26th Health Sciences Center Poster Conference 2022

Under the Patronage of the President of Kuwait University

22-24 March 2022

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Organizing Committee

- Dr. Heba Al Hussaini, Acting Vice Dean Research & Postgraduate Studies
- Prof. Narayana Kilarkaje, Chairman PC2022, Department of Anatomy FOM
- Prof. Kusum Kapila, Department of Pathology, FOM
- Prof. Ahmed Al-Hashim, Department of Pharm Chem, FOP
- Dr. Wadha Al-Fouzan, Department of Microbiology, FOM
- Dr. Mohammed Al-Onaizi, Department of Anatomy, FOM
- Dr. Muddanna Rao, Department of Anatomy, FOM
- Dr. Selma Al-Kafeef, Department of Biochemistry, FOM
- Dr. Reem Al-Sabah, Department of Community Medicine, FOM
- Dr. Sonia Alhashimi, Department of Physiology, FOM
- Dr. Abeer El-Abdallah, Department of Pathology, FOM
- Dr. Shaimaa Karam, Department of Pharmacology & Toxicology, FOM
- Dr. Baydaa Al-Sannan, Department of Obse & Gyne, FOM
- Dr. Laila Qadan, Department of Medicine, FOM
- Dr. Issa Loutfi, Department of Nuclear Medicine, FOM
- Dr. Waleed Al-Herz, Department of Pediatrics, FOM
- Dr. Fawzi Babiker, Department of Physiology, FOM
- Dr. Ali Bourisly, Department of Physiology, FOM
- Dr. Fahad Al-Asfar, Department of Surgery, FOM
- Prof. Chacko Mathew, Department of MLS, FOAH
- Dr. Mona Al-Sane, Department of Preventive Dentistry
- Dr. Walid Al Ali, FOPH
- Mr. Adel Mohahamed Al-Rebab, Administrative Manager, FOM
- Ms. Lateefa, Acting Chairperson, Dept of Finance, FOM

Conference Program Schedule

Inaugural Ceremony: Tuesday, 22nd March 2022

MS Teams Virtual Meeting Link: https://bit.ly/26thHSCPC2022

Program Moderator: **Dr. Mohammad Al-Onaizi**

2:00 PM	***National Anthem, Recitation of Holy Quran***
2:10 PM	***Welcome Address & Opening of Poster Conference*** *Acting Vice-Dean for Research & Postgraduate Studies, Faculty of Medicine*
2:15– 2:30 PM	***Announcement of Awards by Chief Judge***
2:30 – 3.45 PM	***Oral Presentation for Award Winners (4 presentations):*** ***Day 1: Moderator: Dr. Fawzi Babiker*** *Oral Presenters: 15 minutes per each winner* ➢ *Oral -1: MSc-1* ➢ *Oral 2: MSc-2* ➢ *Oral 3: MSc-3* ➢ *Oral 4: MSc-4*
3.50 – 4.00 PM	***Introduction of Keynote Speaker: Professor Narayana Kilarkaje*** *Chairman of Organizing Committee*
4.00 – 5.00 PM	***Keynote Lecture 1:*** Human iPSC-NSC derived Extracellular Vesicle therapy for Alzheimer's Disease: Promise and Challenges **Prof. Ashok K. Shetty, Ph.D.** Associate Director and Professor, Institute for Regenerative Medicine, Department of Molecular and Cellular Medicine, College of Medicine, Texas A&M University
5:05 – 7:00 PM	***Virtual Opening of E- Poster Conference & e-poster viewing (ID 1-54)*** ***(10 minutes per poster)*** *President, Vice President for Research, HSC Vice President, Assistant Vice President for Research, HSC Deans and Vice-Deans, All Participants*

Day 2: Wednesday, 23rd March 2022
MS Teams Virtual Meeting Link: https://bit.ly/26thHSCPC2022
Moderator: Dr. Sonia Alhashimi

3.00 – 3.05 PM	***Announcement of Awards by Chief Judge***
3:05 – 4:35 PM	***Oral Presentation for Award Winners (4 presentations):*** ***Moderator: Prof. Ahmed Al Hashem*** *15 minutes per each Oral Presenter winner* ➢ *Oral 5- PhD-1* ➢ *Oral 6- PhD2* ➢ *Oral 7: Graduate Research - Medical Residents* ➢ *Oral 8: Best Case Report- Clinical Science* ➢ *Oral 9: Best Young Researcher - Clinical Science*
4:40 – 6:15 PM	***E-poster viewing (ID 55-108): Parallel Sessions- (10 minutes per poster)*** ***Please note that the e-poster sessions will run parallel.***

Day 3: Thursday, 24th March 2022:
MS Teams Virtual Meeting Link: https://bit.ly/26thHSCPC2022

Moderator: Dr. Selma Al-Kafeef

2.00 – 2.05 PM	***VDR Remarks*** ***Acting Vice-Dean for Research & Postgraduate Studies, Faculty of Medicine***
2.05 – 2.10 PM	***Introduction of Keynote Speaker: Prof. Narayana Kilarkaje*** Chairman of Organizing Committee
2.10 – 3.05 PM	**Keynote Lecture 2- Biology or Technology? Innovation is the Key** **Prof. Pieter Doevendans MD, PhD, FESC** University Medical Center, Division Heart and Lungs, Dept. of Cardiology, The Netherlands
3.05- 3.10 PM	***Vote of Thanks: Prof. Narayana Kilarkaje***
3.10 – 3.15 PM	***Announcement of Awards by Chief Judge***
3:20 – 4:35 PM	***Oral Presentation for Award Winners (4 presentations):*** ***Moderator: Dr Laila Qadan*** *15 minutes per each Oral Presenter winner* ➢ *Oral 10 - UG1* ➢ *Oral 11- UG2* ➢ *Oral 12-UG3* ➢ *Oral 13- Young Researcher – Basic Sciences*
4:40– 6:30 PM	***E-poster viewing (ID 109 -164): Parallel Sessions: 4.40 - 6.30 PM*** ***(10 minutes per poster)*** *Please note that the e-poster sessions will run parallel.*

E-poster Parallel Sessions

Day 1: Tuesday, 22nd March 2022

Poster viewing session-1: Poster viewing time: 5:05 – 7:00 PM (Poster no.1-54)

Session no./Poster Nos					
S1.1/No. 1-9	S1.2/No. 10-18	S1.3/No. 19-27	S1.4/No. 28-36	S1.5/No. 37-45	S1.5/No. 46-54
Moderator					
Dr S Rao	Prof. Ahmed El Hashim	Dr Issa Loutfi	Dr Abeer Abdullah	Prof Waleed Al-Herz	Dr. Sonia Al Hashimi
Link for the sub-session					
https://bit.ly/PC2022Day1Session1	https://bit.ly/PC2022Day1Session2	https://bit.ly/PC2022Day1Session3	https://bit.ly/PC2022Day1Session4	https://bit.ly/PC2022Day1Session5	https://bit.ly/PC2022Day1Session6

Day 2: Wednesday, 23rd March 2022

Poster viewing session-2: Poster viewing time: Wednesday, 23rd March 2022, 4.40 - 6.15 PM (Poster no. 55-108)

Session no./Poster Nos					
S2.1/No. 55-63	S2.2/No. 64-72	S2.3/No. 73-81	S2.4/No.82-90	S2.5/No.91-99	S2.6/No.100-108
Moderator					
Dr Fawzi Babiker	Dr. Sonia Al Hashimi	Dr. Issa Loutfi	Prof. Kusum Kapila	Dr. Mona Al Sane	Dr. Mohammad Al Onaizi
Link for the sub-session					
https://bit.ly/PC2022Day2Session1	https://bit.ly/PC2022Day2Session2	https://bit.ly/PC2022Day2Session3	https://bit.ly/PC2022Day2Session4	https://bit.ly/PC2022Day2Session5	https://bit.ly/PC2022Day2Session6

Day 3: Thursday, 24th March 2022

Poster viewing session-3: Poster viewing time: Thursday 24th March 2022; 4.40 – 6.30 PM

Session no./Poster Nos					
S2.1/No. 109-117	S2.2/No. 118-126	S2.3/No. 127-135	S2.4/No. 136-145	S2.5/No. 146-155	S2.6/No. 155-164
Moderator					
Dr Fawzi Babiker	Dr. S Rao	Dr. Reem Al Sabah	Dr. Mohammad Al Onaizi	Dr. Mona Al Sane	Dr Shaima Karam
Link for the sub-session					
https://bit.ly/PC2022Day3Session1	https://bit.ly/PC2022Day3Session2	https://bit.ly/PC2022Day3Session3	https://bit.ly/PC2022Day3Session4	https://bit.ly/PC2022Day3Session5	https://bit.ly/PC2022Day3Session6

Instructions

The above-named e-poster viewing program works as follows. The poster presenters prepare power point presentations and save as PDF files and send them to ‘26TH HSC POSTER CONFERENCE 2022’. These files will be made available to all HSC poster conference participants a day before the beginning of the sessions in '26TH HSC POSTER CONFERENCE 2022' folder in MS Teams. Therefore, the posters can be viewed in advance from anywhere. The poster presenters will use their Power Point presentations or their PDF versions during e-poster presentation. In the tables given above, the poster presentations will be conducted on all three days. Each day, there will be six sessions, but all of them will be conducted at the same time, which we call parallel sessions. The audience can join any session of their choice by logging into MS Teams via the hyperlinks given with each session title. Limited number of questions will be permitted from the audience for each presenter.

Roles of moderators and poster presenters

The moderator will invite the poster presenter in a predetermined sequence to present to the audience with specific time limit. The total time allotted for each poster presentation is 10 minutes. The poster presenter will open the poster files in their computers and share the screen to the audience at the scheduled time. The presenters must answer a limited number of questions from moderators and audience. Therefore, a strict adherence to time by the moderators and presenters is essential. Please note that the 10 minutes time allotted includes the poster presentation and question and answer time. At the end of 7 minutes, the moderator will tell the presenter that the time is up, and he/she should stop the presentation to take questions.

26th HSC Poster Conference: Award Winner's Oral Presentation Program through MS Team application

Oral Presentation link: https://bit.ly/26thHSCPC2022					
Day 1 22/3/2022 Moderator	**2.30 -2.45 pm**	**2.50 – 3.05 pm**	**3.10-3.25 pm**	**3.30 – 3.45 pm**	
Dr. Fawzi Babiker	**MSc 1**	**MSc 2**	**MSc 3**	**MSc 4**	
Day 2 23/3/2022	**3.05 - 3.20 pm**	**3.25- 3.40 pm**	**3.45 – 400 pm**	**4.05-4.20 pm**	**4.25-4.40 pm**
Prof. Ahmed El Hashim	**PhD-1**	**PhD2**	**Grad. Res. Medical Resident**	**Case Report**	**Young Researcher - Clinical**
Day 3 24/3/2022	**3.20 - 3.35 pm**	**3.40- 3.55 pm**	**4.00 – 4.15 pm**	**4.20-4.35 pm**	
Dr. Laila Qadan	**UG1**	**UG2**	**UG3**	**Young Researcher – Basic Science**	

In order to receive CME Credits for attending or presenting during the 26th HSC Poster Conference, please register using the below link: https://bit.ly/PC2022CMERegistration

Category 1: 7 credits, varies according to the presentations of each author.

Photograph of Organizing Committee

Vice Dean for Research & Postgraduate Studies, FOM

 *Prof. Narayana Kilarkaje, Chairman PC2022, Department of Anatomy, FOM*	 *Prof Kusum Kapila, Department of Pathology, FOM*
 *Prof. Ahmed Al-Hashim, Department of Pharm Chem, FOP*	 *Dr. Wadha Al-Fouzan, Department of Microbiology, FOM*
 *Dr. Muddanna Rao, Department of Anatomy, FOM*	 *Dr. Mohammed Al-Onaizi, Department of Anatomy, FOM*
 *Dr. Shaimaa Karam Department of Pharmacology & Toxicology, FOM*	 *Dr. Reem Al-Sabah, Department of Community Medicine, FOM*
 *Dr. Ali Bourisly, Department of Physiology, FOM*	 *Dr. Fahad Al-Asfar, Department of Surgery, FOM*
 *Prof. Chacko Mathew, Department of MLS, FOAH*	 *Dr. Mona Al-Sane, Department of Preventive Dentistry, FOD*
 *Dr. Walid Al Ali, FOPH*	 *Dr. Laila Qadan, Department of Medicine*
 *Dr. Sonia Alhashimi, Department of Physiology, FOM*	 *Dr. Fawzi Babiker, Department of Physiology, FOM*

 *Dr. Selma Al-Kafeef, Department of Biochemistry, FOM*	 *Dr. Issa Loutfi, Department of Nuclear Medicine, FOM*
 *Dr. Abeer El-Abdallah, Department of Pathology, FOM*	*Dr. Baydaa Al-Sannan, Department of Obse & Gyne, FOM*
 *Dr. Waleed Al-Herz, Department of Pediatrics, FOM*	*Mr. Adel Mohahamed Al-Rebab, Administrative Manager*

Ms. Lateefa,
Acting Chairperson, Dept of Finance, FOM -

-

Centre for Research Support & Conferences

Dr. Nada Madi, Director

Ms. Teena Sadan *Senior Technician*	*Ms. Eqbal Mohammad*

Mrs. Rania Al-Mawlawi
Administrative Coordinator

Online Registration for CME Credits:https://bit.ly/PC2022CMERegistration

Message from the Vice-Dean for Research & Post-Graduate Studies, Faculty of Medicine

The first Poster Conference was organized in April 1996 at the Faculty of Medicine. Since then, the conference has been a successful yearly event where staff and students of all the Faculties of Health Sciences Centre participate and present their research. Robust research culture is a prerequisite for academic excellence. This concept was clearly understood when the First Poster conference was held 25 years ago at the Faculty of Medicine. The founders of the Poster conference initiated this event with a premise that scientific progress depends on research involving investigation, critical analysis, and exchange of ideas. Another objective of the meeting was to stimulate communication between scientists in various health-related specialties and has grown progressively to involve diverse scientific fields in all the Health Sciences Center Faculties.

In continuing the tradition of inviting internationally recognized Scientists whose work has a significant impact upon the Health Sciences, we invited two Keynote Speakers this year. On the first day of the conference, Prof. Ashok K. Shetty from the Department of Molecular and Cellular Medicine, Institute for Regenerative Medicine, College of Medicine, Texas A&M University will deliver a keynote address on 'Human iPSC-NSC Derived Extracellular Vesicle Therapy for Alzheimer's Disease: Promise and Challenges.' On the last day, Prof. Pieter A. Doevendans, Director of the Netherlands Heart Institute and a renowned cardiologist at UMCU, Utrecht, will speak on 'Biology or Technology? Innovation is the Key'.

A total of 163 posters will be presented at this year's conference, and I do not doubt that the 26th HSC Poster Conference will be a great success. I thank Kuwait University for the continuing support and sponsorship of the Poster Conference and the keynote speakers for accepting our invitation. I express my appreciation to the Vice-President Health Sciences Centre, the Deans of different Faculties of HSC for their encouragement and support, and all HSC technical and support staff who assisted in the organization and implementation of this meeting. I am especially very grateful to the Chairman of the 26th HSC Poster Conference and all members of the Organizing Committee and the Judging Committee for their commitment and efforts to make the conference a very successful event.

Dr. Heba Al Hussaini
Vice-Dean for Research & Postgraduate Studies
Faculty of Medicine

Message from the Chairperson; 26th HSC Conference Committee

It gives me immense pleasure to pen the introductory message to all participants of the 26th Health Sciences Center Poster Conference held from March 22-24, 2022. It is also my privilege to invite all esteemed participants and guests to the conference. Due to the ongoing treacherous Covid-19 pandemic, this year too, the meeting will be held online via the Microsoft Teams application. Historically, the idea of organizing a poster conference every year first emanated 26 years ago with the objective of enhancing and encouraging research at the Health Sciences Center. Over the years, the conference was conducted by 25 formidable organizing committees chaired by highly experienced professors. When I agreed to chair the conference, the first thing that flashed in my gray matter was the challenge of filling into their shoes, at least to half of it. This achievement was made possible by the relentless support of the Organizing Committee and Administration of Faculty of Medicine- both past and present. It was a tough decision to organize this conference from the day we decided to do so due to enormous preparations needed to successfully conducting a meeting of this magnitude at the pandemic time. The only certainty was the uncertainty of ever-evolving situations and the conundrum of whether to hold the conference in-person or online, as both versions needed immaculate planning and its timely efficient implementation.

For the first time in the conference's history, we invited a new variety of abstracts based on scientific reviews. The objective was to encourage young researchers to work with their mentors and learn to systematically analyze the literature and invent that new idea upon which they can research in the future. Another significant change to this year's conference is the introduction of two keynote speakers, unlike only one speaker in the previous years. Two eminent scientists- Professor Ashok Shetty from Texas, USA, and Prof. Pieter Doevendans from the Netherlands- will present their keynote addresses on the first and last days of the conference. Our faculty and students will definitely benefit and get stimulated by the keynote lectures to carry out novel research in the near future. All poster awards are meant to encourage the students and young researchers to attain energy and enthusiasm to conduct more and more quality research in the future. The Judging Committee will have the most difficult task of choosing the awards, but I am convinced that the committee is very efficient and professional to perform the job.

In the future, the poster conference needs to evolve to match the prevailing global scientific scenario and should indulge in creating more interactive sessions for the students and youngsters with the world-renowned researchers. It is also important to change its name from the Poster Conference to something like the Annual Scientific Meeting, which should include platform sessions, invited lectures, workshops and student participation in a large number. The students should be given three days break from their studies to actively participate in the conference. This can be achieved only by our collective efforts supported by a dynamic administrative leadership.

I conclude my message by thanking the HSC Administration, the Administration of Faculty of Medicine, all chairs and members of subcommittees, Judging Committee, and more importantly staff in Centre for Research Support and Conferences, without whom this conference wouldn't be a success. I thank all participants and guests for showing interest in the conference and presenting their valuable research work.

I wish all participants a very successful conference and hope that they all will be intellectually benefited from the meeting.

Prof. Narayana Kilarkaje
Chairman, 26th HSC Poster Conference Committee

Keynote Speakers

Prof. Ashok K. Shetty, Ph.D.
Associate Director and Professor, Institute for Regenerative Medicine,
Department of Molecular and Cellular Medicine,
College of Medicine, Texas A&M University

Keynote Lecture 1: *Human iPSC-NSC derived Extracellular Vesicle therapy for Alzheimer's Disease: Promise and Challenges*

Dr. Ashok K. Shetty received a Ph.D. degree in Neuroscience from the All India Institute of Medical Sciences (AIIMS), New Delhi. Following his postdoctoral research work at Duke University, Dr. Shetty joined the Division of Neurosurgery (Department of Surgery) at Duke University Medical Center as an Assistant Professor in 1995. He became Associate Professor in 1999 and held the position of Professor from 2004 to 2011. Dr. Ashok K. Shetty joined the Texas A&M University College of Medicine in 2011 as a tenured Professor of the Department of Molecular and Cellular Medicine and Director of Neurosciences at the Institute for Regenerative Medicine (IRM). In 2016, he was promoted as Associate Director of the IRM.

Dr. Shetty is a nationally and internationally acclaimed translational neuroscientist. He has received worldwide recognition for his pioneering work in stem cell- and stem cell-derived extracellular vesicle therapy for brain disorders. During the past ten years at TAMU, his research studies have been focused on testing the therapeutic efficacy of human pluripotent stem cell-derived neural stem cells and inhibitory interneurons, and human mesenchymal- and neural stem cell-derived extracellular vesicles for improving brain function in conditions such as temporal lobe epilepsy, traumatic brain injury, aging, and Alzheimer's disease. He has also made seminal contributions to military medicine research, particularly for understanding the pathophysiology of Gulf War Illness and developing novel treatment approaches to improve brain function in veterans. Two of his preclinical study results have served as the basis for ongoing clinical trials in Gulf War veterans.

Dr. Shetty has received continuous extramural research funding as Principal Investigator for over 25 years from sources such as the National Institutes of Health, Department of Defense, Department of Veterans Affairs, and industry. These include 1) five R01 grant awards and an R21 grant award from the National Institutes of Health (NIH); 2) seven Peer-Reviewed Congressionally Directed Medical Research Program (CDMRP) grant awards from the Department of Defense (DOD); 3) five Merit Review grant awards and two Research Career Scientist Awards from the Department of Veterans Affairs and 4) and two industry grants, totaling ~21 million dollars in total costs. He has also served as Co-I of 7 other DOD grants. Grants from the NIH, DOD, and industry fund Dr. Shetty's current research.

Dr. Shetty has authored 173 peer-reviewed publications (141 as senior/first author) and edited a book on Neural Stem Cells in Health and Disease. His work has appeared in many high-impact journals, including Journal of Extracellular Vesicles, Science Advances, Molecular Psychiatry, Proceedings of the National Academy of Sciences (PNAS), Neuropsychopharmacology, Journal of Neuroscience, Aging Cell, Redox Biology, Pharmacology and Therapeutics, Journal of Controlled Release, Progress in Neurobiology, Neuroscience and Biobehavioral Reviews, EBioMedicine, Nature Regenerative Medicine, Stem Cells, Stem Cells Translational Medicine, and Brain, Behavior and Immunity, Dr. Shetty has received >15,600 citations for his publications with an h-index of 63. He is among the top 1% of researchers across all fields for the total number of citations received. Dr. Shetty has the distinction of serving on two NIH Study Sections and one VA study section as a Chartered Member. Besides, he has served as a member of >70 other study section panels of the NIH, DOD, VA, Maryland State Stem Cell Research Fund, and New York State Stem Cell Research Fund. Dr. Shetty is founding editor and Co-Editor-in-Chief of the journal, Aging & Disease, and Associate Editor of 6 Neuroscience journals. He is also a Member of the Editorial Board of many prestigious journals, including The Journal of Extracellular Vesicles, Aging Cell, and Stem Cells. Dr. Shetty is a Fellow of the American Society for Neural Transplantation and Repair.

Prof. Pieter Doevendans MD, PhD, FESC
Director Netherlands Heart Institute
University Medical Center, Division Heart and Lungs,
Department of Cardiology, The Netherlands

Keynote Lecture 2:
Biology or technology? Innovation is the Key

Prof. Pieter Doevendans is a renowned cardiologist from the Neterhlands. He studied medicine the Leiden University and took an extensive training in Cardiology at Maastricht under the guidance of Prof H. Wellens. During his residency he spent two years in San Diego at UCSD where he was trained in molecular cardiology. After building a molecular biology laboratory and a fellowship in interventional cardiology, he moved to Utrecht in 2002 as professor in translational cardiology in 2004 followed by a professorship in general cardiology in 2005. He published more then 800 papers in peer reviewed journals. He trained 120 PhD students. He was a co-founder of three companies (Leadpharma, International Cardio Cooperation and HeartEye).

He held different academic, clinical and research positions. To name a few, he was the former Associate professor in Cardiology at Maastricht from 2000 to 2002, Program leader in CARIM division II Cardiac function from 2000 – 2002. At present, he is a Full professor in Cardiology at Utrecht. He also served as Chairman of department of Cardiology at Utrecht UMC from 2005-2020. He served as Chief of Heart and Lung Center division UMCU from 2012-2017. In addition to these positions, Prof. Doevendans is a member of several professional associations, committees. He was awarded Lorex Award in 1998, and a Fellow of the European Society of Cardiology, and Honorary Professor at Yantai Yuhuangding Hospital, China, and a visiting professor to Harvard University. He is also an honorary fellow of Romanian Academy of Medical Sciences. He successfully conducted so many funded research projects from prestigious sponsors such as CUREPLaN Leducq, RegmedXB CV moonshot and Harvey NOW-OTP estimating to millions of US dollars.

Keynote Abstracts

Keynote Lecture 1:

Human iPSC-NSC-derived Extracellular Vesicle therapy for Alzheimer's Disease: Promise and Challenges

Prof. Ashok K. Shetty, Ph.D.
Associate Director and Professor, Institute for Regenerative Medicine, Department of Molecular and Cellular Medicine, Texas A&M University College of Medicine, College Station, TX

Current treatments do not improve brain function or slow down the disease progression in Alzheimer's disease (AD). Hence, there is a need for new therapeutic approaches capable of restraining disease progression and improving cognitive and mood function. In this regard, extracellular vesicles (EVs) from human induced pluripotent stem cell-derived neural stem cells (hiPSC-NSCs) exhibiting the therapeutic effects of NSCs are of great interest. The first half of the keynote speech will present data on the antiinflammatory and neurogenic properties of hiPSC-NSC-EVs. A later portion of the talk will present data on the promise of hiPSC-NSC-EV treatment in the early stage of AD for maintaining better brain function for extended periods. This study purified EVs from hiPSC-NSC cultures through anion-exchange and size-exclusion chromatography methods, which displayed antiinflammatory activity in macrophage and human iMicroglia in vitro assays and a mouse model of status epilepticus. hiPSC-NSC-EV treatment also triggered increased neurogenesis in the adult rat hippocampus. Next, the efficacy of intranasal administration of hiPSC-NSC-EVs (~200 billion/week for two weeks) was investigated in a mouse model of AD (5XFAD mice, a model of familial AD) on cognitive and mood function using several behavioral tests. Both male and female AD mice receiving the vehicle exhibited impaired object location memory, pattern separation function, and anhedonia. Intranasally administered hiPSC-NSC-EVs incorporated into neurons and microglia in virtually all regions of the AD brain. Moreover, AD mice receiving EVs exhibited improved ability for object location memory, pattern separation function, and no anhedonia. Such functional improvements in EV-treated AD mice were linked with diminished levels of astrocyte hypertrophy, activated microglia, oxidative stress markers, and proinflammatory cytokines in the hippocampus. EV-treatment also reduced the accumulation of amyloid-beta load and phosphorylated tau and maintained a higher level of neurogenesis in AD mice. The results suggested that intranasal administration of hiPSC-NSC-EVs in the early stage of AD could maintain improved cognitive and mood function by restraining neuroinflammatory changes and amyloid-beta and p-tau accumulations and facilitating a higher level of hippocampal neurogenesis.

Funding: Supported by a grant from the National Institute of Neurological Disorders and Stroke (1R01NS106907 to A.K.S.)

Keynote Lecture 2- Biology or Technology? Innovation is the Key

Prof. Pieter A. Doevendans
Director Netherlands Heart Institute
University Medical Center, Division Heart and Lungs,
Department of Cardiology, The Netherlands

In recent years we see a healthy competition between major technological developments, but also completely new biological therapies are emerging. Some nice examples are the complete artificial hearts that are implanted in patients, but also xeno transplantation and novel molecules for vaccination. Based on the current treatment modalities for inherited cardiomyopathies the various options will be highlighted in the presentation, with special attention to mutations in the phospholamban gene. Patients develop a severe phenotype and therefore both biology and technology need to be addressed. Yet it is most important to realize that everything we do in medicine today can be improved through innovation. That includes computer science, engineering, biology and simply medicine. Looking forward to an inspiring meeting.

Best Poster Award Winners: 26th HSC Poster Conference 2021

1 Dr. Nael Al-Naqeeb Award for Best Undergraduate Research

i. A Replication Study of Variants Associated with Multiple Sclerosis Risk in The Kuwaiti Population.
Khadijah Ateyah*[1], Mohammad Dashti[2], Raed Alroughani[3], Rabeah Al-Temaimi[4]
[1]Undergraduate Medical Program, Faculty of Medicine; [2]Genetics and Bioinformatics department, Dasman Diabetes Institute, [3]Neurology Clinic, Al-Amiri Hospital, [4]Human Genetics Unit, Department of Pathology, Faculty of Medicine, Kuwait University.

ii Heavy Metal Content in Herbal Products Sold in Kuwait.
AlAjmi R*[1], Miskin B[1], Smitha S[2], Rao MS[2]. [1]Medical students, Faculty of Medicine, Kuwait University, Kuwait, [2]Department of Anatomy, Faculty of Medicine, Kuwait University, Kuwait.

iii Ferulic Acid Enhance Neuronal Differentiation In Hippocampal Stem Cells Derived Neurospheres.
Amina A.A.A.S. AlSalmi*[1], Maryem A.M.A. Kandari[1], Smitha S[2], Rao MS[2].
[1]5th year medical students, Faculty of Medicine, Kuwait University, Kuwait, [2]Department of Anatomy, Faculty of Medicine, Kuwait University, Kuwait

2 Graduate Research Award for Master's Program

i. Virulence traits and antimicrobial resistance of Escherichia coli cultured from sewage in Kuwait.
Redha MA*, Al-Sweih N, Albert MJ. Department of Microbiology, Faculty of Medicine, Kuwait University.

ii Genomic characterization of whole genome sequences of Acinetobacter baumannii isolates.
Nasser K*[1], Al-Fouzan W[2], Dhar R[2], Purohit P[3], Al-Obaid I[3], Mustafa AS[1]
[1]Department of Microbiology, Faculty of Medicine, Kuwait University; [2]Department of Medical Microbiology, Al-Sabah Hospital, Kuwait; [3]Department of Medical Microbiology, Farwaniya Hospital, Kuwait.

iii Beta-caryophyllene, a CB2 Receptor-Selective Phytocannabinoid, Suppresses Mechanical Allodynia in a Mouse Model of Antiretroviral-Induced Neuropathic Pain.
Aly E*, Khajah M, Masocha W. Department of Pharmacology and Therapeutics, Faculty of Pharmacy, Kuwait University.

3. Graduate Research Award for PhD Program

i. Prenatal exposure to dexamethasone alters the gene expression of cox-2 and pge2 receptors in the rat hippocampus and prefrontal cortex and enhances anxiety-like behavior in a sex-specific manner: **Abul M***, Al-Bader M, Mouihate A. Department of Physiology, Faculty of Medicine, Kuwait University.

ii Efficacy of chemical adjuvants, mycobacteria and a DNA vaccine vector for the induction of antigen-specific antibody responses to a major Mycobacterium tuberculosis-specific Th1 cell antigen Rv3619c**:**
Safar HA*[1], Mustafa AS[1], Amoudy HA[1], El-Hashim A[2]

[1] Department of Microbiology, Faculty of Medicine, Kuwait University, Kuwait; [2]Department of Pharmacology & Therapeutics, Faculty of Pharmacy, Kuwait University, Kuwait.

4 Best Case Report Award for Young Researcher

i Inflammatory fibroid polyp; a rare tumor presenting as small bowel intussusception: **Alshamali M [1]**, Sallam S [1], Al-Zuabi M [1], Kenawy M [1], Abdulraheem J [1], Alzaid D [1], Aleid Y [2], Mohammad K [1]. [1] General Surgery Department, AL-ADAN Hospital, Kuwait; [2] General Surgery Department, Kuwait Institute of Medical Specialization, Kuwait.

Past Poster Day Keynote Speakers and Lectures

2021

Healthy Diets in the 21st Century: What are we talking about? Prof. Carlos A. Monteiro, Professor of Public Health Nutrition at the School of Public Health, University of Sao Paulo, Brazil.

2019

What it takes to become an academic surgeon; Prof. Sami Asfar, Professor, Department of Surgery, Faculty of Medicine, Health Sciences Centre, Kuwait University.

2018

The internal exposome – a global approach to a better understanding of human disease.
Professor Paolo Vineis, Chair in Environmental Epidemiology, Imperial College London, UK

2017

Vascular stiffness and systolic hypertension; Prof. Pierre Moreau, B. Pharm., Ph.D
Dean and Professor, Faculty of Pharmacy - Health Sciences Center, Kuwait University

2016

Chemokines: Key players in immune surveillance and agingProf. Bernhard Moser; Chair (Infection & Immunity), Institute of Infection and Immunity, Cardiff University, Heath Park, Cardiff, UK

2015

The Future Healthcare: Personalized Medicine for Cancer Patients; Prof. Ramzi M. Mohammad, Ph.D., Director, GI-Cancer Research, Karmanos Cancer Institute, Michigan, Department of Immunology and Microbiology, Barbara Ann Karmanos Cancer Institute, Wayne State University, MI

2014

Image-guided surgery – from bench to bedside; Professor Samuel Achilefu; Professor of Radiology, Mallinckrodt Institute of Radiology, Washington University School of Medicine

2013

Stem Cells: Building and Rebuilding the Nervous System; Professor Freda Miller; Senior Scientist, Research Institute, Developmental & Stem Cell Biology, University of Toronto

2012

Cardiovascular health in the 21stcentury; Professor Barry McGrath, Professor of Vascular Medicine & Medicine, Southern Clinical School, Monash University, Australia

2011

Cardiovascular Outcome Trials in Diabetes.; Prof. Rury Holman, Director of the University of Oxford Diabetes Trials Unit, University of Oxford, Canada

2010

New mycobacterial vaccine candidates: from lab to clinical trials.
Prof. Abu Salim Mustafa, PhD, FRC Path. Department of Microbiology, Faculty of Medicine, Kuwait University

2009

Evidence-Based Medicine and Knowledge Translation Research for Better Health Care.; Prof. Brian Haynes, Professor of Clinical Epidemiology and Medicine, Chief of the Health Information Research Unit at McMaster University, Hamilton Ontario, Canada

2008

What Ails The World? How Do We Respond?
Prof. Abdallah S Daar, D.Phil (Oxon), FRSC, FRCP (Lon), FRCS (Eng), FRCS (Ed), FRCS (C), Director of Ethics and Policy, McLaughlin Centre for Molecular Medicine, Professor of Public Health Sciences and Professor of Surgery, Senior scientist and Co-director, Program on Life Sciences, Ethics and Policy, McLaughlin Rotman Centre for Global Health, University of Toronto, Ontario, Canada

2007

From Molecular Imaging to Molecular Medicine.
Prof. Henry N. Wagner, Jr. MD, Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland, USA

2006

Stem cell research.; Prof. Sir Martin Evans FRS, DSc (Nobel Laureate), Director of the School of Biosciences and Professor of Mammalian Genetics at Cardiff University, UK.

2005

How Corticosteroids Work in inflammatory Diseases: New Molecular Insights.; Prof. Peter Barnes is of Thoracic Medicine at the National Heart and Lung Institute, Head of Respiratory Medicine at Imperial College and Honorary Consultant Physician at Royal Brompton Hospital, London, UK.

2004

The Nitric Oxide/Cyclic GMP Pathway: Targets for Drug Development Prof. Ferid Murad, Nobel Prize recipient, Chairman, Department of Integrative Biology and Pharmacology, Director, Institute of Molecular Medicine, University of Texas Medical School, Houston, Texas, USA

2003

The Post-Genomic Era: Global Impact on Medicine and Health Care Delivery Prof. Seyed E. Hasnain, Director, Centre for DNA Fingerprinting & Diagnostics (CDFD) Hyderabad, India

2002

Genetics and World Health: Fact or Fantasy Prof.(Sir) David J Weatherall, Emeritus Professor, Weatherall Institute of Molecular Medicien, University of Oxford, UK

2001

Genomic View of Human History Prof. Mary-Claire King, American cancer Society Research Professor, Department of Medicine and Genetics, University of Washington, Seattle, Washington, USA

2000

Molecular Mechanisms and Biomedical Implications of Apoptotic Cell Death Dr. Sten Orrenius, Professor and Chairman, Division of Toxicology, Institute of Enviornmental Medicine, Karolinska Institute, Stockholm, Sweden

1999

Nutrition, Immunity and Infection: Basic Considerations and Public Health Significance Dr. Ranjit Kumar Chandra, Professor & Director, Allergy, Asthma and Immunology Centre, Gurgaon, India

1998

Futurology in Biomedical Research: From Crystallography to Crystal Gazing Prof. Jasbir S. Bajaj, All India Institute of Medical Sciences, New Delhi, India

1997

The Impact of Research on the Development of an Academician Dr. Elia Ayoub, Distinguished Professor of Pediatrics, Department of Pediatrics, Pediatric Immunology and Infectious Diseases, College of Medicine, University of Florida USA.

Original Research Abstracts List by Subject Area

Allied Health

1

Mohammad Qasem, Mohammed Jamsher: Trends in Anterior Cruciate Ligament Reconstruction in Kuwait: A Retrospective Study

2

Welch A, Nath M, McKiddie F: Left ventricle curve analysis in breast cancer hypertensive patients undergoing cardiotoxic chemotherapy.

Anatomy

3

Alkandari AF*, Sampath M, Alawadhi AA, Alawadhi FA, Soliman DM, Almotairi NM, Alozairi O: Using absorbable suture for traumatic wound closure to avoid additional hospital visit for suture removal during the COVID-19 pandemic: A randomized controlled trial

4

AlHajri SA*, Renno WM, AL-Hassan JM: Evaluation Of The Catfish Skin Preparation (Soluble Protein Fraction, Fraction B -SPF-FB) For The Treatment Of STZ Diabetic-Induced Cardiac complications In Rats

5

AlSabagh AT, Renno WM, Rao MS: Effects of Heat Therapy on Attenuating Muscle Atrophy on an STZ-Induced Diabetic Rat Model

6

Al-Sarraf A, Braysh K*, Kazem F, Rao M, Kilarkaje N, Al-Onaizi M: Impaired Spatial Navigation and Age-dependent Hippocampal Synaptic Dysfunction Accompanied by a Chronic Inflammatory Cytokine Profile in db/db Mice

7

Koubisy HL, Renno WM*, Jassim MA: Recovery of ultrastructure of damaged kidneys in STZ-induced diabetes in SD rats following treatment with catfish Fraction B

8

Al-Mutawa MW, Mousa AM, Jamal W, Renno WM: Abdominal pain is no less important than a headache in COVID-19 diagnosis: Literature Review

9

Saeed SM*, Renno WM, Rao MS: Mechanisms of Lead Induced Decline in Cognitive Functions and Neurogenesis in Young Rats

Behavioral Sciences

10

Asmaa Al-Haqan, Farah Alenezi*, Shriefa Al-Mutairi, Dalal Al-Taweel: Are pharmacists well equipped to deal with global health emergencies? Burnout during COVID-19.

Biochemistry

11

Alothman R, Al-Jarallah A, Babiker F: HDL Protects Against Ischemia Reperfusion Injury By Differentially Regulating mTORC1 And mTORC2 Signaling In Normotensive and Hypertensive Rats

12

Al-Enzi At*, Al-Bustan S, Thameem F: Association of Genetic variants in Renin-Angiotensin System (RAS) with Coronary Heart Disease (CHD) in Kuwaiti Patients

13
Almarzouq D*, Godwin Budadasari G, Al-Maghrebi M: The role of TXNIP/NLRP3 inflammasome pathway in NADPH oxidase-induced ROS and germ cell apoptosis.

14
Baydoun ZA*, Khan I, Rao MS: Effects of Curcumin on ER Stress in Experimental Colitis: Mechanism of Action

15
*Janbeih Z, Benov L, Liagre B: Effect of photosensitizer molecular features on cellular uptake, distribution, mechanism of cell death and photo efficiency

16
Sequeira F, Benov L: Antibacterial activity of modified heme derivatives

17
Al-Hawaj FA*, Zamoon JA: Is hRAGE's Cytoplasmic Domain a Transcription Factor?

18
Alnajem AS*, Godwin Budadasari G, Al-Maghrebi M: The Role of The JAK1/Nrf2/Keap1 Pathway in The Regulation of Germ Cell Apoptosis

19
Ludmil Benov, Simranbir Kaur: Metalloporphyrins with antibacterial activity

Biomedical Engineering

20
Alazmi ES, Bourisly AK, Shuaib A: Photobiomodulation therapy for Age-related macular degeneration (AMD): A computational study

21
AL-Enezi RY, Bourisly AK, Shuaib A: The Effect of the Cerebral Spinal Fluid Thickness and Refractive Index on Functional Near-Infrared Spectroscopy Measurement

22
Al-Haddad AA, Bourisly AK, Shuaib A ,: Photobiomodulation for Cosmetics: A Monte Carlo Simulation Study

Community Medicine

23
Alawadhi FK, AlFarhan MD*, Alqusaimi RA, AlKhabbaz A, Almojil K, Alnaqeb A, Alshammari D, Almutairi M, AlKandari A, Abduljader F, AlMajran A, Longenecker JC: Effect Of COVID-19 Lockdown On Glucose Control, Adherence, And Accessibility To Medical Care Among People With Diabetes In Kuwait

24
AlSomali H*, AlMezrem G, AlMansour N, AlShuraian H, Mataqi F, AlSaffar F, AlMatar R, Alsaid N, Suresh A, Akhtar S: Mobile Phone Use While Driving And Road Traffic Crashes Among Adult Drivers in Kuwait

25
Dougherty A, Al Houti F, Aleinati G, AlMusallam J, AlShatti N, AlJassar R, Khalil SI, Kamal Z, Al-Sultan A, Al-Sabah R: The Prevalence of Workplace Violence against Physicians in Kuwait

26
Najla H Al-Ayyadhi, Laila A Refaat, Mahasen M Ibrahim, Heba M Abd ElGalil: Screening for Bone Mineral Density & Assessment Knowledge level of Low Peak Bone risk factors and Preventive Practices among Kuwaiti Future Mothers

Dentistry

27
Abrar Alanzi, Saleh Hajiah, Anfal Faridoun, Aisha Alterkait: Oral Health Knowledge and Experience of Pediatricians and Pediatric Residents in Kuwait

28
Al-Sane MA: The Success of Vital Pulp Therapy in the Treatment of Deep Caries in Primary Teeth

29
Fatma Taqi, Abrar Alanzi: Attitudes and Knowledge of Dental Patients towards Infection Control Measures in Kuwait University Dental Center

30
Nazar H*, Shyama M, Ariga J: Oral Hygiene Status among Adult Employees in Kuwait

31
Jagan Kumar Baskaradoss, Aishah AlSumait, Eman Behbehani, Muawia A Qudeimat: Association between the caregivers' oral health conceptual knowledge and the oral health of children and youth with special health care needs

32
Qasim S S B*, Saji S, Baig R M, Baskaradoss J K, Ali D, Mesalam A, Murray A C A, Daood U: The In-Vitro Effect of Nano Silver Sodium Fluoride on Artificially Demineralized Root Dentine.

