure to serine protease protein from *A. fumigatus*. This result could prove the theory of degradation of the neuronal system on the IKK pathway. In experiments with selective inhibitors of NF-kappa B translocation (helenalin), it was detected to increase the survival rate of astrocytes and blocking translocation in nucleus NF-kappa B p65.

Conclusion

In conclusion, our findings suggest that serin protease-induced neurotoxicity *Aspergillus fumigatus* DSM 790 in vitro is mediated by the NF-kappa B pathway.

Evaluation of antifungal activity of *Lactobacillus* metabolites against *Candida albicans*

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Introduction

Candida albicans is an opportunistic pathogen, causing superficial and systemic infections of skin, genitalia, gastrointestinal tract and vascular system of humans. Increasing resistance of *C. albicans* to common antibiotics in the treatment of candidiasis has made treatment of these infections challenging. Thus, researchers are seeking novel alternatives for controlling such infections. In this regard, the use of probiotics such as *Lactobacillus* maybe effective for treatment of candidiasis.

Materials & Methods

First, various *Lactobacillus* species including *casei*, *plantarum*, *acidophilus*, *ruteri*, *fermentum* and *rhamnosus* were grown in MRS medium. The antifungal activity of lactobacilli metabolites against *C. albicans* PTCC 5027 was evaluated by Agar well diffusion and microdilution methods. Also, effect of the metabolites on biofilms and germ tube forming ability of *C. albicans* was determined by surface microtiter plate method. Furthermore, the inhibitory activity of the metabolites on growth of *C. albicans* in other carbon-based media such as corn syrup, molasses, malt extract was investigated by microscale optical density assay.

Results

At concentration of 1000 µl/ml, the metabolite of *L. fermentum* PTCC 1638 not only inhibited growth yeasts form of *C. albicans*, but also prevented biofilm and germ tube formation as well as binding capacity to solid surface. Moreover, when cultured in corn syrup medium, the antifungal activity of *L. fermentum* increased by 93% compared to culture in MRS medium. Also, the antifungal activity of *L. fermentum* was mainly associated to acidic metabolites. The combined use of *L. fermentum* supernatant with Amphotericin B and Nystatin doesn't antagonistic effect on the growth of *C. albicans*.

Conclusion

These finding suggested that, the probiotics bacterium *L. fermentum* may be a promising alternative to conventual antibiotics for treatment of candidiasis.

Antagonistic interactions between Non-albicans Candida and Candida albicans

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Introduction

Candida albicans is the most prevalent cause of fungal infections worldwide, especially in the ICU. *Candida albicans* pathogenicity is related to factors such as adhesion to host tissues, biofilm formation, hyphal growth, hydrolytic enzyme secretion and immune. However, Non-albicans *Candida* species have been co-isolated during mixed infections and have been associated with polymicrobial biofilm formation, where these microorganisms interact intensely under the same environment, suggesting a competitive interaction. This study aims to evaluate the influence of Non-Albicans *Candida* species on the pathogenicity of *C. albicans*.

Materials & Methods

In order to quantify the number of cells and metabolic activity of *C. albicans*, we used CFU/mL count and XTT assay, respectively, in monotypic and mixed cultures. Additionally, to determine the level of expression of genes associated with *C. albicans* biofilm formation, *Als3*, *HWP1* and *SAP5* were quantified by qPCR.

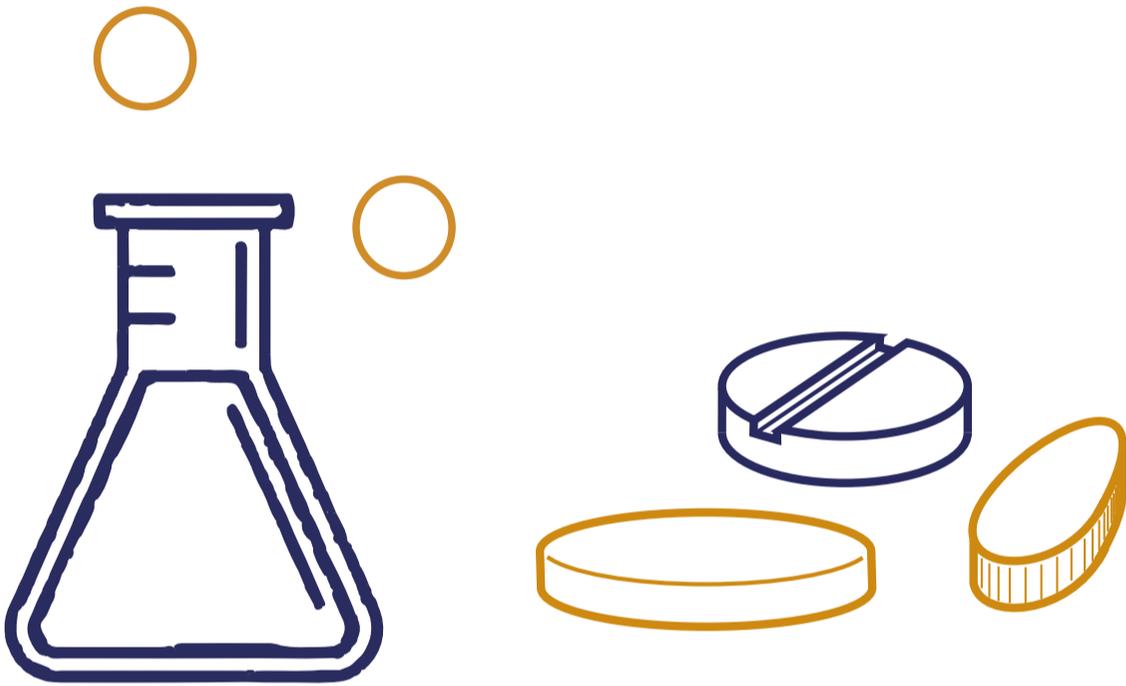
Results

Obtained results showed that *C. albicans* CFU/mL values and metabolic activity were higher in monotypic biofilms compared to biofilms that were co-incubated with Non-albicans *Candida* species. All selected *C. albicans* genes were regulated in antagonist interaction.

Conclusion

There is an antagonistic interaction of Non-albicans *Candida* on *C. albicans* that decreases its pathogenic capacity, and therefore, its ability to generate infections.

Clinical Biochemistry



Presenters:

Quintao, V.C.Q. (Vinicius)

Rabiei Babokani, L.R.B. (Laleh)

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Momot, K.M.

Investigation of the DNA methylation profile in children presenting emergence delirium

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Introduction

Among cognitive changes related to anesthesia, emergence delirium is frequent in children and could be observed in up to 30% of cases. The occurrence of delirium may be related to postoperative cognitive and behavioral changes. Recent studies demonstrated the involvement of epigenetic processes in the behavioral changes related to anesthesia. Thus, performing the DNA methylation profiles is an important tool for studying the role of epigenetic factors in these events.

Materials & Methods

After IRB approval, children between 1 and 12 years old, submitted to general anesthesia for endoscopic procedures, were recruited. Emergence delirium was considered as Pediatric Anesthesia Emergence Delirium Scale score ≥ 10 . DNA from blood lymphocytes were extracted by QIAamp DNA BloodMidi Kit (QIAGEN®). The genomic array was performed using iScan (Illumina®) with HumanCytoSNP850K and Infinium MethylationEPIC BeadChips. Arrays data were treated and analyzed using Bluefuse®, GenomeStudio®, and specific packages in R environment.

Results

We included 53 patients. Twenty-three children (43.4%) presented emergence delirium. Eight children with emergence delirium and eight controls (after age and gender matching) were selected for methylation profile evaluation. Copy number variation analysis demonstrated no presence of pathogenic deletions or duplications. Analysis of methylation raw data showed a difference in the average beta value between cases and controls in selected chromosomes. Bioinformatics analysis demonstrated that children with emergence delirium presented hypomethylation of the genes SLC22A23 and GNA12 in contrast to children that did presented emergence delirium, which those genes were hypermethylated.