Environmental and Occupational Health

33
Soad Albahar*, Mustafa Alzoughool, Ali Al-Hemoud, Barrak Alahmad: The Effects of Ambient PM2.5 on Respiratory Hospital Admissions in Kuwait: 2010-2018

Forensic Pathology

34
Alazemi AM*, El-Fawal MA: Postmortem Findings Among Hanging and Manual Strangulation Fatalities with a Special Reference to Hyoid Bone Fractures: A Systemic Review and Meta-Analysis

Genetics

35
Al-Awadhi AM, Haider MZ, Al-Awadi A, Kalarikkal AK, Hasan EAH, Bartella Y: Relationship of Interleukin-6 (IL6), Interleukin-13 (IL-13) and Tumor Necrosis Factor-Alpha (TNF-alpha) Gene Polymorphisms with Genetic Susceptibility of Psoriatic Arthritis in Kuwaiti Arabs

36
Alsharhan H*, Ng BG, Daniel EJP, Friedman J, Pivnick EK, Al-Hashem A, Faqeih EA, Liu P, Engelhardt NM, Keller KN, Chen J, Mazzeo PA, Rosenfeld JA, Bamshad MJ, Nickerson DA, Raymond KM [16], Freeze HH, He M, Edmondson AC, Lam C [17]: Expanding the Phenotype, Genotype and Biochemical Knowledge of ALG3-CDG

37
Alsharhan H* ,Ahmed AA, Ramadan DG, Alsafi R, Al-Rushood M, Bastaki: Early Diagnosis of Classic Homocystinuria in Kuwait through Newborn Screening: A 6-Year Experience

38
Mohammed Dashti, Hussain Alsaleh, Muthukrishnan Eaaswarkhanth, Sumi Elsa John, Rasheeba Nizam, Motasem Melhem, Prashantha Hebbar, Prem Sharma, Fahd Al-Mulla, Thangavel Alphonse Thanaraj: Mitochondrial haplogroup R associated with a protective effect on obesity in Arabs in Kuwait

39
Mohammed Dashti, Abdullah Al-Matrouk, Juan L Rodriguez-Flores, Arshad Channanath, Prashantha Hebbar, Fahd Al-Mulla, Thangavel Alphonse Thanaraj: Distribution of major pharmacogenomics markers of HLA-B alleles in Qatari population delineated from Next-generation sequencing data

40
Mohamed AK*, Al-Barjas TA, Al-Bustan SA, Bastaki NK: Cloning of partial and full LPL promoters into TOPO-TA and promoterless luciferase vectors

41
Al-Zoubi SM*, Bahbahani H, Al-Bustan S: Signatures of Selection on the Mitochondrial DNA (mtDNA) of Dromedary Camels from the Arabian Peninsula

Health Economics

42
Aljunid SM, NurSyazana MT Aniza I, AznidaFirzah AA, Alkhodary AA, Azzeri A: Economic Burden of Influenza Among The Elderly in Malaysia: Provider's Perspective

Health Management

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Nur AM*, Aljunid SM, Aldoukhi F: Completeness of Medical Record Documentation for Neurology and Neurosurgery Inpatients in a Government Hospital in Kuwait

Health Policy & Management

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Abdulghafoor KA, Aljunid SM: Assessment of management skills among managers in public hospitals in Kuwait

Medical Education

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Al-Kreebani MD* AL-Fouzan W: Knowledge, Attitude, and Practice Among In-training Physicians in Kuwait Institute of Medical Specialization

Medicine

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Albaloul J*, Rajan R, AlJarallah M, Dashti R, AlMullah K, Alharoun: Transcatheter Aortic Valve Replacement in Patients with Heart Failure with Reduced Ejection Fraction: A Single Centre Experience

47
Alrashed F, Shehab M: Comparative Efficacy of Biologic Therapies for Inducing Response and Remission in Fistulizing Crohn's Disease: Systematic Review and Network Meta-analysis

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AlSahow A, AlYousef AQ, AlKandari O, AlHelal B, AlRajab H, AlQallaf A, Bahbahani Y, AlSharekh M, Nessim G, Mashal B, Mazroue A, Abdellatif M, Abdelmoteleb A, Abdelzaher A, Saad M, Abdallah E, ElHusseini Z, Abdelrady A: Acute Kidney Injury Incidence, Causes, Management, and Outcomes: A Prospective, Observational Multi-Center Study

49
Ayman M Nagib, Osama A Gheith, Nabil Alserwy, Ahmad M Abbas, Islam S Elsawi, Prasad Nair, Mahmoud M khaled, Mohamed A Hammad, Zohair A Fayyad, Ahmed F Atta, Ahmed Y Mostafa, Ahmed S Deraz, Mohamed A Moneim, Torki M AlOtaibi: Acute kidney injury among COVID-19 positive patients is associated with higher mortality: single center experience

50
Al-Otaibi T, Gheith O, Nagib AM, Aboatya H, A Halim M, Said T, Emam M, Zakaria El-sayed, Nair P: Safety and efficacy of PCSK-9 inhibition among renal transplant recipients with high cardiovascular risk

51
Al-Qudhaiby M*, Safar F, AL-Bader RB, Saadallah AA, AL-Suwailem FF, Groof YH, Sheikh M: Poly Cystic Ovary Syndrome (PCOS) and Sub-Clinical Hypothyroidism (SCH) among Arab women. A preliminary report

52
Qabazard S, Al-Abdulrazzaq D, Al-Kandari H, Ayed M, Alharbash Z, Al-Khabbaz M, Kalander K, Bin-Hassan S, Alfraij A, Alghounaim M, Alsaeid K, Al-Hashemi H: Establishment and results of pilot phase of the Pediatric COVID-19 Registry in Kuwait (PCR-Q8)

53
Gheith O, Othman N, Al-Otaibi T, Said T, A Halim M, Al-Refaei F, Elserwy N, Mahmoud F, Abduo H, Nampoory N: Structured diabetes education: impact on micro-angiopathies in kidney transplants with post-transplant diabetes: local center experience

54
Yousef AS, Omer MM, Alanbay E, Alobaid KA *: Epidemiology of Pulmonary Aspergillosis in Chest Diseases Hospital

Microbiology and Immunology

55
Abdullah A, Shetty S, Behbehani A, Mokaddas E: Clinical impact of a rapid molecular diagnostic test in patients with sepsis

56
Alajmi RZ, Alfouzan W, Mustafa AS: The Prevalence of Multi-Drug Resistance Enterobacteriaceae among Neonates at Farwaniya Hospital in Kuwait

57
Al-Attiyah R *, Safar H A, Botras L, Botras M, Fatma Al-Kandari F, Chehadeh W, Mustafa AS: Immune Cells profiles in the peripheral blood of patients with moderate to severe COVID-19 and healthy subjects with and without vaccination with the Pfizer-BioNTech mRNA vaccine

58
Al-Mutairi NM*, Ahmad S, Mokaddas E, Al-Hajoj S: First insights into the phylogenetic diversity of Mycobacterium tuberculosis in Kuwait

59
Alrefaei FB, Alhaqqan A: Knowledge & Practice of MRSA Screening For Elective Caesarean Section in Maternity Hospital

60
Albert MJ*, Al Hashem G, Rotimi VO: Multiplex gyrB PCR Assay for Identification of Acinetobacter baumannii is Validated by Whole- genome Sequencing Assay

61
Asadzadeh M, Mokaddas E, Ahmad S, Abdullah AA, De Groot T, Meis JF, Shetty SA: Molecular studies on Candida auris isolates from immunocompromised patients in Ibn Sina Hospital reveal a novel mechanism conferring reduced susceptibility to echinocandins

62
Alkandari A, Alotaibi H: Prevalence of invasive candidaemia among neonates in maternity hospital

63
Alobaid K, Asadzadeh M, Ahmad S, Varghese S: Evaluation of VITKE 2, VITEK-MS and fungal DNA barcode for identifying rare yeast pathogens

64
Alobaid KA *, Al-Aryan A, Al-Sabah H: Epidemiology of Dermatophytes Related Infections. A retrospective Study.

65
Al-Shammari NS*, Iqbal J: Genotyping of Toxoplasma gondii among Pregnant Women in Kuwait

66
Asadzadeh M, Ahmad S, Alfouzan W, Leena J, Meis JF, Parker JE, Kelly SL: Candida kefyr inections in Kuwait: A comparison of antifungal activity by two methods

67
Alkanderi S, AlFreeh M, Bhardwaj RG, Karched M: Impact of the sugar alternative stevia on the expression of streptoccal genes involved in exopolysaccharide synthesis.

68
Chehadeh W*, Beidas M, Safar HA, Al-Shammari S, Botras L, Botras M, Al-Kandari F, Al-Attiyah R, Mustafa AS: A dysregulated antiviral innate immune response in patients with COVID-19

69
Nasser K, Mustafa AS, Safar HA, Albert MJ, Al-Ajmi R, Alfouzan W: Effects of DNA isolation methodology and sequencing chemistry on quality of WGS data for bacterial isolates

70
Madi N, Sadeq M, Essa S, Safar H, Al-Adwani A, Al-Khabbaz M: Strain variation based on spike glycoprotein gene of SARS-CoV-2 in Kuwait during the first year of the pandemic

71
Madi N*, Al-Awadhi E, Al-Assaf F: Dynamic profile of SARS-CoV-2 infection among hospitalized patients in Kuwait: a descriptive study

72
Mathew MM*, Medhat R, Khan SM, Obaid K: Epidemiology and Pidemiology and Prognosis of Infective Endocarditis in Kuwait's Chest Diseases Hospital

73
Moghnia O, Al-Sweih N: Whole Genome Sequencing Analysis of Carbapenem-Resistant Escherichia coli and Klebsiella pneumoniae Strains in Kuwait

74
Mustafa AS, Safar HA, Nasser K, Alajmi RZ, Alatar F, Alfouzan W: Whole-Genome Sequencing for the Species Identification, Genome Characterization, Determination of Drug Resistance Genes and Virulence Factors in Pathogenic Bacteria

75
Mustafa AS*, Nazem A, Dashti G {2], Nasser K, Alatar F: Brucella-Specific IgM, IgG and IgA Antibodies in Sera of Patients Clinically Suspected of Brucellosis

76
Safar HA, Madi N, Mustafa AS, Chehadeh W, Asadzadeh M, Sadeq M, Alawadhi E, Al-Muhaini A, Benthani F, Al-Adwani A: Molecular Epidemiology and Genetic Characterization of SARS-CoV-2 in Kuwait

Molecular Pathology

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Al-Shammeri ND*, Alroughani R, Altemaimi R: Analysis of Multiple Sclerosis Micro RNAs Biomarkers in Kuwait

Neuroscience

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AlOnaizi MA, Alkhalifa AB, Qasem DK, ElAli A: Role of Microglia in Modulating Adult Neurogenesis in Health and Neurodegeneration

Nuclear Medicine and Radiology

79
Asbeutah AM, Brindhaban A: Comparison Between Recorded and Measured Radiation Doses in Diagnostic Full-Field Digital Mammography: A Phantom Study

80
Aldallal Y*, Ashkanani H, Almajran A, Gupta R: Radiology in the Undergraduate Medical Curriculum: The Student Perspective.

81
Aldousari H, Izzeldin M, Alshammari TH, Aldaas R, Esmail A: Assessment of External Radiation Dose Rate after 18FDG-PET/CT Examination

82
Al-Khawari H, Asbeutah AM, Al KandariI L, AlMajran A: Kuwait National Mammography Screening Program: Five years Outcomes in Screening Kuwaiti Women

83
Al-Farhan M Loutfi I: Eighty Years of Radioiodine Use for Thyroid Disease Management. The First and Perfect Theranostic Application

84
*Gupta R, Maryam Al-Shatti, Mohammed AM: Diagnostic Yield of Pulmonary CT Angiography in Pulmonary Embolism and
Correlation with D-Dimer Test.

85
Loutfi I: An Algorithm for Management of Patients with High Risk for Ischemic Heart Disease but Normal Tc-99m Myoview Myocardial Perfusion Imaging

86
Yassin B*, Al-Kanderi AM, Loutfi I: Dynamic Renal Imaging for Evaluation of Urinary Obstruction. An Elegant Example of Applied Pathophysiology in the Clinical Environment

Pathology

87
Ali RH*, Alateeqi M, Jama H, Alrumaidhi N, Alqallaf A, Mohammed E, Almurshed M, Bahzad S: Evaluation of the Oncomine Comprehensive Assay v3 Panel for the Detection of 1p/19q Codeletion in Oligodendroglial Tumors

88
Al-Shammari BM* Al-Abdallah A, Kapila K: Micro-RNA-146b-5p Modulation of the Cellular Stress Response in Papillary Thyroid Cancer

89
Alabduljaleel T*, Mojiminiyi O, Shehab D, Al-Temaimi R: Vitamin D Receptor Gene Polymorphisms and Susceptibility to Type 2 Diabetes Among Kuwaitis

90
Al-Janahi H, Al-Serri A, AL-Bustan S, Jamal M, Al-Temaimi R, Ziyab A: Investigating the contribution of the FTO (rs1558902) and MC4R (rs6567160) gene polymorphisms in obesity and weight loss in patients undergoing balloon interventions

91
Almoualem N, Alabdulla A, Albader M: Placental Growth Factor Expression and Role in Papillary Thyroid Cancer

92
Alawadhi F *, Alroughani R, Al-Temaimi R: The Relationship Between Vitamin D And Leptin Hormone In Multiple Sclerosis Disease

93
Jahanbani I*, Al-Abdallah A, Ali R, Al-Brahim N, Alshammari B, Francis I, Al-Bader M: Evasion of growth suppression in papillary thyroid tumors is mediated by miR-7-5p and miR-146b-5p through regulation of p53, Importin 7 and KLF4

Pediatrics

95
Alabdulrazzaq F, Alsharhan H, Ahmed AA, Marafie MJ, Sulaiman I, Elshafie RM, Alahmad A, Albash B, Ali NM, Xavier Cyril P, Elkazzaz UM, Ibrahim SM, Yasser M E Elfeky, Ayman M Salloum, Asma Alshammari, Rehab M Abdelrahman, Rasha Alsafi, Dina G Ramadan, May Al-Rushood, Laila Bastaki: Newborn Screening Experience for Very Long Chain Acyl-CoA Dehydrogenase (VLCAD) Deficiency in Kuwait

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Albalool J*, Alsaegh A, Ebrahim M, Lyubomudrov V, Elsayed M, Alsaiedi F, Ebrahim O: Surgical Outcomes of Congenital Heart Disease in Down Syndrome: Tertiary centre experience

97
Alhaddad FA*, Abdulkareem AA, Alsharrah DY, Alkandari A, Bin-Hasan SA, Al-Ahmad MS, Al Hashemi HE, Alghounaim MM: Epidemiology of Potential SARS-CoV-2 Reinfection in a Pediatric Cohort in Kuwait
98
Alkamali AA*, Al-Juailla F, Ahmed K, Qabazard S, Alkandari A, Alghounaim M, Al-Abdulrazzaq D, Al-Kandari H: Epidemiology and Clinical Characteristics of SARS-CoV-2 Infection in Kuwait: Results of a National Registry

99
Alqaisi TM*, Al-Juailla FA, Othman FA, Abdalla DK, Alabdulrazzaq DM, Alkandari HM: The Effect of Ramadan Fasting on Complications and Lifestyle Among Children with Type 1 Diabetes in Kuwait

100
Al-Shemmari SA*, Al-Afasi KM, Othman FA, Al-Dihani AM, Atyani SM, Al-Kandari KH, Al-Furaij AK, Al-Kandari HM: Clinical Characteristics of Multisystem Inflammatory Syndrome in Children (MIS-C): Results From a National Pediatrics Registry

101
Haider MZ *, Al-Rushood M, Alsharhan H, Rasoul MA, Al-Mahdi M, Al-Kandari H: The Role of Interleukin-4 (IL4), Interleukin-13 (IL13) Gene Polymorphisms and HLA-DQ Alleles in Genetic Susceptibility of Type-1 Diabetes Mellitus (T1DM) in Kuwaiti Children

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Al-Qabandi W, Dhaunsi G: L-Glutamine reverses Bile Acid-induced inhibition of Growth Factor activity via Modulation of NADPH oxidase in rat hepatocyte cultures: Implications for TPN-induced Cholestasis

103
Sadeq H*, Husain EH, Almutawa F, Al-Qabandi W, AlSaleem T: Effect of COVID-19 Pandemic on Accidental Ingestions in Children: Observational Study.

Pharmacology and Toxicology

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Ahmedy OA*, Ibrahim SM, Salem HH, Kandil EA: Antiulcerogenic Effect of Melittin via Mitigating TLR4/TRAF6 MediatedNF-κB and p38 MAPK Pathways in Acetic Acid-induced Ulcerative Colitis inMice

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Ahmedy OA*, Salem HH*, Sayed NH, Ibrahim SM: Naringenin affords protection against lipopolysaccharide/D-galactosamine-induced acute liver failure: role of autophagy

106
Al-Ansari S*, Al-Taweel D, Al-Haqan A, Koshy S, Qabazard B: Development Of Kuwait National Antidote Stocking Guidelines

107
Al-Kandery AA*, El-Hashim AZ: Central Sensitization of the Cough Reflex by Prostaglandin E2 via EP3 Receptor-dependent Activation of NaV 1.8 Channels

108
Al-Zaid B*, Al-Sabah S, Ezeamuzie CI: The Impact of GLP-1R-GIPR Hetero-dimerization on Cell Signalling

109
Munawar N*, Masocha W, Bitar MS: Alpha-2 Adrenoceptor Activation Attenuates Oxidative Stress, Inflammation and Neuropathic Pain in Type 1 Diabetes Mellitus.

110
Yousif M, Oriowo MA, Chandrasekhar B: The Role of TAAR1 in the Vasodepressor Effect of Trace Amines in the Perfused Rat Kidney.

Pharmacy

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Al-Sejari FM*, Al-Taweel DM: Design and Validation of a Medication Assessment Tool to Evaluate The Quality of Prescribing in The Management of Type 2 Diabetes in Kuwait

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AlMatar RJ*, Al-Haqan A, Waheedi S, Abdullah I: Population Perceptions of Healthcare Services Provided Virtually (Telehealth): A Cross-Sectional Study.

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Katoue MG*, Ker J: Implementing the Medicines Reconciliation Tool in Practice: Challenges and Opportunities for Pharmacists in Kuwait

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Al-Tannak NF*, Alzoubi FM, Kareem FM, Novotny L: Measurement of Endocrine Disruptor Bisphenol-A Leakage from Dental Resin-Based Composite Materials

Pharmacy and Artificial Intelligence

115
Metwally AA*, Nayel AA, Hathout RM: Machine Learning for Predicting in vivo Efficacy of siRNA Ionisable Lipids Nanoparticles

Physical Medicine and Rehabilitation

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Ambardar RA*, AlShehab DA: Comparison of Electrodiagnostic study with clinical and ultrasonographic parameters before and after treating patients of carpal tunnel syndrome with extracorporeal shockwave therapy

117
Al Kandari S*, Prasad L, AlHarrasi B, Al Kandari M: Bladder Management and Urological Complications in Persons with Chronic Spinal Cord Injury

Physical Therapy

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Albahrouh SI, Buabbas AJ: Physiotherapists' Perceptions of and Willingness to Use Telerehabilitation in Kuwait during the COVID-19 Pandemic

Physiology

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Allied Health

1

Trends in Anterior Cruciate Ligament Reconstruction in Kuwait: A Retrospective Study

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Introduction: Anterior cruciate ligament (ACL) injuries are amongst the most common major injuries in sport. They are of particular concern in multi-directional sports, such as basketball, football, and handball. Sport injuries, particularly ACL injuries, are emerging as an international recognised public health problem, making it vital that the demographic features associated with an increased risk of ACL injury are characterised. Objective: to investigate the incidence and demographic features of ACL reconstruction in Kuwait, by age and sex, and to determine whether the incidence of ACL reconstructions has changed during the past years from 2015 until 2019.

Methods:
Retrospective study and data collection were extracted from the Al-Razi orthopedic and rehabilitation hospital in Kuwait. It considered to be the only governmental hospital that operate ACL surgery in Kuwait. The database collects information on the type of procedure, year of procedure, sex and age group of patients, and whether the procedure required day or overnight admission. Patients who underwent a primary knee reconstruction during the period 1 January 2015 to 2019 were identified according to the International Statistical Classification of Diseases and Related Health Problems. The study was approved by the Ministry of Health's Standing Committee for the Coordination of Health and Medical Research in the State of Kuwait (1319/2020).

Results:
1446 surgeries were done from 2015 until 2019. Majority of surgeries were for non-Kuwaiti patients (74%), male (95%). Results showed mean age of patients were (30 ± 9) and length of hospital stay were (5.5 ± 2.8). Data from this study showed growth rate from 2015 until 2019 equal to (104%) and the trendline equation were ($y = 52.5x + 117.3$) with ($R^2 = 0.8731$).

Conclusions:
This study demonstrates that the population-adjusted rate of ACL surgery has increased in the Kuwait between 2015 and 2019 to more than 100%. This analysis of nationally, age and gender representative data allows investigators to draw conclusions about national trends in ACL reconstruction, which may help guide future questions that can be tested in a clinical setting.

Key Words: Anterior cruciate ligament reconstruction; Kuwait; Sport injuries;

Funding Agency: None

Allied Health

2

Left ventricle curve analysis in breast cancer hypertensive patients undergoing cardiotoxic chemotherapy.

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Introduction:
Radionuclide ventriculography (RNA) is a nuclear medicine procedure that uses radiolabelled red blood cells to provide assessment for left ventricle ejection fraction LVEF for patient undergoing cardiotoxic chemotherapy CTX (e.g. Anthracyclines) using cardiac blood pool imaging. The assumed proportionality between blood pool and cardiac chambers allows nuclear medicine computers to calculate various parameters including time-activity curve TAC. Aim: This study aims to predict cardiotoxicity in breast cancer hypertensive HTN patients undergoing anthracycline treatment (i.e. FEC) using TAC-derived parameters (i.e. Rapid filling time RFT, Left ventricle filling rate LVFR and Left ventricle ejection rate LVER). This can be achieved by comparing corresponding pre-CTX parameters with post-CTX LVEF.

Methods:
Thirty-two female breast cancer patients ≥ 60 years old undergoing FEC CTX were retrospectively selected in this study. All patients underwent at least two radionuclide ventriculography scan (before and after CTX therapy). Multiple linear regression model was utilized to predict drop in post-LVEF using TAC-derived parameters (from pre-CTX scan) as predictors.

Results:
The linear regression model results show that 23% of the variance in LVEF can be accounted for by one predictor (i.e. LVFR) $F(1, 30) = 7.3$, $p < 0.01$).

Conclusions:
Researchers may overlook TAC-derived parameters despite their potential impact on predicting cardiotoxicity before or during chemotherapy. Our results suggest that pre-CTX LVFR may predict cardiotoxicity in breast cancer patients with HTN and undergoing anthracycline chemotherapy. Female HTN patient may be at higher risk of developing cardiotoxicity even at lower Anthracycline doses.
Acknowledgment: this study was conducted at the University of Aberdeen and Kuwait University in collaboration with Aberdeen royal infirmary, Scotland.

Key Words: RNA; TAC; LVFR;

Funding Agency: None

Anatomy

3

Using absorbable suture for traumatic wound closure to avoid additional hospital visit for suture removal during the COVID-19 pandemic: A randomized controlled trial

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Introduction:
The COVID-19 pandemic worldwide forced the governments to undertake intervention measures to encourage social distancing. On the other hand, traumatic skin lacerations require multiple hospital visits for dressing changings and suture removal since they are usually repaired with non-absorbable sutures. These visits can be avoided by using absorbable sutures instead. However, absorbable sutures carry the 'theoretical' risk of wound infection. Our objective was to investigate the advantages of using absorbable sutures over non-absorbable sutures in repairing traumatic wound lacerations during the COVID-19 pandemic. The first and second objectives were to assess the rate of infection and the number of clinic visits.

Methods:
A sample of 469 patients with traumatic skin lacerations were analyzed during the COVID-19 pandemic in April 2020. In the control group, wounds were closed using non-absorbable sutures, while rapid-onset absorbable sutures were used in the treatment group. By conducting a phone call follow-up after 21 days, several parameters regarding infection signs and hospital visits were compared between both groups.

Results:
A dramatic decrease in total trauma patients and those who required suturing was observed in April 2020 compared to the same month of the previous four years (p-value< 0.05). No statistically significant difference was observed between absorbable and non-absorbable groups regarding wound infection (4.9% and 3.1% respectively, p-value= 0.623). Using absorbable sutures resulted in fewer post-operative hospital visits than non-absorbable sutures (mean of 1 visit and 3 visits respectively, p-value< 0.001). Although patients in both absorbable and non-absorbable groups removed the sutures by themselves (16.3% and 9.4% respectively, p-value= 0.052), only two participants (0.09%) in the non-absorbable group had self-removal-related complications. This study is limited because the assessment of wound infection was subjective to the patient by a phone call follow-up. Although this may influence our results, we preferred this method of data collection due to the circumstances of COVID-19 pandemic.

Conclusions:
Using absorbable sutures to close traumatic skin lacerations is safe. They should be considered during a pandemic to reduce hospital visits for suture removal, which will subsequently enhance social distancing and relieve hospital load. Moreover, they can prevent unwanted complications of the self-removal of sutures.

Key Words: Traumatic wound; Absorbable sutures; COVID-19 pandemic;

Funding Agency: None

Anatomy

4

Evaluation of the Catfish Skin Preparation (Soluble Protein Fraction, Fraction B -SPF-FB) for the Treatment of STZ Diabetic-Induced Cardiac complications in Rats

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Introduction:

Long-term Diabetes Mellitus (DM) patients suffer from many complications, including cardiovascular difficulties that are on the rise with the increased incidence of DM patients locally and globally. Diabetes-induced cardiovascular complications are leading to severe heart damage. Further, DM-induced heart damages are more resistant to treatment compared with non-diabetic cardiovascular complications. Therefore, there is a need for more effective therapies based on an increased understanding of the underlying mechanisms of DM-induced cardiovascular complications. Recently, we have shown that Fraction B (FB) prepared from a catfish (Arius bilineatus, Val.) significantly lowered blood glucose, increased insulin level, and caused recovery of damaged organs and tissues in STZ-induced diabetes in rats.

Methods:

This study is aimed to unravel the effects of FB treatment on the heart of STZ-induced diabetic rats by assessing the histopathological changes of the heart tissue, cardiac enzymes, and biochemical markers. Male Sprague-Dawley (SD) rats weighing 160-180g were employed into four groups: I. normal control (NC), II. normal control+FB (NC+FB), III. diabetic control (DC), and IV. Diabetic+FB (D+FB). To induce diabetes in rats, they underwent a single intraperitoneal (IP) injection of STZ (55 mg/kg), followed by once a day IP injection of 4.5mg/kg FB treatment for 10 weeks.

Results:

The results showed that IP administration of FB significantly ($p<0.05$-0.001) reduced blood glucose and increased treated rats' weight. Light microscopic assessment showed remarkable recovery of heart tissue in the D+FB group compared to that in DC animals. Blood cardiac enzymes (serum CK and LDH) concentration showed a significant reduction in the DC+FB group compared to those of the DC animals. Biochemical analysis revealed that FB treatment significantly ($p<0.05$) improved heart proteins concentration by modulation of the apoptotic pathway.

Conclusions:

This study proved for the first time the therapeutic effects of FB treatment on DM–induced heart damage and explored its possible curative mechanisms in the diabetic heart.

Key Words: Diabetes; Cardiovascular complications; FB;

Funding Agency: The study was supported by Collage of Graduate Studies, Kuwait University

Anatomy

5

Effects of Heat Therapy on Attenuating Muscle Atrophy on an STZ-Induced Diabetic Rat Model

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Introduction:
Diabetes Mellites (DM) is a metabolic disease, and due to its prevalence, it is relevant in Kuwait. One of the significant complications resulting from DM is muscle atrophy. Patients with DM undergo a significant degree of muscle atrophy with time, thus making routine tasks arduous. The objective is to explore if heat therapy can attenuate the muscle atrophy in an animal diabetic model.

Methods:
Diabetes was induced in male Sprague Dawley rats (3 months old) by injecting STZ intraperitoneally and divided into diabetic group (D) and diabetic + heat therapy (DH) groups which were further divided into three-week (D3W, DH3W) and six-week (D6W, DH6W) groups (n=12 in each group). Age matched normal rats were used for control (C) and heat therapy (H) groups which were divided into three-week (C3W, H3W) and six-week (C6W, H6W) groups (n=12 in each group). Rats in heat therapy groups were exposed to daily 30 minutes heat therapy in temperature-controlled environment chamber either for three weeks (H3W and DH3W groups) or six weeks (H6W and DH6W groups). After heat treatment, all groups were subjected to muscle strength functional tests. At the end analysis of the muscle was done by immunohistochemical and Western blot methods. All data were expressed as mean ± SEM and analyzed with one-way or two-way ANOVA wherever applicable.

Results:
The attenuation of muscle atrophy assessed by rotarod, Kondziella's inverted screen and extensor postural thrust tests showed that diabetic rats exposed to heat performed significantly better than their unexposed counterparts by 6 weeks. Heat therapy reduced muscle atrophy up to 7.1% in diabetic groups. Heat therapy significantly elevated muscle hypertrophy markers(AKT, AMPK, HSP70, and mTOR), and significantly decreased muscle atrophy markers(KLF, MAFbx, and CD68).

Conclusions:
This study shows relevance and clinical significance to utilizing heat therapy as a viable treatment to attenuate muscle atrophy in diabetic patients.

Key Words: Diabetes; Atrophy; Anatomy;

Funding Agency: CGS and Kuwait University Research Sector. (YM06/20)

Anatomy

6

Impaired Spatial Navigation and Age-dependent Hippocampal Synaptic Dysfunction Accompanied by a Chronic Inflammatory Cytokine Profile in db/db Mice

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Introduction:
Type 2 diabetes mellitus (T2DM) increases the risk of developing Alzheimer's Disease (AD), and an abnormal central inflammatory response has been proposed to mediate the consequences of T2DM on hippocampal synaptic integrity and cognitive function. However, the exact implication of T2DM on synaptic integrity in aging has not been investigated. Here, we investigated the age–dependent effects of T2DM on AD-like pathology.

Methods:
Young and aged adult db/db mice were used, and C57BL/6 mice were used as lean controls. The Morris Water Maze (MWM) test was conducted to evaluate diabetes associated–cognitive impairments. Immunohistochemistry and morphological staining assays were performed to determine the consequences of diabetes on the number of astrocytes, microglial activation, and neuronal density. The expression of synaptic markers was determined by Western Blot, and a 62-cytokine protein array was performed to assess the inflammatory profile in the hippocampal region.

Results:
Our results show a significant decrease in neuronal density in the dentate gyrus (DG) hippocampus of young db/db mice as compared to age-matched controls. This decrease was associated with impaired spatial navigation and acquisition. Young db/db mice also demonstrated a decrease in the number of GFAP- positive astrocytes in the three hippocampal regions CA1, CA3 and DG. Conversely, the number of activated microglia was significantly increased in the CA3 and DG regions of the hippocampus in young db/db mice. Our findings also indicate that T2DM triggers synaptic dysfunction in age-dependent manner, in which the expression of both presynaptic (Synaptophysin) and postsynaptic (PSD95) markers remained relatively unchanged in young db/db mice while it was significantly reduced in aged db/db mice, as compared to age- matched controls. This long-term diabetes-mediated effect was accompanied with elevated expression of pro-inflammatory cytokines in the hippocampus of aged diabetic mice.

Conclusions:
Our results suggest that T2DM impairs cognitive function, leads to neuronal loss in the dentate gyrus, and reveals an age-dependent deterioration in hippocampal synaptic integrity in the diabetic state.

Key Words: T2DM, Alzheimer's Disease, Synaptic Integrity; Cognitive function; Hippocampus;

Funding Agency: The Research Sector at Kuwait University grant no. ZM03/16

Anatomy

7

Recovery of ultrastructure of damaged kidneys in STZ-induced diabetes in SD rats following treatment with catfish Fraction B

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Introduction:
Diabetic nephropathy is a major cause of chronic renal failure, which unfortunately has been increasing during the past decades. Diabetic Mellitus induces pernicious effects in all kidney structures, and diabetic nephropathy is an integrated entity that includes various histopathological lesions. Recently, we have shown that Fraction B (FB) prepared from catfish skin sections produced a significant decrease in blood glucose with a commitment increase in serum insulin in STZ-diabetic rats. Further, FB significantly improved kidney functions and biochemical parameters.
AIM OF THE STUDY: To observe the ultrastructural protective effect of FB preparation treatment on the kidneys of STZ-induced diabetic rats.

Methods:
Three experimental groups (n = 3 SD rats/group), Normal Control (NC), Diabetic Untreated (D), and Diabetic Treated with FB (D+FB), were examined. Diabetes was induced in the overnight fasted rats by intramuscular (at Khaldiya we injected 60 mg/kg body weight STZ via IP) injection of streptozotocin. D+FB rats were treated with 3 mg/kg body weight intraperitoneally for eight weeks. Kidney tissues from all experimental animals were collected and processed for electron microscopy and histological and ultrastructural analysis.

Results:
The kidneys of diabetic rats showed thickening of the basement membrane of the Bowman's capsule, necrosis, and pyknotic nuclei of the proximal tubules. These features were reversed when the FB preparation was administered to the D+FB group. Further, all necrotic changes observed in the proximal and distal convoluted tubules, and the deposits were absent in the diabetic rats treated with FB preparation. Also, the treated group showed features of a normal glomerulus, absence of inflammatory cells, normal basement membrane, and capillaries. The FB preparation acted as an anti-inflammatory substance preventing subcellular damage in diabetic kidneys.

Conclusions:
The administration of catfish FB preparation prevents ultrastructural kidney damage in STZ-induced diabetic nephropathy.

Acknowledgements: We would like to thank the Animal Facility and the EM unit in Faculty of medicine. Funding; KFAS CN2013MM01.

Key Words: Diabetes mellitus; diabetic nephropathy; Catfish;

Funding Agency: KFAS CN2013MM01

Anatomy

8

Abdominal pain is no less important than a headache in COVID-19 diagnosis: Literature Review

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Introduction:
SARS-CoV2 is a novel virus, discovered recently in Wuhan, China, in Nov. 2019, belongs to the coronavirus family. It causes COVID-19, the worst respiratory pandemic in the world. Patients with COVID-19 may exhibit severe symptoms such as headache, Myalgia, chest pain and abdominal pain, which pose a great challenge in disease diagnosis.

Methods:
Purpose: The severity and spread of COVID-19 symptoms are different from patient to patient; however, no one is less important than another. This literature review presented the most common pain symptoms associated with COVID-19; headache and the less common one; abdominal pain, showing their prevalence recorded by previous studies, the proposed mechanisms leading to pain, and how they are no less important than each other in diagnosis COVID-19.

Results:
What had been found after reading the relevant studies was that the presence of the virus in the human body triggers the immune system causing cytokine storm, leading to tissue damage and then feeling pain. The severity of pain depends on the number of ACE2 receptors presented in the tissue. Headache is the most common pain appearing in COVID-19 patients, while abdominal pain is less common, but the severity of the abdominal pain, if present, is much higher than a headache.

Conclusions:
All symptoms should be considered, including acute abdominal pain where the respiratory symptoms are hidden. So, the diagnosis of COVID-19 cannot be based only on the most common symptoms or the analysis of oral or nasopharyngeal swabs. Therefore, CT scan and stool analysis should be added.

Key Words: SARS-CoV2, COVID-19; Headache, abdominal pain; cytokine storm, ACE-2 receptor;

Funding Agency: None

Anatomy

9

Mechanisms of Lead Induced Decline in Cognitive Functions and Neurogenesis in Young Rats

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Introduction:

Lead (Pb) is one of the oldest-established and cumulative toxins. Blood Pb levels as low as 3 µgm/dL results in poor cognitive performance. Literatures available on the effect of low-level Pb exposure during the prenatal and the postnatal period on neurogenesis and behavioral development are very few and its mechanism of action is not addressed fully. We aimed to determine the neurotrophic factors, quinolinic acid (QA), pro-proliferative factor (Hes1) and neuronal determination markers (Mash1, Neurogenin1, NeuroD1) levels in young rat pups that are exposed to low levels of Pb during prenatal and postnatal developmental period to explore the mechanism of lead toxicity.

Methods:

In the prenatal Pb exposure experiment, pregnant rats were exposed to Pb throughout pregnancy through drinking water (0.2% lead acetate). Pups born to these Pb-exposed rats were used (n=12). In the postnatal Pb exposure experiment newborn pups (n=12) exposed to Pb from postnatal day 0 to postnatal day 21 through breast milk were used. Pups born to normal rats were used as controls (n=12). Learning and memory was assessed by Morris water maze and passive avoidance test from PND 22-30. QA, Pb, BDNF and VEGF levels in the hippocampal tissue were measured. Hippocampal tissue was processed for doublecortin (DCX), BrdU-DCX immunostaining to analyze the neurogenesis. Data were analyzed with One-way ANOVA followed by Bonferroni's multiple comparison test.

Results:

Results showed significantly impaired spatial learning and memory and passive avoidance memory retention in both prenatal and postnatal Pb exposed rats ($p<0.001$). Hippocampal Pb, QA content, Hes1, Mash1, Neurogenin1, NeuroD1, BDNF, VEGF, dentate gyrus cell proliferation and neurogenesis were significantly decreased in both prenatal and postnatal Pb exposed groups ($p<0.01$-0.001).

Conclusions:

In conclusion Pb exposure both during prenatal and postnatal developmental period affects the adult neurogenesis by decreasing the neurotrophic, pro-proliferative and neuronal differentiation factors in the hippocampus. Decreased neurogenesis leads to cognitive deficit. This new knowledge on mechanism of lead toxicity is useful in designing the drug formulation to treat the neonatal and adult individuals exposed to heavy metal toxicity. Funding/Acknowledgements: This study is funded by CGS and RS, Kuwait University, (Grant# YM02/20). We acknowledge CARF and RCF (Grant#-SRUL02/13), HSC, Kuwait University.

Key Words: Hippocampus; Lead; Neurogenesis,;

Funding Agency: This study is funded by CGS and RS, Kuwait University, (Grant# YM02/20). We acknowledge CARF and RCF (Grant#-SRUL02/13), HSC, Kuwait University.

Behavioral Sciences

10

Are pharmacists well equipped to deal with global health emergencies? Burnout during COVID-19.

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Introduction:
According to the WHO burnout effect is defined as a syndrome conceptualized as result from chronic workplace stress that has not been successfully managed.Since the beginning of the COVID-19 numerous studies have suggested that health care team professionals are at an increased risk of burnout effect compared to other community occupations especially during the pandemic.A negative impact of burnout on the physical and mental wellbeing of the professional health care workers have been documented. The consequences of this undesirable impact are lower productivity of the health care workers which result in diminished quality of care towards the patients
Objectives
This study aimed to evaluate and assess the burnout effect among pharmacists during COVID-19 pandemic in Kuwait.

Methods:
From September 2020 to January 2021, a cross-sectional study using an online self-administered questionnaire was conducted.The questionnaire included demographic questions and items from the Copenhagen Burnout Inventory (CBI) to assess burnout effect in three domains: personal burnout, work-related burnout and client-related burnout effect.The data analysis was preformed using descriptive statistics, correlations and comparative analysis.

Results:
A total of 403 pharmacists took part in this survey; only 277 responses were complete. The overall mean (SD) burnout score for the respondents was 52.8 (19.1).The respondents' mean (SD) scores for personal burnout, work-related burnout and client-related burnout were 56.6 (21.7), 53.9 (21.4) and 47.0 (23.8), respectively.The results showed that young Kuwaiti, female pharmacists graduated from Kuwait University showed higher burnout scores in personal, work-related, and client-related domains. The correlation between personal and work-related scores were stronger (r equals 0.81) when compared with their correlated client-related score (r equals 0.55).

Conclusions:
In Kuwait, pharmacists scored high burnout rates in personal, work-related and client-related level during the COVID-19 pandemic. To overcome the burnout syndrome and maintain pharmacists' psychological well-being, strategies for early identification of burnout and recognition of modifiable factors need to be implemented in Kuwait governmental hospitals.

Acknowledgement/Funding
This research was conducted by Asmaa Al-Haqan, Farah Alenezi, Shriefa Al-Mutairi, Dalal Al-Taweel. This research did not receive any specific grant from funding agencies in the public or commercial sectors.

Key Words: burnout syndrome; pharmacist; COVID-19;

Funding Agency: This research did not receive any specific grant from funding agencies in the public or commercial sectors.

Biochemistry

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HDL Protects Against Ischemia Reperfusion Injury By Differentially Regulating mTORC1 And mTORC2 Signaling In Normotensive and Hypertensive Rats

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Introduction:
Hypertension is a risk factor for the development of cardiovascular diseases. High density lipoprotein(HDL)protects against myocardial ischemia-reperfusion injury(IRI)in normotensive rats.However, it not clear if HDL can protect hypertensive rats against IRI. Mammalian target of rapamycin(mTOR)C1 and C2 play opposing roles in the protection against IRI, whereby mTORC1 is detrimental and mTORC2 is protective. Nonetheless, the role mTORC1 and mTORC2 signaling in myocardial IRI in hypertension is not clearly understood. Objective:Test if HDL protects against IRI in Wistar Kyoto(WKY)rats and spontaneously hypertensive rats(SHR)and investigate the involvement of mTORC1 and mTORC2 signaling cascades in HDL effects.

Methods:
Hearts from 12-14 wk old WKY and SHR were isolated and subjected to 30min cycles of IRI using a modified Langendorff system.HDL(400µg)was added by end of ischemia.In experiments testing the role of signaling molecules, hearts were treated with mTORC1 antagonist(rapamycin,100nM)or mTORC1&C2 antagonist(PP242,0.3µM) administrated 10 min prior to the addition of HDL.Hemodynamic data was computed digitally.Infarct size was measured by TTC staining.The expression levels and activation stats of signaling molecules were evaluated by immunoblotting against total and phosphorylated forms of the proteins.

Results:
SHR expressed higher levels of active mTORC1 than WKY as indicated by the significant($P<0.05$) increase in phospho-mTOR and phospho-PRAS40 levels in SHR.Blockage of mTORC1 protected WKY and SHR against IRI as evident by the significant($P<0.05$) improvements in cardiac hemodynamics and reduction in infarct size. WKY expressed significantly($P<0.05$) higher levels of mTORC2 substrate, phospo-Akt, than SHR.Blockage of mTORC2 was detrimental for WKY but not SHR. HDL treatment significantly($P<0.05$) reduced IRI in WKY and SHR.HDL treatment significantly($P<0.05$) inhibited mTORC1 yet increased mTORC2 activity and attenuated apoptosis in WKY and SHR.

Conclusions:
WKY and SHR expressed different basal levels and demonstrated differences in the activation state of mTORC1 and C2.Basal mTORC2 activity was increased in WKY and it played an essential protective role against IRI.mTORC1 however, demonstrated higher basal activity in SHR and played a detrimental role in both WKY and SHR.HDL protected normotensive and hypertensive rats against myocardial IRI.HDL protection involved mTORC1 inhibition, mTORC2 activation and attenuation of myocardial apoptosis in WKY and SHR

Key Words: HDL; mTOR; Ischemia, reperfusion, hypertension;

Funding Agency: The project was funded by the School of Graduate Studies and Research Administration Grant No. MY04/18.

Biochemistry

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Association of Genetic variants in Renin-Angiotensin System (RAS) with Coronary Heart Disease (CHD) in Kuwaiti Patients

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Introduction:

Renin angiotensin system (RAS) is involved in the regulation of salt and water balance in the body and thereby maintaining blood pressure. RAS genes polymorphisms especially the insertion / deletion polymorphism of angiotensin converting enzyme I (ACE-ID), the M235T variant of angiotensinogen (AGT-M235T), and the A1166C polymorphism of angiotensin II type 1 receptor (AT1R-A1166C). have been shown to be associated with coronary heart disease (CHD) in many populations. However, the relationship of these RAS polymorphisms in Kuwaiti population is limited. Therefore, the aim of this study is to investigate whether these three RAS polymorphisms are associated with CHD in a Kuwaiti cohort.

Methods:

The three selected candidate susceptibility polymorphisms were genotyped from the RAS genes [ACE-I/D, AGT-M235Tand AT1R-A1166C] in the DNA isolated from 600 Kuwaiti subjects (CHD=297) and (control =303). Two SNPs [AGT-M235T and AT1R-A1166C] were genotyped by the Real-time PCR Taqman allele discrimination assay. The ACE-I/D polymorphism was genotyped by restriction fragment length polymorphism assay. Genotypic data obtained were first tested for Hardy-Weinberg Equilibrium (HWE) followed by statistical association analysis with CHD susceptibility.

Results:

The genotype frequencies of AGT-M235T were found to be within the HWE ($P>0.05$). However, a deviation from HWE was observed for ACE-I/D in the CHD group ($P< 0.05$) due to low count of DD and high count of II, which may have affected the frequencies in the cohort sample. Also, the AT1R-A1166C deviation from HWE was observed as a result of excess count of the A allele in both the control group and the cohort yet a low count was observed in the CHD group compared to the expected.

Conclusions:

Our primary data indicate that the deviations from HWE does not appear to result from either sampling or typing error because of one of the variants examined (AGT-M235T) was in HWE. In addition, for ACE-I/D, the deviation observed in the cohort is the reflection of the actual deviation of the minor allele in the CHD group. Also, the deviation observed in both the CHD group and control groups for AT1R-A1166C in which the control group had excess AA genotype while the CHD group had none. Further analysis is need to validate the HWE findings followed by association analysis.

Key Words: renin angiotensin system (RAS); polymorphism; HWE;

Funding Agency: college of graduate studies at Kuwait University

Biochemistry

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The role of TXNIP/NLRP3 inflammasome pathway in NADPH oxidase-induced ROS and germ cell apoptosis.

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Introduction:
Testicular ischemia reperfusion injury (tIRI) is considered the underlying mechanism for testicular torsion and detorsion (TTD), a urologic emergency affecting young males. This injury causes enhanced production of reactive oxygen species (ROS) increasing cellular oxidative stress leading to inflammation and germ cell apoptosis (GCA). This study tests the effect of NADPH oxidase (NOX) on the thioredoxin interacting protein (TXNIP)/ NOD-like-receptor-3 (NLRP3) inflammasome pathway, oxidative stress and GCA during tIRI.