Conclusion

Our results suggest that DNA methylation profiles may present significant differences between children with emergence delirium and controls, including specific genomic regions. The gene SLC22A23, family of Brain Organic Cation Transporter, express proteins that function as uniporters, symporters, and antiporters to transport organic ions across cell membranes. The gene GNA12 is involved in the G protein-coupled receptors recognizing diverse messengers such as light, small molecules, and neurotransmitters. Lactic acid concentrations and other metabolites after sevoflurane anesthesia measured by functional MRI are related to emergence delirium, and those metabolites could be involved in the emergence delirium physiopathology through specific genes. Therefore, we emphasize the importance of investigating and identifying epigenetic alterations to understand this relevant adverse event.

The role of peptides in the protective mechanisms of the neurotoxicosis evoked in the animal models.

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Introduction

Introduction. Most of the peptides which appear to be derived due to proteolytic processing have proven to possess immunoregulatory, antioxidant and other biological activities during various damages of CNS leading to neurodegenerative disorders like Alzheimer's disease (AD). Many investigations have been carried out in order to find out regulatory agents capable to perform effective neuroprotection. A hypothalamic prolin rich peptide discovered by A.Galoyan was isolated from neurosecretory granules of hypothalamus. The aim of our research work was to determine the quantitative changes of pro- and antioxidant metalloproteins in the blood serum of white rats at aluminum neurotoxicosis (an animal model of AD) and regulation of their level by hypothalamic polypeptide.

Materials & Methods

Material and methods. We have worked out aluminum neurotoxicosis as an animal model of AD. The neurotoxicosis was achieved by administration of 0,2ml of 10% AlCl₃ at first and third days of experiment. Previously, five days earlier the animals were injected intraperitoneally 6mcg of the peptide. The prooxidant system was represented by measurement of the level of cytochromes b5 and sum of cytochromes b558I to b588bIV, as well as the concentration of suprol and its activity. The antioxidant system includes the determination of activities of catalase and Cu-Zn-dependent superoxide dismutase (SOD).

Results

Results and discussion. The data of our research work have shown that in the condition of neurotoxicosis the level of prooxidant metalloproteins like the cytochromes b5 and sum of cytochromes b558I and b558II, b558III and b588bIV were significantly increased in blood serum whereas the activities of antioxidant enzymes were in some extent decreased. The administration of prolin rich peptide not only enhanced the level of antioxidant enzymes but also exert a stabilizing effect on the concentration of prooxidant metalloproteins in the blood of the animals.

Conclusion

Summary. We can conclude that the above mentioned peptides undoubtedly can be used as an effective neuroprotectors not only at aluminum induced toxicity but also during various disorders of CNS.

THE CHANGES IN THE LEVEL OF MEMBRANE PHOSPHOLIPIDS AND THE ACTIVITY OF LIPID PEROXIDATION WITH SARCOMA-45 AND AFTER THE APPLICATION OF A NEW CYAN-CONTAINING LACTONE

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Introduction

The search for new active pharmacological substances with antioxidant and membrane resistant effects is an actual issue nowadays.

The aim of the research is to study the effect of a new derivative of cyan containing lactones (2-cyan-3,4,4-trimethyl-2-buten-4-olid), synthesized in Yerevan State University, in the membranes of hepatocytes and blood erythrocytes with Sarcoma-45 at lipid peroxidation (LPO) and phospholipid (PL) exchange.

It was indicated that the following components have a regulative effect, which is expressed by a decrease of LPO and stabilization of lipid components of erythrocytes and hepatocytes membranes.

Materials & Methods

The experiments were carried out on 30 white Wistar rats weighing 140-160 g, divided into three experimental groups.

The fractionation of individual PLs was performed by thin-layer chromatography method. The LPO activity was estimated by the amount of the final molecular LPO products (malondialdehyde). Malondialdehyde (MDA) was determined in samples by colour reaction with thiobarbituric acid.