Methods:
Thirty-six male Sprague-Dawley rats were divided into three groups: sham, unilateral tIRI only and tIRI treated with apocynin, a NOX inhibitor. The tIRI rats underwent an ischemic injury for 1 hour followed by 4 hours of reperfusion. Histological analysis was used to evaluate spermatogenic damage, while real time PCR was used to measure the gene expression of apoptosis markers and inflammasome components. Oxidative stress, caspase activation, and NOX activity were assessed using biochemical assays. Inflammation and apoptosis markers were detected by ELISA and Western blot.

Results:
As a result of tIRI, there was a decrease in total antioxidant capacity and suppressed activities of superoxide dismutase and catalase. Spermatogenic damage was associated with increased GCA reflected by an increase in the activities of caspases 1, 9 and 8. Tissue inflammation was demonstrated by a marked increase in the concentrations of myeloperoxidase, IL-1beta and IL-18. The TXNIP/NLRP3 inflammasome pathway was activated both transcriptionally and post-transcriptionally during tIRI. Inhibition of NOX had a protecting effect against GCA, oxidative stress and testicular inflammation.

Conclusions:
Based on the results of this study, the TXNIP/NLRP3 inflammasome pathway plays a vital role in tIRI and is regulated by NOX.

Key Words: Testicular Ischemia Reperfusion Injury; NADPH Oxidase, Oxidative Stress;

Funding Agency: This work was supported and funded by Kuwait University Research Grants No. YM 06/19 and SRUL 02/13.

Biochemistry

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Effects of Curcumin on ER Stress in Experimental Colitis: Mechanism of Action

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Introduction:
Curcumin, a natural polyphenol has anti-inflammatory effects mediated through the NFkB, however its effects on the ER stress in IBD is less understood. The aim of this study is to investigate the effects of curcumin on ER stress in experimental colitis by examining the PERK signaling pathway.

Methods:
Colitis was induced in SD male rats by intrarectal instillation of TNBS. Animals were divided into four groups: non-colitis control, TNBS untreated colitis, curcumin treated colitis and 5-ASA treated colitis. Curcumin and 5-ASA (5-amino salicylic acid) treatment s were initiated 2 hours before induction of colitis and followed until day 7 post-TNBS. Colitis was characterized by measuring body weight, colon hypertrophy, Myeloperoxidase (MPO) activity and histological methods. The level of ER stress markers including PERK, ATF4, eIF2S1-P, eIF2alpha and Grp78 was estimated by ECL western blot analysis, ELISA and immunofluorescence.

Results:
There was a significant increase in colon hypertrophy, MPO activity and infiltration of inflammatory cells in mucosa and submucosa as compared to the non-colitis controls. In addition, colitic rats lost significant body weight. All these changes were significantly reversed by both curcumin and 5-ASA treatments of colitic rats. The levels of ER stress marker proteins including grp78, PERK, eIF2S1-P and ATF-4 were significantly increased in colitis as compared to the non-colitis controls, and were significantly reversed by both curcumin and 5-ASA treatment.

Conclusions:
These findings suggest anti-inflammatory effects of curcumin comparable to 5-ASA which are accompanied by reversal in the expression of stress marker proteins investigated in this study. Therefore, curcumin is a potential candidate to be used as a natural adjunct therapy for IBD.

Key Words: Colitis; Curcumin; ER stress; PERK;

Funding Agency: The Kuwait University Research sector (YM03/19), and the College of Graduate Studies for partial financing of this study.

Biochemistry

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Effect of photosensitizer molecular features on cellular uptake, distribution, mechanism of cell death and photo efficiency

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Introduction:
Photodynamic therapy (PDT) has been approved for treatment of neoplastic and non-neoplastic disorders. PDT is based on production of cytotoxic species by light-sensitive compounds called photosensitizers (PSs). Location and extent of photo-damage, which depends on PSs properties, determines the mode of cell death and consequently the outcome of PDT. The aim of this study was to investigate how the structure of specially designed arene ruthenium (II) porphyrin (ARP) photosensitizers affects their cellular localization, cell death mechanisms, and consequently their PDT efficacy.

Methods:
A series of ARP PSs with different degree of substitution were synthesized. Their effect on Colo205 cells' viability and proliferation was tested using MTT and SRB assays, respectively. Singlet oxygen production was determined by photodecomposition of 1,3-diphenylisobenzofuran. Mechanism of cell death was assessed by flowcytometry and subcellular localization of PSs was studied by confocal microscopy. Experiments were repeated at least three times, with 3 replicates. Results are presented as mean ± SD.

Results:
The photoefficiency of Arene Ruthenium (II) Porphyrins depends on the structure of PSs and the presence or absence of Zinc. At 5µM the tetrasubstituted Zinc chelated porphyrins demonstrated the highest PDT efficiency followed by the disubstituted Zinc chelated porphyrins, because the tetrasubstituted zinc chelated compounds showed higher intracellular accumulation than the disubstituted compounds, localized in the endoplasmic reticulum and mitochondria, and are better generators of singlet oxygen than disubstituted compounds. .PDT-triggered cell death mechanisms where less than 50% of the cells survived for 48 h.

Conclusions:
Key factors which determine photoefficiency of ARP PSs include singlet oxygen quantum yield, number, and positions of substituents at the periphery of the porphyrin ring, symmetry of the molecule, and presence of Zn chelated by the tetrapyrrole ring.

Support: Kuwait University College of Graduate Studies and Grant

Key Words: Photodynamic therapy; Photosensitizers; Ruthenium porphyrins;

Funding Agency: Kuwait University College of Graduate Studies and Grant

Biochemistry

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Antibacterial activity of modified heme derivatives

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Introduction:
Increasing antibiotic resistance creates a demand for alternative antimicrobials. A promising approach is development of antimetabolites with bactericidal action. Heme is among the most common cofactors participating in various metabolic processes. Most microorganisms are able to synthesize heme, but heme uptake from the host is essential for bacterial pathogens. We designed heme-based antimetabolites by keeping the heme core intact and attaching substituents at the periphery of the porphyrin ring. The aim of the current study was to investigate how modification of the heme core influence bactericidal efficacy.

Methods:
The heme core was modified by attaching aliphatic chains-holding pyridyl rings at four meso positions. Bacteriostatic activity was assayed by monitoring cell proliferation. Antimetabolic action was determined by the MTT assay and bactericidal efficacy was assessed by plating and counting colonies. All experiments were repeated at least 3 - 5 times with 3 replicates. Results are expressed as means ± S.D.

Results:
Increasing lipophilicity of the modified heme by increasing the length of the aliphatic chains increased heme uptake but decreased its bacteriostatic effect. At 3 μM the ethyl derivative completely blocked cell proliferation while the octyl had no effect even at 5 μM. The tested compounds suppressed MTT reduction by a concertation-dependent manner, which indicate interference with bacterial metabolism. Exposure to ethyl and hexyl derivatives at concentrations ≥5 μM resulted in rapid loss of viability. Exposure to sublethal concentrations of modified heme did not lead to selection of resistant mutants.

Conclusions:
Heme modification by derivatization of the periphery of the tetrapyrrole ring produces analogs with bacteriostatic and bactericidal activity. The efficacy of the compounds depends on the lipophilicity of the molecule. The bacteriostatic effect can be attributed to interference with cell metabolism.

Funding Agency: Grant MB01/18 from Kuwait University

Key Words: Heme modification; Bacteriostatic; Antibacterial, antimetabolite;

Funding Agency: Grant MB01/18 from Kuwait University

Biochemistry

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Is hRAGE's Cytoplasmic Domain a Transcription Factor?

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Introduction:
The human receptor of advanced glycation end products (hRAGE) is an immunoglobulin superfamily protein receptor. The hRAGE protein is located in various cellular membranes. Several families of ligands can bind to hRAGE including AGE's (advanced glycation end-products). The hRAGE signaling, activated by ligand attachment, triggers many signaling pathways. One pathway includes specific cleavage of the cytoplasmic domain of hRAGE by gamma-secretase to produce the hRAGE-Cyto domain. hRAGE-Cyto was hypothesized to be a transcription factor. Our goal is to test the form of nucleic acid structure to which the hRAGE-Cyto domain can bind (single or double-stranded DNA). In addition, our aim is to quantitatively characterize their strength of binding (Kd's) and their stoichiometries.

Methods:
hRAGE-Cyto domain DNA was amplified in plasmid by DH5α bacterial cells using the alkaline lysis method. DNA sequencing was performed in Iowa State University's DNA facility. BL21 bacterial cells were used for hRAGE-Cyto recombinant fusion protein expression. Protein was purified by Amylose column chromatography and size exclusion chromatography (SEC). Ready-made SDS-PAGE was used. The FLS 980 machine was used to determine the changes in the wavelength and/or the intensity of fluorescence of the protein in the absence and presence of DNA.

Results:
The plasmid DNA was purified, sequenced, and translated and no mutations were found in the sequence of our protein residues. The BL21 cells were induced by Isopropyl beta-D-1-thiogalactopyranoside (IPTG) which resulted in high expression of our recombinant fusion protein. Amylose resin was used to purify the fusion protein. The fusion protein was cleaved by Tobacco Etch Virus (TEV) enzyme. Now, our target protein (hRAGE-Cyto) was purified further by SEC. All purification steps were followed using ready-made SDS-PAGE. Preliminary protein fluorescence data were collected with and without DNA.

Conclusions:
In vitro evidence of the hRAGE cytoplasmic domain's ability (or lack thereof) to act as a transcription factor may add to the unknown signaling mechanisms of hRAGE biology and could help in drug innovation. Funding/Acknowledgments: The work described in this project was supported by CGS (2000 KD). In addition, I would like to thank my advisor (Dr. Jamillah Zamoon), the Science Analytical Facility for use of their instruments, the research core facility for training me, and Kuwait University for this opportunity.

Key Words: hRAGE; Transcription Factor; Protein-DNA interaction;

Funding Agency: The work describes in this project was supported by college of graduated studies (2000 KD)

Biochemistry

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The Role of The JAK1/Nrf2/Keap1 Pathway in The Regulation of Germ Cell Apoptosis

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Introduction:
Testicular torsion is a common urological emergency that leads to testicular ischemia. Detorsion of the testis causes testicular ischemia reperfusion injury (tIRI), which accentuates the damage to the testes. The damage to the testes is due to oxidative stress that leads to germ cell apoptosis (GCA). The aim of this study is to investigate the link between JAK1/STAT3 signaling pathway with the Nrf2/Keap1 signaling pathways and their effect on tIRI-induced oxidative damage.

Methods:
Thirty-six male Sprague-Dawley rats were assigned to 3 groups: sham, unilateral tIRI and tIRI with AG490 (40 mg/kg), a JAK inhibitor. The ischemic injury was achieved by the occlusion of the spermatic cord using a straight bulldog clamp. Spermatogenesis was assessed histologically using the Johnson's score. Expressions of the JAK1/STAT3 and the Nrf2/Keap1 pathways were assessed using western blotting. Moreover, the concentrations of the blood-testis barrier (BTB) proteins (claudin 11, connexin 43, occludin, TJP1, gelsolin) were detected using their respective ELISA assay kits. Biochemical assay kits were used to measure enzyme activity for caspase 9, superoxide dismutase and catalase and to measure the levels of protein carbonylation and lipid peroxidation markers (PCC and MDA, respectively). The relative mRNA expressions of the regulators of apoptosis (Bcl2, Bax and Birc5) and antioxidant enzymes (CAT, SOD1, GSR, NQO-1, HMOX-1) were evaluated using real time PCR.

Results:
Damage to spermatogenesis was associated with reduced levels of the majority of the BTB junction proteins, increased lipid peroxidation and protein carbonylation in tIRI. This was paralleled with an increase in the activity of caspase 9, the imbalance in the Bax/Bcl2 ratio and Birc5 downregulation in favour of apoptosis. During tIRI, increased Keap1 protein levels inhibited Nrf2 expression leading to the downregulation in the relative mRNA expression of most of its downstream antioxidant genes and catalase activity. AG490 treatment and subsequent JAK1 inhibition attenuated the above tIRI-induced GCA and oxidative stress.

Conclusions:
Our findings suggest that JAK1 signalling regulates the activity of the Nrf2/Keap1 pathway, which in turn controls the gene expression of antioxidant enzymes. Inhibition of JAK1 protected against GCA, prevented Keap1 overexpression, activated Nrf2, upregulated the expression of antioxidant enzymes and prevented tIRI-induced oxidative stress.

Key Words: JAK1/STAT3 pathway; Nrf2/Keap1 pathway; Germ Cell Apoptosis;

Funding Agency: CGS-RA Grant YM 06/19 and KU-RA Grant SRUL02/13.

Biochemistry

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Metalloporphyrins with antibacterial activity

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Introduction:
The alarming rate of spread of resistance against traditional antibiotics inspires the search for new compounds with antibacterial activity. Our previous studies demonstrated that some metalloporphyrins exert bactericidal action. The mechanism of this effect, however, is unknown. The aim of the current study was to establish structure-activity relationship and to investigate how metalloporphyrins with different structure damage bacterial cells.

Methods:
Mn-, In-, and Zn-metalloporphyrins were modified by attaching aliphatic chains at ortho, meta or para position to the meso pyridyl rings. Bactericidal activity was assayed by plating and counting colonies. Effect on metabolic activity was determined by the MTT assay and by measuring respiration. Morphological changes were established by electron microscopy. DNA damage was assessed by agarose electrophoresis. All experiments were repeated at least 3 - 5 times with 3 replicates. Results are expressed as means ± S.D.

Results:
The main molecular features that determine metalloporphyrins' antibacterial activity are charges, lipophilicity, and three-dimensional shape. Positive charges and amphiphilic properties are a must, but are not sufficient to make a metalloporphyrin bactericidal. While cationic, amphiphilic metalloporphyrin with substituents at ortho position demonstrate low cytotoxicity, their para-substituted analogs exerted strong antibacterial activity. These compounds suppressed cell metabolism and intercalated in DNA, triggering DNA degradation. The effect did not depend on the nature of the metal chelated by the porphyrin ring.

Conclusions:
Modifications at the periphery of the tetrapyrrole ring produced metalloporphyrins with strong antibacterial activity. Planar, cationic, para-substituted amphiphilic molecules rapidly penetrated bacterial cells, suppressed metabolism, and caused irreversible DNA damage.

Key Words: metalloporphyrin, antibiotic; bactericidal; bacteriostatic;

Funding Agency: MB01/18

Biomedical Engineering

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Photobiomodulation therapy for Age-related macular degeneration (AMD): A computational study

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Introduction:
Age-related macular degeneration (AMD) is an ocular disease that causes central loss of vision. This disease occurs in the posterior ocular fundus called the macula, and it has two main types, dry AMD and wet AMD. In the first category, drusen is accumulated in the macula. A small quantity of drusen might not interfere with vision; however, as it grows increasingly severe, it becomes dangerous. In the second case, blood vessels grow beneath the macula that leak blood into the retina. Previous studies have shown that changes in melanin distribution can be correlated with AMD severity. Although there is no known cure for AMD, recent studies have found that Photobiomodulation therapy (PBMT) has a novel new approach to treat a variety of retinal diseases including AMD.

Methods:
In this research, a slab retinal model was built with four different layers (neural retina, RPE, choroid, and sclera) using Monte Carlo simulation to evaluate the influence of various laser parameters (wavelength: 660 nm, 810 nm; beam type: pencil, gaussian, and disk) on light absorption in the human eye retina at different melanin and hemoglobin concentrations.

Results:
The change in melanin and hemoglobin concentrations has a major impact on light absorption, which was evident by the drastic decrease of retinal irradiance values. Reducing melanin concentration could increase the penetration depth of light deep into the retina which would be beneficial for photobiomodulation (PBMT). The simulations also showed gaussian light sources were more effective than the disk light source, due to the concentric profile of their radially emitted beams. As expected, the melanin absorbs light most effectively at 660 nm wavelength.

Conclusions:
This research is a proof of concept for experimentally validating retinal penetration depth of light beams in different regions of retina and by different melanin and hemoglobin concentrations.

Key Words: Monte Carlo simulation (MC); Age-related macular degeneration (AMD);

Funding Agency: None

Biomedical Engineering

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The Effect of the Cerebral Spinal Fluid Thickness and Refractive Index on Functional Near-Infrared Spectroscopy Measurement

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Introduction:

Functional near-infrared spectroscopy (fNIRS) is a non-invasive technique for measuring brain activity by producing real-time pictures of brain blood flow and metabolic function. Previous researchers used a variety of light sources and detectors to measure how much the back-scattered light was dampened in the area of interest. The majority of investigations do not consider physical brain deterioration caused by ageing or structural variations.

Methods:

The purpose of this study was to investigate the effect of the variation in thickness of cerebral spinal fluid (CSF) and refractive index on fNIRS measurements. This study performs a Monte Carlo (MC) simulation to investigate near-infrared light (NIR) propagation in the adult head model. The head of an adult is modelled using the Colin27 model, which presents the head model as a multi-layered model that consists of six layers: scalp, skull, CSF, grey matter, white matter, and cavities in the brain. Furthermore, we developed complicated human brain atlases incorporating various CSF thicknesses and CSF refractive index, similar to biological tissue variations. We investigated the time-of-flight for light propagation in the brain as a function of source-detector spacing and CSF refractive indices and thickness using MC. We then computed the spatial sensitivity profiles at several source-detector distance ranges.

Results:

Late photons in the time-resolved reflectance curve revealed slope changes in the CSF thickness and refractive index increase. According to our results, the presence of the phenomenon was apparent under a variety of measuring circumstances, suggesting that CSF thickness and refractive index modifications are very responsive.

Conclusions:

Monte Carlo simulations could be useful in investigating the relationship between the CSF refractive index and thickness in the adult brain. Our study provides new insight towards enhancement in NIRS technology.

Key Words: Functional near-infrared spectroscopy (fNIRS); Monte Carlo simulation; Brain

Funding Agency: None

Biomedical Engineering

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Photobiomodulation for Cosmetics: A Monte Carlo Simulation Study

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Introduction:
Cosmetic Photobiomodulation therapy (PBMT) is a relatively new specialty in dermatology that has been demonstrated to enhance collagen synthesis and repair photoaged skin. PBMT improves the antioxidant defense system in the skin locally. Collagen formation is most efficiently carried out at wavelengths between 630 and 800 nm, whereas photoaged skin requires wavelengths of 900 nm. Similarly, inflammatory acne has been shown to be treated with ~415 nm light therapy. To understand the principles of PBMT, it is necessary to have a complete understanding of how light tissue interaction works.

Methods:
We used a three-dimensional multilayer Monte Carlo simulation tool to model light penetration and absorption in human skin. The epidermis, dermis, and subcutaneous fat were represented as three separate layers. A uniform, Gaussian, and LED-style light profiles were simulated with various ranges from 400 to 900 nm.

Results:
The penetration depth is largely controlled by this spectrum range, which influences the targeted structure being focused. The findings indicate that when a Gaussian source is utilized, the local volumetric dose is more concentrated than when a disk source is utilized. In addition, LED sources demonstrated comparable results to those obtained with a gaussian source.

Conclusions:
For photobiomodulation to be effective, it is necessary that light has the ability to penetrate the skin. Additionally, the choice of source type should match the desired penetration range to deliver acceptable quantities of energy to the tissue of interest even in a multilayer system. The data presented in this study will assist researchers in selecting wavelength, light source type, and light power for PBMT. The results provide the fundamental basis required to design optimal PBMT treatments.

Key Words: Monte Carlo Simulation; Cosmetic; Photobiomodulation;

Funding Agency: None

Community Medicine

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Effect Of COVID-19 Lockdown On Glucose Control, Adherence, And Accessibility To Medical Care Among People With Diabetes In Kuwait

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Introduction:
Patients with diabetes require continuous care, which was affected by the COVID-19 lockdown in many countries. This study aimed to assess the impacts of the lockdown on diabetics regarding accessibility and adherence to diabetes clinical care, Emergency Room visit changes and HbA1c levels, and their attitudes towards telemedicine.

Methods:
Using "snowball" sampling via social media platforms, this cross-sectional study enrolled 675 adults with diabetes in Kuwait. An online questionnaire assessed the accessibility and adherence to diabetes clinic visits and medication regimens, effect of the lockdown on HbA1c, and attitudes towards telemedicine. Multivariate logistic regression was used to adjust the association between participant characteristics and receiving no diabetes care during the COVID-19 lockdown.

Results:
The mean age was 43.7; 58.5% of participants were female and 89.6% were Kuwaiti. The change in mean number of outpatient visits from before to during (mean, –2.1 visits), and from before to after the lockdown (mean, –1.3 visits) were significant. The median number of ER visits from before to during the lockdown decreased significantly. However, self-reported change in HbA1c(%) from before to after the lockdown (-0.06; p=0.51) was insignificant. Self-reported prevalence of difficulties due to insufficient medications stock and refilling were both significantly higher among non-Kuwaitis.The main reported obstacle to attending clinic visits was fear of COVID-19 (43.4%). Approximately 1 out of 5 participants agreed that their "health deteriorated during the lockdown due to the unavailability of clinics." Almost one-third reported using telemedicine at least once, of whom 62.4% reported considering it effective. After adjustment for age, gender, nationality, governorate, family income, diabetes type, the odds of having "no diabetes care visits" were higher in Hawalli compared to Asimah(OR=1.7; p=0.02), and higher in type 2 than type 1 diabetes (OR=1.6; p=0.01).

Conclusions:
The COVID-19 lockdown had a significant impact on some aspects of diabetes care in Kuwait, affecting accessibility and adherence to clinic visits and medication regimens. Telemedicine was used by a minority of participants. These results can inform diabetes care health planners to identify methods that could help maintain healthcare access during lockdowns, with the potential aim of preventing complications resulting from delayed care.

Key Words: COVID-19 Lockdown ; Diabetes Mellitus ; Healthcare ;

Funding Agency: None

Community Medicine

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Mobile Phone Use While Driving And Road Traffic Crashes Among Adult Drivers in Kuwait

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Introduction:
Background and objectives: This cross-sectional study assessed the one-year prevalence of road traffic crashes (RTCs) among adults in Kuwait, the frequency of hand-held mobile phone usage while driving, and the association between hand-held mobile phone usage and RTCs.

Methods:
During December 2021, a cross-sectional study was conducted using a self-administered electronic questionnaire among adult drivers living in Kuwait aged 18 years and above, of either gender, or any nationality. We computed the RTC prevalence during the past year and the frequencies of hand-held mobile phone usage while driving. Chi-square analyses were conducted to evaluate the significance of association of many variables with RTC. The variables significantly related to the outcome were subjected to multivariable logistic regression. Adjusted odds ratio and their 95% confidence interval were also used.

Results:
Of 1755 participants, 39.7% were between 18-25 years old, 58.2% were females, and 88.4% were Kuwaiti. The prevalence of RTC in the past one-year was 26%. Chi-square test showed an association between RTC in the past one-year in Kuwait and age. It also showed an association between RTC in the past one-year in Kuwait and vision problems. Furthermore, there's an association between RTC in the past one-year and the regular mobile phone usage while driving, following the traffic rules, observing speed limit and respecting it, and total years of driving. Of the participants 1143, 285 were aware of the penalty of mobile phone usage while driving. Multivariable logistic regression model showed a statistically significant relationship with age 18-25 (adjusted OR = 2.03; 95% CI: 1.29-3.19), regular use of mobile phone while driving (adjusted OR = 2.23; 95% CI: 1.45-3.4), total years of driving for 1-3 years (adjusted OR = 2.39; 95% CI: 1.42-4.00), and never observing speed limit and respecting it (adjusted OR = 2.13; 95% CI: 1.21-3.73).

Conclusions:
The study showed a high one-year prevalence between hand-held mobile phone usage while driving and road traffic crashes (RTCs) among adults living in Kuwait. Younger age groups, less years of driving and never observing speed limit or respecting it were also significantly associated with RTCs.

Key Words: Road traffic crashes; Mobile phone use ; Adult drivers;

Funding Agency: None

Community Medicine

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The Prevalence of Workplace Violence against Physicians in Kuwait

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Introduction:
Workplace Violence (WPV) is defined as incidents where staff are abused, threatened, or assaulted in circumstances related to their work, including commuting to and from work, involving an explicit or implicit challenge to their safety, wellbeing, or health. WPV directed against physicians affects their wellbeing and hinders their ability to provide optimal care for their patients. WPV in the healthcare sector is a global public health problem; a metanalysis found the 12-month prevalence of WPV against physicians globally to be 56.8%. The aim of this study was to assess the prevalence, consequences, and types of WPV against physicians in Kuwait, to identify associations between sociodemographic and occupational factors and WPV, and to evaluate the workplace response towards incidents of violence.

Methods:
This cross-sectional study surveyed 459 physicians in Kuwait through an online questionnaire sent to participants by email through the Kuwait Medical Association and by social media. The survey consisted of three sections: sociodemographic and occupational factors, questions about WPV incidents, and the workplace response to the WPV. Data were collected over an eleven-day period in October 2021, and the response rate was 99%.

Results:
Of the surveyed physicians, 48.0% experienced WPV in the past 12 months. The types of WPV experienced were verbal (100.0%), psychological (72.9%), sexual (29.6%), and physical violence (24.7%). Weekly working hours, the number of existing violence prevention measures in the workplace, and working in the public sector were significantly associated with WPV incidents after adjusting for possible confounders. Of those who experienced WPV in the past 12 months, 52.5% did not report any incident and 42.1% only reported some incidents, with 71.1% of them explaining that there was no use in reporting. The top reported preventive measure currently existing in the physicians' workplaces was having posters warning against violence, while the top reported measure that physicians believed should be implemented was having clear reporting guidelines.

Conclusions:
This study found a high 12-month prevalence of WPV against physicians in Kuwait. Working long hours per week, the number of violence prevention measures in the workplace, and working in the public sector were significant predictors for experiencing WPV. Appropriate interventions must be implemented to address this increasing public health problem.

Key Words: Workplace Violence; Physicians; Kuwait;

Funding Agency: None

Community Medicine

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Screening for Bone Mineral Density & Assessment Knowledge level of Low Peak Bone risk factors and Preventive Practices among Kuwaiti Future Mothers

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Introduction:
Attaining greater peak bone mass (PBM) prior to the onset of bone loss is getting increasing public health attention as healthy strong bones is essential to maintain our life. Females are more susceptible to bone loss. Knowledge and awareness about low Peak bone mass and its related risk factors are important contributors to its preventive behavior. Objective: To screen apparently healthy young Kuwaiti future mothers for low bone mineral density (BMD) and to assess their knowledge level about determinants of PBM and preventive practices.

Methods:
A cross-sectional comparative study on 445 eligible women aged 18-35 years either students or employees from Kuwait University AlKhaldeya campus, which is comprised of three faculties, using multi-stage random sampling with proportionate allocation from three faculties. Data on socio-demographic and life style variables were obtained by face to face interview using a semi structured questionnaire. Their knowledge was assessed using the modified Osteoporosis Knowledge Assessment Tool (OKAT). Bone mineral Density (BMD) was measured using a Quantitative Ultrasonography (QUS).

Results:
More than half (59.3%) of females were having poor knowledge. A statistically significant relation was noted between the overall knowledge score and age, college, occupation and socioeconomic class ($P< 0.05$ for each). Only 13.9% have low Z score by QUS. By logistic regression higher knowledge score (OR= 3.29, 95%CI=1.71-6.38, $p<0.001$), less carbonated beverage (OR=2.29, 95%CI=1.37-3.81, $p=0.001$) and coffee consumption (OR=2.09 95%CI=1.29-3.39, $p=0.003$) positively affect BMD. While, inadequate exercises level (OR=0.73 95%CI=0.55-0.95, $p=0.019$), and indoor exposure to sun light (OR=0.49 95%CI=0.31-0.79, $p=0.003$) negatively affect BMD.

Conclusions:
Unacceptable knowledge score significantly associated with BMD Z-score status. More attention should be devoted to education programs targeting adolescents and young females to promote knowledge about PBM and practice towards accrual and maintenance of bone health.

Key Words: PBM; BMD; Knowledge;

Funding Agency: KFAS

Dentistry

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Oral Health Knowledge and Experience of Pediatricians and Pediatric Residents in Kuwait

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Introduction:
Objective: to evaluate the knowledge level and practice of pediatricians and pediatric residents regarding children's oral health in Kuwait.

Methods:
A nationwide cross-sectional survey was distributed to pediatricians and pediatric residents practicing in Kuwait. Data concerning demographic variables, knowledge on dental caries preventive measures, current anticipatory guidance, and experience with dental problems and oral care were collected using online and paper-based surveys.

Results:
A total of 230 completed the survey with a response rate of 50.1%. Most respondents (81%) had noticed dental caries in children more frequently. Two-thirds of respondents felt confident in detecting dental caries. However, more than two-thirds were unfamiliar with preventive dental practices and management of dental trauma. Only 16.5% of the respondents got a satisfactory knowledge score on the preventive measures questions and nearly 51% got a satisfactory knowledge on the current anticipatory guidance questions. No significant correlations were found between gender or years of practice and knowledge scores. Respondents' confidence in detecting caries was significantly associated with the knowledge score of the anticipatory guidance (p=0.003).

Conclusions:
Dental caries is an oral problem commonly encountered by many pediatricians and pediatric residents in Kuwait. The majority have adequate knowledge on the current anticipatory guidance of oral health issues, but they have insufficient knowledge levels on oral preventative measures. Adequate education and training in oral health are highly recommended.

Key Words: Pediatrics; Oral health; knowlege;

Funding Agency: None

Dentistry

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The Success of Vital Pulp Therapy in the Treatment of Deep Caries in Primary Teeth

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Introduction:
A growing body of evidence in the dental literature is favoring a less invasive approach in treating dental caries (minimal invasive dentistry), with reported high success rates. The aim of the present study was to compare the success rate of indirect pulp therapy (IPT) with that of ferric sulphate pulpoyomy (FSP) in the treatment of deep carious lesions in vital primary teeth.

Methods:
This was a retrospective chart review performed on 230 vital primary molars with deep caries approaching the pulp. Of those 105 (45%) were treated with IPT, and 125 (55%) were treated with FSP. All teeth were restored with stainless steel crowns. Mean follow-up period was 13 months. Success was assessed clinically (no pain; tenderness to percussion; mobility, or sinus tract present); and radiographically (no periodontal ligament loss or widening; no furcation pathology; no pathologic root resorption). SPSS v 22 was used for data analysis. The difference in the success rate between IPT and FSP was analyzed using Chi-square test. Ethical approval for the study was obtained from the Health Science Center Ethical Approval Committee.

Results:
Overall all the success rate for IPC was 100% and 90% for FSP. Of the FSP failures (N=13), 4 failed both clinically (fistula) and radiographically (internal root resorptions) and required extractions, while 9 failed radiographically only internal root resorptions). The clinical success rate was not significantly different between both groups, while the radiographic success was significantly different between the groups ($p<0.01$).

Conclusions:
In the present study, IPT had significantly higher radiographic success rate than FSP in the treatment of deep carious lesions on vital primary molars at 13 months.

Key Words: Vital pulp therapy; Indirect pulp therapy; Pulpotomy ;

Funding Agency: Unfunded study

Dentistry

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Attitudes and Knowledge of Dental Patients towards Infection Control Measures in Kuwait University Dental Center

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Introduction:
Objective: to determine the level of knowledge and attitudes of dental patients attending Kuwait University Dental Clinics (KUDC) regarding the infection control protocols practiced in the clinic.

Methods:
A cross-sectional descriptive survey was carried out among dental patients attending KUDC. A structured questionnaire was used to collect data about participants' sociodemographic, knowledge regarding the dental cross-infection, and attitudes related to infection transmission and control in dentistry. A total knowledge score was calculated based on five questions related to the cross-infection. It was then classified into three tertials: poor score (<50% of the correct answers), fair score (50%-75% of the correct answers), and satisfactory score (>75% of the correct answers). Descriptive statistics and chi-square analysis were used.

Results:
Two hundred and two dental patients agreed to participate in the study. 95 participants (47%) had poor knowledge about the dental cross-infection while only 40 participants (19.8%) had a satisfactory knowledge. Patients with a University degree or higher education had a better level of knowledge (75%) compared to patients with a lower educational level (15%, p=0.04). The majority of participants agreed that the dentist should wear gloves (95.5%), masks (89.6%), safety glasses (70.3%), and gowns (84.7%). Many patients believed that the protection measures are mainly to stop the infection transmission from patient to patient via the dentist.

Conclusions:
Nearly half of dental patients attending KUDC have poor knowledge regarding the transmission of infection in the dental clinic. The educational level was significantly associated with their level of knowledge. Patients demonstrated an overall positive attitude regarding the infection control protocols practiced in the dental clinic. Raising the awareness among dental patients about dental infection transmission and protective measures is of utmost importance.

Key Words: Infection control; Dentistry; Knowledge;

Funding Agency: None

Dentistry

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Oral Hygiene Status among Adult Employees in Kuwait

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Introduction:
The objective of this study was to determine the oral hygiene status among adult employees in Kuwait.

Methods:
This cross-sectional study was done among adults working at the Ministries Complex and Housing Authority in Kuwait. A convenience sample (N=1294) of adults participated in this study. Six trained and calibrated dentists examined them. Oral examinations were performed using a mouth mirror and a periodontal probe. Oral hygiene was assessed using the debris index simplified (DI-S), which describes the extent of soft deposits, and is one of the 2 components of the simplified oral hygiene index (OHI-S) developed by Green and Vermillion.

Results:
Of the 1294 adults, 19.6% had good, 36.1% fair and 44.4% had poor oral hygiene. More than half (57.5%) of males had poor oral hygiene, while only 16.9% of females had poor oral hygiene ($p<0.001$). Two-thirds of non-Kuwaitis (66.5%) had poor oral hygiene, compared to one-third (32.6%) of Kuwaitis ($p<0.001$). Almost two-thirds of adults (61.5%) with University education and above had good and fair oral hygiene. Larger number of adults with a diploma qualification had good and fair oral hygiene when compared to those with an intermediate school or lower education (25.5%/43.6% vs. 5.7%/21.9%). The percentage of adults with poor oral hygiene was highest among those who had their dental visit more than one year ago (55.4%) when compared to those, less than a year ago (37.2%) ($p<0.001$). Higher percentages of smokers (62.9%) had poor oral hygiene when compared to non-smokers (36.2%), and fewer smokers had good oral hygiene than non-smokers (8.1% vs. 24.6%) ($p<0.001$).

Conclusions:
Most of the adults had fair and poor oral hygiene. More number of adults with a higher education level had good and fair oral hygiene, compared to those with a lesser education. This study suggests the need to encourage dental visits and educate toward adopting positive oral health practices in workplaces among adults in Kuwait.

Key Words: Oral hygiene; Adult employees; Kuwait;

Funding Agency: None

Dentistry

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Association between the caregivers' oral health conceptual knowledge and the oral health of children and youth with special health care needs

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Introduction:
Aim: Previous studies have shown that children of caregivers with low oral health literacy (OHL) had poorer oral health status than children of caregivers with adequate OHL. However, there is a paucity of information on this relationship among children and youth with special health care needs (CYSHCN). Accordingly, this study aims to assess the association between the caregivers' oral health conceptual knowledge construct of OHL and the oral health status of CYSHCN.

Methods:
This cross-sectional study was conducted in four schools dedicated for CYSHCN. A 48-item questionnaire gathered information about the demographic and socioeconomic factors, the child/adolescent's medical condition, dental characteristics, caregiver self-efficacy and the child's dental attitude. The Comprehensive Measure of Oral Health Knowledge (CMOHK) questionnaire was used to record the caregivers' conceptual knowledge construct of OHL. The Löe & Silness gingival index (GI) and the Silness & Löe plaque index (PI) were used to assess gingival health and plaque levels, respectively. Directed acyclic graphs (DAGs) were utilized for the selection of the appropriate set of confounding variables for regression analysis. The mean score differences and 95% confidence intervals (CI) were estimated to quantify the associations of the various covariates with oral health outcome variables.

Results:
This study included 214 child/caregiver dyads. Most participants were physically disabled (56.1%) followed by children with hearing difficulty (9.8%) and congenital anomalies/syndromes (7.9%). The mean PI and GI of the children was 1.26±0.52 and 1.30±0.47, respectively. The median CMOHK score was 12 and the respondents were dichotomized based on the median value. Low caregiver oral health conceptual knowledge was significantly associated with higher PI scores (β [95% CI]= -0.26 [-0.41, -0.13]; $p<0.001$. Older participants (12-21-year-olds) had significantly higher plaque scores compared with younger participants (6-12-year-olds) (β [95% CI]= 0.33 [0.18, 0.51]; $p<0.001$). Participants who brushed their teeth twice or more daily had significantly lower (β [95% CI]= -0.15 [-0.43, -0.01]; $p=0.046$). Conceptual knowledge score was not significantly associated with GI.

Conclusions:
This study found that children of caregivers' with low conceptual knowledge levels had higher plaque scores.

Key Words: oral health; special care needs; oral health literacy;

Funding Agency: DD01/18

Dentistry

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The In-Vitro Effect Of Nano Silver Sodium Fluoride On Artificially Demineralized Root Dentine.

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Introduction:
This study intended to synthesize nano silver sodium fluoride formulation compare the effect of this formulation on artificially demineralized root dentine lesions with commercially available alternatives silver diamine fluoride (SDF) and sodium fluoride (NaF) after pH cycling.

Methods:
To prepare the NSSF 0.3gms of CH, 58.8ml of distilled water was added and allowed to stir for 20 minutes (mins). Then 1.2 mL of Acetic acid (0.2M) was added to this solution drop wise and the solution stirred for 3 hours (hrs) to prepare a 0.5 wt % solution. Sodium borohydride was added, and the reaction was undertaken in dark. Particle size analysis was conducted using a Zetasizer. Specimens were prepared at buccal or lingual aspects of the roots. The mounted teeth were submerged completely in the demineralising gel such that the prepared root surface was fully covered with equal volumes of gel. The demineralized specimens were randomly assigned to 4 groups (Control, NSSF, SDF and NaF) (n=15). After finishing the treatment, all specimens underwent cyclic demineralization and remineralization. Specimens were characterized using Scanning electron microscopy with EDX analysis, FTIR spectroscopy, surface, and cross-sectional microhardness and nanoindentation, atomic force microscopy (AFM), and X-ray photoelectron spectroscopy (XPS). All experimental data was processed for statistical significance.

Results:
Synthesized NSSF displayed a characteristic peak at 420nm in UV-vis spectroscopy and TEM showed circular particle morphology. SEM revealed partial occlusion of dentinal tubules with NSSF, whilst the EDX showed low concentration of Silver and fluoride. Increment in the microhardness was noted on the surface and from 25 to 100 um. FTIR-ATR spectroscopy also revealed higher mineral to matrix and carbonate content.

Conclusions:
Silver nanoparticles with sodium fluoride can be successfully synthesized and characterized. However, the current concentrations need to be greater in order to effect artificially demineralized root dentin lesions in the short time period as reported in the current study.

Acknowledgments
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Key Words: Nanosilver; Fluoride; Root dentine, Demineralization, In-vitro;

Funding Agency: No funding was received for this project

Environmental and Occupational Health

33

The Effects of Ambient PM2.5 on Respiratory Hospital Admissions in Kuwait: 2010-2018

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Introduction:

Several studies show significant increases in risk of respiratory hospital admissions associated with high concentrations of ambient fine particulate matter, or PM2.5. Because dust is a major component of PM2.5 in the region, concentrations of this pollutant in Kuwait far exceed air quality standards. The extent to which we understand the impact and burden of high PM2.5 concentrations on morbidity in the country is limited. In this study, we investigate the effects of PM2.5 on the risk of respiratory-related hospital admissions among different strata of the Kuwaiti population.

Methods:

We conducted a Quasi-Poisson regression analysis in a time-series design to investigate daily variations in respiratory hospital admission counts and average PM2.5 concentrations from 2010 to 2018. A generalized linear model was used to adjust for time, day of week, humidity, and temperature. Individual and cumulative lag effects of PM2.5 over a 5-day period were estimated using distributed lag linear models. Finally, we examined these associations after stratifying by gender, age group, and nationality.

Results:

There were 218,749 total respiratory admissions in Kuwait during the study period. Our results indicate that for every 10 µg/m3 increase in PM2.5, there is a 1.61% (95% CI=0.87, 2.35%) increase in respiratory admissions over a 5-day cumulative distributed lag. A significant effect was observed in both genders and higher estimates were observed among Kuwaitis overall. Non-Kuwaiti males, however, show a higher percent of admission increase than Kuwaiti males, 2.15% (95% CI=0.99, 3.32%) and 1.60% (95% CI=0.52, 2.70%), respectively. Our estimates show that a 10 µg/m3 reduction in average exposure will potentially avert 391 respiratory admissions per year (95% CI=211, 571), with a 265 decrease in admissions among Kuwaitis and a 262 decrease among children under 15 years.

Conclusions:

Increases in average PM2.5 concentrations can contribute to a rise in respiratory hospital admissions in Kuwait overall. Kuwaitis and children under 15 years are most susceptible to such exposure in the short-term. To our knowledge, the present study is the first to explore the effects of PM2.5 exposures on daily respiratory admissions in Kuwait. Due to the prominent nature of dust in the region, the findings of the study are informative to public health authorities in Kuwait.

Key Words: Kuwait, Dust, PM2.5; Time series; hospital admissions;

Funding Agency: None

Forensic Pathology

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Postmortem Findings Among Hanging and Manual Strangulation Fatalities with a Special Reference to Hyoid Bone Fractures: A Systemic Review and Meta-Analysis

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Introduction:

Hanging is one of the commonest suicidal methods, whereas manual strangulation is not a frequent means of homicide. The aim of this study is to illustrate the significance of external and internal postmortem findings among individuals of suspicious violent asphyxia. Publications on this topic are scarce in Kuwait and include only one retrospective study of hanging victims. This is the first publication on this topic in Kuwait.

Methods:

Secondary data are collected by searching the PubMed and Google scholar from January 2010 through March 2021. Inclusion criteria comprised both hyoid bone and laryngeal cartilages fracture in fatalities due to hanging and manual strangulation. Exclusion criteria contained other categories of death due to violent asphyxia. The statistical SPSS software is used for meta-analysis.

Results:

A total of 6497 fatalities were included in this study which comprised 6419 suicidal hanging subjects (98.8%) and 78 homicidal manual strangulation victims (1.2%). Hyoid bone fracture was demonstrated in 24.9% of the hanging victims, and 61.5% of fatalities due to manual strangulation, with a significant difference between the two forms of violent asphyxia ($P < 0.00001$). On the other hand, fracture of the thyroid cartilages was significantly more frequently encountered in hanging fatalities than in victims of manual strangulation; 30.8% and 7.7% respectively ($P < 0.00001$). More hyoid bone and laryngeal cartilage fractures were detected in the older age groups above 40 years. Males outnumbered females in the suicidal hanging group; 4556 males (71%), compared to 1864 females (29%), whereas the number of females was slightly higher than that of males in homicidal manual strangulation; 36 (46.2%) and 31 (39.7%) respectively. Most of the victims were in their third decade of life. Ligature marks were demonstrated in 5753 out of 6419 hanging victims (89.6%). Soft tissue subcutaneous hemorrhages were present in 70% of hanging cases. Meanwhile, characteristic external injuries in the form of multiple neck abrasions and bruises, in addition to petechial and subcutaneous hemorrhages, were demonstrated in victims of manual strangulation.

Conclusions:

Postmortem examination of the hyoid bone and laryngeal cartilages is of particular significance in suspected cases of violent asphyxia. Meanwhile, hanging and manual strangulation fatalities can be differentiated through identifying the characteristic external and internal autopsy findings.

Key Words: Hanging; Manual Strangulation; Hyoid Bone Fracture ;

Funding Agency: None

Genetics

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Relationship of Interleukin-6 (IL6), Interleukin-13 (IL-13) and Tumor Necrosis Factor-Alpha (TNF-alpha) Gene Polymorphisms with Genetic Susceptibility of Psoriatic Arthritis in Kuwaiti Arabs

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Introduction:
Psoriatic arthritis (PsA) is a chronic, systemic inflammatory arthritic disease in which joint inflammation is associated with cutaneous psoriasis which can lead to pain, swelling or stiffness in joints. It results from a complex interplay between genetic, immunologic and environmental factors. It is considered as a T cell-mediated disorder in which activation of T cell is a key step in disease onset. The T-lymphocytes are thought to affect epidermal growth homeostasis by inducing increased keratinocyte proliferation and abnormal differentiation. Altered cytokine networks have been shown to play a central role in pathogenesis of PsA. Psoriasis is characterized by Th-1 type cytokine pattern with the predominant secretion of interleukin-6 (IL6), interleukin-13 (IL13) and Tumor necrosis factor-alpha (TNF-alpha). The objective of this study was to study the relationship between IL6, IL13 and TNF-alpha gene polymorphisms and genetic susceptibility of PsA in Kuwaiti patients.

Methods:
We have investigated the association of IL6, IL13 and TNF-alpha gene polymorphisms in 113 Kuwaiti patients with psoriatic arthritis and compared it to that in 104 healthy controls. The diagnosis of PsA was based on the presence of inflammatory arthritis associated with psoriasis, usually with no rheumatoid factor in the serum. The genotypes for IL6, IL13 and TNF-alpha gene polymorphisms were determined by using polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) method and confirmed by DNA sequence analysis.

Results:
The frequency of IL6 and IL13 gene polymorphisms manifested a statistically significant difference between Kuwaiti PsA patients and controls in the Dominant model but not in the Co-dominant model. In contrast, the frequency of TNF-alpha showed a statistically significant difference between the two study groups in both dominant and Co-dominant models of genetic analysis. The frequency of variant allele (R) of the IL13 gene polymorphism was higher in PsA patients compared to the controls. The variant genotypes of all three cytokine gene polymorphisms showed marked differences between the male and female Kuwaiti PsA patients.

Conclusions:
Our data show a significant association of three cytokine gene polymorphisms (i.e. in IL6, IL13 and TNF-alpha genes) with PsA in Kuwaiti patients and highlight their contribution in genetic susceptibility of this chronic disease possibly along with other factors.

Key Words: Genotype; Psoriatic arthritis; Cytokine gene polymorphism;

Funding Agency: None

Genetics

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Expanding the Phenotype, Genotype and Biochemical Knowledge of ALG3-CDG

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Introduction:
Congenital disorders of glycosylation (CDGs) are a continuously expanding group of monogenic disorders of glycoprotein and glycolipid biosynthesis. They are due to defects in the peri/post-translational glycosylation of proteins or lipids resulting in multi-system diseases. ALG3-CDG is one of the rare types of CDG and was first reported in 1995 as an autosomal recessive disorder. ALG3 encodes for an alpha-1,3-mannosyltransferase enzyme involved in N-glycan synthesis. Defects in ALG3 result in an accumulation of Man5- GlcNAc2-PP-dolichol. Individuals with ALG3-CDG frequently exhibit severe neurological involvement (epilepsy, microcephaly, hypotonia), ocular anomalies, dysmorphic features, skeletal anomalies and feeding difficulties. We present 10 unreported individuals diagnosed with ALG3-CDG based on molecular and biochemical testing with 11 novel variants in ALG3, bringing the total to 40 individuals with ALG3-CDG.

Methods:
9 individuals underwent clinical genetic testing. We quantitatively analyzed the N- glycan profile of total plasma glycoproteins from 4 of them using a clinically validated N-glycan assay. Carbohydrate deficient transferrin (CDT) testing was performed in 8 individuals by mass spectrometry.

Results:
our cohort has additional novel features that further expand the symptomatology of ALG3-CDG, which include endocrine abnormalities, neural tube defects, mild aortic root dilatation, immunodeficiency and renal anomalies.

Conclusions:
We present 10 additional cases of ALG3- CDG with 11 novel variants, further clinical features and new biomarkers related to glycosylation dysfunction in ALG3-CDG. In addition to the typical multisystem disease seen in ALG3-CDG, we expand the symptomatology of ALG3-CDG. Our study provides recommendations for management of individuals with ALG3- CDG.

Key Words: congenital disorders of glycosylation; N-glycan; neural tube defects;

Funding Agency: The Rocket Fund and NIH grants R01DK99551, T32 GM008638 and U54 NS115198-01

Genetics

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Early Diagnosis of Classic Homocystinuria in Kuwait through Newborn Screening: A 6-Year Experience

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Introduction:
Kuwait is a small Arabian Gulf country with a high rate of consanguinity. A national newborn screening (NBS) program was expanded in October 2014 to include a wide range of endocrine and metabolic disorders. Classical homocystinuria (HCU), is an inborn error of methionine (Met) and homocysteine (Hcy) metabolism with a global incidence of ~1:260,000, and the highest incidence reported in Qatar, affecting 1 in 1800.HCU is an autosomal recessive disorder, caused by deficiency of the cystathionine beta synthase (CBS) enzyme, pyridoxine-dependent, resulting in an elevated blood, urine, and tissue levels of Hcy and its precursor Met. CBS enzyme is encoded by CBS gene.

Methods:
A retrospective study conducted between January 2015 and December 2020 revealed a total of 304,086 newborns have been screened in Kuwait.

Results:
6 newborns were diagnosed with HCU with an incidence of 1:50,000, which is not as high as in Qatar but higher than the global incidence. Molecular testing for 5 of them has revealed 3 previously reported pathogenic variants in the CBS gene, c.969G>A, p.(Trp323Ter);. c.982G>A, p.(Asp328Asn); and the Qatari founder variant c.1006C>T, p.(Arg336Cys). Adding Met/Phe ratio to blood Met level as a first-tier and tHcy as a second-tier strategy has increased the specificity of NBS testing.

Conclusions:
Our study is the first to review the experience of the NBS program for HCU in Kuwait. We demonstrated that our national NBS for HCU is highly effective, the screened positive cases are successfully followed up, and the affected infants are treated within an average of 9 days of their lives. We report the incidence of HCU in Kuwait to be 1 in 50,000 since the expansion of the NBS program in October 2014, emphasizing its effectiveness and importance. We recommend adding Met/Phe ratio to blood Met level as a first-tier and tHcy as a second-tier strategy in our national HCU screening to further increase the specificity of NBS testing.

Key Words: Classic homocystinuria, methionine, molecular test; total homocysteine; incidence;

Funding Agency: N/A

Genetics

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Mitochondrial haplogroup R associated with a protective effect on obesity in Arabs in Kuwait

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Introduction:
Whole-exome sequencing is a valuable tool to determine genetic variations that are associated with rare and common health conditions. A limited number of studies demonstrated that mitochondrial DNA can be captured using whole-exome sequencing. Previous studies have suggested that mitochondrial DNA variants and haplogroup lineages are associated with obesity. Therefore, we investigated the role of mitochondrial variants and haplogroups contributing to the risk of obesity in Arabs in Kuwait using exome sequencing data.

Methods:
Indirect mitochondrial genomes were extracted from exome sequencing data from 288 unrelated native Arab individuals from Kuwait. The cohort was divided into obese [body mass index (BMI) ≥ 30 kg/m2] and non-obese (BMI < 30 kg/m2) groups. Mitochondrial variants were identified, and haplogroups were classified and compared with other sequencing technologies. Statistical analysis was performed to determine associations and identify mitochondrial variants and haplogroups affecting obesity.

Results:
Haplogroup R showed a protective effect on obesity [odds ratio (OR) = 0.311; P = 0.006], whereas haplogroup L individuals were at high risk of obesity (OR = 2.285; P = 0.046). Significant differences in mitochondrial variants between the obese and non-obese groups were mainly haplogroup-defining mutations and were involved in processes in energy generation. The majority of mitochondrial variants and haplogroups extracted from exome were in agreement with technical replica from Sanger and whole-genome sequencing.

Conclusions:
This study leads to identification of mitochondrial haplogroup of R and low risk for obesity in Kuwaiti population. In addition, potential association was also observed between the L haplogroup to be associated with higher risk for obesity in Kuwaiti population

Key Words: Mitochondrial DNA; Obesity; Kuwait;

Funding Agency: Kuwait Foundation for Advancement in Sciences

Genetics

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Distribution of major pharmacogenomics markers of HLA-B alleles in Qatari population delineated from Next-generation sequencing data

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Introduction:
Human Leukocytes Antigen proteins are present at the cellular surface of antigen presenting cells and play a crucial role in the adaptive immune response. Class I genes, specifically HLA-B alleles are associated with Adverse Drug Reactions (ADRs). Although, ADRs is one of the common causes of hospitalization as well as mortality, there is no enough data for the prevalence of HLA-B pharmacogenetics markers in the Arab countries. In this study, we investigated the frequency of major HLA-B pharmacogenomics markers in Qatar population.

Methods:
Next-generation sequencing data of 1,098 Qatari individuals were used for HLA-B typing using HLA -HD Version 1.4.0 and with IPD-IMGT/HLA for official HLA name assignment.

Results:
In total, 472 major HLA-B pharmacogenetic markers were identified with the most frequent pharmacogenetic marker in the Qatari population is HLA-B*51:01 (30%), which is associated with phenytoin and clindamycin-induced-ADRs. The second most frequency pharmacogenetic marker is HLA-B*58:01 allele (6.56%), which is associated with allopurinol-induced ADRs. The third most frequent pharmacogenetic marker is HLA-B*44:03 allele, which is associated with phenytoin induced ADRs.

Conclusions:
To establish pharmacogenetics screening program in Qatar, especially for the high prevalent HLA-B pharmacogenetic markers identified in this study as it will be cost-effective intervention for prevention of drug-inducing hypersensitivity.

Key Words: Pharmacogenetics; HLA typing; Population;

Funding Agency: None

Genetics

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Cloning of partial and full LPL promoters into TOPO-TA and promoterless luciferase vectors

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Introduction:

LPL gene participates in lipid metabolism through hydrolysis of triglycerides stored in lipoproteins (e.g. chylomicrons and very-low-density lipoproteins). LPL has been implicated in the increased risk of metabolic disorders including obesity, and subsequently, heart disease. LPL promoter is a key regulatory element that controls gene activity. Molecular cloning technique allows designing a recombinant DNA molecule with different methods for unlimited applications, such as functional analysis. The Objective of this project is to clone partial and full LPL promoters into TOPO-TA vector, and subsequently into promoterless Luciferase vector using non-conventional and conventional methods.

Methods:

DNA fragments from partial and full LPL promoters were PCR amplified using human genomic DNA samples. DNA fragments were subsequently ligated into TOPO-TA vector and transformed to competent E. coli by heat shock method. Recombinant plasmids were purified from positive colonies. Afterward, partial and full LPL promoters were digested from the TOPO-TA vector and cloned into the promoterless luciferase reporter plasmid (i.e. pGL4.10) using restriction digestion and ligation. Same steps were performed for E. coli transformation, screening of positive colonies, and confirmation of the successful cloning of partial and full LPL promoters into the promoterless luciferase vectors.

Results:

Results of PCR and restriction digestions were analyzed by running DNA fragments on gel electrophoresis. Expected band sizes confirmed the expected results. Sequencing with sanger method revealed successful cloning of partial and full LPL promoters into the promoterless luciferase vectors in the correct orientations.

Conclusions:

Future studies will be conducted using these constructed luciferase vectors to test for functional activities of partial vs. full LPL promoters in mammalian cell lines. The study will provide insights into functional activities of LPL promoters to derive expression of LPL genes and possible to link clinical abnormalities to LPL promoter activity.

Funding/ Acknowledgement:

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Key Words: LPL promoter; Cloning; Molecular Biology;

Funding Agency: Kuwait University Research Administration (Project SL01/20 and Project YS02/20).

Genetics

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Signatures of Selection on the Mitochondrial DNA (mtDNA) of Dromedary Camels from the Arabian Peninsula

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Introduction:

Abstract: Mitochondria are vital organelles carry their own genetic material that might be a potential target of natural selection to maintain dromedary camels' adaptivity to harsh environmental conditions. In this project, will be analysed the full mitochondrial DNA "mtDNA" of dromedary camel samples for signatures of natural selection. This data will be complemented with full mtDNA sequences of different samples representing the Camelidae family available online. Different statistical tools will be applied on the generated data, such as McDonald-Kreitman test and PAML (Phylogenetic analysis by maximum likelihood) package, to define genes and genomic variants on the mtDNA under selection pressures that might be associated with the adaptivity of dromedaries to the surrounding environmental condition.

Introduction: The Camelidae family is divided into two tribes; the old world Camelini and new world Lamini. The Camelini tribe is composed of three species, in which two are domesticated; dromedary (Camelus dromedarius) and Bactrian camels (Camelus bactrianus), while the third species (Camelus ferus) is still in a wild state. Mammalian mtDNA is a small circular chromosome within the mitochondria, the organelle responsible for production of the cellular energy molecules (ATP). Objectives: Analysing the mtDNA of dromedary camels from the Arabian Peninsula for signatures of selection that might be associated with their adaptation to harsh environmental conditions.

Methods:

The full mtDNA sequence have been extracted from whole genome sequence data of dromedary camel (n=32) samples generated from previous study using the GATK bioinformatics tool, and full mtDNA sequences of different Camelidae species; dromedary, Bactrian, Ferus, Llama, Vicuna, Guanaco, and Alpaca will also be retrieved from the NCBI database (n=31). Analyzing the full mtDNA sequences using specialized computer software's such as: Mega-X Software for phylogenetic tree building, in addition to PAML and DnaSP for identifying the signature of selection sites.

Results:

UPGMA phylogenetic tree of concatenated protein coding genes of mtDNA for 8 different species, (n=64) samples, this includes the project samples(n=32), and database samples (n=31), In addition to cattle sample (NC_006853.1) as out group.

Conclusions:

The phylogenetic tree of the concatenated protein coding sequence shows that the variation is existing between camel's species not within species.

Key Words: Positive selection; dromedary camels; mitochondrial DNA;

Funding Agency: CGS Masters degree

Health Economics

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Economic Burden of Influenza Among The Elderly in Malaysia: Provider's Perspective

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Introduction:
Influenza is a contagious respiratory illness and may cause life-threatening complications among the high-risk groups. Estimation of the economic burden are essential to guide policy-making on influenza vaccination program, especially in resource-limited settings. The aim of the study was to estimate the economic burden of influenza from the provider's perspective among elderly in Malaysia.

Methods:
Direct cost of influenza disease for all severity level is calculated from casemix data and clinical pathway analysis. Two outpatient visits prior to hospital admission were assumed to calculate the annual cost per patient. Sensitivity analysis was conducted to assess the impact of variations in costs and incidence rate of influenza for both costing approaches.

Results:
Average annual direct costs of managing mild, moderate and severe influenza were estimated to be RM2,435 (USD 579), RM6,504 (USD 1549) and RM13,282 (USD 3,163), respectively The estimated total annual economic burden of influenza among the elderly aged 60 years and above in Malaysia was RM3.28 billion (USD 782 million) which is equivalent to 10.7% of MOH budget for 2020. Sensitivity analysis indicated that influenza incidence rate and cost of managing severe influenza were two most important factors that influence the total economic burden.

Conclusions:
Overall, our results have shown that influenza is responsible for a substantial economic burden in the Malaysia. The high cost of influenza suggests that further efforts are required to implement influenza immunisation program in the elderly to reduce the disease and economic burden.

Key Words: Influenza; Economic Burden; Casemix;

Funding Agency: None

Health Management

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Completeness of Medical Record Documentation for Neurology and Neurosurgery Inpatients in a Government Hospital in Kuwait

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Introduction:
Medical record documentation (MRD) is very important aspect of hospital management since it may reflect the performance and the effectiveness of the patient treatments. Currently, there is no study on the completeness and accuracy of MRD in government hospital in Kuwait. The study aims is to assess the completeness of inpatient MRD for neurology and neurosurgery cases in a public hospital in Kuwait.

Methods:
A total of 283 medical records of patients discharged from January to June 2020 were randomly selected from one public hospital in Kuwait. 123 and 160 medical records were from neurosurgery and neurology patients, respectively. The MRD was assessed using a 13-items check-list covering important information that should be available in a good quality medical record. Five types of MRD covered in the study were admission form, medical history and physical examination record, progress notes, treatment sheet and discharged summary.

Results:
Most of the patients were Kuwaiti (70.3%), males (73.1%), below 45 years (61.5%), and admitted for less than 5 days (77.4%). The overall completeness rate of MRD was 54.8%. The admission form has the highest level of completeness (68.5%) while the discharge summary is the lowest (26.2%). The completeness of basic patient information ranges from 60.5% for age, 56.9% for gender, 57.7% for nationality and 60.3% for discharge status. The completeness of clinical data was quite low for primary diagnosis (59.2%), secondary diagnosis (20.8%), Primary procedure (51.5%) and other procedure (15.7%)

Conclusions:
The completeness of medical record documentation in the hospital is generally low and need to be improved. Intensive training and the close monitoring of completing the MRD in the hospital should be undertaken to prevent any negative affect on patient outcome and hospital management in general.

Key Words: Medical Records; Completeness; Public Hospital;

Funding Agency: None

Health Policy & Management

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Assessment of management skills among managers in public hospitals in Kuwait

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Introduction:
Effective management in healthcare facilities are crucial in facing the current challenges in health systems. This study aims to assess the managerial skills of managers in public hospitals in Kuwait.

Methods:
A cross-sectional study using a self-administrated questionnaire, was conducted among first-line managers, middle-level managers, and top-level managers in 10 public hospitals in Kuwait. Six of these hospitals are Secondary level hospitals, one in each governorate, and four are tertiary level hospitals located in Al-Sabah medical area. 500 respondents were randomly selected to complete the 15-items questionnaire.

Results:
The response rate was 64%. Most of the respondents were females (62.2%), age 40years and above (55.2%), served as first line managers (61.56%) with high management skills (62.2%). Female managers had higher management skills than males (70.4% vs 48.8%; X2=14.918; p <0.001). Age is directly related to management skills. Different management levels had a significant effect on management skill. Managers who received formal training in healthcare administration had higher management skill than managers who did not receive training. Experience in management had a significant effect on management skills where managers who had more than 10 years of experience in management had the highest management skills.

Conclusions:
In Kuwaiti hospitals, female managers had better management skills than males. Although age, different management levels, and formal training in healthcare management improved management skills. The experience was also important in developing managerial skills. Managers in Kuwaiti hospitals have high management skills overall.

Key Words: Management skills; Public Hospitals; Kuwait;

Funding Agency: None

Medical Education

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Knowledge, Attitude, and Practice Among In-training Physicians In Kuwait Institute of Medical Specialization

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Introduction:
The physicians should strive to conduct research in order to contribute to the generation of evidence. A review of literature showed that there is no research done about knowledge, attitude, practice towards research among postgraduate doctors in Kuwait. The objective of this study is to assess medical research related knowledge, attitude and practice of resident doctors in Kuwait and to know the obstacles preventing residents from doing medical research.

Methods:
A written informed consent of the participants was taken from all participants; a cross-sectional structured questionnaire was sent to 200 residents at different level of training under different programs at Kuwait Institute of Medical Specialization (KIMS). A total of 113 residents responded to the questionnaire. The questionnaires were sent online via Google form. All participants were provided with sufficient time to fill the questionnaire. The data was expressed in percentage and analyzed by Microsoft Office Excel 2011.

Results:
A total of 113 residents responded to the questionnaire. The Levels of Evidence Medicine hierarchy was known to 85%. However, research statistics and methodology were poor. 94% of the residents agreed that patient outcome improves with continued medical research. Although 79% of the residents were interested in conducting research in future, 37% had made paper/poster presentations and only 34% had publications. Lack of time (64%), inadequate support by mentors (63%) lack of research curriculum (56%) and inadequate facilities (56%) were stated as major obstacles for pursuing research.

Conclusions:
Our study shows that residents have a reasonable knowledge about research. They also demonstrated a positive attitude toward research, but they were unable to translate their knowledge and attitude into actual practices.

Key Words: Medical research; Residents; KAP;

Funding Agency: None

Medicine

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Transcatheter Aortic Valve Replacement in Patients with Heart Failure with Reduced Ejection Fraction: A Single Centre Experience

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Introduction:

Objectives: To define baseline echocardiographic, electrocardiographic (ECG) and computed tomographic (CT) findings of patients undergoing transcatheter aortic valve replacement (TAVR) and analyze their overall procedural outcomes

Methods:

Between 2018 and 2021, patients with severe aortic stenosis (AS) who performed transcatheter aortic valve replacement (TAVR) in Sabah Al Ahmad Cardiac Centre, Al Amiri Hospital were identified. A retrospective review of patients' parameters including pre-, intra-, and post-procedural data was conducted. Patients were grouped in 2 subgroups according to their EF: EF <40% (HFrEF) and EF ≥40%. The data included patients' baseline characteristics, electrocardiographic and echocardiographic details along with pre-procedural CT assessment of aortic valve dimensions. Post-operative outcomes including conduction disturbances, pacemaker implantation and in-hospital mortality following TAVR were additionally analyzed.

Results:

A total of 61 patients with severe AS underwent TAVR. The mean age was 73.5±9, and 21 (34%) of the patients were males. The mean ejection fraction (EF) was 55.5 ± 9.7 %. Of 61 patients, 12 (20%) were identified as heart failure with reduced EF (<40%). These patients were younger, more often males, and were more likely to have coronary artery disease (75% versus 53.1%). Left ventricular hypertrophy and diastolic dysfunction was documented in 75% and 58.3% of patients with HFref respectively. Post TAVR conduction disturbances, with the most common being LBBB was observed in 41.7%. Permanent pacemaker was implanted in 3 of patients with HFref (25%). There were no significant differences between the two groups with regards to in hospital mortality (p=0.618).

Conclusions:

Severe AS with EF <40% constitute a remarkable proportion of patients undergoing TAVR. Preliminary results of post-operative conduction disturbances and in hospital mortality in HFrEF patients do not differ from patients with LVEF ≥40%.

Key Words: Aortic stenosis; TAVR ; HfrEF;

Funding Agency: None

Medicine

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Comparative Efficacy of Biologic Therapies for Inducing Response and Remission in Fistulizing Crohn's Disease: Systematic Review and Network Meta-analysis

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Introduction:
The management of patients with fistulizing Crohn's disease (CD) is challenging. Several biologics have been used for the treatment of fistulizing CD over the last two decades. We aimed to compare the efficacy of biologic therapies in inducing response and remission in fistulizing Crohn's disease.

Methods:
Systematic searches were made of MEDLINE, EMBASE, Scopus, Cochrane Central databases for randomized controlled trials (RCTs) to November 2021 that assessed the efficacy of infliximab, adalimumab, certolizumab, vedolizumab, or ustekinumab against placebo or an active agent for induction of response or remission in adult Crohn's patients with fistulizing disease. Primary outcome was proportion of patients with fistula response or remission as defined by each RCT. Pairwise treatment effects were estimated through a Bayesian random-effects network meta-analysis and reported as odds ratios (OR) with a 95% confidence interval (CI).

Results:
Ten studies (RCTs) were included in the analysis. Main analysis showed that there was no statistical difference in induction of remission between infliximab, adalimumab, certolizumab, vedolizumab and ustekinumab. Anti-TNFs were superior to placebo in inducing response [OR= 0.51 (95% CI 0.35; 0.750] and remission [OR= 0.36 (95% CI 0.22; 0.58)]. Infliximab was superior to placebo in inducing response [OR= 0.36 (95% CI 0.17; 0.75)] and remission [OR=0.17 (95% CI 0.03; 0.87)]. Ustekinumab was superior to placebo in inducing response [OR=0.48 (95% CI 0.26; 0.860] but not remission [OR=0.50 (95% CI 0.13; 1.93)]. Vedolizumab was not superior to placebo in induction of remission [OR=0.32 (95% CI 0.04; 2.29)]. Certolizumab was not superior to placebo in induction of response [OR=0.78 (95% CI 0.40; 1.55)] or remission [OR= 0.78 (95% CI 0.40; 1.55)]. Infliximab was superior to adalimumab in induction of response [OR=0.24 (95% CI 0.06; 0.99)] but not remission [OR=0.31 (95% CI 0.04; 2.27)].

Conclusions:
In patients with fistulizing CD, anti-TNFs are effective in inducing response and remission. Infliximab was superior to adalimumab for inducing response but not remission. No difference between various biologics was observed for inducing remission. These data highlight the need for dedicated studies to assess the efficacy of biologics in fistulizing Crohn's disease.

Key Words: Biologic Therapies ; Fistulizing Crohn's Disease; Remission, response ;

Funding Agency: None

Medicine

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Acute Kidney Injury Incidence, Causes, Management, and Outcomes: A Prospective, Observational Multi-Center Study

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Introduction:
ntroduction: Little is known about the epidemiology, characteristics, management and outcomes of acute kidney injury (AKI) in Kuwait, and we aim to assess that.

Methods:
We prospectively collected demographic (age, sex, etc.), clinical (baseline eGFR [i.e., before AKI], comorbidities), management (dialytic, non-dialytic) and 30-day kidney and patient outcome data for AKI referrals to nephrology in major public hospitals from 1/Jan/2021 to 30/Jun/2021. Data analysis was performed using SPSS 16

Results:
Total AKI referrals: 2048 (males: 58%; mean age: 64 years). Baseline eGFR < 60 in 43% patients, and those were older than patients with eGFR ≥ 60 (mean age: 69 vs. 60 years), had lower mean baseline eGFR (37 vs. 89) and more DM (82% vs. 59%) and HTN (85% vs. 60%), and lower likelihood of receiving fluid during AKI. Mechanical ventilation was needed for 42% of cases (more likelihood in patients with baseline eGFR ≥ 60). Dialysis was needed for 34% of cases (higher usage of dialysis in patients with baseline eGFR ≥ 60 group). Of patients dialyzed, 73% on ventilation, vs 24% of patients not dialyzed. At 30 days, 33.5% died (higher rate in patients with baseline eGFR ≥ 60 than patients with baseline eGFR < 60). Of patients dialyzed, 54% died on dialysis and 24% alive and still on dialysis at 30 days. Of all cases, 29% were COVID-19-associated. Of the COVID-19 associated cases, 72% needed mechanical ventilation (vs. 28% in non-COVID-19 associated AKI) and 59% died (vs. 23% of non-COVID-19 associated AKI). Age > 65, COVID-19, vasopressors and ventilation associated with poor kidney and patient outcomes. Covid-19, vasopressors, diuretics and ventilation associated with more dialysis. Kuwaitis were 60% of all AKI cases as Kuwaitis were older, and with lower baseline eGFR, and had more DM and HTN. No differences in mortality or kidney recovery by nationality or sex. Two or more AKI episodes during study period seen in 6.6%. Recurrent group had less ventilation (27% vs 42%), less dialysis (21% vs 35%), higher kidney recovery rates (24% vs 43%) and lower mortality (18% vs 86%). Total AKI cases in Ramadan was 158 and 24% were fasting before admission. No difference between fasting and non-fasting in dialysis or mortality

Conclusions:
AKI consumes resources (ICU beds, ventilators and dialysis) and associated with high mortality. COVID-19 increases risk of AKI and worsens kidney and patient outcomes. Sex, nationality, recurrent AKI and Ramadan fasting do not worsen outcomes

Key Words: AKI; Dialysis; Mortality;

Funding Agency: None

Medicine

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Acute kidney injury among COVID-19 positive patients is associated with higher mortality: single center experience

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OTC

Introduction:
Despite the lungs are the major targets of COVID-19, other organs such as the kidneys are also affected. Renal complications of COVID-19 are not yet well studied. Aim: We aimed to study the prevalence of acute kidney injury (AKI) among positive COVID-19 cases that were managed in the intensive care unit (ICU) in a single isolation hospital during the pandemic, and to explore its impact on patient outcome.

Methods:
This retrospective study included 616 patients with COVID-19 who were managed in the ICU in a single isolation hospital in Kuwait during the pandemic, from February to December, 2020. AKI was defined according to the serum creatinine criteria in the Kidney Disease: Improving Global Outcomes (KDIGO) guidelines. Of the 616 patients, 40.2% developed AKI (group 1, n=248) and were compared with the patients without AKI (group 2, n=368).

Results:
Most of cases in the 2 groups were males (73% vs. 70.7%), aged (60.8± 14 vs. 51.7± 16 years) respectively. The 2 groups were comparable regarding chronic kidney disease (2% vs. 0.8%), and chronic pulmonary disease. Other factors were significantly predominating among group 1 as diabetes mellitus (63.7 vs. 40.5%), hypertension (74.2% vs. 40.5%), ischemic heart disease (26.2% vs. 12.5%) ($p<0.05$). Fever, cough shortness of breath and dehydration were significantly more frequent presentations among patient of group 1, and had radiological findings that were synchronized with COVID-19 (89.5% vs. 50.8%) ($p<0.05$). Moreover, sepsis, volume depletion, shock, arrhythmias and ARDS predominated among the AKI group ($P<0.05$). Number of cases who were managed by therapeutic anticoagulation was significantly higher in AKI patients (89.9 % vs. 51.9%); also cases who received supportive vasopressors and convalescent plasma transfusion as well as steroid were significantly higher in the same group($p<0.05$). Other therapeutic modalities as antivirals, tocilizumab and hydroxychloroquine were comparable in both groups. We found that, acute respiratory failure requiring mechanical ventilation was significant among AKI group (66.8% vs. 29.4%), and the overall mortality rate was significantly higher in the same group (62.5%. vs. 32.8%).

Conclusions:
The prevalence of AKI in patients with COVID-19 was 40.2%, and it was associated with poor prognosis among ICU covid-19 positive cases.

Key Words: COVID-19 infection; AKI; Outcome;

Funding Agency: None

Medicine

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Safety and efficacy of PCSK-9 inhibition among renal transplant recipients with high cardiovascular risk

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Introduction:
Reduction of LDL cholesterol levels is associated with a reduction of major cardiovascular events. Monoclonal antibodies inhibiting proprotein convertase subtilisin/Kexin type A(PCSK-9) have not evaluated among renal transplant recipients despite its favorable safety profile. Aim of the study: To evaluate the safety and efficacy of evolocumab in reducing lipids and cardiovascular events among risky renal transplant recipients.

Methods:
195 kidney transplant recipients- who were followed up in Hamed Al-Essa organ transplant center with high cardiovascular risk (>20)- were enrolled in this randomized controlled study during the period between 6.2017 and 6.2018. Patients who received statin and evolocumab (140mg/ 2 weeks, group1, n=97) while those who were maintained on statin alone comprised group 2(n=98). After 24 months, they were followed up clinically and by laboratory investigations.

Results:
The 2 groups were comparable regarding their demographics including pre-transplant co-morbidities ($p>0.05$). Before enrollment in the study, post-transplant complications were comparable apart from a higher prevalence of NODAT in group 2($p=0.033$). Smokers were significantly more prevalent in group 1. Moreover, basal graft function was significantly higher in group 1 while the type of immunosuppression was equivalent in both groups($p>0.05$). Clinically we found no significant differences between the two groups concerning any cardiovascular events and both graft and patient outcomes were comparable ($p>0.05$). We found significantly higher basal cholesterol in group 1(5.5 vs. 4.7, $p<0.001$) which came down significantly in the same group after 3 months and thereafter ($p=0.031$) compared to group 2 and to basal values ($p<0.001$). Similarly, cholesterol started to lower significantly at 12 months in group 2. We observed that triglycerides in the two groups were comparable ($p>0.05$) till the end of the study.However, TG at 6 months was significantly lower compared to basal values in both groups($p<0.05$). We reported 2 cases of acute MI and 1 atrial fibrillation in the group2.

Conclusions:
Evolocumab is a promising lipid-lowering agent among renal transplant with high cardio-vascular risk. Earlier reduction of cholesterol was observed in the add-on evolocumab group but without significant positive cardiovascular impact.

Key Words: Hyperlipidemia,; renal transplant, ; high cardiovascular risk, outcome;

Funding Agency: None

Medicine

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Poly Cystic Ovary Syndrome (PCOS) and Sub-Clinical Hypothyroidism (SCH) among Arab women. A preliminary report

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Introduction:
Rotterdam criteria defined Poly Cystic Ovary Syndrome (PCOS) as ovarian volume more than 10 cc with more than 12 follicles (2-9mm). Association between the clinical and biochemical parameters of PCOS and sub clinical Hypothyroidism, which is an early and subtle state of thyroid hypofunction as defined by Thyroid Stimulating Hormone (TSH) levels of < 10 mIU/L has been reported. The aim of this ongoing study is to assess the prevalence of SCH in our cohort of PCOS and to explore whether there is an association between clinical, biochemical and MRI features of PCOS and SCH and to determine whether there is a cutoff level of TSH which correlates with these manifestations.

Methods:
The ongoing study is expected to be conducted on 300 female subjects comprising of 150 cases of PCOS and 150 as controls. So far 198 subjects, comprising of 121 cases of PCOS and 58 controls are included in this study. All subjects had biochemical analysis and magnetic resonance imaging (MRI) examination. The subjects (cases and controls) were divided in to 2 categories: - Euthyroid with TSH level >= 0.27- 5 mIU/L- SCH with TSH level >=5.1 - 10 The severity of the clinical, biochemical, and radiological features were compared in these sub-groups.

Results:
Our preliminary study revealed that 71 out of 121 (59%) subjects with clinical PCOS revealed typical MR imaging features of PCOS. In 30 (24%) subjects MR imaging features depicting small volume ovaries (<10cc) but more than 12 follicles were considered as atypical features. In 20 (16%) cases the ovaries were normal.

Conclusions:
Our initial report demonstrates that the imaging features of PCOS as per the Rotterdam criteria with respect to volume and the no. of cysts may not apply to our population. Our subjects with smaller ovarian volume with or without lesser than 12 micro cysts can still be a feature of PCOS in the appropriate clinical and biochemical setting.

Key Words: PCOS; TSH; MRI;

Funding Agency: KFAS

Medicine

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Establishment and results of pilot phase of the Pediatric COVID-19 Registry in Kuwait (PCR-Q8)

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Introduction:
Establishing a pediatric COVID-19 registry in Kuwait (PCR-Q8) deemed imperative during the pandemic to study children infected with severe acute respiratory syndrome-related coronavirus 2 (SARS-CoV-2) focusing on mode of presentation, therapeutic interventions, disease severity and early outcomes. We describe the rapid establishment of the PCR-Q8 registry showcasing an infrastructure of the development process and present the results of the pilot phase.

Methods:
The registry was developed and implemented using the general key steps from Gliklich et al. resource titled "Registries for Evaluating Patient Outcomes: A User's Guide" as a guide for best practice, experience from a previously established pediatric diabetes registry in Kuwait and several other COVID-19 registries developed globally. During the pilot phase, a convenience sample of 120 children were included, of those 66 (55%) were male. The study protocol was approved by the Ethics Review Committee at Kuwait Ministry of Health.

Results:
Experience and expertise from other COVID-19 registries, guidance provided by the World Health Organization (WHO) and effective collaboration and cooperation between the stakeholders, study group and data enterers during these challenging times were critical for the development and implementation of the registry. Our pilot results were similar to international reports where most children presented with mild disease (69.2%), majority (70.2%) had normal chest X-ray, and the most common symptom at presentation was fever (77%).

Conclusions:
We anticipate the PCR-Q8 development to be a steppingstone for more in-depth investigation of SARS-CoV-2 infection in children in Kuwait and further other registry establishments.

Acknowledgements: This registry development could not have been possible without the support from Ministry of Health Assistant Undersecretary: Dr. Abdulrahman Al-Mutairi; Program Director of Pediatrics Residency Program at Kuwait Institute of Medical Specialization (KIMS): Dr. Mohammed Al-Humaidan; The Kuwait Medical Student Association and the medical students at the Faculty of Medicine, Kuwait University; Director General of Dasman Diabetes Institute: Dr. Qais Al-Duwairi; IT Department at Dasman Diabetes Institute: Moataz Khamis, Mohammed Al-Qersh.

Key Words: Pediatric; COVID-19; Registry;

Funding Agency: None

Medicine

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Structured diabetes education: impact on micro-angiopathies in kidney transplants with post-transplant diabetes: local center experience

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Hamed Alessa OTC

Introduction:
Diabetes knowledge among kidney transplant recipients with post-transplant diabetes (PTDM) is not assessed exhaustively.
Aim of the study: We aimed to evaluate the impact of structured diabetes education on the development of diabetic micro-and macro-angiopathies in kidney transplant patients with post-transplant diabetes.

Methods:
In this prospective randomized controlled study, 210 renal transplants with PTDM were categorized in 2:1 groups according to type of diabetes education. Group 1 (n=140) received structured diabetes education while group 2(n=70) received conventional education. Patients'data were collected through patient identification form, and metabolic control parameters form.

Results:
Most patients in the two groups (1&2) were Kuwaiti (60.7 vs. 58.6%), men (57.9 vs. 68.6%), with high school education level (43.6vs.48.6%). The minority was smokers (12.9 vs.8.7%) but chronic glomerulonephritis was the original disease in 36.4 vs. 35.4% of cases. Most of patients (72.8 vs. 78.6%) were hemodialyzed pre-transplant. At the start of the study, the percentage of patients with diabetic neuropathy was comparable in both groups (32.4 vs. 27.6% in the two groups respectively) and after 24 months follow up EMG/NC did not show significant difference between the studied groups($P>0.05$). Similarly, the number of patients with fundus imaging showing retinopathy was comparable in both groups at the start and at the end of the study ($p>0.05$). Also, macroangiopathic events were higher in group 1 but did not rank to significance ($p>0.05$). On the other hand, although the percentage of patients with nephropathy was comparable in both groups at the start of the study but the percentage decreased significantly in group 1 after 24 months of the study compared to group 2 and to the basal value in the same group($p=0.016$).

Conclusions:
Structured diabetes education is associated with reduction of diabetic nephropathy but without significant impact on other micro- or macroangiopathy. It is highly recommended to be delivered to all diabetic kidney transplant recipients.

Key Words: Diabetss education; Renal transplant ; microangiopathy;

Funding Agency: None

Medicine

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Epidemiology of Pulmonary Aspergillosis in Chest Diseases Hospital

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Introduction:

Pulmonary aspergillosis is well known fungal infection that cause considerable morbidity and mortality. The clinical presentation varies and includes invasive, allergic and chronic forms. In Kuwait, disease burden is unknown. The aim of study is to describe epidemiology of pulmonary aspergillosis in chest diseases hospital.

Methods:

This is a prospective observational study for 6 six months duration. Cases were defined as patients with respiratory symptoms and/or abnormal chest imaging plus a positive respiratory culture growing Aspergillus species or a positive Aspergillus antibody test. Further medical history was obtained including demographic data, comorbid conditions such as tuberculosis, bronchial asthma etc. Detailed history about respiratory and general symptoms and its duration, and description of abnormal radiology findings were also recorded. Laboratory investigations included complete blood count, respiratory culture and susceptibility, total Ig E, Aspergillus specific Ig E, and Aspergillus immunodiffusion test.

Results:

Eight cases were found. Age distribution ranged from 10 -57 years old. Five males and three females were affected. 4 patients were Indians, two Kuwaitis, one Pakistani and one Saudi. With regard to medical history, two patients had bronchial asthma, one patient had been infected with tuberculosis and other patient had current tuberculosis. Chest imaging revealed cavities in three patients and a fungal ball in one patient. Laboratory investigations showed positive Aspergillus immunodiffusion test in three patients, and positive total Ig E and Aspergillus specific Ig E in three patients. With regard to Aspergillus species distribution, 3 A. fumigatus, 3 A. niger, and one A. flavus were involved. After considering the clinical, imaging and laboratory findings and after careful interpretation, the diagnosis of these patients were as follow: three patients had chronic pulmonary aspergillosis, two had allergic broncho-pulmonary aspergillosis, and three were asymptomatic. No invasive infections were found.

Conclusions:

The current study provides some insight in the epidemiology and burden of pulmonary aspergillosis. Chronic pulmonary aspergillosis occurs in patients with previous or current tuberculosis. Allergic pulmonary aspergillosis seems to be underestimated. Awareness of such fungal infections and proper use of imaging and specific laboratory investigations could improve diagnosis and outcome.

Key Words: pulmonary ; aspergillosis ; epidemiology ;

Funding Agency: None

Microbiology and Immunology

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Clinical impact of a rapid molecular diagnostic test in patients with sepsis

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Introduction:
Prompt recognition and management of sepsis and septic shock improves patient outcomes. The BioFire FilmArray blood culture identification (BCID) is a molecular-based rapid diagnostic test for bloodstream infections.

Objectives
This prospective study was done at Ibn sina Hospital to evaluate the clinical impact of the FilmArray Blood Culture Identification (BCID) panel on the management of septic patients with positive blood cultures.

Methods:
All blood cultures received from patients admitted to neurosurgery, pediatric surgery, cancer center, organ transplant center and burn and plastic surgery center were included in the study. Positive blood culture bottles (BacT/ALERT FAN Plus aerobic or anaerobic bottles,bioMérieux, France) were processed with the BioFire FilmArray BCID panel and then run on the BD PhoenixTM automated identification and susceptibility testing system.

Results:
A total of 90 micro-organisms were cultured from 84 positive blood culture bottles. Six of those yielded mixed growth of two organisms. Fifty-three (59%) organisms were Gram-negative, 31(34%) were Gram-positive and in 6 (7%) Candida was detected. The most commonly encountered organism in our study was coagulase negative Staphylococcus (21) followed by Escherichia coli (19) out of which 84% (16)were CTX-M positive. Klebsiella pneumonia (12)was the next common Gram-negative detected, 67% (8) of those were CTX-M positive and 3 were NDM and one was OXA48 positive. Following discussion of results of the 84 patients generated by the BioFire with the treating clinicians within two hours, 24 (29%) patients underwent appropriate escalation of antimicrobial therapy and 11 (13%) had their therapy appropriately de-escalated. In 15 patients (18%) antibiotics were discontinued and there was no modifications done in 34 (40%) patients.

Conclusions:
In our setting, the BioFire FilmArray BCID panel clearly provided rapid results which permitted for appropriate adjustment of empirical antimicrobial therapy in a large proportion of patients.

Key Words: Sepsis; Biofire; Molecular;

Funding Agency: None

Microbiology and Immunology

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The Prevalence of Multi-Drug Resistance Enterobacteriaceae among Neonates at Farwaniya Hospital in Kuwait

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Introduction:

Enterobacteriaceae is a diverse family of Gram-negative bacteria that cause hospital and community acquired diseases. Antimicrobial resistance, a global public health concern, threatens humans. The world health organization has declared carbapenem-resistant and third-generation cephalosporin-resistant Enterobacteriaceae as a critical priority for research and development. Increasing numbers of neonates with serious bacterial infections, due to resistant bacteria, are associated with considerable morbidity and mortality rates. β-lactams, fluoroquinolones, and aminoglycosides are the three main groups of antibiotics that Enterobacteriaceae confer resistance to, besides folate pathway inhibitors and tigecycline. The aim of this study was to evaluate the prevalence of multidrug-resistant Enterobacteriaceae in the neonatal population and-their mothers in Farwaniya Hospital in Kuwait and to determine the basis of resistance by PCR and partial gene sequencing.

Methods:

A total of 484 rectal swabs (242 from the neonates and 242 from the mothers) were collected from Obstetrics and Gynecology labor rooms and wards of Farwaniya Hospital. The samples were cultured on MacConkey agar and MacConkey supplemented with meropenem. Identification and sensitivity testing were performed for each isolate using VITEK® 2 system (bioMérieux, Marcy l'Etoile, France). Each isolate flagged with any of the resistance terms was tested for susceptibility by the E-test method. The detection of resistance genes and the presence of mutations were determined by molecular methods (PCR and DNA sequencing).

Results:

Among the samples tested by VITEK® 2 system and E-test method, no MDR Enterobacteriaceae were detected among neonates while 12 (13.6%) isolates from the mothers' samples were MDR. ESBL, aminoglycosides fluoroquinolones, folate pathway inhibitors resistance genes were detected by molecular methods while Beta-lactamase inhibitors, carbapenems, and tigecycline resistance genes were not.

Conclusions:

The status of resistance can be considered as promising and manageable among neonates in Kuwait. Furthermore, it is possible to conclude that neonates are acquiring resistance mostly from the environment and after birth but not from the mothers.

Key Words: Enterobacteriaceae; Neonates; Drug resistance;

Funding Agency: Kuwait University, College of Graduate Studies and Research Sector (Project number MY 09/19).

Microbiology and Immunology

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Immune Cells profiles in the peripheral blood of patients with moderate to severe COVID-19 and healthy subjects with and without vaccination with the Pfizer-BioNTech mRNA vaccine

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Introduction:
Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), the causative agent of Coronavirus disease 2019 (COVID-19), has caused a global crisis. Patients with COVID-19 present with a range of clinical manifestations, from no symptoms to severe illness. Little is known about the profiles of immune cells required to protect against SARS-CoV-2. Objectives: To determine the immune cell profiles in the peripheral blood of COVID-19 patients and compare them with vaccinated and healthy subjects.