Results

A significant violation of membrane lipids metabolism, in particular phospholipids (PL), was revealed, which is manifested by a more than double increase in the content of cytotoxic lysophosphatidylcholines (LPC) both in erythrocyte membranes ($P < 0.001$) and in hepatocytes ($P < 0.001$).

It was confirmed that during Sarcoma-45 the quantity of phosphatidylcholines (PC) and phosphatidylethanolamines (PE) decreases both in erythrocytes ($P < 0,001$; $P_1 < 0,01$) and in hepatocytes ($P < 0,001$; $P_1 < 0,01$).

After application of 2-cyan-3,4,4-trimethyl-2-buten-4-olid normalization of almost all studied indices are observed. The marked tendency to normalization of the levels of cytotoxic and membranolytic LPC is also revealed, with a significant rise of PC content ($P < 0.001$).

Conclusion

Due to the results of our research, the studied preparation possess antioxidant and membrane resistant effect.

Thus, the manifested regulative effect of new derivative cyan containing lactone on the metabolism of PL and LPO in hepatocytes and erythrocytes indicates the need for its further targeted study in case of this pathology.

Endothelial injury in distal transradial access and traditional transradial access during percutaneous interventions

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Introduction

Recently, the distal transradial access (dTRA) has been proposed as an alternative to traditional transradial access (TRA). During percutaneous interventions and during hemostatic compression, mechanical stress of arterial walls occurs. It is caused by needle puncturing an artery wall, sheath inserted in the lumen of artery, and external pressure of dressing. Damaged endothelium releases markers of injury. The aim of the study was to quantify and compare the vascular injury between dTRA and TRA.

Materials & Methods

40 adult patients, qualified for the elective coronary angiography, were recruited. The procedures were performed by EAPCI certified operators. After an intervention, a pressure dressing was applied to the puncture site. The dressing was removed after 120 minutes. The puncture site was assessed, for the presence of hematoma and pulse. The blood from cephalic vein was collected to EDTA tubes, then centrifuged. Plasma concentrations of Endothelin-1 (ET-1), Interleukin-8 (IL-8), Soluble Vascular Cell Adhesion Molecule-1 (sVCAM-1) were determined using the ELISA method. Markers were chosen on the grounds of literature. Subjects received 11-point visual-analogue scale (VAS) to assess firstly the level of pain at the time of gaining vascular approach and secondly during the maintenance of the pressure dressing.

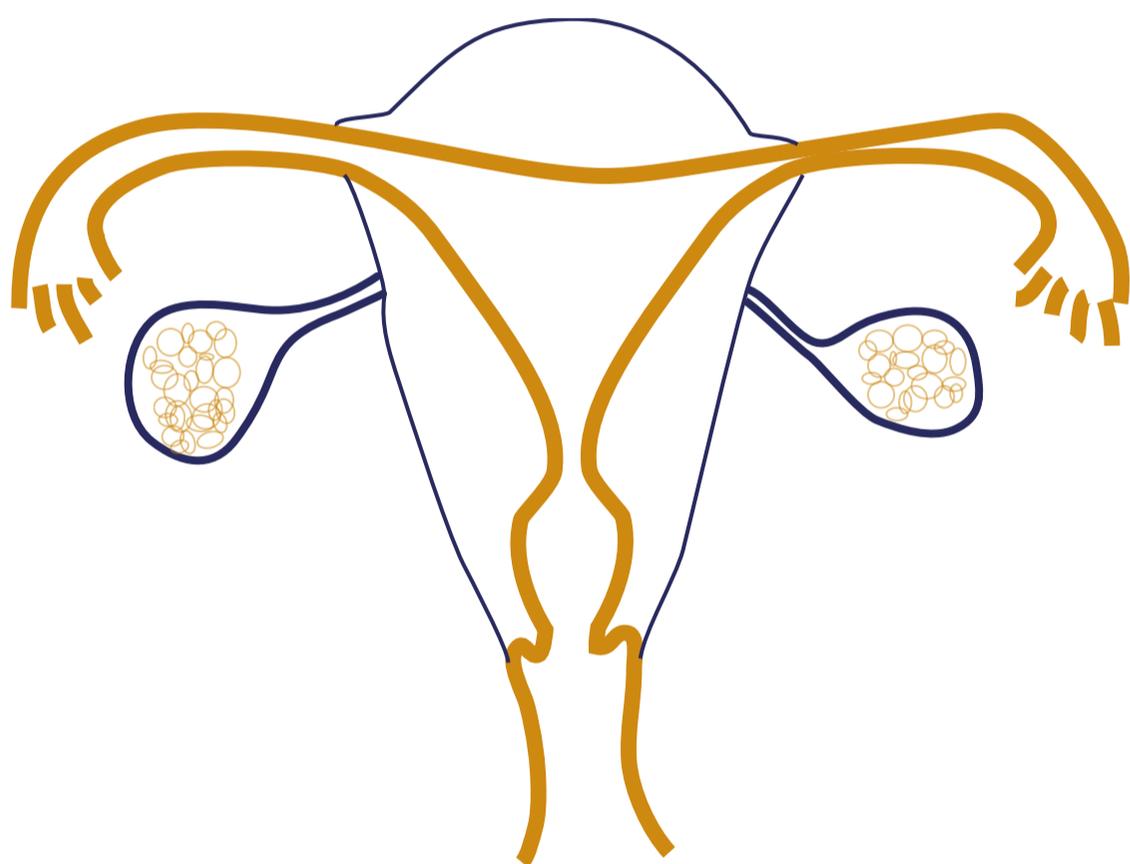
Results

Successful cannulation was obtained in 18 (90%) subjects in dTRA and 20 (100%) in TRA group. After dTRA there was 1 case (6%) and after TRA- 0 cases of hematoma (ns). In all of the subjects after dTRA and TRA, distal pulse was detected. ET-1 concentration was $2,08 \pm 0,19$ (dTRA) vs. $2,00 \pm 0,29$ (TRA) [pg/ml] (ns); sVCAM-1: $12,71 \pm 3,97$ vs. $12,86 \pm 4,29$ [ng/ml] (ns); IL-8: $8,81 \pm 0,42$ vs. $9,15 \pm 0,52$ [pg/ml] (ns). Perceived pain does not differ significantly between two groups and was not related to concentration of endothelial injury markers.

Conclusion

Vascular damage does not differ between two approaches, tortuosity of radial artery in anatomical snuffbox does not affect risk of endothelial injury. Perceived pain in dTRA and TRA is comparable. However, in some cases anatomical characteristics of radial artery in snuffbox make it impossible to gain distal approach. dTRA approach is not inferior to TRA. It should be widely used in percutaneous interventions in cardiology, radiology, neurology.

Reproductive Health



Presenters:

Harre, N.S.A. (Antonia)

Mokos, M. (Mislav)

The induction of primordial germ cells in the rabbit and its dependence on cell migration and growth factor gene expression

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Introduction

Initiating factors in the onset of mammalian germ cell induction processes are currently best understood in mice and humans: The emergence of the primitive streak, which marks the onset of gastrulation and primordial germ cell induction, takes place after the implantation of the embryo in the maternal uterine mucosa. In rabbit embryos however, this process occurs while the embryo is in a spheric shape in the uterine horn; this presents the opportunity to answer questions as to whether primordial germ cell induction is dependent on implantation, on embryo shape during gastrulation, and on the expression of signalling factors such as bone morphogenetic proteins (BMPs). We therefore aimed to analyse the influence of physiological primitive streak formation and the role of localized BMP2/4 concentrations on the induction of primordial germ cells, in rabbit embryo.