Methods:
Blood samples were collected from COVID-19 patients with moderate to severe disease (n=52), and compared the findings with those from healthy subjects vaccinated with Pfizer BioNTech mRNA vaccine (VS) (n=62), and non-vaccinated healthy subjects (HS) (n=30). Absolute counts and percentages of total lymphocytes and lymphocyte subsets (CD3+, CD4+, and CD8+ T cells, CD19+ B cells, and CD16+CD56+ NK cells) in the peripheral blood of the three groups were analyzed using flow cytometry. Ethical approvals were obtained from the Ethical Committees of the Health Sciences Centre, and the Ministry of Health, Kuwait. Statistical analyses of data were performed using SPSS release 25.0.

Results:
The results showed that the absolute counts of total lymphocytes, CD3+, CD4+, and CD8+ T cells, CD19+ B cells, and CD56+ NK cells, were significantly lower in COVID-19 patients than HS and VS. The percentages of CD3+ and CD4+ T lymphocytes were also significantly lower in COVID-19 patients. However, the percentage of CD16+CD56+ NK cells was significantly higher in the peripheral blood of COVID-19 patients, compared to the HS and VS groups with no detectable differences in the percentages of CD8+ T cells and CD19+ B cells between the three groups. Analysis of the monocyte subsets showed a significantly higher percentage of CD14+HLA-DR+ monocytes in COVID-19 patients compared to HS whereas the frequencies of CD14+CD16+ HLA-DR+ monocytes, and CD16+HLA-DR+ monocytes were significantly lower in the blood of the patients than that of HS.

Conclusions:
These findings demonstrate perturbations of both innate and adaptive immune cell subsets that reflect dysregulated host responses in COVID-19 patients.

Key Words: Severe Acute Respiratory Syndrome Coronavirus 2 (S; COVID-19; lymphocytes;

Funding Agency: Kuwait Foundation for the Advancement of Sciences (KFAS), project No PN-20-13MI-06.

Microbiology and Immunology

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First insights into the phylogenetic diversity of Mycobacterium tuberculosis in Kuwait

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Introduction:
Background: Tuberculosis (TB) is a major infectious disease. Fingerprinting studies help in understanding transmission of Mycobacterium tuberculosis among populations for proper disease control. Kuwait is a low TB incidence country and ~80% TB and >90% drug-resistant TB cases occur among expatriate patients. This study investigated M. tuberculosis genotypes circulating in Kuwait during a 6-month period. Also, the performance of REBA and gMTBDR+ assays in detecting resistance to rifampicin (RMP) and isoniazid (INH) among phenotypically drug-resistant M. tuberculosis isolates was studied.

Methods:
M. tuberculosis isolates (n=256) were analyzed by spoligotyping according to manufacturer's instructions, major lineages were determined and a dendrogram was created by UPGMA using MIRU-VNTRplus software. Further genotypic heterogeneity among 35 selected isolates was studied by 9-loci-based MIRU-VNTR typing. Drug susceptibility testing was performed by MGIT 960 system and REBA MTB-MDR/GenoType MTBDRplus (REBA/gMTBDR+) assays.

Results:
Spoligotyping assigned 188 (73.4%) isolates to specific shared international type (SIT) while 68 isolates exhibited orphan patterns. All major M. tuberculosis lineages were detected and EAI, CAS and Beijing families were predominant. Phylogenetic tree showed 151 patterns with 105 isolates exhibiting a unique pattern while 151 isolates clustered in 26 patterns. MIRU-VNTR typing data showed that most isolates with identical SIT were genotypically different. Fifteen isolates were resistant to one/more drugs. REBA and gMTBDR+ detected INH-resistance in 11/12 and 10/12 and RMP-resistance in 4/5 and 4/5 resistant isolates, respectively

Conclusions:
Fingerprinting data suggest that most expatriate patients were infected with unique M. tuberculosis strains, likely acquired in their native countries several years ago and that their active disease resulted from reactivation of latent infection. Both, REBA and gMTBDR+ performed similarly for detection of resistance to isoniazid and rifampicin.

Key Words: Mycobacterium tuberculosis; Epidemiology; REBA MTB-MDR;

Funding Agency: None

Microbiology and Immunology

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Knowledge & Practice of MRSA Screening For Elective Caesarean Section in Maternity Hospital

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Introduction:
Methicillin-resistant Staphylococcus aureus (MRSA) is a major cause of healthcare- as well as community-acquired infection . The aim of study to document the local compliance with MRSA screening guidelines at the maternity hospital and the routine screening in all women with elective Caesarean section.

Study Design:
Retrospective study.

Methods:
A retrospective study was conducted at the maternity hospital between January 2021 to November 2021 for women with elective Caesarean sections. We collected the patients demographic data, the month of surgery, MRSA screening before surgery, if any post-operative swabs. An online self-reporting questionnaire link was created for all gynecology and nursing departments.

Results:
The prevalence of MRSA was higher among women with elective caesarean sections. A total of 1097 Patients had elective caesarean sections,and none of them were screened for MRSA. MRSA was isolated from wound infection in 18 cases [1.6%] after elective caesarean sections. Additionally, MRSA prevalence (238) was recovered when samples were collected due to concern regarding infection, the sample sites had high vaginal swabs (76.4%) and wound swabs (23.5%). In total, responses to questionnaire was received from of 17 doctors (10.1%) and 151 nurses (89.8%).

Conclusions:
Despite high rates of caesarean section, pre-operative screening of pregnant women for MRSA is unlikely to be done under prevailing epidemiologic circumstances. This study demonstrated low compliance to MRSA screening guidelines for caesarean sections and limited knowledge. Which indicate the need to apply or modify the infection control policy. An approach based on the results of this in-depth analysis would be to develop a risk assessment tool that focuses on identifying and screening women before caesarean section. Therefore, these data suggest that routine screening in maternity hospital, in this specific clinical context adds clinical value. However, more research is required to establish the MRSA screening for women having caesarean sections.

Key Words: MRSA; Prevalence; elective caesarean section

Funding Agency: None

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Multiplex gyrB PCR Assay for Identification of Acinetobacter baumannii is Validated by Whole-genome Sequencing Assay

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Introduction:
Acinetobacter baumannii is a notorious nosocomial opportunistic bacterial pathogen that infects vulnerable patients in the hospital wards and high dependency units such as the intensive care unit (ICU). The organism is a member of Acinetobacter calcoaceticus-Acinetobacter baumannii (ACB) complex. Because the members are closely related, phenotypic tests cannot distinguish them into individual species but certain molecular tests can. One such molecular test is a multiplex PCR assay based on gyrB gene. However, many molecular tests, including gyrB PCR have not been validated against the gold standard DNA-DNA hybridization assay for taxonomic classification, which is a laborious method. With the availability of whole-genome sequencing (WGS), sequence-based methods to replace DNA-DNA hybridization tests have been developed. One such method is a k-mer-based search of sequence reads using the Kraken 2 program. We used WGS and Kraken 2 program on a set of A. baumannii isolates to validate the gyrB PCR assay.

Methods:
The study consisted of 32 adult patients in the ICU of Mubarak Al-Kabeer Hospital, Kuwait who had rectal colonization with A. baumannii after hospitalization during the period, March 2015-June 2016. Rectal swabs were collected on the day of admission, third day after admission, and then twice weekly until the patient was discharged or dead. Rectal swab was initially enriched in an acetate containing broth and then subcultured on to Acinetobacter CHROMagar. Different morphotypes of typical red colonies were screened by API 20NE and confirmed as A. baumannii by the multiplex gyrB PCR assay. Susceptibility to different classes of antibiotics was tested by E test or agar dilution. Genome sequencing of the isolates was done by Illumina platform and taxonomy determined by Kraken 2 program using the PlusPF database.

Results:
We cultured 270 sequential A. baumannii isolates from the rectal swabs of the 32 patients. The isolates exhibited 48 different phenotypic antibiotic resistance patterns. The sequences of 269 isolates were determined and the taxonomy was assigned. All the 269 isolates were confirmed as A. baumannii by Kraken 2 program.

Conclusions:
There was a 100% concordance between the gyrB PCR assay and the gold standard sequence-based assay in the identification of A. baumannii. gyrB PCR assay is now a properly validated assay using a gold standard method for easy identification of A. baumannii.

Key Words: A. baumannii; gyrB PCR; Whole-genome sequencing;

Funding Agency: Kuwait Foundation for Advancement of Science (KFAS) with grant number CR1713MI01

Microbiology and Immunology

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Molecular studies on Candida auris isolates from immunocompromised patients in Ibn Sina Hospital reveal a novel mechanism conferring reduced susceptibility to echinocandins

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Introduction:
Candida auris is an emerging, multidrug-resistant pathogen that exhibits clade-specific resistance to fluconazole and also develops resistance to echinocandins and amphotericin B easily. This study analyzed C. auris isolates for alterations in ERG11 and hotspot-1 and hotspot-2 of FKS1 for detection of mutations conferring reduced susceptibility to antifungals.

Methods:
C. auris isolates (n=49) obtained from 18 immunocompromised patients during June 2016-December 2018 were analyzed. Antifungal susceptibility testing was performed by Etest and broth microdilution-based MICRONAUT-AM assay. Mutations in ERG11 and hotspot-1 and hotspot-2 regions of FKS1 were detected by PCR-sequencing and fingerprinting of the isolates was done by short-tandem-repeat typing.

Results:
Patients had multiple comorbidities/risk factors for Candida spp. infection including cancer/leukemia/lymphoma/myeloma (n=16), arterial/central line (n=17), urinary catheter (n=17), mechanical ventilation (n=14) and major surgery (n=9) and received antifungal drugs as prophylaxis and/or empiric treatment. Seven patients developed C. auris candidemia/breakthrough candidemia, nine patients had candiduria with/without candidemia and four patients developed surgical-site/respiratory infection. Resistance to fluconazole and amphotericin B was detected in 44 and four isolates, respectively. Twelve C. auris isolates from eight patients showed reduced susceptibility to echinocandins. Seven isolates contained hostspot-1 mutations and three isolates from a candidemia patient contained R1354H mutation in hotspot-2 of FKS1. Ten patients died, five were cured, two were lost to follow-up and treatment details for one patient were not available.

Conclusions:
Our findings describe a novel mechanism of resistance (R1354H mutation in hotspot-2 of FKS1) to echinocandins in a patient with breakthrough candidemia and unfavorable clinical outcome for all C. auris-infected >70 year-old patients.

Key Words: Candida auris; Breakthrough candidemia; Echinocandin resistance;

Funding Agency: Unfunded

Microbiology and Immunology

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Prevalence of invasive candidaemia among neonates in maternity hospital

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Introduction:
Objectives: Neonatal candidaemia is one of the leading causes of bloodstream infections in neonatal intensive care units. It causes significant morbidity and mortality. This study aimed to determine the prevalence of candidaemia, the risk factors and the most common Candida species among neonate over a period of 3 years in a maternity hospital, Kuwait.

Methods:
A retrospective study was conducted at the maternity hospital in Kuwait among neonates with positive blood culture with Candida species during the period between October 2018 to October 2021.

Results:
Out of 9,500 neonates admitted to maternity hospital, 70 cases of candidaemia were detected with an overall prevalence of (0.726%) and a morality rate of (33.9%). An increased rate of candidaemia was found to be in neonates born of gestational age of ≤ 30 weeks (62%) and with birth weight of <1000 g (43%). The most prevalent Candida spp. identified was Candida parapsilosis (45%) followed by Candida albicans (31.9%). Our overall sensitivity to the tested antifungal drugs was (97.1%). In our study, we found that more than half of the neonates with candidaemia had a persistent infection reaching (67.1%).

Conclusions:
This study highlights the potential risk factors associated with candidaemia among neonates, which include gestational age, birth weight, broad spectrum antibiotics at the time of infection, total parenteral nutrition, mechanical ventilation, history of necrotizing enterocolitis, abdominal surgery and neonate rectal colonization. The rate of persistent candidaemia was found to be high among neonates and was associated with an increased mortality rate. It is important to identify those at risk in order to institute appropriate preventive and treatment measures.

Key Words: Prevalence; Candidaemia; Neonate;

Funding Agency: None

Microbiology and Immunology

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Evaluation of VITKE 2, VITEK-MS and fungal DNA barcode for identifying rare yeast pathogens

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Introduction:

Accurate and rapid identification of yeast isolates from clinical specimens has become important for patient care due to emergence of several novel rare yeast pathogens in recent years which also exhibit resistance to one or more antifungal drugs. In this study, we compared the performance of two commercial fungal identification systems, VITEK 2 and VITEK-MS with a fungal DNA barcoding system based on the internal transcribed spacer (ITS)-region of ribosomal(r) DNA.

Methods:

A total of 37 rare yeast isolates cultured from various clinical specimens over a period of two years were studied. The isolates were subjected to species-specific identification by the assimilation profiles generated from VITEK 2, protein profiles from VITEK-MS and DNA sequence data for the ITS region of rDNA. Susceptibility to antifungal drugs was determined by Etest against four commonly used antifungal drugs.

Results:

Only 15 of 37 isolates were correctly identified to the species level while 15 isolates were misidentified and 7 remained unidentified by VITEK 2. However, 20 of 37 isolates were correctly identified to the species level by VITEK-MS with the remaining 17 isolates scoring as 'unidentified'. The ITS region sequence-based DNA barcoding identified all 37 isolates which belonged to 14 different species. Concordance of DNA barcode with VITEK 2 and VITEK-MS for identifying rare yeast species was 41% and 54%, respectively. Reduced susceptibility to fluconazole, amphotericin B and caspofungin was detected in 15, 4 and 1 isolate, respectively. Two isolates were multidrug-resistant.

Conclusions:

Our data are consistent with recent findings showing that the ITS region of rDNA-based DNA barcoding is the new gold standard for accurate diagnosis of infections due to rare Candida/yeast species as the other two methods yielded suboptimal results. Lack of inclusion of Cyberlindnera fabianii in the database of VITEK-MS mostly resulted in poor performance of this, otherwise, rapid and accurate diagnostic method. Detection of 2 multidrug-resistant strains and resistance to fluconazole in 15 of 37 (40.5%) Candida/yeast isolates also reinforces the need for rapid and accurate identification of rare Candida/yeast species for proper patient management due to limited antifungal armamentarium.

Key Words: Rare Candida/yeast-species identification; VITEK 2/VITEK-MS; ITS region of rDNA

Funding Agency: Unfunded

Microbiology and Immunology

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Epidemiology of Dermatophytes Related Infections. A retrospective Study.

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Introduction:
Dermatophytes are a common cause of cutaneous infections that affect large number of healthy individuals throughout their lives. Although such infections are classically benign, they have a negative impact on patients physical and psychological health. We aim to explore the epidemiology of dermatophytes infections.

Methods:
The study was performed through a retrospective surveillance of mycology laboratory data from Mycology reference laboratory in the year 2021. Dermatophytes grown from other laboratories are sent to mycology reference laboratory for species identification. Otherwise, clinical samples such as hair, skin scales and nails are sent along with corresponding demographic data. Such samples were divided into two parts. The first is examined microscopically and second is cultured in Sabouraud agar media with and without cycloheximide and then incubated at 30 C for minimum of two weeks. Dermatophytes were identified by colonial morphology and microscopic findings.

Results:
Sixty dermatophytes were isolated. Male to female ratio was 2:1. Sixty percent of patients were children. Half of the cases were isolated from hair specimens and second half were from skin. Only one nail specimen was culture positive. With regard to dermatophytes distribution, Microsporum species were the commonest and involved mostly Microsporum canis (26). Other less common species included 2 Microsporum audouinii, and 2 Microsporum praecox. 7 other Microsporum species were not identified to species level. On the other hand, 23 Trichophyton species were found including 5 Trichophyton tonsurans, 4 Trichophyton interdigitale, 3 Trichophyton rubrum, 1 Trichophyton simii, and 1 Trichophyton erinaceid. 7 other Trichophyton species were not identified to species level.

Conclusions:
Phenotypic identification, which was once regarded as the standard method for identifying dermatophytes has failed in identifying significant number of isolates. As in other types of moulds, phenotypic examination do not help in identifying uncommon and evolving species. Hence molecular testing is essential for accurate identification and for better understanding of the epidemiology of such common fungal infections. The following species were reported for the first time in Kuwait, namely: T. erinacei, T. simii and M. praecox.

Key Words: Dermatophytes ; fungal ; Kuwait ;

Funding Agency: None

Microbiology and Immunology

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Genotyping of Toxoplasma gondii among Pregnant Women in Kuwait

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Introduction:
Background: Primary toxoplasmosis early in pregnancy may cause a threatening abnormalities to the developing fetus. Therefore, many molecular and genotyping studies have revealed that there was an association between congenital toxoplasmosis and the T. gondii genotype. The aim of this study was to determine T. gondii genotypes circulating among pregnant women in Kuwait by RFLP method using two restriction endonuclease enzymes Sau3AI and HhaI for 5' and 3' ends, respectively, and DNA sequencing of the SAG2 gene.

Methods:
All 35 IgG-positive samples were subjected to nested PCR to confirm T. gondii infection by B1 gene amplification, after which the genetic characterizations were performed according to the nested PCR-RFLP method and DNA sequence analysis.

Results:
T. gondii DNA was detected in all IgG-positive samples amplifying of the B1 gene by nested PCR showed 97 bp bands in the nested PCR. All of 35 DNA extracts were subjected to nested-PCR to amplify 5’ and 3’ ends of the SAG2 gene. As expected, the PCR product size was 242 bp (5’ end) and 221 bp (3’ end). The amplified fragments were genotyped at 5’ and 3’ ends of the SAG2 locus using the RFLP method. The results showed 241 bp fragments in 5’-SAG2 locus and 221 bp fragments in 3’-SAG2, with no cut site, indicating that all samples were f genotype I (100%). To confirm the RFLP results, ten samples were randomly selected for direct sequencing, indicating that all samples were of genotype I. Discussion: Today, exploration of the genetic diversity of Toxoplasma is extremely important for understanding its global distribution and determinants of its evolution. There was a strong evidence that the genotype of Toxoplasma may be associated with disease severity. By exposure to type I genotype it can be interpreted as a virulent strain with a high level of parasitemia in the blood, with a possible increase in the risk of infection passing through the placenta, resulting in severe symptoms and\or anomalies in the fetus or the newborn.

Conclusions:
This is the 1st study of the Toxoplasma genotypes in Kuwait, recording type I as the dominant strain among pregnant women. DNA sequence analysis confirmed that the RFLP results from ten randomly selected samples were of genotype I. Our study excluded type II strain of T. gondii as a major cause of congenital toxoplasmosis, however, it remains uncertain to what extent the parasite's genotype directly contributes to the clinical severity of human toxoplasmosis.

Key Words: T.gondii Genotyping ; Pregnant women ; Kuwait ;

Funding Agency: Research sector #YM14/17

Microbiology and Immunology

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Candida kefyr inections in Kuwait: A comparison of antifungal activity by two methods

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Introduction:

Background: Invasive fungal infections usually affect immunocompromised/immunosuppressed hospitalized patients with/without other co-morbidities. Recent emergence of multidrug-resistant (MDR) Candida (such as C. auris) and other yeast species is a matter of serious concern due to limited antifungal armamentarium available to treat these infections. Candida kefyr is an emerging, potentially MDR yeast that causes invasive candidiasis in susceptible patients. This study characterized clinical C. kefyr isolates collected during 2011-2020 in Kuwait and performed antifungal susceptibility testing (AST) by two methods against antifungal drugs.

Methods:

C. kefyr isolates (n=89) obtained from 73 patients were identified by Vitek 2 yeast identification system and by PCR amplification of rDNA. AST was performed for amphotericin B (AMB), fluconazole (FLU), voriconazole (VOR), caspofungin (CAS) and micafungin (MFG) by Etest and for AMB, FLU, VOR, itraconazole (ITR), posaconazole (POS), CAS, anidulafungin (AFG) and MFG by broth microdilution-based MICRONAUT-AM (BMD) assay. Recent epidemiological cutoff values
were used for detection of non-wild-type (n-WT) strains. Molecular basis of reduced susceptibility to echinocandins was studied by PCR-sequencing of hotspot(HS)-1 and HS-2 regions of FKS1.

Results:

Candiduria and candidemia occurred in 36 and 4 patients, respectively. Eleven and 10 isolates were n-WT for AMB by Etest and BMD, respectively. Three isolates were n-WT for FLU by both tests and 2 of these isolates were also n-WT for VOR while 1 isolate was also n-WT for ITR and POS by BMD. One isolate was n-WT for CAS and MFG by Etest and for AFG and MFG by BMD. Three other isolates also showed reduced susceptibility to CAS and MFG by Etest. Categorical agreement between Etest and BMD for five drugs was >98.9%. Two non-synonymous polymorphisms were detected near HS-2 region of FKS1. However, all isolates including those with reduced susceptibility to echinocandins contained wild-type sequence of HS-1 and HS-2.

Conclusions:

Ten C. kefyr isolates from 7 patients were detected as n-WT for AMB and 3 isolates from 3 patients were n-WT for FLU by both, Etest and BMD with categorical agreement of >98.9% for five drugs. Two MDR C. kefyr were also identified highlighting its emergence in Kuwait. Although two non-synonymous polymorphisms were detected near HS-2 region of FKS1, all C. kefyr isolates contained wild-type sequence of HS-1 and HS-2.

Key Words: Multidrug-resistant Candida kefyr; Antifungal drug susceptibility; Categorical

Funding Agency: Research Sector Grant MI02/20

Microbiology and Immunology

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Impact of the sugar alternative stevia on the expression of streptoccal genes involved in exopolysaccharide synthesis.

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Introduction:
Acid production by sucrose fermentation disturbs the balance in the dental plaque by lowering the oral pH. According to the ecological plaque hypothesis this low pH results in an increase in cariogenic bacteria in the dental plaque. As a consequence of the profound effect of sucrose on caries initiation and progression, more studies are directed toward finding non cariogenic artificial sweeteners that can be used as an alternative to sucrose. Existing literature shows that dietary sucrose upregulates the expression of biofilm associated genes involved in exopolysaccharide (EPS) production, e.g., gtfB and gtfC. In this study, we aim to investigate the effect of the sugar alternative stevia on streptococcal genes encoding glucan-dinding proteins and glucosyltransferases, which are essential for the synthesis of extracellular polysaccharides.

Methods:
Bacterial strains Streptococcus mutans CCUG 11877 and Streptococcus gordonii CCUG 33482 were grown as biofilm culture in the presence of sucrose or stevia (25 mg/ml) in 5% CO_2at 37 ºC for 2 days. RNA was purified, converted to cDNA and RT-PCR was performed on ABI 7500 machine.

Results:
Both S. mutans and S. gordonii formed thick biofilms as revealed by crystal violet staining. In S. mutans, stevia induced significantly higher expression of gtfB and gbpB genes compared to sucrose. However, expression of the same genes in S. gordonii did not differ between the treatments, while gtfB expression being higher with sucrose treatment.

Conclusions:
Increased expression of gtfB and gbpB genes in S. mutans upon treatment with stevia may lead to more sugar utilization and thus enhance acidogenicity in the plaque. Further studies are needed to understand more about possible effects of stevia on genes involved in sucrose uptake and fermentation.

Key Words: Stevia; Dental caries; Dental plaque;

Funding Agency: SRUL 01/14

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A dysregulated antiviral innate immune response in patients with COVID-19

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Introduction:
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causes coronavirus disease 2019 (COVID-19) that is associated with clinical symptoms ranging from mild respiratory disease to critical illness that may lead to death, especially in patients with chronic underlying conditions. Exaggerated activation of inflammatory immune response is frequently detected in patients with severe and critical COVID-19. The objective of this study was to investigate the potential role of host innate antiviral immune response in disease progression.

Methods:
White blood cells were separated from blood samples collected from 21 patients with severe COVID-19, 29 patients with mild or moderate COVID-19, and 20 healthy controls. Total RNA was extracted from white blood cells using the MagNA Pure LC 2.0 System. The profile of the host innate antiviral gene expression was determined by real-time RT-PCR using the Human Antiviral Response PCR array system, followed by the calculation of the fold change in gene expression detected in patients in comparison with healthy controls. The fold regulation threshold was ≥ 2 for upregulation and ≤ -2 for downregulation.

Results:
The expression of cathepsin L (CTSL) that mediates degradation of protein antigens produced by pathogen endocytosis, and transcripts of 3 interferon stimulating genes, ISG15, MX1 and OAS, that mediate inhibition of viral replication, was upregulated in more than 50% of COVID-19 patients, with no statistical difference between patients with severe disease and those with mild or moderate disease. On the contrary, the expression of genes important for the induction of an antiviral response (e.g., TLR8, TLR9, IFNA2, IFNB1, APOBEC3G), an inflammatory response (e.g., JUN, MAP3K7, TNF) and antigen presentation (CD40, CD80), was downregulated in 52-76% of patients with severe disease, and 24-89% of patients with mild/moderate disease. In particular, the low expression of TNF mRNA was observed in ~76% of patients with severe COVID-19, and ~31% of patients with mild/moderate disease (p=0.004).

Conclusions:
Our findings suggest that similarly to SARS-CoV-1 and MERS-CoV infections, SARS-CoV-2 infection features a dysregulated antiviral innate immune response leading to viral immune evasion and active viral replication. Acknowledgement: This study has received financial support from the Kuwait Foundation for the Advancement of Sciences (KFAS), grant No PN-20-13MI-06.

Key Words: SARS-CoV-2; COVID-19; Antiviral immune response;

Funding Agency: Kuwait Foundation for the Advancement of Sciences (KFAS), Grant No PN-20-13MI-06.

Microbiology and Immunology

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Effects of DNA isolation methodology and sequencing chemistry on quality of WGS data for bacterial isolates

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Introduction:
Nanopore sequencing technologies enable real time analysis of nucleic acid sequences through detection of electrical current changes as nucleic acids pass through protein nanopores. These whole genome sequencing approaches are steadily replacing traditional and next generation methodologies in clinical and research fields. This study aimed to cross compare DNA extraction methods and sequence chemistries -run in a ONT MinION device- in relation to quality of genomic DNA and of sequence output.

Methods:
Eleven bacterial isolates were grown on agar plates at 37°C for 24 hours, and the grown colonies suspended in nuclease free water. DNA was extracted and purified by various methods: 1) Monarch kit (NEB), 2) QIAamp DNA mini kit (Qiagen), 3) QIAamp fast DNA stool mini kit (Qiagen) with modifications, 4) boiling at 95°C for 20 minutes. All processed DNA was quantitated fluorometrically (Qubit) and spectrophotometrically for purity (Nanodrop), then used for DNA library preparation before proceeding with respective sequencing chemistries (Oxford Nanopore Technologies). Quantitation was repeated as instructed throughout both library preparation protocols. The libraries were sequenced on FLO-MIN106D flow cells on a MK1C device. Sequences underwent quality checks (FastQC) which defined the most favorable methods of extraction/purification and sequencing.

Results:
Qubit and Nanodrop readings validate sample preparation in terms of DNA quantity and quality, respectively. Qubit readings are proportionate to DNA yield, whereas a Nanodrop range of 1.8-2.0 denotes DNA purity, and together generally predict the quality of resulting sequences. The tested methods of DNA extraction can be ordered from least to most effective as follows: boiling followed by purification, QIAamp DNA blood mini kit and stool mini kit (whether as standalone extraction or coupled with purification), and lastly, direct Monarch purification from suspension. Sequencing chemistries were evaluated based on correlation of Qubit readings with sample dilution and workflow, and FastQC scores over 20 (representing high quality reads). Thus, ligation sequencing output was of higher quality than PCR barcoding.

Conclusions:
It can be inferred from sample concentrations, purity, and quality of sequencing output that DNA extraction and purification from suspensions via Monarch kit -preceding ligation sequencing- is the superior approach to whole genome sequencing of bacterial isolates with Oxford Nanopore technology.

Key Words: Whole genome sequencing; DNA extraction; Sequencing chemistry;

Funding Agency: None

Microbiology and Immunology

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Strain variation based on spike glycoprotein gene of SARS-CoV-2 in Kuwait during the first year of the pandemic

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Introduction:

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is the causative agent of coronavirus disease 2019 (COVID-19), which was first identified in Wuhan, China, in December 2019. With the global transmission of the virus, many SARS-CoV-2 variants have emerged due to the alterations of the spike glycoprotein. Therefore, the S glycoprotein encoding gene has widely been used for the molecular analysis of SARS-Co-2 due to its features affecting antigenicity and immunogenicity.

Methods:

We analyzed the S gene sequences of 35 SARS-CoV-2 isolates in Kuwait from March 2020 to February 2021 using the Sanger method and Oxford Nanopore sequencing technology to confirm novel nucleotide alterations.

Results:

Our results show that the Kuwaiti strains from clade 19A and B were the dominant variants early in the pandemic, while clade 20I (Alpha, V1) was the dominant variant from February 2021 onward. Besides the known mutations, novel 21 nucleotide deletions in the S glycoprotein in one Kuwaiti strain revealed a recombinant SARS-CoV-2 with the defective viral genome (DVG).

Conclusions:

This study emphasizes the importance of closely perceiving the emerging clades with these mutations during this continuous pandemic as some may influence the specificity of diagnostic tests, such as RT-PCR and even vaccine design directing these positions.

Funding/Acknowledgements:

This project has no funding agency. We thank all the medical staff at Adan and Mubarak Al-Kabeer hospitals for their outstanding efforts in providing the clinical samples. Great appreciation goes to all laboratory technicians at the two hospitals to devote time and effort during the SARS-CoV-2 pandemic in Kuwait.

Key Words: SARS-CoV-2; Spike glycoprotein; Oxford Nanopore sequencing technology ;

Funding Agency: None

Microbiology and Immunology

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Dynamic profile of SARS-CoV-2 infection among hospitalized patients in Kuwait: A descriptive study

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Introduction:
The coronavirus induced disease 2019 (COVID-19) pandemic caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) in Wuhan (China) in December 2019 is currently spreading rapidly worldwide. This study aimed to analyze the dynamic profile of SARS-CoV-2 infection among hospitalized patients to characterize the period of viral shedding and detection among patients.

Methods:
Retrospectively, 103 confirmed SARS-CoV-2 patients hospitalized at Jaber hospital in Kuwait were included. Demographic and clinical characteristics of the patients were collected. Nasopharyngeal swabs were obtained at different time intervals and analyzed by Real-Time RT-PCR for SARS-CoV-2 infection.

Results:
Of 103 hospitalized patients with SARS-CoV-2 infection, the median age was 41 years, and 64% were male. The median period from admission to the positive SARS-CoV-2 RT-PCR test was 19 days (IQR, 13–22). The median period from admission to active negative SARS-CoV-2 RT-PCR test result was 22 days (IQR, 16–26). Older patients, patients with comorbidities, and patients with symptoms were more likely to have extended viral shedding.

Conclusions:
For the first time, this descriptive study was conducted in Kuwait on SARS-CoV-2 RT-PCR test results from 103 patients positive for SARS-provided solid proof and a good understanding of the dynamic profile of SARS-CoV-2 infection among patients in Kuwait. This information will further enrich the global knowledge on the emerging SARS-CoV-2.

Funding/Acknowledgements:
No funding resources were declared for this study. Special thanks to the outstanding work of all medical staff in all hospitals in Kuwait. Great appreciation goes to all laboratory technicians at Jaber hospital to devote time and effort during the SARS-CoV-2 pandemic in Kuwait.

Key Words: SARS-CoV-2; COVID-19; RT-PCR;

Funding Agency: None

Microbiology and Immunology

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Epidemiology and Pidemiology and Prognosis of Infective Endocarditis in Kuwait's Chest Diseases Hospital

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Introduction:
Objectives: To study the epidemiology and outcome of infective endocarditis (IE) cases in Chest Diseases Hospital, Kuwait.

Methods:
This is a prospective observational study of patients admitted to the Chest Diseases Hospital with IE from July 2018 to December 2021.

Results:
This study was done in a tertiary care center which includes patients from all over Kuwait. The total number of patients with IE were 28. Of the 28 patients, 24 (85.7%) were males, and 4 (14.28%) were females. The median age was 48 years (range: 1 month — 80 years). Twenty cases (71.42%) had native valves, eight patients (28.57%) had prosthetic valves, the most commonly involved valves were aortic, 16 (57.14%) and mitral 8 (28.57%). The blood cultures were positive in 25 (89.2%) patients, and the most commonly isolated organisms were Viridans Streptococci (S. anginosis, S. mitis/oralis, S. mutans, S. parasangunis and S. gordonii) which were found in 12 (42.8%) patients, followed by Enterococcus faecalis, in 4 (14.28%) patients. The other etiological agents were MRSA, MSSA, and Staphylococcus epidermidis 3 each (10.7%), HACEK group (Cardiobacterium hominis), C. albicans and Streptococcus pneumoniae 1 each (3.5%). Out of 28 patients, the number of community acquired cases were 26 (92.8%) and hospital acquired cases were 2 (7%). Surgical intervention was done in 11 cases (39.2%) and the in-hospital mortality rate was 4 (14.2%).

Conclusions:
Community acquired native valve infective endocarditis was the predominant type of endocarditis with Viridans Streptococci as the most common etiology. It is noteworthy that there were no recorded 30 day mortality after surgical intervention. Ongoing active surveillance of IE is essential for designing local antibiotic policy for such life threatening infection.

Key Words: infective endocarditis; cardiac center; Kuwait;

Funding Agency: None

Microbiology and Immunology

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Whole Genome Sequencing Analysis of Carbapenem-Resistant Escherichia coli and Klebsiella pneumoniae Strains in Kuwait

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Introduction:
The spread of carbapenem-resistant Escherichia coli and Klebsiella pneumoniae is a global concern. The management of infections caused by multi-drug resistance (MDR) Gram negative organisms posed substantial clinical challenges in both hospitals and community. This study aimed to investigate the genetic characteristics of MDR E. coli and K. pneumoniae isolates.

Methods:
Bacterial identification and antibiotic susceptibility testing were performed by standard methods. Whole-genome sequencing (WGS) was carried out on eight carbapenem-resistant isolates using an Illumina MiSeq platform. The raw reads were quality controlled and used for de novo whole genome assembly. The assembled draft genomes were annotated and checked for species status using 16s rRNA gene extracted from the whole genome. The sequences were blasted against antimicrobial resistance (AMR) genes database to determine the resistance genes present in each isolate.

Results:
WGS detected several resistance genes mediating the production of β-lactamases, including carbapenems and extended-spectrum β-lactamase genes as (blaOXA-1, blaOXA-48, blaKPC-2, blaKPC-29, blaNDM-6, blaCMY-4, blaTEM, blaSHV-1, blaSHV-11, blaTEM-12, blaCTX-M-15, blaOKP-B, blaACT and blaEC), furthermore OqxA/B and qacEdelta efflux pumps. In addition to other MDR genes as aminoglycoside modifying enzymes genes (aph(6)-Id, aph(3")-Ib, aac(3)-IIa, aac(6')-Ib, and aadA1), quinolone resistance (gyrA_D87N, gyrA_S83F, gyrA_S83L, parC_S80I, parE_S458A, parE_I355T, parC_S80I, and qnrB1), trimethoprim-sulfamethoxazole (dfrA17, dfrA12, sul1and sul2), tetracyclines (tetA and tetB), fosfomycin (fosA) resistance genes, while other genes were detected conferring chloramphenicol and macrolides resistance (floR, catA2, cmIA5 and cmphA). The complete genome sequence data have been submitted to the National Center for Biotechnology Information (NCBI) and deposited at BioProject accession numbers for K. pneumoniae isolates PRJNA632581 and E. coli isolates PRJNA630112.

Conclusions:
Comprehensive analysis of MDR strains provided by WGS, which detected variable antimicrobial resistance genes and their precise resistance mechanism. WGS is essential for control and prevention strategies to combat the growing threat of AMR and implementation of multifaceted interventions are needed.

Key Words: Whole genome sequencing ; Multi-drug resistant gram negative; Carbapenem-

Funding Agency: None

Microbiology and Immunology

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Whole-Genome Sequencing for the Species Identification, Genome Characterization, Determination of Drug Resistance Genes and Virulence Factors in Pathogenic Bacteria

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Introduction:

The identification and characterization of bacterial species using whole-genome sequencing is a relatively recent advancement in the study of bacterial pathogens. The whole-genome sequence data can be used to obtain information about the species, genotypes, presence of plasmids, phages, drug resistance genes, mobile elements, virulence factors, etc. This study aimed to identify and characterize four drug-resistant bacterial isolates obtained from clinical specimens in Kuwait.

Methods:

The bacteria were grown on agar plates and the colonies were suspended in saline. DNA from the bacterial cells was purified using the Monarch genomic DNA purification Kit. The isolated DNA was quantitated and checked for purity using a spectrophotometer (Nanodrop), and a fluorometer (Qubit), respectively. DNA libraries were prepared from isolated genomic DNA and Oxford Nanopore Technologies Ligation Sequencing Kit, and sequenced using FLO-MIN106D flow cell on a MK1C device. Appropriate commands/software/pipelines were used for data analysis, i. e. MinKNOW for basecalling and demultiplexing, Cat for combining multiple FASTQ files into a single FASTQ file, Porechop for trimming barcodes and adaptors, Fastqc to check the quality of the sequences, Flye for de novo assembly, Medaka for polishing assembled sequences, EPI2ME Agent-WIMP for identification of bacterial species, Prokka for annotation, on-line software for virulence factor identification, and ResFinder and Resistant Gene Identifier for resistance genes.

Results:

The whole-genome sequence data identified the bacterial species of the four isolates as Acinetobacter bereziniae, Acinetobacter soli, Enterococcus faecalis, and Klebsiella pneumoniae. It also provided information about the mean coverage, N50 contig length, number of contigs, genome size, GC content, coding sequences, numbers of genes, rRNA, tmRNA, tRNA, phages, and plasmids. Further in-depth analysis showed that Klebsiella pneumoniae had the highest number of drug-resistant genes and virulence factors, followed by Enterococcus faecalis, Acinetobacter bereziniae, and Acinetobacter soli.

Conclusions:

Whole-genome sequencing is a promising technology to characterize bacterial genomes, study the drug resistance and virulence markers in bacteria. Hence, it has immense potential in the epidemiology of pathogenic bacteria and the management of patients infected with drug-resistant species/strains.

Key Words: Pathogenic bacteria; Whole-genome sequencing; Drug-resistance genes and

Funding Agency: None

Microbiology and Immunology

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Brucella-Specific IgM, IgG and IgA Antibodies in Sera of Patients Clinically Suspected of Brucellosis

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Introduction:

Human brucellosis is a potentially life-threatening multisystem disease endemic in many parts of the world including Kuwait. The diagnosis of brucellosis requires a detailed patient history, followed by laboratory tests to confirm the clinical diagnosis. The laboratory diagnosis of brucellosis is usually performed using blood culture and serological assays. However, culture is time-consuming and hazardous with low sensitivity. Among the serological methods, agglutination tests are the most widely used method for the confirmation of human brucellosis, but these tests detect only two classes of agglutinating antibodies, i.e. IgM and IgG. IgM is present mainly during the acute phase and IgG during the chronic phase of the disease. The third class of antibodies present in serum, i.e. IgA, is not detected by agglutination tests. This class of antibodies can be detected by Enzyme-linked immunosorbent assays (ELISA). The objective of this study was to determine the positivity for Brucella-specific IgA, along with IgM and IgG in the sera of patients suspected of brucellosis, and identify the proportion of individuals who may be positive only for one class of antibodies.

Methods:

Sera (n=2765) were obtained from various hospitals in Kuwait from patients suspected of human brucellosis during the years 2019 to 2021 for routine testing in the Reference Serology and Molecular Microbiology Laboratory. All the sera were tested for Brucella-specific IgM, IgG, and IgA antibodies using ELISA kits from Virion Serion (Germany) according to the manufacturer's instructions. The ELISA plates were read for optical densities in a spectrophotometer at 450 nm and the antibodies were quantified in terms of units using the EasyAnalyze software provided by the Kit manufacturer. The results were interpreted as positive, borderline and negative, according to the kit manufacturer's criteria.

Results:

Among the patients tested, 51% were positive for any antibody, and 30%, 30%, and 46% were positive for IgM, IgG, and IgA, respectively. Furthermore, 3%, 4% and, 7% were positive only for IgM, IgG, and IgA, respectively. A similar trend was seen each year.

Conclusions:

Estimation of Brucella-specific IgM, IgG, and IgA antibodies by ELISA is required for the sensitive serodiagnosis of human brucellosis because agglutination tests, due to their inherent inability to detect IgA, will give false-negative results in a significant number of patients.

Key Words: Brucellosis; Serodiagnosis; ELISA;

Funding Agency: Unfunded

Microbiology and Immunology

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Molecular Epidemiology and Genetic Characterization of SARS-CoV-2 in Kuwait

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Introduction:
Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the causative agent for coronavirus disease 19 (COVID-19), was first detected in Kuwait in February 2020. Since then, it has caused more than 415,349 infections and 2,468 deaths, as of December 28, 2021. In the last two years, multiple SARS-CoV-2 epidemiological waves have hit Kuwait, resulting in variant distribution and implications for the pathogenesis of the virus. This study aimed to characterize the genetic variants of SARS-CoV-2 circulating in Kuwait for a detailed understanding of their genetic diversity and to monitor the accumulation of mutations over time.

Methods:
This study randomly enrolled 209 COVID-19 patients whose nasopharyngeal swabs were positive for SARS-CoV-2 between March 2020 and June 2021 using RT-PCR. The whole genomes of SARS-CoV-2 from the nasopharyngeal swabs were sequenced using the Oxford Nanopore sequencing technology following the ARTIC network protocol. All 209 sequences were analysed using Nextsrain/Augur pipeline for multiple sequencing alignment (MAFFT v7.455). A time-resolved Maximum-Likelihood phylogenetic tree was constructed using IQ-Tree (v1.4.4) under the GTR substitution model, visualized with auspice, and modified with the Interactive Tree of life (iTOL) v6 software. The mutation frequencies were calculated among each strain to detect missense and synonymous mutations throughout the virus genomes using Jalview (v 2.11.1.5).

Results:
Whole-genome sequencing has identified different clades/strains circulating in Kuwait mimicking the global spread of the virus. Clade 20A was dominant from March 2020 until January 2021, and then clade 20I (strain: alpha V1) emerged and dominated. In June 2021, the number of cases infected with clades 21I, 21A, 21J (strain: delta) increased and dominated. We detected several known clade-defining missense and synonymous mutations and several other missense mutations in the genes encoding functionally important viral proteins that included ORF1a, ORF3a, ORF8, S, and N regions.

Conclusions:
Detecting and analysing mutations and monitoring the evolution of SARS-CoV-2 over time is essential to help better understand the spread of various clades/strains of SARS-CoV-2 and their implications for pathogenesis. In addition, knowledge of the circulating variants and genome sequences variability of SARS-CoV-2 may potentially influence the development of vaccines and antiviral drugs to control the COVID-19 pandemic.

Key Words: SARS-CoV-2; WGS; Strains;

Funding Agency: This project was fully funded by Kuwait foundation for the advancement of sciences (project code: CORONA PROP 140)

Molecular Pathology

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Analysis of Multiple Sclerosis Micro RNAs Biomarkers in Kuwait

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Introduction:
Introduction & Objective: MicroRNA (miRNA) is a small molecule of non-coding RNA that functions in post-transcriptional regulation of gene expression. Recent studies found that miRNAs are dysregulated in Multiple Sclerosis (MS) which is a chronic neuroinflammatory, autoimmune disorder that causes demyelination of the central nervous system. Our aim was to replicate the analysis of selected MS miRNA biomarkers (miR-145-5p, miR-326, and mir-20a-5p) to determine their association with MS in a Kuwaiti cohort.

Methods:
A total of 59 MS patients with a ratio of 2.2:1 female: male and 44 sex and an approximate age matched healthy Kuwaiti controls were selected. The miRNAs' expression of hsa-miR-20a-5p, hsa-miR-145-5p, and hsa-miR-326 were evaluated in plasma samples by Real-Time quantitative PCR, and the delta-delta Ct method (2–ΔΔCt) was used to determine miRNA fold expression.

Results:
the expression of hsa-miR-326 was significantly decreased in MS when compared to healthy control ($p = 0.002$), while hsa-miR-145-5p and hsa-miR-20a-5p showed no differences. Hsa-miR-145-5p expression showed a significant increase in MS males when compared to male healthy controls ($p = 0.025$). In addition, the expression of hsa-miR-326 maintained association with MS diagnosis in males (p-value= 0.047), and females (p-value= 0.016) separately.

Conclusions:
MS patients have a decreased expression of miR-326, highlighting a potential use of this miRNA as a biomarker for MS diagnosis in the future. The expression of hsa-miR-145-5p appears to be a male-specific MS biomarker.
Acknowledgment of research grants and facilities: sincere gratitude to Collage of Graduated Studies at Kuwait University.

Key Words: miRNA; Multiple Sclerosis; Kuwait;

Funding Agency: collage of Graduated Studies at Kuwait University.

Neuroscience

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Role of Microglia in Modulating Adult Neurogenesis in Health and Neurodegeneration

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Introduction:

Microglia are the resident immune cells of the brain. Microglial cells play key roles in maintaining brain homeostasis and regulating brain immune responses. The overwhelming evidence suggests that microglia are crucially implicated in influencing neuronal proliferation and differentiation, as well as synaptic connections, and thereby cognitive and behavioral functions. Here, we review the role of microglia in adult neurogenesis under physiological conditions, and how this role is affected in neurodegenerative diseases.

Methods:

A comprehensive search and review of existing literature were completed based on a wide range of key terms including microglia, neurogenesis, neurodegeneration, and Alzheimer's disease (AD). Databases were searched including PubMed, ScienceDirect, Frontiers, Research gate, Wiley online library, and Karger publishers. Publications with these keywords were collected, analyzed, and organized according to how microglia regulates adult neurogenesis health and disease.

Results:

Microglia play an important role in preserving brain structural and functional integrity in physiological and pathological conditions. Moreover, most of the experimental findings in various animal models clearly indicate that neurogenesis is impaired in an age-dependent manner, in line with abnormal microglial function with age. Further investigations are needed to determine how neurogenesis changes with age in humans. In addition, evidence shows that microglia attempt to prevent AD pathogenesis, which includes abnormal adult neurogenesis, at early stages of the disease but largely fail on the long-term as the pathogenesis progresses.

Conclusions:

The recent findings are highlighting an unexpectedly complex, yet fascinating, role of microglia in regulating adult neurogenesis. However, further evidence is still required to fully address the mechanism mechanisms underlying microglial cell contribution in modulating neurogenesis in aging and neurodegenerative diseases, and to characterize the subsequent outcomes. Moreover, a better understanding of the regulatory mechanisms that trigger microglial dysfunction during age and neurodegenerative diseases, would allow the development of novel immunomodulatory therapeutic interventions that aim essentially to influence neurogenesis via modulation of microglial cell responses.

Key Words: Neurogenesis ; Microglia; Neurodegenerative diseases (AD) ;

Funding Agency: Kuwait University

Nuclear Medicine and Radiology

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Comparison Between Recorded and Measured Radiation Doses in Diagnostic Full-Field Digital Mammography: A Phantom Study

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Introduction:
There are concerns regarding the difference between directly recorded and measured entrance skin dose (ESD) and average glandular dose (AGD) in full-field digital mammography (FFDM).
Objective: To evaluate the effect of different exposure parameters on ESD and AGD (both have unit microgrey) recorded directly and measured from an FFDM unit using a phantom.

Methods:
The ESD and AGD of 27 FFDM (cranio-caudal projection) images of tissue-equivalent phantoms were acquired using a General Electric (GE Senographe Essential) FFDM unit. The phantoms were used to simulate three different breast thicknesses (4, 5, & 6cm) and compositions (fibroglandular, fibroffaty, & fatty). The exposure parameters of tube potential (28, 30, & 32 kV), tube load (range, 45-70mAs), and target/filter (Mo/Mo, Mo/Rh, & Rh/Rh; Mo= Molybdenum and Rh= Rhodium) combinations were recorded directly from the FFDM unit.

Results:
The mean difference between the directly recorded and measured for ESD and AGD were 0.23 and 0.080, respectively. The 95% confidence interval for ESD and AGD were (0.1-0.36) and (0.1-0.04), respectively. A one sample t-test showed that there was a statistical significant difference between the directly recorded and measured for ESD (P=.001) and AGD (P< .001). Pearson's correlation test showed positive significant correlation between the directly recorded and measured for ESD and AGD (r=1, P<.001). The difference between the directly recorded and measured ESD and AGD was statistical significant for all the exposure parameters that were used but it was small.

Conclusions:
The directly recorded ESD and AGD in FFDM unit are comparable to the measured ESD and AGD using a RaySafex1 dosimeter for the exposure parameters that were used. This confirm that we can use the directly recorded doses in quality control program in FFDM.

Key Words: Breast imaging; Dosimetry; full-field digital mammography;

Funding Agency: None

Nuclear Medicine and Radiology

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Radiology in the Undergraduate Medical Curriculum: The Student Perspective.

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Introduction:
Radiology is integral part of undergraduate medical education. Despite the undeniable importance of radiology. Many recent studies have shown that medical graduates exhibit a minimal level of radiology knowledge and find it difficult to select the appropriate imaging investigation during their clinical practice. This may be attributed to a lack of time allotted to radiology teaching during undergraduate training. This study aims to assess the satisfaction of Kuwait's medical students with the radiology curriculum and their confidence in application of the basic radiological principles and knowledge as well as their suggestions for a radiology teaching.

Methods:
This cross-sectional study was conducted among undergraduate medical students at Kuwait University. The study employed a questionnaire, which aimed to assess the students' perception of the current radiological teaching approach, as well as their confidence in their grasp of radiological skills needed during clinical practice. Ethical approval was obtained. The sample size of the study was 451 students. Descriptive analysis was conducted using SPSS 25.

Results:
91.8% of the participants agreed that the radiologist is an important part of the medical team. 97.2% of them believed that having a grasp on general radiological concepts is important for a doctor. More than half of the participants (54.8%) reported that the time allotted to radiology teaching in their curriculum is inadequate. Most students were of the opinion that they lack the confidence in interpretation of imaging studies like X-rays, CTs, and MRIs. 75.5% of students reported that they would like radiological subspecialties to be incorporated during their core medical rotation. Most of the students preferred hospital-based and problem-based learning sessions as their most desired methods for radiology learning.

Conclusions:
Radiology is an integral part of modern medicine. Majority of medical students expressed the need for more Radiology teaching in medical curriculum and suggested to incorporate hospital based and problem based learning instead of didactic lectures

Key Words: Radiology; Education; Kuwait;

Funding Agency: None

Nuclear Medicine and Radiology

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Assessment of External Radiation Dose Rate after 18FDG-PET/CT Examination

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Introduction:
This study was conducted to assess the external radiation dose after 18FDG-PET/CT Examination.

Methods:
117 patients were enrolled in the study. Radiation exposure was measured using the Calibrated Survey Meter at 0, 30, 100, 150, and 200cm distance; in the constant time interval. The time of measurement was; immediately post-injection, 30mint after the injection, 60mint later to injection, and at the time of releasing the patient.

Results:
The result showed that the mean radiation equivalent dose rate at 0mint/0cm was 414µSv/h, at 30mint/30cm was 99.7µSv/h, and 60mint/100 cm was 18.3µSv/h. The radiation dose at different distances at the time of releasing the patient was 160.9µSv/h, 70.9µSv/h, 12.4µSv/h, 7µSv/h, and 3.7µSv/h respectively.

Conclusions:
The study concluded that the resulting exposure is below regulatory limits. The patient can be discharged safely with considered distance (at least 0.5 m) and time for more protection especially at first 60 minutes after the injection of radionuclide.

Key Words: 18FDG-PET/CT, ; Dose Rate, ; Radiation Exposure, Molecular Imaging, Patient

Funding Agency: None

Nuclear Medicine and Radiology

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Kuwait National Mammography Screening Program: Five years Outcomes in Screening Kuwaiti Women

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Introduction:
Breast cancer is the most common malignancy among women in Kuwait and it represents 39.8% of all female cancer cases. To report the data of the Kuwait National Mammography Screening Program (KNMSP) for a 5- years period using full-field digital mammography (FFDM).

Methods:
We included 20,483 mammography screens done for 14,773 Kuwaiti women (age 40 years and above) who attended the KNMSP from 2014 to 2019 to screen for breast cancer. A FFDM system (Hologic, Selenia, USA) was used to acquire the mammographic images in craniocaudal (CC) and mediolateral oblique (MLO) projections which correlated with histopathology findings. Independent double-blind reading of the mammograms was performed by two radiologists. Analysis of the data was carried out.

Results:
The mean age ±SD was 51.8 ± 8.2 (age range 40-87.7 years). The participation rate was 7.8 % of the target population. A total of 233 (1.6%) women had breast cancer detected. The majority of breast cancer cases were reported in the age group 45-49 years (21.5%). The KNMSP study recall rate for 5- consecutive years was a range of 11.9 % - 16.5% (mean 14.3%). The detection rate of ductal/lobular carcinoma in situ and invasive breast cancer were 2.5 and 13.6 per 1,000 screened women, respectively. The histologic features of breast cancer showed that invasive ductal carcinoma was the most common type. The mean tumor size ±SD was 19.5 ± 14.3 with a range of 5.0-86.0 mm. The interval cancers detected were 34 cases and the retention rate was 29.2%.

Conclusions:
Screening mammography improves early detection of breast cancer but poor participation is a limitation. We are aiming to increase the participation rate to 70% of the population by proper measures.

Key Words: Breast cancer; Screening mammography; Kuwait national mammography screening

Funding Agency: None

Nuclear Medicine and Radiology

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Eighty Years of Radioiodine Use for Thyroid Disease Management. The First and Perfect Theranostic Application

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Introduction:
In 1941, Dr Saul Herz gave the first radioiodine treatment to a patient suffering from hyperthyroidism at Massachusetts General Hospital in the USA. Since then, widespread use of the radioisotopes of iodine followed to manage hyperthyroidism and thyroid cancer. By virtue of the different physical decay properties of the iodine radioisotopes, diagnostic as well as therapeutic use has been possible, thus exemplifying the theranostic concept that has been gaining popularity over the years. Radioisotopes of iodine that emit gamma rays such as I-123, I-131 and I-124 have been employed as diagnostic tools for various thyroid conditions such as Graves disease, thyroid nodules and cancer. While radioisotopes of iodine that emit particles such as I-131 have been used as radiotherapeutic agents in hyperthyroidism and thyroid cancer. The objective of this review is to provide a state-of-the-art account of the theranostic use of the iodine radioiotopes in various clinical conditions affecting the thyroid.

Methods:
Seminal articles and our own experience related to the testing, introduction and clinical use of the radioisotopes of iodine have been highlighted. Of these, the work by Mazzaferri et al 1994 proved beyond doubt the benefit of adding radioiodine to the treatment protocol in differentiated thyroid cancer. Refinements of such administration followed to maximize the survival rates and provide guidelines that could be applied in an objective manner depending on the initial size of the tumor and its spread ESTIMABLE 1 &2 trials. These resulted in more concrete findings in how radioiodine should be used.

Results:
In addition to the role of the thyroid scan in the definition of the functional status of a thyroid nodule, the theranostic role of the iodine radioisotopes in differentiated thyroid cancer was established. Patient with low risk tumors don't require the addition of radioiodine therapy. While high risk patients benefit from administration of a high dose and if dedifferentiation had occurred. This could be dealt with using various interventions that can cause redifferentiation and rendering the tumor responsive again to radioiodine therapy.

Conclusions:
Theranostic use of iodine radioisotopes in the management of thyroid disease has reached an unprecedented success thanks to the better understanding of the effects of the treatment and implementation of management protocols based on carefully designed and conducted research trials.

Key Words: Thyroid; Iodine radioisotopes; Cancer;

Funding Agency: None

Nuclear Medicine and Radiology

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Diagnostic Yield of Pulmonary CT Angiography in Pulmonary Embolism and Correlation with D-Dimer Test.

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Introduction:
Objective: Pulmonary CT angiography (PCTA) is the imaging modality of choice for the diagnosis of pulmonary embolism (PE). Recommended standard of the diagnostic yield of PCTA by Royal college of Radiology, UK is 15.4-37.4%. The aim of this study was to evaluate the appropriate use and diagnostic yield of PCTA in cases of suspected pulmonary embolism (PE) and its correlation with D-Dimer test in a teaching hospital in Kuwait.

Methods:
Retrospective cross sectional study of 467 (244 males (52.13%)) who underwent PCTA in Mubarak Al Kabeer hospital for suspected acute PE was done from January 2018 to December 2018. The mean age of patients was 51.51±18.62 years. PCTA was performed on GE Revolution 64 multi slice CT scan using thin slices (0.625 mm) and 50 cc contrast, with the outcome being positive or negative for PE. The location of the thrombus on PCTA was noted. The correlation of D-Dimer test and PE was done. Descriptive and analytical statistics including Chi-square test and T-test was performed and value of $p \leq 0.05$ was taken as the significance level.

Results:
Of the 467 PCTA performed, 81 were positive for PE giving PCTA positive yield of 17.30 %. 63% of the positive cases were males and 37% were females (p-value = 0.034). The mean age was not significantly different between patients positive and those negative for PE (53.62±18.44 vs. 51.11±18.67; p = 0.270). The thrombus was detected in main pulmonary artery (MPA) in 17 (21.0%), in segmental in 15 (18.5%) and sub segmental in 18 (22.2%) and both segmental and sub segmental in 31 cases (38.3%). D-Dimer test was positive in 324 cases, of which 59 (18.20%) were positive and 265 were negative for PE on PCTA. There was no significant association between D-Dimer and PCTA as diagnostic tests for PE (p = 0.359).

Conclusions:
Diagnostic yield of PCTA with positive result is 17.30% is within the recommended guidelines. D-Dimer test did not contribute to the clinical utility of PCTA in the diagnosis of PE.

Key Words: Pulmonary embolism; Pulmonary CT angiography; D-Dimer;

Funding Agency: None

Nuclear Medicine and Radiology

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An Algorithm for Management of Patients with High Risk for Ischemic Heart Disease but Normal Tc-99m Myoview Myocardial Perfusion Imaging

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Introduction:
The use of stress-rest Tc-99m Myoview myocardial perfusion imaging (MPI) for evaluation of ischemic heart disease (IHD) is widespread as a non-invasive and accurate test for presence of myocardial ischemia. Some patients, however, despite having risk factors and clinical presentations for IHD show normal MPI. An algorithm for further evaluation of those patients is proposed based on their clinical and data derived from the MPI itself resulting in a cardiac management score that would favor the performance of more advanced tests such as measurement of myocardial blood flow by PET or invasive intervention such coronary angiography.

Methods:
One hundred Stress-Rest Tc-99m Myoview MPI studies were reviewed sequentially from the pool of MPI studies performed at our department for evaluation of IHD. The cases were divided into positive or negative for ischemia. Negative studies were scored according to Age (>50 yr), Gender (Male), Presence of risk factors such as diabetes mellitus (DM), high blood pressure (HTN) and dyslipidemia (DLP) as well as presence of clinical symptoms (CS) of chest pain and dyspnea . Also, presence of ECG changes during the stress test was added to the score. The maximum positive score was 8 (1 for each of the above present) with <3 considered to be insignificant for IHD and between 3-5 intermediate risk necessitating more non-invasive testing such as cardiac PET with measurement of myocardial blood flow and ≥6 would be candidates for invasive Coronary Angiography.

Results:
There were 29 patients (29%) below the age of 50 years and 53 males (53%). Forty-six patient had DM, 75 HTN, 60 DLP and 73 with CS. ECG changes were found in 35 patients. There were 66 patients with normal MPI (66%). Of those, there were 15 patients (23%) who had a score of <3, 37 patients (56%) a score of 3-5 and 14 (21%) a score of ≥6.

Conclusions:
A cardiac management score based on the clinical, risk factor and ECG data in patients with normal MPI would provide a more objective management strategy for these patients for IHD identification by further non-invasive or more invasive diagnostic means.

Key Words: Myocardial perfusion imaging; Ischemic Heart Disease; Risk factors for Coronary

Funding Agency: None

Nuclear Medicine and Radiology

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Dynamic Renal Imaging for Evaluation of Urinary Obstruction. An Elegant Example of Applied Pathophysiology in the Clinical Environment

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Introduction:
Obstruction of urine flow in various parts of the urinary system has deleterious effects on renal function usually in the absence of significant clinical signs and symptoms. The disease entity of hydronephrosis is an anatomical corollary of urinary obstruction. Various imaging modalities have contributed to the evaluation and management of obstruction from the plain abdominal x-ray to more developed methods such as US, IVU, CT, or MRI. Nuclear Medicine tests have evolved through the years to address the issue of significant obstruction particularly in a dilated/hydronephrotic system; thus providing a physiological means to identifying obstruction and to safeguard renal function. The objective of this presentation is to focus on the role of the nuclear medicine applications for evaluation of urinary obstruction especially the diuretic renogram and state-of-the-art use in this condition.

Methods:
informative articles and our own experience related to testing and clinical use of the different protocols of diuresis renography have been highlighted. Historically and as a starting point for evaluation of obstruction, the rather invasive Whitaker test has been used. The introduction of the diuretic renogram by administration of Lasix to induce drainage in a dilated collecting system was pioneered by Conway, Majd and Piepsz. Further refinements of the technique by development of special quantitative analyses have been added by the International Scientific Committee of Radionuclides in Nephrourology (ISCORN) leading to standardization of the methods and better use in the clinical setting.

Results:
A large body of knowledge exists in the medical literature and our extensive experience in the application of diuretic renography for evaluation of urinary obstruction. As an example of the local expertise, an MSc thesis from Kuwait University was submitted on the Scintigraphic Patterns in Patients with Urinary Stones Using Tc-99m MAG3 Dynamic Renal Imaging and Specialized Computer Analysis which has aptly shown the benefit of applying the methods of analysis for addressing the issue of urinary stone complications including obstruction.

Conclusions:
Diuresis renography is currently widely used for evaluation of urinary obstruction and monitoring its effect on renal function. This stems from standardization of the method and the options of specialized computerized analysis developed by learned societies in the field.

Key Words: Kidney; Urinary Obstruction; Diuretic renogram;

Funding Agency: KuMSA SCORE Scheme

Pathology

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Evaluation of the Oncomine Comprehensive Assay v3 Panel for the Detection of 1p/19q Codeletion in Oligodendroglial Tumors

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Introduction:
Accurate assessment of 1p/19q codeletion status in diffuse gliomas is of paramount importance for diagnostic, prognostic and predictive purposes. While targeted next generation sequencing (NGS) has been widely implemented for glioma molecular profiling, its role in detecting structural chromosomal variants is less well established, requiring supplementary informatic tools for robust detection. Herein, we evaluated a commercially available amplicon based targeted NGS panel (Oncomine Comprehensive Assay v3) for the detection of 1p/19q losses in glioma tissues utilizing an Ion Torrent platform and the standard built-in NGS data analysis pipeline solely.

Methods:
Using as little as 20ng of DNA from formalin-fixed paraffin-embedded tissues, we analyzed 25 previously characterized glioma samples for multi-locus copy number losses (CNLs) on 1p and 19q. The samples included 11 oligodendrogliomas (ODG) and 14 non-oligodendroglial (non-ODG) controls. The pathological diagnoses were refined according to the 2016 WHO classification and cIMPACT-NOW updates. Fluorescence in-situ hybridization (FISH) was used as a reference standard.

Results:
The software confidently detected combined contiguous 1p/19q CNLs in 11/11 ODGs (100% sensitivity), using a copy number cut-off of ≤1.5 and a minimum of 10 amplicons covering the regions. Only partial nonspecific losses were identified in non-ODGs (100% specificity). Copy number averages of ODG and non-ODG groups were significantly different ($p<.001$). NGS was concordant with FISH and was superior to it in distinguishing partial from contiguous losses indicative of whole-arm chromosomal deletion.

Conclusions:
The Oncomine Comprehensive Assay v3 panel, along with the standard Ion Torrent algorithm software, accurately detected 1p/19q losses in ODG samples, obviating the need for specialized custom-made informatic analyses. Incorporating this into routine glioma NGS workflow will allow for simultaneous detection of point mutations and 1p/19q codeletion in a rapid cost-effective manner negating the need for multiple testing of the same sample by different modalities and improving turnaround time.

Key Words: 1p/19 codeletion; Oncomine Comprehensive Assay; glioma;

Funding Agency: None

Pathology

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Micro-RNA-146b-5p Modulation of the Cellular Stress Response in Papillary Thyroid Cancer

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Introduction:
Papillary thyroid cancer (PTC) is the most common type of thyroid cancer in Kuwait and worldwide. Oxidative stress is an important event in carcinogenesis and the Nrf2/HMOX-1 pathway is an established mediator of the oxidative stress response in various conditions. In our previous studies we have demonstrated that miR-146b-5p is highly up-regulated in classic PTC (CPTC) and has a role in regulating molecules involved in the cellular stress response. objective: The aim of this study is to investigate the role of miR-146b-5p in modulating the Nrf2 pathway in PTC.

Methods:
Primary thyroid cell culture was transfected with miR-146b-5p mimic or inhibitor and the expression of HMOX-1 (antioxidant downstream the Nrf2 pathway) and KPNA6 (nuclear transport regulator of Nrf2), was tested by RT-PCR. Expression of HMOX-1, KPNA6 and Nrf2 was also tested by immunohistochemistry in clinical thyroid tissue samples.

Results:
Functional experiments revealed that miR-146b-5p regulates the expression of KPNA6 in CPTC. HMOX-1 is highly expressed in CPTC compared to other thyroid lesions. The expression and subcellular localization of HMOX-1 and Nrf2 proteins indicate higher activity of the Nrf2/HMOX-1 pathway in CPTC compared to other thyroid tissues.

Conclusions:
miR-146b-5p modulates the oxidative-stress response in CPTC by targeting KPNA6 and regulating the Nrf2/HMOX-1 pathway activity.
Acknowledgments: College of Graduate Studies and Research Sector for funding this research (YM03/18).

Key Words: miR-146b-5p, Papillary thyroid cancer; oxidative stress; HMOX-1, KPNA6;

Funding Agency: College of Graduate Studies and Research Sector (YM03/18).

Pathology

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Vitamin D Receptor Gene Polymorphisms and Susceptibility to Type 2 Diabetes Among Kuwaitis

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Introduction:
Type 2 diabetes mellitus (T2DM) and obesity are prevalent in Kuwait. Vitamin D (VD) deficiency is a known risk factor for both disorders. Our objective was to determine the association of VD deficiency and vitamin D receptor (VDR) common genetic variants on T2DM risk in Kuwait.

Methods:
This case-control study included 203 Kuwaiti T2DM patients and 162 healthy Kuwaiti controls. VD levels were measured using enzyme linked immunosorbent assays. Genotyping of VDR rs2228570 and rs731236 was performed using Taqman genotyping assays.

Results:
VD deficiency was prevalent in both T2DM patients and healthy controls. VDR rs731236G associated with T2DM risk (Odds ratio 1.66, p=0.0008). VDR haplotype analysis revealed GG/AA, GA/AA or GG/AG to associate with T2DM risk (p=0.01) and increased risk of diabetic neuropathy (p=0.002). VDR rs731236GG influenced VD levels in the total population sample (p=0.008).

Conclusions:
VDR rs731236G is associated with T2DM risk in Kuwait, and VDR haplotype of less active, low expressing VDR is associated with T2DM and diabetic neuropathy risk. Therefore, individuals with these VDR haplotypes are at risk to develop T2DM should adhere to vitamin D supplementation.

Acknowledgment of research grants and facilities: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Key Words: Type 2 diabetes mellitus; Vitamin D; Common genetic variants;

Funding Agency: None

Pathology

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Investigating the contribution of the FTO (rs1558902) and MC4R (rs6567160) gene polymorphisms in obesity and weight loss in patients undergoing balloon interventions

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Introduction:
Obesity represents a critical factor contributing to the burden of morbidity and mortality worldwide. The complex nature of obesity requires a comprehensive understanding of the genetic mechanisms underlying its etiology in order to achieve more effective therapeutic strategies. The genomic information from GWA-studies gathered over the years from obese patients have shown a strong correlation between obesity and the unique genetic make-up of an individual. Therefore, understanding the genetic background of an individual and identifying their polymorphisms through genotyping, could serve a potential method to achieve a customized approach for weight loss. Furthermore, those who undergo bariatric interventions exhibit varying success rate on satisfactory weight loss, suggesting a possible role of the genetic variations.

Methods:
In efforts to examine the level of impact of genetic contribution to weight loss, following balloon intervention, we have first conducted a research to investigate the relationship of the two top-hits SNPs, previously-reported to be associated with BMI, which are rs1558902 and rs6567160 in the FTO and MC4R genes respectively, on 113 overweight/obese cohort among the Kuwaiti population. The variants were genotyped and their association with 5 obesity metrices (BMI, BMI point loss, %EWL, %EBMIL and %TWL) were later statistically analyzed to find any significance.

Results:
The FTO rs1558902 gene polymorphism was found to be associated with increased BMI in the overweight/obese cohort. Also, the MC4R rs6567160 variant was found to be associated with increased BMI among females carrying C-allele and increased BMI in males carrying the T-allele which shows that the variant is sex specific. In addition, the FTO variant showed an association in males and their total weight loss at their 3 months follow up after balloon insertion, whereas the MC4R variant did not show any significance regarding total weight loss at 3 months.

Conclusions:
The current study aimed to assess the relationship between selected SNPs from a meta-GWAS in relation to obesity and weight loss. We were able to find significant associations between the FTO and MC4R genes and obesity. Therefore, we suggest further studies on a wider selection of genes to attempt and limit obesity on the Kuwaiti population by potentially select the most suitable and most effective weight losing procedure for that person based on their genetic information.

Key Words: Obesity; FTO (rs1558902) ; MC4R (rs6567160) ;

Funding Agency: CGS

Pathology

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Placental Growth Factor Expression and Role in Papillary Thyroid Cancer

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Introduction:
Papillary thyroid cancer (PTC) is often associated with intra-tumour lymphocytic infiltration (TIL). The role and significance of TIL in PTC progression and immune escape is controversial between different studies. Placental growth factor (PlGF) is an angiogenic factor found to be overexpressed in cancer and to have a role in modulating the tumor microenvironment in a way promoting immune escape. In this study we hypothesized that PlGF is overexpressed in PTC and is associated with an immune suppressive microenvironment. Aim: The aim of this study is to investigate the expression of PlGF and its receptor, VEGFR1, in PTC and to characterize the intra-tumor infiltrating lymphocytes with focus on regulatory T and B lymphocytes sub-populations previously reported to be affected by PlGF.

Methods:
Total of 70 paraffin embedded thyroid tissues samples including classic PTC (cPTC), follicular variant PTC (FVPTC), non-invasive follicular neoplasm with PTC nuclear features (NIFTP), and multinodular goiter (MNG) were studied. Expression of PlGF and VEGFR1 was tested by real time PCR and immunohistochemical staining. Lymphocytes profile was tested by immunofluorescence staining with CD4, CD19 and CD8 antibodies. Colocalization of CD19/ TGFbeta (markers of B regulatory cells) and CD4/FLT1 (markers of T regulatory cells) was assessed by immunofluorescence and confocal microscopy.

Results:
PlGF and VEGFR1 are more expressed in CPTC compared to non-neoplastic tissues. Infiltrating lymphocytes were mainly CD8+ and CD19+ cells. Colocalization of CD19/TGFbeta (B regulatory cells) and CD4/FLT1 (T regulatory cells) were detected in PTC tissues in correlation with increased PlGF expression.

Conclusions:
PlGF is highly expressed in CPTC and correlate with the presence of regulatory lymphocytes subpopulations with immunosuppressive functions.

Acknowledgment
This work is supported by college of graduate studies and research sector post graduate project number YM05/21. We acknowledge the use of Research Core Facility RCF project SRUL 02/13.

Key Words: Thyroid cancer ; Placantal growth factor ; VEGFR1;

Funding Agency: College of graduate studies and research sector post graduate project number YM05/21

Pathology

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The Relationship Between Vitamin D and Leptin Hormone in Multiple Sclerosis Disease

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Introduction:
In recent years a negative relationship between vitamin D and leptin levels have been suggested. This relationship is hypothesized to be disturbed in chronic disorders where both hormones are suspect risk factors. Here, we investigated the regulatory genetic relationship between the two hormones in Multiple Sclerosis (MS) in which both hormones are suggested to modulate disease pathogenesis.

Methods:
Two common functional variants in vitamin D receptor (VDR) and two in vitamin D binding protein (VDBP) were genotyped using Taqman genotyping assays in 185 MS patients and 157 healthy Kuwaiti controls. Vitamin D and leptin levels were assessed using enzyme linked immunosorbent assays.

Results:
No correlation was found between vitamin D and leptin levels in either healthy controls or MS patients. None of the assessed VDR and VDBP variants or their haplotypes associated with MS risk. However, VDR haplotype effected leptin levels in the total cohort ($p = 0.024$), specifically in females where both VDR haplotype and VDR rs731236 associated with leptin levels ($p=0.034$ and 0.026). In MS patients, VDR haplotypes also associated with leptin levels ($p = 0.027$), but not in healthy controls ($p = 0.58$). Moreover, VDR haplotype and VDR rs2228570 influenced vitamin D levels in the total cohort ($p = 0.043$ and 0.017), and in MS patients ($p=0.009$ and 0.008).

Conclusions:
This is the first report to show a VDR genetic regulatory effects on leptin levels that might explain the relationship reported between the two hormones in health and disease. A VDR haplotype of a less active, low expressing VDR associated with higher leptin levels and lower vitamin D levels. This finding should enforce the need of vitamin D supplementation in carriers of this VDR haplotype and in diseases where these two hormones may influence disease progression.

Key Words: Multiple Sclerosis; Vitamin D; Leptin;

Funding Agency: None

Pathology

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Evasion of growth suppression in papillary thyroid tumors is mediated by miR-7-5p and miR-146b-5p through regulation of p53, Importin 7 and KLF4

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Introduction:
Resistance of cell death and evasion of growth suppressors are key hallmarks of carcinogenesis. MicroRNAs are emerging as key regulators of cancer development due to their ability to regulate the expression of multiple genes. We have shown previously that miR-7-5p and miR-146b-5p are deregulated in papillary thyroid neoplasms compared to non-neoplastic lesions. Our previous results also showed that miR-146b-5p regulate key molecules involved in cell death. In this work, we hypothesized that miR-7-5p and miR-146b-5p contribute to thyroid cells carcinogenesis by suppressing the activity of p53 pathway.

Methods:
miR-7-5p and miR-146b-5p mimics/inhibitors were transfected into primary cultured thyroid cells. Transfection effect on p53 signaling pathway and potential related target molecules was studied by luciferase reporter assay, Real time PCR, immunofluorescence staining and immunoblotting techniques.

Results:
miR-7-5p and miR-146b-5p gain of function and loss of function, respectively, induces cell death and increases the activity of p53 signaling pathway in thyroid cells. Functional experiments also showed that miR-7-5p and miR-146b-5p regulate the expression of IPO7 and KLF4, key regulators of the p53 pathway. Protein expression pattern and subcellular localization of IPO7, p53, MDM2 and KLF4 in transfected cells and in clinical thyroid tissue specimen confirmed the association between suppressed p53 activity and regulation of miR-7-5p and miR-146b-5p.

Conclusions:
Downregulation of miR-7-5p and upregulation of miR-146b-5p are mechanisms involved in evasion of p53-mediated growth suppression during thyroid tumorigenesis.

Key Words: miRNA; Thyroid cancer; Tumor suppressor genes;

Funding Agency: Research sector, Kuwait University MG 04/19

Pediatrics

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Newborn Screening Experience for Very Long Chain Acyl-CoA Dehydrogenase (VLCAD) Deficiency in Kuwait

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Ministry of Health

Introduction:
Among the various inborn errors of fatty acid oxidation disorders, very long chain acyl-CoA dehydrogenase deficiency (VLCADD) is the most common disorder in Kuwaiti population, which has been noticed especially following the launch of the expanded newborn screening (NBS) program in Kuwait in October 2014. It is caused by deficiency of VLCAD coenzyme, encoded by ACADVL gene which converts very-long-chain fatty acids into energy. In October 2014, the Kuwait Ministry of Health has started a publicly funded expanded NBS program for a wide range of metabolic and endocrine disorders and thus replacing the old limited NBS.

Methods:
A retrospective analysis of the data registry for the NBS over the 6-year period between January 2015 and December 2020 in Kuwait has been conducted after obtaining consent from the NBS program. This data included newborns delivered in hospitals all over Kuwait. Data on metabolite concentrations in dried blood spots at the time of screening obtained from all newborns were reviewed. The positive initial screening is followed by a confirmatory plasma or dried blood acylcarnitine analysis with or without a follow-up genetic analysis of ACADVL gene.

Results:
Total of 36 cases of 304,086 screened newborns have been identified and confirmed to have VLCADD with an incidence of ~1:8300. The diagnosis was based on the detection of elevated blood C14:1 and C14:1/C2 ratio in the initial dried blood spots in the NBS, followed by a confirmatory blood acylcarnitines profile for VLCADD with a follow-up genetic analysis, except for 3 babies who had positive initial screen but have died before obtaining confirmatory analyses. Molecular testing of 16 of them has revealed a founder pathogenic truncating mutation in exon 2 of the ACADVL gene, c.65C>A; p.(Ser22Ter). We have identified 3 genetically confirmed cases with VLCADD following a positive initial screen but negative confirmatory acylcarnitine analysis. This is the first study to review the Kuwaiti NBS experience of VLCADD since its launch in October 2014. We recommend including molecular genetic testing for ACADVL gene as part of the NBS for VLCADD particularly for the cases with negative confirmatory acylcarnitine profile.

Conclusions:
Our study provides evidence that the expanded NBS in Kuwait has led to the early detection of VLCADD cases and the initiation of the adequate management plan aiming to prevent death and disability.

Key Words: VLCAD; NEWBORN SCREENING; Kuwait;

Funding Agency: None

Pediatrics

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Surgical Outcomes of Congenital Heart Disease in Down Syndrome: Tertiary centre experience

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Introduction:
Objective: To define the main types of congenital heart defects in patients with Down syndrome (DS) undergoing surgical repair and analyze their overall surgical outcomes

Methods:
Between 2009 and 2021, DS patients with congenital heart defects undergoing repair surgery at Chest Disease Hospital (CDH) were identified. A retrospective review of preoperative diagnosis and baseline characteristics along with surgical details was conducted. Post-operative outcomes including total length of hospital and intensive care unit (ICU) stay, complications and mortality were analyzed.

Results:
163 patients with DS were identified. 52% of patients were male, mean gestational age was 37.4 weeks, mean age at initial surgery was at 8.6 months. Out of the 168 surgeries, the most prevalent procedures were complete AVSD repair 70 (43.2%) followed by peri-membranous VSD repair 56 (34.5%) and TOF repair 15 (9.3%. The most prevalent complication was prolonged intubation (13%) followed by sepsis (8%) and pleural or pericardial effusion (5.7%) in addition to other less common complications such as chylothorax and pneumothorax.

Conclusions:
AVSD and perimembranous VSD constitute the main congenital heart defects in DS patients

Key Words: Down syndrome; Congenital heart defects ; AVSD;

Funding Agency: None

Pediatrics

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Epidemiology of Potential SARS-CoV-2 Reinfection in a Pediatric Cohort in Kuwait

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Introduction:
Since the first case of (SARS-COV-2) reinfection among adults in August 2020, interest in the risk and rate of reinfection is increasing. However, COVID-19 disease dynamics differ in children. The subsequent protection from Severe acute respiratory syndrome-related coronavirus 2 (SARS-COV-2) infection in pediatrics is not well reported in the literature. Objectives: We aimed to identify the clinical characteristics and dynamics of SARS-CoV-2 PCR re-positivity in children.

Methods:
1-Study design: This is a population-level retrospective cohort study in Kuwait included children 12 years and younger between February 28th, 2020, and March 6th, 2021. Patients were identified through multiple national-level electronic COVID-19 databases. SARS-CoV-2 reinfection was defined as having two or more positive SARS-CoV-2 PCR done on a respiratory sample, at least 45 days apart. Clinical data was obtained from the Pediatric COVID-19 Registry in Kuwait (PCR-Q8). It included detailed individual-level demographic, laboratory and clinical characteristics of all children diagnosed with COVID-19 in Kuwait.2-Data analysis: Descriptive analysis was performed to compare between primary and secondary infections. Calculated days at risk included the period from the day of first positive SARS-CoV-2 PCR starting February 28th, 2020 to the second positive test or March 6th, 2021. Clopper-Pearson test was used to calculate the 95% CI. Sensitivity analysis was done assessing incidence of reinfection considering a minimum interval for PCR re-positivity of 60 and 90 days.

Results:
Thirty pediatric COVID-19 patients had SARS-CoV-2 reinfection at an incidence of 1.02 (95% CI 0.71-1.45) infection per 100,000 person-days and a median time to reinfection of 83 days (IQR 62-128.75). The incidence of reinfection decreased to 0.78 (95% CI 0.52-1.17) and 0.47 (95% CI 0.28-0.79) per person-days when the minimum interval between PCR repositivity was increased to 60 and 90 days, respectively. The mean age of reinfected subjects was 8.5 years (IQR 3.7-10.3) and majority (70%) were female. Most children (55.2%) had asymptomatic reinfection. Fever was the most common presentation in symptomatic patients. One immunocompromised experienced two reinfection episodes.

Conclusions:
SARS-CoV-2 reinfection is uncommon in children. Previous confirmed COVID-19 in children seems to induce a protective immunity against future infections.

Key Words: Pediatric; SARS-COV-2; Epidemiology;

Funding Agency: None

Pediatrics

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Epidemiology and Clinical Characteristics of SARS-CoV-2 Infection in Kuwait: Results of a National Registry

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Introduction:
To better understand the impact of COVID-19 on children, a pediatric registry was established, recording all cases of severe acute respiratory syndrome-related coronavirus 2 in children, focusing on disease presentation, complications, severity of the disease and early outcomes. This study provides us with crucial information about the severity, complications, and outcome of COVID-19 on children.

Methods:
A retrospective, national-level, cohort study was performed and included all children aged ≤ 12 years with a confirmed SARS-CoV-2 infection by polymerase chain reaction in Kuwait between February 24th to December 31st, 2020. Cases were identified through reviewing national electronic SARS-CoV-2 testing, hospital admission records, and medical transfer services. During the study period infected children were identified through symptomatic testing, contact tracing, routine screening upon hospitalization, and screening before and after travel. Children who had equivocal RT-PCR result were excluded. Also, patients who had positive SARS-CoV-2 specific antibodies without documentation of positive SARS-CoV-2 RT-PCR were excluded in the analysis. Patient demographics, medical history, SARS-CoV-2 testing, signs and symptoms, therapeutic and medical intervention, complications, laboratory tests and outcome were obtained using The Kuwait Pediatric COVID-19 Registry (PCR-Q8). Descriptive analysis was performed.

Results:
During the study period, a total of 14,322 children aged ≤12 were diagnosed with SARS-CoV-2 infection in Kuwait. The monthly number of cases peaked during the summer of 2020 (July-September), and this was followed by a rapid decline during the beginning of winter of 2020. The median age was 7.6 years and half were male. Less than one-third (29.4%) were symptomatic. The number of children with pre-existing comorbidities was 228; the most common comorbidities were asthma(54),chronic neurological disorder(29) and acquired/congenital heart disease (25). The number of hospitalized children was 1599 (11.2%). The most common symptoms of those who were hospitalized were fever (39.8%), cough (17.6%), runny nose (11.1%). A total of 32 children were admitted to intensive care, and 5 deaths were recorded.

Conclusions:
Overall, the pediatric COVID-19 registry has invaluable information about the about the effect of COVID-19 on children in Kuwait. Most children with SARS-CoV-2 infection did not require hospital admission, and only 5 deaths were recorded.

Key Words: Pediatrics; SARS-CoV-2; COVID-19;

Funding Agency: None

Pediatrics

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The Effect of Ramadan Fasting on Complications and Lifestyle Among Children with Type 1 Diabetes in Kuwait

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Introduction:
Children with Type 1 diabetes (T1D) are exempt from fasting the holy month of Ramadan, however, some may insist on fasting despite their susceptibility to acute complications. The aim of this study was to monitor the frequency of acute diabetes complications as well as assess lifestyle changes and glycemic status among children with T1D in Kuwait.

Methods:
Patients (aged 8-18) and their parents were randomly selected from the Childhood-Onset Diabetes electronic Registry (CODeR) and surveyed through phone calls shortly after Ramadan, (1442 Hijri; April 12-May 11, 2021). Participants were enrolled regardless of the number of days fasted. Diabetes medical history, short-term complications including hypoglycemia and hyperglycemia episodes, hospitalization and lifestyle changes during Ramadan were recorded. HbA1c results during the 6-month period before Ramadan were collected from hospital records. Descriptive analysis was performed.

Results:
A total of 137 patients were included in the study (median age 13.1 years (IQR 11.5-14.8), 53% males, 61% Kuwaiti, median diabetes duration 5.5 years (IQR 4.0-7.3). Prior to Ramadan, mean HbA1c was 10.4±2.08. Of the patients, 67% fasted more than 15 days, 60% fasted intermittent days and only 20% received diabetes Ramadan education. Patients who fasted continuous days experienced less hyperglycemia episodes than those who fasted intermittent days (p=0.01). In contrast, an increase in hyperglycemic episodes was significantly associated with better treatment compliance (p=0.03). Patients who changed their dietary habits during Ramadan reported more hypoglycemic attacks than those who maintained their diet (p=0.03). During fasting, 3.5% of patients experienced at least one episode of severe complications requiring hospitalization. No significant correlation was found between acute diabetes complications (hypoglycemia and hyperglycemia) and different age groups (≤13 vs. >13 years), sleeping patterns, physical activity, insulin regimen (MDI vs. CSII/pump).

Conclusions:
Diabetes care may deteriorate during Ramadan due to changes in diet and lifestyle which significantly impact glycemic control and the occurrence of complications. However, children with T1D fast due to cultural and social reasons which impact them positively. Therefore, increased Ramadan diabetes education, medical consultations and guidance should be given to these patients to avoid potential risks of acute diabetes complications during Ramadan.

Key Words: Pediatrics, Diabetes, Type 1 Diabetes; Fasting; Diabetes Complications;

Funding Agency: None

Pediatrics

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Clinical Characteristics of Multisystem Inflammatory Syndrome in Children (MIS-C): Results From a National Pediatrics Registry

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Introduction:
Coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has been causing a global epidemic since December 2019. A variety of clinical outcomes have been reported with COVID-19, ranging from no clinical symptoms to severe respiratory diseases and even death. In children, SARS-CoV-2 infection can lead to multi-organ manifestations needing intensive treatment, defining a novel disease known as Multisystem Inflammatory Syndrome in Children (MIS-C).
Objectives:
To describe the clinical, epidemiological, and radiological characteristics as well as the outcomes of children with MIS-C.

Methods:
Children aged ≤ 12 years who met the World Health Organization MIS-C diagnostic criteria were identified from the national Pediatric COVID-19 Registry in Kuwait (PCR-Q8). Clinical and radiological characteristics, management, and outcomes were obtained for these children.

Results:
Eighty-six children were identified in the period (April 2020-November 2021). Seventy cases were diagnosed with MIS-C, 12 cases with Kawasaki, and 6 cases with Atypical Kawasaki. The median age was 5.5 years (IQR 2.7-8.1), 55.8% were boys and 54.6% were non-Kuwaitis. Around 52 children had evidence of recent COVID-19 infection (positive RT-PCR result and positive IgG rapid antibody/antigen detection). All children were symptomatic and presented with fever with an average of 5 days duration prior to admission. Gastrointestinal symptoms were present in 77.9%, respiratory symptoms in 39.5%, skin rash in 60.4%, and mucocutaneous changes in 30.2%. Oxygen therapy was required in 22%, and only 6 patients required invasive mechanical ventilation. A total of 34 children required admission to the Pediatric Intensive Care Unit (PICU), and the median of PICU length stay was 4 days. Only 16 children required inotropic support. Treatment included IVIG in 82.5%, antibiotics in 80.2%, and corticosteroids in 63.9%. Echocardiographic findings showed cardiac dysfunction in 16 children. One death occurred due to severe pneumonia and septic shock.

Conclusions:
This is the first study on the demographic, clinical, and epidemiological characteristics of children diagnosed with MIS-C in Kuwait. COVID-19 related symptoms, the severity of disease, and other factors can vary widely among the pediatric population. Further studies are needed to better understand disease mechanisms for better management and outcomes.