Materials & Methods

A total number of 95 blastocysts (White New Zealand) at 6,2 dpc (days post coitum) were incubated with Rho-associated coiled kinase (ROCK) inhibitor in vitro and then analysed by whole-mount in situ hybridisation for primordial germ cell markers NANOS3 (7 blastocysts) and BLIMP1 as well as signalling molecules BMP4 (6 blastocysts) and BMP2, and histological and statistical analysis

Results

The NANOS3 expression domain was distributed in 85% (n=7) of specimens in a crescent shaped area in the posterior third of the embryonic disc, compared to a more condensed expression restricted to the posterior pole in wild type specimen. In ROCK inhibited embryos, BMP4 and NANOS3 expression domains overlap in 53% (n= 13) laterally at the extraembryonic border and in 92% (n=13) in a crescent like area along the posterior border between embryonic and extraembryonic tissue.

Conclusion

The induction of primordial germ cells may, indeed, be dependent on the locally high concentration of BMP2/4 but largely independent from the physiological formation of the primitive streak in the rabbit embryo. If our results were to be confirmed by others, our research could help to complement the understanding of primordial germ cell induction and be applied in reproductive medicine.

Association between testicular histological features and stereological properties of seminiferous tubules in patients with Y chromosome microdeletions

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Introduction

Y chromosome microdeletions (YCDs) affect around 5-10% of men with azoospermia. They occur in the azoospermia factor (AZF) region and result with the impairment of spermatogenesis. A success rate of testicular sperm extraction (TESE) in patients with YCDs depends on residual spermatogenesis and may be up to 50%. Our study aimed to evaluate the association between histological features and stereological properties of seminiferous tubules in patients with YCDs.

Materials & Methods

The study was conducted on 28 human testis biopsy specimens obtained from 14 patients with Y chromosome microdeletion. Control group included 33 samples from 18 patients (3 of them with a solitary testis) with obstructive nonhereditary azoospermia. Qualitative histological analysis and morphometric stereological analysis of seminiferous tubules (including volume, surface area, length and number of tubules) were performed in both groups.

Results

All investigated stereological parameters were significantly smaller in YCDs compared to the control group. Qualitative histological analysis revealed significant impairment of spermatogenesis in YCDs with three recognized histological subgroups: 1) 15/28 (54%) biopsy samples presented with mixed atrophy of seminiferous tubules; 2) 7/28 (25%) with Sertoli cell-only syndrome; 3) 6/28 (21%) with maturation arrest. When comparing histological subgroups, there were no significant differences in the results of the stereological analysis.

Conclusion

In patients with YCDs there is severe damage to seminiferous tubules. Quantitative stereological analysis in YCDs patients has a discriminatory value in assessing the damage of seminiferous tubules in azoospermia workup. Histological analysis has a predictive value for successful sperm isolation via TESE in patients with YCDs.

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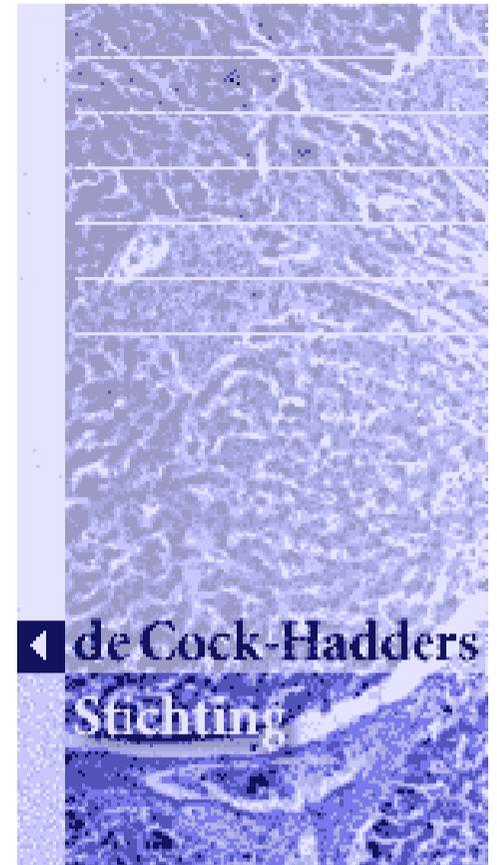
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