Key Words: Pediatrics ; SARS-CoV-2; MIS-C;

Funding Agency: Ministry of Health, Kuwait

Pediatrics

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The Role of Interleukin-4 (IL4), Interleukin-13 (IL13) Gene Polymorphisms and HLA-DQ Alleles in Genetic Susceptibility of Type-1 Diabetes Mellitus (T1DM) in Kuwaiti Children

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Introduction:
T1DM is a multifactorial disease resulting from a complex interplay between genetic and non-genetic factors. Cytokines play a crucial role in pathogenesis of autoimmune diseases possibly due to their effector and regulatory functions in immune and inflammatory responses. IL4 gene (on chromosome 5q31-33) carries a single nucleotide polymorphisms (SNP) in its promoter (-590C/T), which is associated with a number of autoimmune diseases. IL4 and IL13 are key components in induction of the Th2 lymphocyte phenotype and in the down-regulation of Th1 lymphocyte phenotype. We have determined the genotype frequency of IL4 gene promoter polymorphism (-590C/T), IL13 gene polymorphism p.(Arg130Glu) and HLA DQ alleles in Kuwaiti children with T1DM to investigate their role in genetic susceptibility.

Methods:
This study included 244 Kuwaiti children with T1DM and 200 controls. The criteria by International Society for Pediatric and Adolescent Diabetes (ISPAD) was used for diagnosis of T1DM. The control subjects were healthy Kuwaitis, none had close relative with T1DM and were evaluated by a specialist. The genotypes for IL4 (-590C/T) and IL13 p.(Arg130Glu) gene polymorphisms were identified by PCR-RFLP methods. HLA-DQ alleles were determined by sequence-specific PCR method.

Results:
The frequency of IL4 (-590C/T) gene polymorphism showed a statistically significant difference between Kuwaiti T1DM patients and controls in the Dominant model of genetic analysis but not in the Co-dominant model in which the significant difference was detected only in the heterozygous state. For IL13 gene polymorphism p.(Arg130Glu), a statistically significant difference between patients and controls was detected only for heterozygous genotype in the Co-dominant model but not in the Dominant model. In 55% T1DM patients, the HLA genotype was either DQ2/2 or in combination with a DQ8 allele. Collectively, 91% had either DQ2 or DQ8 alleles in different combinations. Amongst the T1DM patients with HLA-DQ2/2 genotype 80% had CC, 15% had CT and 5% had TT genotype of the IL4 gene polymorphism. In T1DM patients with DQ2/8 genotype, 69% had the CC, 22% had CT and 9% had TT genotype of the IL4 gene polymorphism.

Conclusions:
Our data highlights the role of C-allele of IL4 (-590C/T) and Q allele of IL13 p.(Arg130Glu) gene polymorphisms along with HLA-DQ2 and DQ8 alleles in genetic susceptibility of T1DM in Kuwaiti children.

Key Words: Cytokine gene; Type-1 diabetes mellitus; HLA-DQ alleles;

Funding Agency: Research Sector, Kuwait University, Project No. MK02/20

Pediatrics

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L-Glutamine reverses Bile Acid-induced inhibition of Growth Factor activity via Modulation of NADPH oxidase in rat hepatocyte cultures: Implications for TPN-induced Cholestasis

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Introduction:
Cholestasis is a major complication of total parenteral nutrition (TPN) administration in premature neonates due to cytotoxic effect of bile acids. We hypothesize that activities of certain growth factors, involved in development, growth/regeneration and function of the liver, are affected by TPN-induced cholestasis.

Methods:
Hepatocytes cultures were treated with varying concentrations of Glycochenodeoxy cholic acid (GCDC) in the presence and absence of L-Glutamine (Gln) or apocynin. Fetal Bovine serum (FBS)- or growth factors (GFs)- induced DNA synthesis in cell cultures was measured by BrdU incorporation assay following treatment with GCDC / Gln and/ Apoynin. Protein expression of NOX1 was evaluated by Western blot.

Results:
Treatment of hepatocyte cultures with GCDC significantly decreased the FBS-induced Bromo-deoxyUridine (BrdU) incorporation, however inhibition of GF induced-DNA synthesis particularly in response to addition of Fibroblast Growth factor (FGF) and Hepatocyte growth factor (HGF) was more pronounced. Addition of L-Gln to cell cultures markedly attenuated GCDC-mediated inhibition of DNA synthesis in both FBS and GF-treated cells. GCDC significantly increased expression of NADPH oxidase (NOX)-1 that was markedly reduced by L-Gln. Addition of apocynin significantly blocked the GCDC-mediated inhibition of GF-induced DNA synthesis.

Conclusions:
This study suggests that pathological events of TPN-induced cholestasis might involve dysfunction of certain growth factors via NOX modulation which can be partly corrected by supplementation with L-glutamine.

Key Words: Hepatocytes; Growth Factors; Cholestasis;

Funding Agency: Supported by Research grant from Research Sector MK 01 /18

Pediatrics

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Effect of COVID-19 Pandemic on Accidental Ingestions in Children: Observational Study.

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Introduction:
Coronavirus disease-19 (COVID-19) was declared by the World Health Organization (WHO) as a global pandemic on March 2020. Several measures have been attempted to contain the spread of the virus including school closures and lockdown. These measures have resulted in children staying at home with potential hazard exposure such as accidental drug or foreign body ingestions. In this study, we investigate the impact of COVID-19-related measures on admissions of children with accidental foreign body or drug ingestion.

Methods:
All accidental ingestion admissions to pediatric wards at Al-Amiri hospital during the pandemic from March 2020 till February 2021 were retrospectively reviewed. They were compared with admission data from the pre-pandemic period from March 2019 till February 2020. The subjects were all children aged 12 years or less admitted with accidental foreign body or drug ingestion. All children with food impaction or aspiration were excluded from the study. Data were analyzed using Statistical Package for Social Sciences (SPSS).

Results:
There were 90 admissions with accidental ingestion during the pandemic compared to 138 admissions in the pre-pandemic period. The mean age of admission during non-COVID-19 period was 3.9 ± 2.6 years, and 4.1 ± 2.9 years during pandemic period. Males were more involved in foreign body ingestion compared to females in both periods. The most common cause of accidental ingestion in children in both periods was medication ingestion. Coin ingestion was the second common cause during the pandemic compared to detergent in the pre-pandemic period.

Conclusions:
In conclusion, during COVID-19 pandemic there was a decline in the number of cases admitted with accidental ingestion among children compared to the pre-pandemic period. This was a result of the lockdown and constant observation of families to their children at home.

Key Words: foreign body; drug; COVID-19;

Funding Agency: None

Pharmacology and Toxicology

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Antiulcerogenic Effect of Melittin via Mitigating TLR4/TRAF6 MediatedNF-κB and p38 MAPK Pathways in Acetic Acid-induced Ulcerative Colitis in Mice

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Introduction:
Ulcerative colitis (UC) is a chronic disease driven primarily by uncontrolled pervasive inflammatory responses affecting the colon and rectum. Currently available medications carry multiple detrimental adverse effects which have emphasized the mandatory need for safer and more efficient novel therapeutic alternatives. Melittin is the main constituent of bee venom and exhibits potent anti-inflammatory properties.

Methods:
The antiulcerogenic effect of oral melittin (40 µg/kg) was explored in the current study using the acetic acid-induced colitis model.

Results:
Increase in bodyweight and decrease in colon mass index were observed in the melittin group. Microscopically, melittin ameliorated acetic acid-induced histological damage. Melittin administration has efficiently amended the elevated levels of the cytokines, tumor necrosis factor (TNF-α) and interleukin 6 (IL-6) seen in the colitis group. This was accompanied by inhibition of the upstream signaling molecules, Toll-like receptor 4 (TLR4), tumor necrosis factor receptor(TNF-R)-associated factor (TRAF6), mitogen-activated protein kinase 38 (p38 MAPK), and nuclear factor kappaB(NF-κB) in the melittin group. Moreover, treatment with melittin resulted in marked decrease in colonic level of prostaglandin E2 (PGE2) together with the enzymes involved in its synthesis, secretory phospholipase A2 (sPLA2)and cyclooxygenase 2 (COX-2). Additionally, melittin has attenuated acetic acid-induced oxidative stress as manifested by the significant diminishment in malondialdehyde (MDA) as well as the increase in superoxide dismutase (SOD) and reduced glutathione (GSH) levels.

Conclusions:
Therefore, melittin mitigated UC pathogenesis and could be considered as a potent and promising therapeutic alternative for UC treatment

Key Words: ulcerative colitis, melittin, ,; TLR4, TRAF6; sPLA2,;

Funding Agency: None

Pharmacology and Toxicology

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Naringenin affords protection against lipopolysaccharide/D-galactosamine-induced acute liver failure: role of autophagy

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Introduction:
Acute liver failure (ALF) is considered a fatal clinical disorder and novel therapeutic interventions Acute liver failure (ALF) is considered a fatal clinical disorder and novel therapeutic interventions are mandatory. Naringenin is a flavonoid with anti-inflammatory, antioxidant and antiapoptotic are mandatory. Naringenin is a flavonoid with anti-inflammatory, antioxidant and antiapoptotic effects that have displayed beneficial effects in different animal models of ALF. The current study effects that have displayed beneficial effects in different animal models of ALF. The current study aimed at investigating the hepatoprotective effect and the possible underlying molecular aimed at investigating the hepatoprotective effect and the possible underlying molecular mechanisms of naringenin in lipopolysaccharide (LPS)/D-galactosamine (D-Gal) mouse model of mechanisms of naringenin in lipopolysaccharide (LPS)/D-galactosamine (D-Gal) mouse model of ALF. Moreover, naringenin mediated modulatory effect on autophagy was explored.ALF. Moreover, naringenin mediated modulatory effect on autophagy was explored.

Methods:
Acute liver failure (ALF) was induced using single intraperitoneal injection of LPS (50 µg/kg) and D-Seventy Swisss albino mice were used in this study. Acute liver failure (ALF) was induced using Gal (600 mg/kg i.p). Naringenin (100 mg/kg, i.p.) for 6 days was administered prior ALF induction. single intraperitoneal injection of LPS (50 µg/kg) and D-Gal (600 mg/kg i.p). Naringenin (100 mg/kg, i.p.) for 6 days was administered prior ALF induction. For survival testing, results were analyzed using log-rank test and in the other experiments, data were analyzed by one-way analysis of variance (ANOVA) followed by multiple comparisons using Tukey-Kramer test.

Results:
naringenin pretreatment substantially alleviated LPS/D-Gal-induced liver injury, enhanced survival, Naringenin pretreatment substantially alleviated LPS/D-Gal-induced liver injury, enhanced survival, improved liver function and ameliorated histopathological liver changes. Importantly, naringenin improved liver function and ameliorated histopathological liver changes. Importantly, naringenin potently activated autophagy as evidenced by the increased Beclin-1 expression and LC3 II/LC3 I potently activated autophagy as evidenced by the increased Beclin-1 expression and LC3 II/LC3 I ratio. Furthermore, results demonstrated that naringenin alleviated oxidative stress by inducing ratio. Furthermore, results demonstrated that naringenin alleviated oxidative stress by inducing nuclear factor-erythroid 2-related factor 2 (Nrf2) and increasing hepatic SOD activity and GSH level nuclear factor-erythroid 2-related factor 2 (Nrf2) and increasing hepatic SOD activity and GSH level as well as ameliorated endoplasmic reticulum (ER) stress. Likewise, naringenin mitigated LPS/D-Gal-as well as ameliorated endoplasmic reticulum (ER) stress. Likewise, naringenin mitigated LPS/D-Gal-triggered inflammation by suppressing NF-κB and NLRP3 pathways. Accordingly, apoptotic cell triggered inflammation by suppressing NF-κB and NLRP3 pathways. Accordingly, apoptotic cell death provoked by LPS/D-Gal challenge was markedly attenuated as depicted by the decrease in death provoked by LPS/D-Gal challenge was markedly attenuated as depicted by the decrease in caspase-3 and p53 in naringenin-treated mice. To investigate the contribution of autophagy to caspase-3 and p53 in naringenin-treated mice. To investigate the contribution of autophagy to naringenin-conferred hepatoprotection, autophagy was inhibited using 3-methyladenine (3MA). naringenin-conferred hepatoprotection, autophagy was inhibited using 3-methyladenine (3MA). Strikingly, 3MA co-treatment abolished the hepatoprotective effect of naringenin, a finding that Strikingly, 3MA co-treatment abolished the hepatoprotective effect of naringenin, a finding that strongly suggests that naringenin-afforded protection is, at least in part, attributed to autophagy.strongly suggests that naringenin-afforded protection is, at least in part, attributed to autophagy.

Conclusions:
The present study revealed that naringenin exerted a prominent hepatoprotective effect by The present study revealed that naringenin exerted a prominent hepatoprotective effect by promoting autophagy with consequent attenuation of inflammatory responses, oxidative stress, ER promoting autophagy with consequent attenuation of inflammatory responses, oxidative stress, ER stress and apoptosis. Our study provide evidence that naringenin use holds a promise as a stress and apoptosis. Our study provide evidence that naringenin use holds a promise as a potential therapeutic agent for ALF management.potential therapeutic agent for ALF management.

Key Words: Naringenin, Acute liver failure, ; Autophagy, Oxidative stress,; ER

Funding Agency: None

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Development of Kuwait National Antidote Stocking Guidelines

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Introduction:
Poisoning is a major public health problem that involves in most cases significant costs for medical services and can ultimately lead to death. Antidotes have a very critical role in management of the poisoned patient. Effective management of poisoning requires adequate stocking of antidotes in hospitals that provide emergency care. Public and private hospitals in Kuwait have suboptimal stocks of essential antidotes. For this reason, there is an urgent need to develop expert consensus guidelines for adequately stocking the essential antidotes. Objectives: This study aims to generate useful and clinically relevant recommendations for antidote stocking in hospitals that provide emergency care in Kuwait and to establish a first draft of the Kuwait Antidote Guidelines.

Methods:
A formal iterative process was conducted using the e-Delphi method for reaching consensus of antidote stocking in Kuwait. The study involved two rounds. For each round, a questionnaire was developed using Qualtrics® and sent to the participants involved in the study (n=22). The participants were asked to indicate their level of agreement on the inclusion of each individual antidote (n=47) in the Kuwait National Antidote Guidelines on a four point-Likert scale. Consensus was gained if >75% of the expert panel agreed on the inclusion of the antidote provided and there was no strongly disagree answer. Otherwise, the antidote was reassessed during round 2. Results from each round were analyzed descriptively on Qualtrics®.

Results:
22 experts completed Round 1 (response rate 73.3%). Out of the 47 antidotes, the experts unanimously agreed to the inclusion of 41 antidotes in the antidote stocking guidelines; only six antidotes did not reach consensus and seven new antidotes were suggested. During Round 2, all of the 22 experts who participated in round 1 have completed Round 2 (response rate 100%). They re-assessed the six antidotes that did not reach consensus during the first round. Additionally, they rated the level of agreement to the inclusion of the newly suggested seven antidotes to the guidelines. Out of 13 antidotes involved in Round 2, only two antidotes reached consensus.

Conclusions:
This is the first study that aims to produce clinically relevant recommendations and to establish primary consensus on the antidotes stocking in hospitals that provide emergency care in Kuwait. The goal is to establish a first draft of the Kuwait National Antidote Guidelines.

Key Words: Antidotes; Emergency; Kuwait;

Funding Agency: None

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Central Sensitization of the Cough Reflex by Prostaglandin E2 via EP3 Receptor-dependent Activation of NaV 1.8 Channels

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Introduction:
Cough hypersensitivity is a main characteristic feature associated with several types of cough, including chronic cough. Prostaglandin E2 (PGE2) is an inflammatory mediator with established roles in the induction/sensitization of cough reflex through a peripheral action. However, whether PGE2 can sensitize the cough reflex via a central mechanism of action is not known. In this study, using a conscious guinea pig model of cough, we investigated whether PGE2 can sensitize the cough reflex via a central action, and if so, via which mechanisms.

Methods:
Drugs were administered centrally by the intracerebroventricular (i.c.v.) route, one week following stereotaxic surgery. Using a whole-body plethysmograph set-up, guinea pigs were exposed to aerosolized citric acid (0.2 M) to induce cough, which was recorded using an automated cough analyzer.

Results:
PGE2, dose-dependently, enhanced the citric acid-induced cough ($P \leq 0.001$; n=8-13). A similar effect was seen with the non-selective EP1/EP3 agonist, sulprostone ($P \leq 0.01$; n=7-9). Pretreatment with EP1 antagonist, ONO-8130, did not affect the sulprostone-induced cough sensitization (n=6-10), whilst the EP3 receptor antagonist, L-798,106, dose-dependently inhibited this effect ($P \leq 0.05$; n=7-10). Treatment with either the EP2 receptor agonist, butaprost or the EP4 agonist, L-902,688, had no effect on the citric acid-induced cough (n=7-11). Furthermore, pretreatment with either the TRPV1 antagonist, JNJ-17203212 or the TRPA1 antagonist, HC-030031, alone or in combination, did not alter the PGE2-enhanced citric acid-induced cough (n=6-10). Furthermore, pretreatment with tetrodotoxin did not affect the PGE2-induced cough (n=5-7), while the NaV 1.8 antagonist, A-803467, dose-dependently inhibited this effect ($P \leq 0.05$; n=5-6).

Conclusions:
Our findings show that PGE2 sensitizes the cough reflex centrally via EP3 receptors-dependent activation of NaV 1.8 but independently of TRPV1/TRPA1 and TTX-sensitive sodium channels activation. These results indicate that PGE2 plays an important role in central sensitization of the cough reflex and suggest that central EP3 receptors and Nav 1.8 channels may represent novel antitussive molecular targets in the CNS.

Key Words: Prostaglandin E2; Cough; Central Sensitization;

Funding Agency: This study was funded by the College of Graduate studies, Kuwait University and by Kuwait University Research Sector grant number [YP02/18].

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The Impact of GLP-1R-GIPR Hetero-dimerization on Cell Signalling

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Introduction:
The incretin hormones-glucose-dependent insulinotropic polypeptide (GIP) and glucagon like peptide-1 (GLP-1), are important regulators of many aspects of metabolism including insulin secretion. Their receptors (GIPR and GLP-1R) are closely related members of the secretin class of G protein-coupled receptors. Both receptors are expressed on pancreatic beta-cells. Our objectives were to investigate whether these receptors dimerize in vitro and the impact of this dimerization on cell signalling.

Methods:
Receptor dimerization was studied using bioluminescence resonance energy transfer (BRET) saturation assay. GLP-1R was labelled at C-terminus with nano-luciferase (Nluc, donor) and stably expressed in Flip-In HEK-293 cells. Cells were transiently transfected with increasing amounts of GLP-1R or GIPR labelled with a variant of yellow fluorescent protein (YFP or SYFP2, acceptor). Saturation curves were generated in the absence or presence of 1 micro M GIP or GLP-1. Dose dependent recruitments of labelled mini-G proteins or arrestin 3 to GLP-1R-Nluc in the absence or presence of non-labelled GIPR were observed using BRET. Data (mean ± S.E.M) were from at least three experiments and expressed as fold change from basal. Statistical significance ($P \leq 0.05$) was determined using ANOVA.

Results:
BRET curves were plotted as a ratio of YFP or SYFP2 fluorescence to Nluc luminescence. The GLP-1R-GIPR hetero-dimerization resulted in exponential curves consistent with saturable BRET signals. Stimulation with GLP-1 significantly increased while GIP significantly decreased the maximum BRET signal ($P \leq 0.05$, n=3). Treatment with different ligands did not cause significant changes in BRET signal except the GLP-1 metabolite, GLP-1 (9-36), which caused a significant increase ($P \leq 0.0001$, n=3). Recruitment of Gs to GLP-1R was not significantly affected by the hetero-dimerization. The GIP treatment of non-labelled GIPR showed a dose dependent increase in BRET signal. Dose dependent Gq and arrestin 3 recruitments to GLP-1R in presence of non-labelled GIPR was significantly attenuated ($P \leq 0.05$, n=3 and $P \leq 0.001$, n=4 respectively). Stimulation of non-labelled GIPR with GIP had no effect on Gq and arrestin 3 recruitments in the hetero-dimer.

Conclusions:
The BRET results support the hypothesis that GLP-1R and GIPR form hetero dimers. The presence of GIPR attenuates Gq and arrestin 3 recruitments to GLP-1R but does not affect Gs recruitment to GLP-1R.

Acknowledgment KU YM02/19.

Key Words: GLP-1R; GIPR; Dimerization;

Funding Agency: Research Sector, Kuwait University. YM02/19.

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Alpha-2 Adrenoceptor Activation Attenuates Oxidative Stress, Inflammation and Neuropathic Pain in Type 1 Diabetes Mellitus.

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Introduction:

Neuropathy is one of the major complications of uncontrolled diabetes mellitus (DM). Activators of the noradrenergic system have been reported to alleviate hyperalgesia and allodynia in models of diabetic neuropathy. However, their possible effects on oxidative stress and inflammation remain to be elucidated. This study was aimed to investigate the role of guanfacine, an alpha-2A adrenoceptor agonist, in attenuating oxidative stress, inflammation and neuropathic pain in a streptozotocin (STZ) model of type 1 DM.

Methods:

Male Wistar rats (two-three months old; 200-250 grams; n = 114) were treated with STZ (55 mg/kg, i.p.) or its vehicle. Responses to thermal and mechanical stimuli were evaluated. Guanfacine (0.6 mg/kg, i.p.) was administered for two weeks starting at week eight after STZ administration, when the rats developed hyperalgesia/allodynia. The dorsal root ganglia (DRG) were isolated at 12 weeks after STZ administration for hematoxylin and eosin staining and gene expression studies. Gene expression of oxidative stress markers, nuclear factor erythroid 2-related factor 2 (Nrf2), superoxide dismutase 2 (SOD2) and heme oxygenase-1 (HO-1), and anti-inflammatory molecules, transforming growth factor-beta (TGF-β) and interleukin (IL)-10, and proinflammatory molecules, IL-1β and tumor necrosis factor-alpha (TNF-α) was evaluated by real time polymerase chain reaction. The effects of guanfacine and yohimbine, an alpha-2A adrenoceptor antagonist, on behavioral tests were evaluated. Differences were considered significant at $p < 0.05$ (one/two-way analysis of variance).

Results:

Diabetic rats developed thermal hyperalgesia and cold/mechanical allodynia. The DRG of diabetic rats showed abnormal morphology, including satellitosis and neuronophagia, which was reversed by treatment with guanfacine. Treatment with guanfacine also reversed the diabetes-induced decrease in gene transcripts of Nrf2, SOD2, HO-1, TGF-β and IL-10, and increase in IL-1β and TNF-α transcripts. Guanfacine had antihyperalgesic/antiallodynic effects on diabetic rats but had no effect on naïve rats. The antihyperalgesic/antiallodynic activities of guanfacine were antagonized by yohimbine.

Conclusions:

The results of this study demonstrate that guanfacine has antihyperalgesic/antiallodynic activities, which is dependent on alpha-2A adrenoceptor activation and its effects on diabetic neuropathy may be in part due to its anti-oxidative and anti-inflammatory effects.

Key Words: Alpha-2A adrenoceptor; neuropathic pain; Oxidative stress;

Funding Agency: KU Graduate Studies Grant YM 05/19

Pharmacology and Toxicology

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The Role of TAAR1 in the Vasodepressor Effect of Trace Amines in the Perfused Rat Kidney.

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Introduction:
Trace amines such as Tryptamine, Beta-Phenylethylamine (PEA), and 3-Iodothyronamine (T1AM) are group of endogenous amines present in mammalian peripheral system at low concentrations under normal physiological conditions. The three trace amines appears to affect the cardiovascular pathologies including tachycardia, hypotension or hypertension. Previously it was accepted that trace amines are indirectly acting sympathomimetic promoting the release of noradrenaline from the nerve ending. Trace amines produce their effects through G-protein coupled receptors (GPCRs) known as trace amine-associated receptors (TAARs). The study was designed to examine the hypothesis that TAAR activation exhibit a vasodepressor response via TAAR-1 receptors.

Methods:
Male Wistar Kyoto age 12-14 weeks were used in this investigation (n=54). Animals left kidney was carefully isolated and placed in a temperature-controlled perfusion chamber and perfused with Krebs' solution using a channel masterflex peristaltic pump. After rising the tone dose-response curves were established for tryptamine, PEA, T1AM and RO5263397 in the presence of ritanserin before and after selective TAAR-1 antagonist EPPTB. All changes in perfusion pressure were recorded through a transducer Lectromed, and data were statistically analyzed by Student's t-test.

Results:
Tryptamine, PEA, T1AM, and RO5263397 appears to induce a significant decrease in perfusion pressure of kidney preparations from normotensive WKY rats ($p < 0.05$). The TAAR-1 antagonist EPPTB (1 uM) did not reduce the relaxant effects of tryptamine and PEA, T1AM, and RO5263397 in the perfused kidney. A higher concentration of EPPTB (100 uM) produced a significant increase in perfusion pressure (> 80 mM) of the preparation. At this concentration of EPPTB, the reduction in perfusion pressure induced by Tryptamine, PEA, T1AM and RO5263397 was abolished. Isoprenaline-induced reduction in perfusion pressure was also significantly ($p < 0.05$) reduced by this concentration of EPPTB suggesting a non-specific effect of EPPTB.

Conclusions:
The results obtained suggest that TAAR-1 receptors are not involved in tryptamine, PEA and T1AM induced relaxation response in the perfused kidney. It is possible that other TAAR subtypes may be involved in this response.

Key Words: Trace amines; Trace amine-associated receptors-1; Perfusion pressure;

Funding Agency: Funding: Collage of Graduate Studies and Research Sector (Grant No. YM02/21), Kuwait University. Kuwait.

Pharmacy

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Design and Validation of a Medication Assessment Tool to Evaluate the Quality of Prescribing in The Management of Type 2 Diabetes in Kuwait

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Introduction:

Diabetes is a chronic illness that is considered globally as one of the most challenging health problems in the 21st century. Healthcare systems need to develop a quality measurement framework at every level to allow the improvement of patient care. It has been reported that, with the diversity of prescribers in Kuwait, there is an urgent need for standardization of care by healthcare professionals to offer consistent provision of best quality care to patients with diabetes. This study aims to develop and validate an evidence-based medication assessment tool (MAT) using quality standards extracted from international clinical guidelines to evaluate prescribing practices in the management of type 2 diabetes.

Methods:

The development process of the MAT was based on two stages: i) development stage (concept definition and identification, domain definition and identification, item generation and instrument construction) and ii) judgment-quantifying stage (content validity of items, content validity of instrument). Content validity was determined using two quantitative approaches: a) Content Validity Ratio (CVR) and the Content Validity Index (CVI) and b) Content Validity Index at the item level (I-CVI) as well as the scale-level (S-CVI/Ave) with the average approach. Criteria were considered for removal if CVR<0.566 and/or I-CVI<78%. A feasibility study was conducted on 30 random patient records from Kuwait National Diabetes Registry (KNDR) to ensure the tool's fitness for purpose.

Results:

The results of the development stage resulted in the creation of draft 1 of the MAT, with 42 criteria. Through the judgment-quantifying stage (with the participation of 12 experts), eight criteria had a CVR<0.566 and I-CVI<78%. From those, 3 criteria were removed, 5 were retained, and one criterion was divided. Data revealed that blood pressure control standards were the most agreed standards among all experts and lipid management recommendations were the least criteria to show agreement. As a result of that, draft 3 of the MAT had 39 criteria with a total MAT CVI of 0.79 and S-CVI of 0.89, indicating that the MAT had an acceptable content validity. A feasibility study revealed total adherence scores of 54.9%.

Conclusions:

The tool designed and validated in this study can be used to measure prescribing practice in the management of type 2 diabetes in Kuwait, and to highlight areas for review and possible improvement in prescribing adherence.

Key Words: Type 2 diabetes ; Kuwait ; Prescribing ;

Funding Agency: None

Pharmacy

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Population Perceptions of Healthcare Services Provided Virtually (Telehealth): A Cross-Sectional Study.

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Introduction:
The tremendous evolution of technology during the last few decades led to the consideration of telehealth as an important element of a high-quality healthcare system and a convenient alternative to pursuing in-person healthcare visits. In the era of the Coronavirus Disease 2019 (COVID-19) pandemic, healthcare systems wish to harness the advantage of distant care provision to transcend barriers to access healthcare facilities. This study aims to investigate general population perceptions (acceptance, comfort, perceived ease of use, and perceived quality of care) towards telehealth.

Methods:
A cross-sectional survey was conducted using a validated online questionnaire. The questionnaire investigated the general population's familiarity and experience with virtual provision of healthcare (telehealth) in Kuwait. Descriptive statistics, correlations, and multivariate analysis were performed.

Results:
A total of 484 responses were received. Of those, 65% (N= 315) showed high acceptance of telehealth, of which, 73.5% (N=119) were comfortable using it, and 48.2% (N=78) perceived themselves capable of utilizing its systems. Multivariate analysis showed that participants with moderate or high comfort score and those who perceived equal quality of care received from VV are more likely to accept a virtual call from their healthcare provider compared to those with low comfort score (OR=4.148, 95% CI=1.444-11.91, P=0.008, OR= 20.27, 95% CI=6.415-64.05, P<0.0001, OR= 2.585, 95% CI=1.364-4.896, P<0.004 respectively).

Conclusions:
Perceptions of telehealth were overall positive, indicating a tendency to accept the implementation of such technology.

Key Words: telehealth; telemedicine; perceptions; patients; Kuwait;

Funding Agency: None

Pharmacy

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Implementing the Medicines Reconciliation Tool in Practice: Challenges and Opportunities for Pharmacists in Kuwait

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Introduction:
Using the medicines reconciliation tool which involves preparing an updated list of patient's medications at each transition of care can enhance patient safety. The pharmacist has been leading this process in western healthcare systems. Little is known about pharmacists' role in medicines reconciliation in Middle Eastern Countries. The objectives of this study were to explore the implementation of medicines reconciliation in Kuwait hospitals, pharmacists' role in this process and perceptions of the challenges in implementing it in practice.

Methods:
This was an exploratory descriptive study of medicines reconciliation practices at eleven secondary/tertiary hospitals in Kuwait. A mixed-method research design was used whereby 110 hospital pharmacists participated in 11 focus groups and 88 of them completed self-administered surveys.

Results:
Participants reported that medicines reconciliation is poorly applied in hospitals and that they had limited role in the process. The current medicines reconciliation policy does not assign any responsibilities for pharmacists in this process. The most significant barriers to applying medicines reconciliation by pharmacists were inadequate staff numbers, lack of time, difficult access to patient information, lack of policy to support pharmacist role and patients' lack of knowledge about their medications.

Conclusions:
Hospital pharmacists in Kuwait advocate implementing medicines reconciliation but report significant strategic/operational barriers to its application. Efforts are needed in policy reform and team training to enable pharmacists provide effective services including medicines reconciliation.

Key Words: Medicines reconciliation; patient safety; health policy;

Funding Agency: None

Pharmacy

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Measurement of Endocrine Disruptor Bisphenol-A Leakage from Dental Resin-Based Composite Materials

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Introduction:
Bisphenol A (BPA) derivatives monomers as resins, are common components in dental restorative materials and materials used for orthodontic treatment. However, they are a source for BP-A leakage, which can affect adult and child health as an endocrine disruptor.

Methods:
A validated analytical method was established to investigate the level of BPA leakage from four selected weights (0.1, 0.2, 0.3, 0.4 mg) of five different resin combinations used in dental restorative materials. The resin combinations were cured with light for 20 seconds and kept in 1 mL of acetonitrile and sonicated for 30 minutes. Separation was achieved by using BEH C18 (1.7 µm, 2.1 x 100 mm) analytical column (Waters® Acquity UPLC) and a mobile phase composed of water and acetonitrile (68:32 v/v). Moreover, Waters® Xevo G2-SQToF coupled with Waters® Acquity UPLC system with binary Solvent Manager (I-Class) via electrospray ionization (ESI) interface was used to confirm peaks identities.

Results:
BPA was detected in all resin combinations, and in all selected sample weights. However, BP-A was below the limit of quantification (LOQ) in all selected weights of Filtek Z350 XT Universal Restorative System. The results show that BPA is still released from selected dental resin combinations available in the market despite the general concern about its potential adverse effects.

Conclusions:
Nevertheless, the amounts of BPA were within the acceptable levels indicated by the U.S. Environmental Protection Agency and the U.S. Department of Health and Human Services National Toxicology Program and represent a very small contribution to the total BPA exposure, the use of alternative materials such as high-viscosity glass ionomers, inorganic biomaterials, and ceramic would be ideal and healthier for adults and children.
Acknowledgment: This research was funded by Kuwait University- Research Sector, grant number PC01/19 (NAT).

Key Words: Bisphenol A; Cancer; Analytical Chemistry;

Funding Agency: This research was funded by Kuwait University- Research Sector, grant number PC01/19 (NAT).

Pharmacy and Artificial Intelligence

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Machine Learning for Predicting in vivo Efficacy of siRNA Ionisable Lipids Nanoparticles

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Introduction:
Prediction of the in vivo efficacy of siRNA ionisable-lipid nanoparticles is required because it saves time and resources, however, it was never achieved before. This work aims to apply machine learning techniques to predict siRNA nanoparticles in vivo efficacy.

Methods:
Lipid structures and relevant formulation properties and in vivo efficacy data were extracted from five publications. The data set was prepared by combining 1D and 2D molecular descriptors of the ionisable lipids with two nanoparticles formulation-related properties. Feature combinations for modelling were selected by an evolutionary algorithm. For constructing the predictive models, artificial neural networks, support vector machines and partial least squares regression were used.

Results:
The resulting data set contained 120 entries and 438 features columns. Two training sets and two external validation sets were prepared. The training sets contained 90 lipids and the validation sets contained 30 lipids. The results showed the successful predictions of validation set siRNA dose as a measure of in vivo efficacy. R^2 of validation set predictions had values of 0.86 – 0.89 and 0.75 – 80 for validation sets one and two respectively. Artificial neural networks resulted in the best R^2; 0.89 and 0.80, and best root mean squared error; 0.23 and 30, for validation sets one and two respectively.

Conclusions:
Integrating machine learning with cheminformatics resulted in the successful prediction of in vivo efficacy of siRNA nanoparticles. The composition of the training and validation sets together with the machine learning method affect the quality of predictions.

Key Words: siRNA; nanoparticles; machine learning;

Funding Agency: None

Physical Medicine and Rehabilitation

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Comparison of Electrodiagnostic study with clinical and ultrasonographic parameters before and after treating patients of carpal tunnel syndrome with extracorporeal shockwave therapy

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Introduction:
Aim: To find out improvement in Electrodiagnostic study in patients with Carpal tunnel syndrome treated with Extracorporeal shockwave therapy.

Methods:
Adults with mild to moderate carpal tunnel syndrome (MAYO CLINIC CLASSIFICATION) were included in the study. Patients presenting with tingling, numbness in first, second or third digits, pain, positive Tinel sign or Phalen sign were evaluated using Boston carpal tunnel syndrome questionnaire (BCTSQ) scores calculating symptom severity score (SSS), functional status score (FSS), ultrasonographic evaluation and nerve conduction study to confirm the diagnosis. Patients were given extracorporeal shock wave therapy (ESWT) once a week for 4 weeks and received total of four sessions. BTSQ was used to record clinical SSS and FSS. Visual analogue scale (VAS) was used for evaluating the pain. Ultrasonographic measurement of median nerve cross sectional area (CSA) at the carpal tunnel inlet was calculated for each patient. Nerve conduction study (gold standard for diagnosing carpal tunnel syndrome) was done and latency and conduction velocity for both median motor and median sensory was recorded. All the parameters were repeated after treating patient with ESWL.

Results:
Five patients were included in the study (5 hands) in the age group (avg 46.5) (Four female and 1 male). There was improvement in BTSCQ score (SSS improved 47.14% and FSS 40.14%) VAS score (70.89%) and there was marginal improvement in ultrasonographic evaluation. Nerve conduction parameters motor latency improved by 13.37% motor CV 13.76% as well as sensory latency 16.52%and sensory CV 23.15% which was consistent with improvement in clinical findings, BTSCQ SCORE, VAS SCORE as well as ultrasonographic findings.

Conclusions:
This is the first Preliminary study showing clear benefit of extracorporeal shockwave therapy in mild and moderate carpal tunnel syndrome using the gold standard Electrodiagnostic study which correlated with the clinical signs and symptoms, BCTSQ, VAS score and ultrasonographic evaluation. We recommend larger study to validate the finding of our study.

Key Words: ELECTRODIAGNOSTIC STUDY; EXTRACORPOREAL SHOCKWAVE THERAPY;

Funding Agency: None

Physical Medicine and Rehabilitation

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Bladder Management and Urological Complications in Persons with Chronic Spinal Cord Injury

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Introduction:

Proper management of neurogenic bladder is important as urinary complications can cause significant morbidity and mortality in persons with spinal cord injury (SCI). Our objective was to find out the methods of bladder management used by chronic SCI patients in Kuwait and to compare the urological complications occurring between three different methods of bladder management – clean intermittent catheterization (CIC), indwelling catheter and condom catheter

Methods:

Retrospective data of urinary complications was collected from the hospital files and by interview of SCI patients who were attending outpatient clinic in Physical Medicine and Rehabilitation Hospital and those who were at least one year post injury. Those patients who had significant neurological recovery and were continent were excluded. We compared three main complications - recurrent urinary tract infections (UTI), calculi formation and hydronephrosis among different methods of bladder management.

Results:

Total number of SCI patients was 80. There were 59 males and 21 females between the ages 21 to 72 years. The number of years post SCI varied from 1 to 36 years. 50 patients (63%) of them had complete spinal cord injury. There were 55 paraplegics (69%), 20 tetraplegics (25%) and 5 with cauda equina syndrome (6%). 41 patients (51%) were doing CIC, 15 patients (19%) were on condom catheter and 24 (30%) had indwelling catheter. Of the 24 patients on indwelling catheter, 18 had suprapubic catheter and 6 had urethral catheter. Among the 41 patients doing CIC, calculi were seen in 4 patients (9.8%), 3 had recurrent UTI (7.3%) and 1 (2.4%) had hydronephrosis. Of the 24 patients on indwelling catheter, 6 patients (25%) had calculi formation, 3 (13%) had recurrent UTI and none had hydronephrosis. Of the 15 patients on condom catheter, 4 (27%) had recurrent UTI, 1 (7%) had calculi formation and 2 (13%) had hydronephrosis. Other complications noted were urethral strictures which were seen in 3 patients (7%) of those on CIC and epididymo-orchitis in 3 patients (13%) with indwelling catheters.

Conclusions:

Least complication rate was found in patients doing intermittent catheterization which is the preferred method of neurogenic bladder management worldwide. Even though our sample size was small, and we surveyed only those SCI patients coming to Physical Medicine and Rehabilitation Hospital for review, our results are similar to what is described in literature.

Key Words: Spinal cord Injury; Neurogenic bladder; Complications;

Funding Agency: None

Physical Therapy

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Physiotherapists' Perceptions of and Willingness to Use Telerehabilitation in Kuwait during the COVID-19 Pandemic

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Introduction:
Telerehabilitation has been considered a suitable alternative healthcare delivery system during the COVID-19 outbreak, and many studies have promoted its feasibility in delivering physical care to patients who live with pain and disability. Physiotherapists' perceptions and willingness are two key factors that influence the provision of remote physiotherapy. This study aimed to explore the perceptions of physiotherapists toward telerehabilitaion and their willingness to use this method during the COVID-19 pandemic in Kuwait. Barriers that may hinder the use of telerehabilitation were also investigated in this study.

Methods:
The following methods were used: a cross-sectional survey and face-to-face semi-structured interviews. In the cross-sectional survey, an electronic questionnaire was sent to 747 physiotherapists who were working in the governmental health sector. The questionnaire included four sections: perceptions of telerehabilitation, comfort with technology, willingness to use telerehabilitation, and barriers to using telerehabilitation. Six interviews were conducted with physiotherapy managers to explore the barriers and facilitators of telerehabilitation practice. Descriptive data analysis was conducted, and a cross-tabulation technique was used to find the associations between the variables, in which chi-square tests were used to identify the significance of the results, where $p<0.05$. Thematic content analysis was used to analyze the transcripts of interviews.

Results:
273 completed questionnaires were received, giving a response rate of 36.5%. Most of the respondents (237; 86.8%) considered telerehabilitation a viable option to deliver healthcare to patients during the COVID-19 pandemic. Despite the lack of information and communication technology (ICT) (156; 57.1%), 89% (243) of the respondents were willing to integrate telerehabilitation into their conventional practice. The results indicate that the more the physiotherapists used the internet and email in their work and the more comfortable they were with technology, the more willing they were to use telerehabilitation systems ($p=0.01$). Physiotherapy managers reported that patients' privacy and the confidentiality of their data were considered barriers.

Conclusions:
Physiotherapists showed overall positive perceptions and willingness to use telerehabilaition to improve patients' access to physiotherapy services during the pandemic despite lack of technological readiness which was the top barrier to telerehabilitaion use.

Key Words: Telerehabilitaion; Physiotherapist's Perception; COVID-19 Pandemic;

Funding Agency: None

Physiology

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Female Rats are More Prone to Memory Impairment and Synaptic Proteins Alteration Induced by Prenatal Exposure to Dexamethasone

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Introduction:
The synthetic glucocorticoid (sGC) dexamethasone (DEX) is routinely prescribed to pregnant women at risk of preterm delivery or who are bearing fetuses at risk of developing congenital adrenal hyperplasia. However, prenatal activation of glucocorticoid receptors results in long-lasting deleterious effects on cognitive functions during adulthood. In the present study, we sought to assess the prenatal DEX effects on learning and memory as well as on synaptic proteins expression in the prefrontal cortex (PFC) and dorsal hippocampus (D-HPC); two brain structures involved in object recognition and spatial memory respectively.

Methods:
Pregnant moms received daily intra-peritoneal injections of either DEX (0.2mg/kg) or saline from gestation day (GD)14 until GD21. The protein expression of the pre-synaptic protein; synaptophysin (SynP) and the post-synaptic protein; post synaptic density 95 (PSD95) in the PFC & D-HPC of adult male & female offspring were explored using western blot. Adult offspring were subjected to spatial and object recognition memory tests using Morris water maze (MWM) and novel object recognition (NOR) test respectively.

Results:
Prenatal exposure to DEX was associated with reduced expression of SynP and PSD95 proteins in the D-HPC and the PFC of adult female but not male rat offspring. Maternal exposure to DEX during pregnancy was associated with a significant decrease in the time spent in the target quadrant and significant increase in the latency to enter the target quadrant in the MWM in females but not males' adult offspring. However, maternal exposure to sGC led to reduced time in exploring and roaming around the novel object when compared to the familiar one in the NOR test in both adult females and males.

Conclusions:
Prenatal DEX-induced decrease in synaptic proteins expression is associated with memory impairment in a sex-dependent manner. Funding/Acknowledgment: This work was supported by the CGS & RS grant YM11/17. We thank Dr. Rao Muddanna for his expert advice and guidance in the Morris water maze test and the personnel of the ARC for their help.

Key Words: Dexamethasone; Cognitive Functions; Synaptic Protiens;

Funding Agency: CGS & RS grant YM11/17.

Physiology

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Maternal Immune Activation Alters GABAergic Interneurons in the Offspring's Prefrontal Cortex: A Sex-Dependent Effect.

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Introduction:
Exposure to pathogen during pregnancy have pronounced effect on the function and excitability of offspring's brains likely by reducing the inhibitory output from the prefrontal cortex. Experimental evidence suggests that maternal immune challenge with bacterial active ingredient lipopolysaccharide (LPS) leads to reduced cell density of gamma aminobutyric acid-containing inhibitory interneurons (GABA-interneurons) in offspring's prefrontal cortex. Therefore, our objective was to assess whether IL-6 mediates long-lasting impact of LPS on the cell density of GABAergic interneurons in the prefrontal cortex of juvenile offspring.

Methods:
Pregnant rats were given three daily intraperitoneal injections of either pyrogen-free saline or lipopolysaccharide (LPS, 100 µg/Kg) in the presence or the absence of an IL-6 neutralizing antibody (IL-6Ab, 10 µg/Kg), on gestation days (GD) 15, 17 and 19. Each rat group (Saline-IgG, LPS-IgG, Saline-IL-6Ab, LPS-IL6Ab) consists of 5-6 pregnant rats. Twenty-one days after birth, male and female rats were separated from their moms and separately housed 4 per cage until postnatal day 30. GABAergic interneurons, including parvalbumin-, somatostatin-, serotonin receptor 3A- containing interneurons and neurons expressing the GABA synthetizing enzyme (GAD67), were monitored in the prefrontal cortex using fluorescent immunohistochemistry.

Results:
Prenatal LPS induced a significant reduction in the cell density of parvalbumin- and 5HT3A-containing interneurons in the prefrontal cortex of female but not male rat offspring. This effect was reversed when the IL-6Ab was prenatally co-administered with LPS. However, prenatal LPS did not affect the cell density of either somatostatin- or GAD-containing interneurons in the prefrontal cortices of both male and female offspring.

Conclusions:
Female rats are highly sensitive to prenatal immune challenge that induced a reduction in prefrontal inhibitory interneurons. These long-lasting impacts of immune challenge were mediated by LPS-activated IL-6. This study highlights the importance of exploring the early brain development and plasticity that might underlie sex-dependent behavioral dysfunction later in life.

Key Words: Interleukin-6; Pregnancy; GABA neurons;

Funding Agency: College of Graduate Studies, Kuwait University. Research Sector: Grant No. YM04/21.

Physiology

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Glucose transporter type 4 mediates the Cardioprotective Effects of RAS antagonism in the diabetic heart

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Introduction:
Diabetes mellitus (DM) is a risk factor for cardiovascular diseases specifically the ischemic heart diseases (IHD). Renin angiotensin system (RAS) affects the heart directly and indirectly. However, its role in the protection of the heart against ischemia and reperfusion (I/R) injury is not completely understood. The aim of the current study was to evaluate the efficacy of the angiotensin-converting enzyme (ACE) inhibitor and Angiotensin II receptor (AT1R) blocker or a combination thereof in protection of the heart against I/R injury.

Methods:
Hearts isolated from adult male Wistar rats (n=8) with STZ-induced diabetes were used in this study. Hearts were subjected to I/R injury, treated with Captopril, ACE inhibitor, Losartan, AT1R antagonist or a combination thereof. Hemodynamic data was acquired online using software designed specifically for that purpose. Infarct size was evaluated using 2,3,5-Triphenyltetrazolium chloride (TTC) staining. Hearts lysates were used to evaluate the levels of apoptosis markers (caspase 3 and 8), and Glucose transporter type 1 and 4 (GLUT1 and GLUT4) using Western blotting. Pro-inflammatory cytokines were evaluated by enzyme linked immunosorbent assay (ELISA). Data were analyzed using two-way analysis of variance (ANOVA).

Results:
Captopril and Losartan alone or in combination abolished the effect of I/R injury in the diabetic hearts. Captopril and Losartan alone or in combination resulted in a significant ($P<0.05$) recovery in the hemodynamics, reduced the infarct size and the apoptosis markers. Treatment with Captopril, Losartan and their combination significantly ($P<0.05$) reduced, pro-inflammatory cytokines and increased GLUT4 protein levels.

Conclusions:
Blocking RAS system protected the diabetic heart against I/R injury. This protection followed a pathway that uses GLUT4 axis to decrease the apoptosis markers and pro-inflammatory
cytokines.

Key Words: Ischemia Reperfusion,, ; RAS, Captopril, Losartan; Diabetes mellitus,

Funding Agency: YM01/18

Physiology

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Can natural products turn into potential drugs in contemporary pharmaceuticals?

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Introduction:
The biosynthesis of plants-derived natural products (NP) had immensely attracted scientific attention. This is presumably due to their potential use in pharmaceuticals. Despite the advances in pharmacognosy in exploiting the use of NP as potential antibacterial, antifungal and anticancer drugs, the dilemma between using such agents as effective medical treatment protocols remains controversial. The objective of this study is to determine the potential use of plant-derived NP in contemporary pharmaceuticals.

Methods:
Plant-rich secondary metabolites were obtained from sage, thymus and rosemary leaves. Total phenolics and flavonoids were quantified using standard operational procedure (SOP) from 8 independent replicates. Statistical analyses (ANOVA - t-test and regression) were performed using Minitab Software version 17.0 at $\alpha = 0.05$ significance level. The formation of a colored ferrous-probe complex from a colorless ferric-probe complex in extracts was evaluated using Ferric reducing power assay. Sage phenolics separation was performed using LC- MS/MS (Waters Xevo G2-S QToF) from 2-4 methanolic extracts.

Results:
Methanolic extracts showed better quantification compared to water and ethanol extracts. The HPLC-MS data indicated that antioxidant activity of air-dried sage leaves was due to the appreciable concentration of ferulic acid rosmarinic acid, and caffeic acid glucoside with retention time (min) of 5.21, 5.66 and 0.70, respectively.

Conclusions:
Precautions in extract preparations must satisfy international standard operational criteria to preserve antioxidants & the narcotic nature of plant-derived secondary metabolites. Sage, rosemary and thymus showed variable antioxidant capacities with a promising lipid peroxidation prevention.

Acknowledgment
We acknowledge the use of LC- MS/MS, project No: GS 01/03

Key Words: natural products, antioxidants, phenolics, terpene; pharmacognosy; alternative

Funding Agency: Self-funding Phase I project

Physiology

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Resistance Exercise Alters Cytokine Levels in Lysolecithin-Induced Brain Injury

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Introduction:
Studies have shown that aerobic exercise exerts neuroprotective effects on brain injuries. There is a paucity of studies exploring the impact of resistance exercise on brain recovery from injuries. In the present study we have explored the impact of resistance exercise on lysolecithin-induced brain injury.

Methods:
The resistance exercise model used in this study was developed in our laboratory and was recently patented through patent office of research sector of Kuwait University. Sprague Dawley rats were subjected to resistance exercise three days per week for 13 weeks by inducing them to pull progressively increasing heavy loads. The control group walked through the track without pulling a load. At the end of these series of exercises, all rats were subjected to stereotaxic surgery and the left striatal area was injected with lysolecithin (2µl of 1% solution) while the right striatal area was injected with pyrogen-free saline (2µl) to serve as control. Striatal areas were excised and the protein levels of pro-, anti-inflammatory cytokines, chemokines and growth factors were measured using rat cytokine array.

Results:
Resistance exercise significantly decreased the levels of CINC-2, CINC-3, CNTF, Fractalkine, IL-6 in the lysolecithin-injected area, 3 days post-lesion. These differences were not observed 14 days after the lesion, while we have noticed a consistent trend towards increased levels of some growth factors.

Conclusions:
These factors are largely produced by microglia; the immune competent cells of the brain. Thus, it appears that resistance exercise suppresses microglial acute response to injury.
Funding/ acknowledgment: This work was supported by the college of graduate studies and research Sector Grant# YM09/20. We thank the personnel of the Animal Resource Centre for their help and acknowledge the guidance of Dr. Rao Muddanna in stereotaxic surgery.

Key Words: Resistance Exercise; Brain injury; Cytokines;

Funding Agency: YM09/20

Physiology

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Partial pressure of oxygen and cerebral blood flow in the freely moving rat brain during hypoxemia.

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Introduction:

Brain hypoxia occurs either due to insufficient cerebral blood flow (CBF) or due to low partial pressure (PO2) of O2 in the blood (hypoxemia). This in vivo study was aimed to explore brain PO2, CBF and lactate concentrations in awake, freely moving rats exposed to hypoxemia.

Methods:

PO2 or CBF sensors were implanted in the cerebral cortices of SD rats; the jugular vein was catheterized. After 3-days of recovery, the implanted PO2 and CBF sensors were connected to the Oxylite and OxyFlow systems, respectively (Oxford Optronics, UK). The rats were exposed to normal air (normoxia) for 30 min, and then to 48 h hypoxemia (8% O2 in N2, PO2 60 mmHg) in O2 Control In-Vivo Cabinet (Coy Laboratories, US). Measurements were recorded 1/sec for 48h with (n=7) or without (n=5) CO2 scrubbing procedure. Blood samples were collected at different time points (n=5/point). In some cases, brain and CSF samples were collected after 6h, 24h or 48h (n=5-7 for every time point). Lactate concentration was estimated by a colorimetric assay (Abcam, UK). Data is presented as mean±SE. Statistical analysis was done using unpaired t-test and $p<0.05$ was set as a level of significance.

Results:

Brain PO2 (mmHg) in normoxia was 49.5±0.52; it dropped to 9.3±0.73 after 30 min of hypoxemia and then steadily increased, plateauing at 28.7±0.03 and 25.4±0.22 after 24h and 48h of hypoxemia, respectively. CBF did not change significantly during hypoxemia, but severe hyperventilation occurred, the latter likely being enabled by an increase in CO2 in the chamber to >3% after 24h-48h. When CO2 was maintained below 0.3%, hyperventilation was limited; the overall shape of the brain PO¬2 in time curve did not change, but PO2 dropped to 6.02±0.06 after 30 min of hypoxemia and then increased, reaching 17.05±0.03 and 20.02±0.02 after 24h and 48h, respectively ($p<0.05$ vs. PO2 without CO2 scrubbing). Lactate concentration (mmol/L) increased from 4.32±0.11 (plasma), 0.25±0.03 (CSF) and 1.5±0.12 (brain) in normoxia to 10.96±0.42 (plasma), 1.6±0.13 (CSF) and 3.22±0.16 (brain) after 24h of hypoxemia ($p<0.05$ vs. normoxia); only in the CSF it decreased after 48h of hypoxemia to 1.03±0.16 ($p>0.05$ vs. normoxia).

Conclusions:

The rat brain revealed ability to partially adapt to hypoxemia, which was likely related to hyperventilation and not to increase in CBF.

Acknowledgement: The study was funded by Research Administration grant no YM05/18 and by College of Graduate Studies.

Key Words: Hypoxemia; Brain ; Cerebral blood flow;

Funding Agency: Research sector, Kuwait University YM 05/18

Physiology

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Progesterone Limits the Increase in p53 caused by Dexamethasone Treatment in the Labyrinth Zone of Rat Placenta

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Introduction:

Placental apoptosis plays important roles in both normal physiological and abnormal pathological placental development. Fetal growth is highly dependent on the placenta, thus any disruption in placental formation may lead to intrauterine growth restriction (IUGR). The rat placenta consists of a basal zone (BZ) and labyrinth zone (LZ). The BZ is the major site of placental hormone production and it goes under physiological apoptosis at the end of term. While the LZ is the major site for nutrient/waste exchange which is essential until the end of term. Dexamethasone (DEX) is a synthetic glucocorticoid that stimulates placental apoptosis and inhibits feto-placental growth which leads to IUGR. Research on rats indicated that DEX-induced IUGR is associated with placental apoptosis. In the LZ of IUGR placentas the activity of p53, a tumor suppressor protein that initiates apoptosis, is increased. Progesterone (P), on the other hand, has been shown to inhibit placental apoptosis. Furthermore, research conducted on human and rat placentas showed that low maternal progesterone level during pregnancy is associated with low fetal and placental weights and development of IUGR. We hypothesize that P will reverse the apoptotic effects of DEX-induced IUGR.

Methods:

Pregnant Sprague-Dawley rats received daily intra-peritoneal injections of either saline (C group), DEX (0.2 mg/kg; DEX group), P (5 mg/Kg/day: P group) or mixture of DEX + P (0.2 mg/kg + 5 mg/Kg/day: DEX+P group) starting from 15 days of gestation (dg) to 21 dg. Gene and protein expressions of p53 in the BZ and LZ were investigated by RT-PCR and Western blotting in all groups.

Results:

In BZ, DEX decreases the p53 mRNA and protein expression while P treatment increases it and returned it to normal levels ($p<0.05$). Also, p53 mRNA expression decreased in DEX group compared to that in P ($p<0.05$). In P group, p53 protein expression was lower than in C and DEX+P ($p<0.05$). In the LZ, DEX increases the p53 mRNA and protein expression while P treatment decreases it but not to normal levels ($p<0.05$). In comparison to C, p53 mRNA and protein expression was higher in P group ($p<0.05$). Also, in P group p53 mRNA expression was higher than that in DEX+P, while the p53 protein expression was lower than that in DEX group ($p<0.05$).

Conclusions:

In the LZ, P reduces the high level of p53 caused by DEX which could be associated with reduction in apoptosis.

Key Words: Rat placenta; Progesterone; Apoptosis;

Funding Agency: Research Sector, Kuwait University YM11/15

Physiology

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The Effect of Renal Ischemia Reperfusion on the Renal Expression of Epithelial Sodium Channels in rat: Possible Role of Neural Precursor Cell-Expressed Developmentally Down-Regulated Protein (Nedd4-2)

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Introduction:
The epithelial sodium channel (ENaC) expressed in renal collecting duct epithelia is an important regulator of sodium balance and blood pressure (BP). ENaC is regulated by the ubiquitin ligase Nedd4-2, which binds to αENaC and causes its retrieval; a process that is inhibited by phosphorylation of Nedd4-2. Humans and animals develop hypertension after renal ischemia reperfusion (IR) and despite the significant role of αENaC in BP regulation, the effect of renal IR on renal αENaC expression has not been explored. Therefore, the aim of this study is to investigate the effect of renal IR on αENaC gene and membrane protein expression and whether Nedd4-2 plays a role in these processes.

Methods:
Adult Sprague-Dawley rats were randomized into two groups: IR group, in which both renal arteries were occluded by clamps for 30 minutes, and sham group in which the same surgical procedure was followed without occluding the renal arteries. The clamps were then removed so blood flow to both kidneys is restored; and 48 hours later the kidneys were harvested. Renal αENaC gene expression was studied using RT-PCR with Hydroxymethylbilane synthase (HMBS) as a house-keeping gene. Protein expression of αENaC in renal membrane fractions and protein expression of phospho-Nedd4-2 in renal homogenates were assessed by Western blot. PCR results were normalized to the expression of HMBS using $2^{-\Delta\Delta Ct}$ method. For Western blot, the ratio of the target protein band density to total protein loaded was estimated. Results were expressed as mean ±SEM. Control groups were compared to IR groups using student t test and $p<0.05$ was set as significant.

Results:
There was no difference in mRNA levels of αENaC between IR group and sham group. There was a decrease in membrane protein expression of αENaC after IR (0.13±0.02) vs. control (n=5): (0.31±0.06) ($p<0.05$). However, there was an increase in renal protein expression of p-Nedd4-2: IR (n=6) = 0.0154 ± 0.003 vs. control (n=5) = 0.005 ±0.001 ($p<0.05$).

Conclusions:
48 hours after IR αENaC gene expression did not change, however membrane expression of αENaC decreased, suggesting decreased trafficking of αENaC to the membrane. Whether decreased trafficking of αENaC is mediated through Nedd4-2 or through another mechanism can only be elucidated after protein expression of Nedd4-2 is measured, especially that the levels of the inactivated form p-Nedd4-2 were increased.

Acknowledgment: This project is funded by the College of Graduate Studies, KU.

Key Words: Renal; Ischemia Reperfusion; Epithelial Sodium Channel;

Funding Agency: College of Graduate Studies

Physiology

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Angiotensin (1-7) Does Not Alter miRNAs Expressions in leptin-Receptor Deficient Obese Type 2 Diabetic Mice

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Introduction:
Angiotensin (1-7) (Ang (1-7) arguably plays a renal protective role in diabetes by countering angiotensin II actions on podocytes. micro-RNAs (miRNAs) are small, single-stranded non-coding molecules. Renal abnormal expression of some miRNAs might be involved in podocyte injury. We hypothesize that the possible reversal of diabetes-induced renal injury by Ang (1-7) could be mediated through modulating renal miRNA levels. Objective: To study the effect of Ang (1-7) administration on renal miRNAs expression in type 2 diabetic mice.

Methods:
Eight-week-old male BKS.Cg-Dock7m +/+ Leprdb/J (db/db) mice and age matched heterozygous controls were randomly divided into 4 groups (n=6/group): Control vehicle-treated, diabetic vehicle-treated, control treated with Ang (1-7), and diabetic treated with Ang (1-7) (500µg/Kg, i.p.). Treatments started at 12-week-old and lasted for 4 weeks, and mice were sacrificed at the end of week 16. Diabetes was confirmed if fasting blood glucose (FBG) was > 14mM. Renal expression of miR-29a, miR-155-5p, and miR-30 was studied in all groups using real-time PCR. These miRNAs were chosen according to their target proteins which are mainly expressed in podocytes or related to renal injury and fibrosis. This experiment was approved by Animal Ethics Committee at the Health Sciences Center.

Results:
PCR results were normalized to the expression of miRNA 202 using 2–ΔΔCt method. Results were expressed as mean ±SEM. Experimental groups were compared using one-way ANOVA followed by the suitable post hoc test dependent on the homogeneity of variances and $p < 0.05$ was considered significant. Results: At 16 weeks, there was a significant increase in FBG levels (26.3±3.2 vs. 6.3±0.4 mM) ($p<0.01$), polydipsia (10.3±2.0 vs. 3.8±0.5 ml/24hrs) ($p<0.01$), and polyuria (5.76±1.7 vs. 0.95±0.3 ml/24hrs) ($p<0.05$), when compared to controls. These parameters were not affected by Ang (1-7) treatment. Real-time PCR results showed no significant changes in expressions of miR-29a-3p, miR-29a-5p, miR-155-5p, or miR-30 in both untreated and Ang (1-7) administered mice.

Conclusions:
Ang (1-7) does not affect the gene expression of miR-29a-3p, miR-29a-5p, miR-155-5p, and miR-30 in normal and diabetic mice kidneys, suggesting that the putative renal protective effects of Ang (1-7) are not mediated through the above-named miRNAs.
Acknowledgment: This project is funded by the College of Graduate Studies, KU.

Key Words: Diabetes ; Renal ; Angiotensin (1-7), miRNA;

Funding Agency: college of graduate studies

Physiology

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Discrepancy between the actions of Glucagon-like Peptide-1 receptor ligands in the protection of heart against ischemia reperfusion injury

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Introduction:
Tirzepatide is a dual glucagon-like peptide-1 (GLP 1) and glucose dependent insulinotropic polypeptide (GIP) receptor agonist. The results of clinical trials show that tirzepatide is very effective in treating type 2 diabetes mellitus (T2DM) and obesity. GLP 1 is an incretin hormone with therapeutic potential beyond T2DM, however it is rapidly degraded by dipeptdyl peptidase-IV (DPP-IV) to GLP-1 (9-36). Exendin-4 (Ex-4) is a DPP-IV resistant GLP-1 receptor agonist and when truncated to Ex-4 (9-39) acts as a GLP-1 receptor antagonist. In the present study we evaluated the potential protection of the heart against ischemia and reperfusion (I/R) injury by these molecules.

Methods:
Hearts isolated from Wistar rats (n=8) were perfused by a modified Langendorff. Left ventricle (LV) contractility and cardiovascular hemodynamics were evaluated by a data acquisition program and infarct size was evaluated by 2,3,5-Triphenyl-2H-tetrazolium chloride (TTC) staining. Hearts were subjected to 30 min regional ischemia, produced by ligation of left anterior descending (LAD) coronary artery followed by 30 min reperfusion. Hearts were treated with either the non-lipidated precursor of tirzepatide (NLT), GLP-1, GLP-1 (9-36) or Ex-4 in the presence or absence of Ex-4 (9-39) at the beginning of reperfusion. Data were analysed using two-way analysis of variance (ANOVA).

Results:
Infusion of GLP-1 (9-36) or Ex-4 protected the heart against I/R injury ($P>0.01$) by normalizing cardiac hemodynamics and infarct size. Neither NLT, GLP-1 or Ex-4 (9-39) showed protection to the heart. Interestingly Ex-4 (9-39) blocked Ex 4 mediated protection but not that of GLP-1 (9-36).

Conclusions:
These data suggest that Ex-4 mediated protection is GLP-1 receptor-dependent but GLP-1 (9-36) mediated protection is not. This protection follows a pathway that increases the antioxidants and decreases the pro-inflammatory cytokines levels.

Acknowledgement: We acknowledge the Health Science Animal facility for providing the animals. This study was supported by grant #MY01/20 from Research Administration, Kuwait University.

Key Words: Glucagon-like Peptide-1; ischemia reperfusion; Cardio-physiology;

Funding Agency: Kuwait University - College of graduate studies

Physiology

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Role of Apocynin, an NADPH Oxidase Inhibitor, in the Protection of the Heart against Ischemia/Reperfusion Injury

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Introduction:
Ischemia and reperfusion (I/R) result in several events, like induction of inflammation and oxidative stress which play a significant role in tissue damage leading ultimately to I/R injury. Reduced nicotinamide adenine dinucleotide phosphate (NADPH) oxidase is a major source for reactive oxygen species (ROS) production and progress of I/R injury. Apocynin, a specific inhibitor of NADPH oxidase and a strong antioxidant is protective against I/R injury, however, its role in the protection is not completely understood. In the present study we investigated the prospective therapeutic effects of apocynin against cardiomyocyte I/R injury and the potential signaling pathways of its protection.

Methods:
Langendorff-perfused Wistar rat hearts (n=8) were used for this study. Left ventricle (LV) hemodynamics and contractility were evaluated by a data acquisition program and infarct size was evaluated by 2,3,5-Triphenyl-2H-tetrazolium chloride (TTC) staining. Hearts were subjected to 30 min regional ischemia, produced by ligation of left anterior descending (LAD) coronary artery followed by 30 min reperfusion. Hearts were treated during reperfusion with either apocynin, cyclic adenosine diphosphate-ribose (cADPR) hydrolase cluster of differentiation 38 (CD38) inhibitor (calbiochem), nitric oxide donor, 5-Nitroso-N-acetyl-DL-penicillamine (SNAP), nitric oxide inhibitor (L-name), NAADP inhibitor (Ned-19) and cADPR agonist in the presence or absence of apocynin. Data were analyzed using two-way analysis of variance (ANOVA).

Results:
Infusion of apocynin protected the heart against I/R injury ($P>0.01$) by normalizing cardiac hemodynamic levels and decreasing the infarct size. This protection was negated by co-infusion of CD38, L-name, Ned-19, but not by SNAP. Interestingly, cADPR induced calcium release completely abrogated the protection produced by apocynin treatment.

Conclusions:
These data suggest that apocynin protection is mainly mediated by calcium release from calcium acidic stores. This protection follows a pathway that involves CD38, nitric oxide and NAADP.
Acknowledgement: We acknowledge the Health Science Center Animal Facility for providing the animals. This study was supported by grant #MY05/20 from Research Administration, Kuwait University.

Key Words: Ischemia Reperfusion, Cluster of differentiation 3; Hyperglycemia; Apocynin;

Funding Agency: Kuwait University, YM 05\20

Psychiatry

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Analyzing A Decade of Diagnostic Terminology On Depression Psychometric Studies Done In The Middle East

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Introduction:
Depressive disorders affect many people worldwide with significant morbidity. The Middle East is one such region, but there is a large discrepancy between the prevalence reported in depression articles versus the estimated calculated levels of true depression published by WHO and the annual International Global Burden of Diseases studies. One such cause could be the use of the terminology used by researchers in their articles.

Methods:
A collection of key terms were used with [OR] Boolean operator on PsychInfo, PubMed, EMBASE, and Scopus with [AND] operator to narrow the results to each country in the Middle East. A total of 1495 studies were collected, which were then reduced to 168 after filtering and removal of studies that did not use psychometric tests.

Results:
The determination of terminology was focused on whether the article correctly stated they were testing for depressive symptoms using a psychometric test, or whether they were stating the depression diagnosis. Surprisingly, very few papers stated the limitations of only psychometric testing, with close to 70% of papers every year not mentioning any form of depressive symptoms. In 2021 though, 53% of papers list the term depressive symptoms, making it the core rather than stating the psychometric test was diagnosing depression. However, approximately still half of all papers each year do not mention that a more formal psychiatric interview would be needed to diagnose depression.

Conclusions:
With the DSM-5TR and ICD-11 about to be released, the terminology used by clinicians is also coming into question. The trend in research should continue stating depressive symptoms rather than stating depression prevalence when describing results from psychometric studies rather than clinical interviews. Publishing the correct vocabulary will allow others to interpret the data accurately in their own studies and help produce true estimates of morbidity in advanced studies such as meta-analyses.

Key Words: depressive symptoms; Middle East; review;

Funding Agency: None

Psychiatry

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A Scoping Review On Methods Of Data Collection By Depression PrevalenceStudies In The Middle East From 2011-2021

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Introduction:
Psychiatry has advanced significantly in the past 10 years, with improvements in screening, testing, and diagnostic criteria. While neuroimaging and biochemical markers are currently under investigation for depression screening, the current standard remains as a psychometric test that clinicians can administer to assess the need for formal psychiatric testing. We aimed to do a scoping review to see the methods of data collection used by researchers within the Middle East and assess whether the improvements in data collection were reflected in the studies.

Methods:
Four major databases, PubMed, EMBASE, SCOPUS, and Google Scholar were searched using key words and imported onto EndNote. A total of 2304 articles were collected, 804 of which were then removed as they were duplicated. A total of 1500 abstracts and titles were screened and a further 1187 were removed. The remining 313 were read in their entirety to test for eligibility, and a further 131 were removed due to non-eligibility. At the end, a total of 182 articles met the criteria for inclusion and were used in the analysis and results.

Results:
61% of all studies did self-administered questionnaires. Furthermore, more than 50% of the studies used either the PHQ or BDI, both tests validated against the DSM-III and IV and ICD-9. Furthermore, 1.6% of articles used the HDRS/HAM-D which is not indicated for screening of depression but rather the follow up for an individual already diagnosed with depression. Lastly, 7.7% of articles used a structured comprehensive psychometric test that usually requires a face-to-face interview such as the CIDI or MINI.

Conclusions:
While mental health is a crucial topic with a community and requires continued care and funding, the data from which these conclusions are drawn must be carefully analyzed. There have been significant improvements to psychometric testing, but many authors are still using older but better validated studies. Unfortunately, they are validated against older DSM or ICD criteria, and hence would not be as applicable now.

Key Words: depression; Middle East; scoping review;

Funding Agency: None

Psychiatry

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An In-depth Look Into the Studied Population Groupsin Prevalence of Depression Articles From The Middle East

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Introduction:
Depressive symptoms are a phenomenon that can occur in almost any medical illness as well as relatively healthy people. Depression secondary to a medical condition is an under-reported and understudied phenomenon.

Methods:
An initial scoping review was conducted which yielded a total of 182 articles from a total of 2304 studies collected from PubMed, EMBASE, SCOPUS, and Google Scholar. These 182 articles were then further broken down into 2 categories, diseased and non-diseased populations. A "Diseased" population study was defined as an article that tested depressive symptomatology in a predefined population that was co-morbid with another medical or psychiatric condition. A "Non-Diseased" population was defined as the opposite, a studied population that did not have or could be assumed to not have a predefined co-morbid condition. These 2 groups were further broken down into categories based on medical subspecialties or community subgrouping.

Results:
A total of 96 articles testing for depression prevalence were published with a diseased population and 86 in a non-diseased population within the Middle East. The majority of diseased were in endocrine (22 articles) and they only tested in diabetic patients. The next group was nephrology with 14 articles, all of which were studying hemodialysis patients. In the non-diseased population, the largest group were studies done on health sciences center students all over the Middle East with 25 articles. The second most studied group were similar: School, Highschool, and University students with 18 articles. Of note, 7 articles truly tested the general population within the Middle East, 3 of which were conducted in Saudi Arabia.

Conclusions:
Diseased and non-diseased populations are almost equally studied in the Middle East. However, there are still many identifiable gaps. Only diabetes has been studied in endocrine disorders, whereas thyroid conditions have not been studied, despite being common in the Middle East. Furthermore, there are many areas of potential research such as palliative patients or testing the depressive effects of those in physical rehab after a traumatic accident.

Key Words: Depressive disorders; Middle East; Review;

Funding Agency: None

Psycology

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Prevalence of depression and anxiety in clinically stable patients with COVID-19 compared to recovered patients

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Introduction:
Coronavirus Disease (COVID-19) has spread worldwide since 2019. As a result, Kuwait started containment and quarantine efforts to reduce the consequences of the outbreak, to prevent the health system from break down and to prevent the time to reach the peak of the epidemic. Patient with COVID-19 may show different signs of psychological disorders. Objective: To investigate the prevalence of depression, anxiety and decrease in quality of life among recovered patient of COVID-19.

Methods:
An online cross-sectional survey, targeting three groups: clinically stable patients with COVID-19, recovered COVID-19 patients, and healthy control people group were done. Three survey Arabic version questionnaires were used: the Patient Health Questionnaire 9 (PHQ-9), Generalized Anxiety Disorder 7 (GAD-7), and shorter version of Quality-of-Life (QoL) Questionnaire (SF-12). PHQ-9 and GAD-7 Questionnaires were classified to four categories: minimal, mild, moderate, and severe for GAD-7. And the PHQ-9 classified to four categories: no depression, minor depression, major depression, and severe depression for PHQ-9. The study was approved by the Ministry of Health's Standing Committee for the Coordination of Health and Medical Research in the State of Kuwait (1583/2020). Study was conducted over a period of 5 months.

Results:
510 participants completed the three questionnaires: patient (2%), recovered (31%), and healthy (67%). Majority of Participants were Kuwaiti, Female and aged between 18-31 years old. PHQ-9 showed that the majority of participants have no depression: Patient (63.6 %), Recovered (52.6 %) and Healthy (45.2 %). GAD-7 showed (36.4%) and (27.3%) of patient have moderate and severe anxiety, respectively. In addition, (31.4%) and (25%) of recovered participants have moderate and minimal anxiety. Moreover, Healthy participants showed to have severe anxiety (30.6%) and (26.5%) with mild anxiety. Quality-of-Life (QoL) Questionnaire showed that majority of participant have Moderately quality of life: patient (90.9 %), recovered (92.3 %) and healthy (90.4 %). The results showed non-significant differences between the three groups ($P>0.05$).

Conclusions:
The COVID-19 pandemic has influenced various aspects of individuals' QoL, as well as their physical and psychological health. Further studies with larger sample sizes and longer follow-up periods are required to confirm the findings of this study.

Key Words: depression; anxiety; COVID-19 ;

Funding Agency: None

Public Health

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Analysis of Construction Injury/Fatality and Preventive Measures in Kuwait

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Introduction:
Any injury, disease, or death that results from the workplace is termed as an occupational injury, disease, or other death, especially construction which is a very risky business in terms of safety and health, but it does not have to be. Construction work is rapidly expanding globally and in Kuwait. With the expansion of construction, construction-related injuries are also growing day by day. The goal of the study was to highlight the importance of addressing issues to strategize preventive measures to reduce the number of accidents and occupational diseases in construction.

Methods:
A systematic review on construction injuries as a secondary research mechanism was used to carry out this research. This helps scholars in getting in-depth knowledge about construction injuries and preventive measures. This review used articles that were published in the last 25 years in PubMed, Cochrane, google scholar, Embase, and other electronic databases.

Results:
A summary of articles that were retrieved from many countries including one study in Kuwait was reviewed. Limited use of PPE, lack of training for staff, low educational level of the workers, age, work shift, and poor lighting in worksites were among the causes of such injury. The industries which are included in this study are Agricultural and Fishing, Construction/Building, Water, Gas and Electricity, Storage and Transportation, Mines and Petroleum, and others.

Conclusions:
Construction injuries in Kuwait should be a priority because the safety of construction workers in Kuwait is not optimal. The modifiable risk factors such as the use of personal protective equipment (PPE), lack of safety training, and gender were the major associated factors with injury. Therefore, a continuous safety training and awareness creation program on risk-taking behavior should be given to construction workers. Additionally, the misuse of tools is the common problem behind injuries. The Authority needs to focus on laws related to occupational health and safety of the workers and management need to be educated to handle health and safety management efficiently.

Key Words: Construction ; Occupational Injury/disease/death ; Systematic Review, Electronic

Funding Agency: None

Public Health

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e-Learning Opportunities in OSH Capacity Building in Extractive Industries (Mining Case in Africa)

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Introduction:
Challenges in the extractive industries including mining are great because mining activities over several years of operation ended up with serious negative occupational safety and health (OSH), environmental, and social impacts. The objective is to use E-learning to build OSH capacity to address the negative impact of mining on miners/populations/environment.

Methods:
Field study that was conducted on behalf of The World Bank and the government of Congo required visits to the sites, collection of samples of water and soil, collection of health data, and interviews with key personnel including representatives of mining companies, miners, and surrounding populations. This assessment led to the idea of building OSH capacity given the shortage of local OSH professionals using e-learning. Samples of surface water, groundwater, soil, and air were collected and analyzed along with surveys on OSH issues including noise and observations.

Results:
Most of the samples of water, air, and soil exceeded international and national standards. This calls for an OSH capacity building to address the issues of environmental contamination and this can be done using e-learning targeting inspectors/safety engineers who lack basic training in OSH.

Conclusions:
Once trained, OSH professionals will work with their government to make sure the mining companies abide by their corporate social responsibility using the 3 p's (people, planet, and profit) of sustainability/HSE that leads to the protection of the environment. OSH capacity building via e-learning can address the OSH and environmental issues.

Key Words: Occupational safety and health (OSH), Health Safet; Pillars of sustainability,

Funding Agency: The authors thank the World Bank for providing the funding to assess the impact of mining in the Democratic Republic of Congo and KFAS for providing funding for the OSH and COVID-19 Prevention Training (CORONA PROP 134).

Public Health Department of Environmental and Occupational Health

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Psychosocial Stress in the Workplace

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Introduction:
Psychosocial stress is defined as a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being. The objective is to investigate the risk factors that are associated with psychosocial stress and to sort out the best evidence-based prevention measures in the workplace.

Methods:
This research is a systematic review using online medical search engines, such as PubMed and Medline to find articles on Psychosocial stress that have been published during the last 50 years. Keywords such as “Psychosocial stress” and “stress among workers". Other main resources used include the official websites of the WHO, ILO, NIOSH, and OSHA.

Results:
Psychosocial stressors at work are associated with a 76% elevated risk of sickness absence. Around half of European workers consider stress to be common in their workplace, and it contributes to around half of all lost working days. It is associated with an increased incidence of psychosocial risks at work causing work-related stress, anxiety depression, and fatigue which can then lead to accidents and diseases, reduce performance and productivity, and affect working relations. Psychosocial stress at work increases the likelihood of self-medicating using recreational drugs, alcohol, or cigarettes to re-establish internal homeostasis (alleviate stress). Over 600,000 men and women from 27 cohort studies in Europe, the USA, and Japan suggest that work stressors, such as job strain and long working hours, are associated with a moderately elevated risk of incident coronary heart disease (CHD) and Stroke. Managing stress can be done with simple changes that can go a long way in improving your overall health and reducing stress.

Conclusions:
Psychosocial stress can be quite debilitating with severe consequences on one’s health and productivity in the workplace. There exist tools and strategies that can be helpful in preventing one’s stress levels from escalating. Many techniques lead to the relaxation response, typically, at least one technique will “click”. These are exercise, meditation [silent, focused, prayer, guided (imagery, progressive relaxation), active (yoga, shaking...)], autogenics, hypnosis, and mindfulness-based stress reduction (MBSR).

Key Words: Psychosocial Stress; Workplace stress; Systematic review;

Funding Agency: None

Reproductive Physiology

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Progesterone Partially Improves Placental Angiogenesis and Alters the Expression of Nuclear and Membrane Progesterone Receptors in DEX-induced Intrauterine Growth Restriction

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Introduction:

Intrauterine growth restrictions (IUGR) is known as the inability to achieve fetal growth potential for specific gestational age. IUGR is manifested by lower placental size and decreased placental vascularity indicated by lower expression of vascular endothelial growth factor (VEGF). IUGR pregnancies are also correlated with lower maternal progesterone (P4) levels. Studies showed that P4 induces VEGF expression in different tissues. Therefore, the aim of the present study is to evaluate the effect of endogenous P4 administration on pregnancy outcomes and placental VEGF expression as well as the modulation of nuclear and membranous progesterone receptors (PR) in dexamethasone (DEX)-induced IUGR model in rodent.

Methods:

Pregnant Sprague-Dawley rats were allocated into 4 groups based on daily intraperitoneal injection of: saline, DEX (0.2 mg/kg), DEX and P4 (0.2 mg/kg; 5 mg/kg, respectively) and P4 (5 mg/kg). Injections started on gestation day (dg) 15 and lasted until the day of sacrifice (19 and 21 dg). Elisa was used to evaluate maternal P4 levels. Real-time PCR and Western blotting were used to evaluate gene and protein expressions of VEGF, and nuclear and membrane PR in labyrinth and basal placental zones. Immunohistochemistry was used to locate VEGF and different PR in placental cells.

Results:

The dose of DEX used induced moderate IUGR with 16% reduction in fetal body weight and 27% reduction in placental weight. P4 co-administration with DEX was able to prevent the reduction in fetal body weight that was seen with DEX treatment. DEX also resulted in decreased expression of VEGF in both placental zones and P4-co-treatment with DEX prevented this reduction. Nuclear and membrane PR showed tissue specific expression in different placental zones and responded differently to both DEX and P4.

Conclusions:

Our study proves that progesterone treatment improves the outcomes in IUGR pregnancy by increasing placental vascularity indicated by higher expression of placental VEGF. The enhancement in placental vascularity prevented the reduction in fetal body weight seen with dexamethasone treatment, at least partially, through improving nutrient delivery to the fetus and possibly through increasing steroidogenesis.

Acknowledgement: Animal Resource Centre, Research Core Facility and Research Sector, Kuwait University (Grant no. YM11/15); Kuwait Foundation for Advancement of Sciences (Grant no. CB18-63MO-01).

Key Words: intra-uterine growth restriction; vascular endothelial factor; progesterone receptors;

Funding Agency: Research Sector, Kuwait University (Grant no. YM11/15), Kuwait Foundation for Advancement of Sciences (Grant no. CB18-63MO-01).

Surgery

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The impact of COVID-19 pandemic on the rate of medical, surgical and psychological complications and quality of life of patients who underwent bariatric surgery in Kuwait.

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Introduction:
Kuwait has one of the highest rates of obesity worldwide, with a high frequency of bariatric surgeries performed. This study aims to investigate the relation between the impact of COVID-19 pandemic and the quality of life of bariatric patients. In addition to identifying the impact of COVID-19 pandemic on the effect of bariatric surgery on the rate of chronic conditions.

Methods:
This cross-sectional study was conducted through an online-based questionnaire. Participants were divided into two groups: non-pandemic bariatric group and pandemic bariatric group. The non-pandemic bariatric group were patients who underwent bariatric surgery during 2010 to 2018, whereas the pandemic bariatric group were patients who had the surgery during 2019, 2020, and 2021.The survey assessed baseline characteristics and medical and surgical complications of patients who underwent bariatric surgery. The validated Generalized Anxiety Disorder-7 (GAD-7) scale and Bariatric Quality of Life questionnaire were utilised.

Results:
A total of 199 participants were included in our target population. There were significant differences between pandemic bariatric group and non-pandemic bariatric group in the following complications: acid reflux (20.8% vs. 7.4%, p-value= 0.015), nausea and vomiting (19.2% vs. 4.4%, p-value= 0.004), and hair loss (46.2% vs. 14.7%, p-value= 0.0001) respectively. There were significant differences between the pandemic bariatric group and non-pandemic bariatric group who stopped taking chronic disease medications after surgery which included bronchodilators (58.8% vs. 8.3%, p-value= 0.008, respectively) and painkillers (62.5% vs. 23.1%, p-value= 0.034, respectively). There were no significant differences between pandemic bariatric group and non-pandemic bariatric group in the psychological and quality of life measures.

Conclusions:
Higher rate of complications was significantly associated with the pandemic bariatric group. Further studies should focus on providing resources that facilitate an excellent care for patients and implementing measures and strategies designed to prevent such complications during crisis.

Key Words: Surgery; Bariatric ; COVID-19 ;

Funding Agency: None

Surgery

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A Retrospective Analysis of Facial Fractures in Kuwait

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Introduction:
Facial fractures are one of the commonest injuries seen in emergency department. This type of fracture has different impacts on the patient; physiologically, functionally as well as having an effect on personal self-stem. The aim of the study was to analyze and widen our understanding regarding the demographics and epidemiology of facial fractures.

Methods:
A retrospective study was conducted using data collected from the oral and maxillofacial department in Al-Amiri Hospital during the period of January 2017 to June 2020.

Results:
Young adult males were the most affected population that presented with facial fractures in our department, with a ratio of 3.2:1 male (76.3%) to female (23.7%) and age group between 21-30 mostly (42.5%). RTA (37.5%), falls (32.5 %), assault (21.25 %) followed by sports injures respectively. The majority of fractures were I the mandible (66.25%) either in one site of the mandible or combined fracture, and the second most common site was the zygomatomaxillary complex (17.5%). The management of choice for facial fracture in Al-Amiri hospital was ORIF (95%)

Conclusions:
Our current study demonstrated that age, gender and etiology affect the prevalence of facial fractures as well as the site of fracture and our choice to manage and treat these types of injuries.

Key Words: Facial fracture ; Mandible ; Open reduction;

Funding Agency: None

Surgery

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Reverse remodeling and heart recovery following lung transplant in pulmonary artery hypertension

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Introduction:
Pulmonary artery hypertension (PAH) is a progressive disease that results in right heart dysfunction. Lung transplantation (LTx) improves survival in end stage disease. The aim of this study is to assess heart recovery after LTx in primary and secondary LTx.

Methods:
We conducted a single center retrospective review for patients with primary and secondary PAH who underwent LTx between the period of January 2015 and December 2020. Baseline characteristics and echocardiographic measures were assessed pre-operative and after 1 year follow-up. Survival comparison between primary and secondary PAH was estimated by Kaplan-Meier method.

Results:
We identified 43 participants for the study. Among the participants, 11 case had primary PAH. Median age during transplant was 60 years (45.5,65.5). Left atrium anterio-posterior dimensions, systolic right ventricle pressure tricuspid peal regurgitant velocity and severity of tricuspid regurgitation were found to be significantly improved post-operatively compared to pre-operative echocardiography (p-value <0.05). Overall mortality was not significant between primary and secondary PAH (p-value = 0.66).

Conclusions:
LTx can reverse heart remodeling and facilitate recovery in primary and secondary PAH. Our data confirm the importance of LTx as a viable option in PAH patients failing medical treatment.

Key Words: Pulmonary artery hypertension; Lung transplantation; Heart remodeling ;

Funding Agency: None

Vaccinology & Preventive medicine

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Determinants of hesitancy towards COVID-19 vaccines in in State of Kuwait; an exploratory Internet-based survey

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Introduction:
The coronavirus disease 2019 (COVID-19) pandemic has wrought havoc upon healthcare and economic systems worldwide. COVID-19 vaccines considered a beacon of hope for normal life to return. We wished to understand the willingness of people in Kuwait to be vaccinated against COVID-19.

Methods:
An online, exploratory, cross-sectional study conducted on 16– 18 January 2021 using a validated structured questionnaire adapted from earlier studies to collect data from adults aged 18 years or older living in Kuwait applying a "snowball sampling" method by sharing the survey link in social-media platforms (mainly via WhatsApp™ and Twitter™). The questionnaire consisted of five parts: (1) sociodemographic data, (2) measuring participants' perception and willingness to accept a COVID-19 vaccine through four questions. Each question was answered on a three-level Likert scale ("No", "Not sure", "Yes"), the items were coded 0, 1, and 2, respectively, and summed for a possible range of 0–8. Accordingly, the mean perception score was calculated, with ≥4 considered denoting a "positive" perception and <4 reflecting a "negative" perception. Part (3) focused on main concerns regarding uptake of a COVID-19 vaccine. (4) best solutions to encourage vaccine uptake according to the participant's opinion. (5) Tools affecting perception towards COVID-19 vaccination, participants could choose more than one answer.

Results:
7274 people received an online link of the survey on their smartphone or computer, and 6943 people enrolled in this study (95.4%). Kuwaiti nationals represented 79.7% of the study cohort, 54.8% were aged ≥40 years, and 66.7% were females. Hesitancy against a COVID-19 vaccine was remarkably high (74.3%), with 50.8% not planning to take it and 23.5% not sure about taking it. The mean perception score was 3.4 ± 2.8, with 66.8% having a negative attitude towards a COVID-19 vaccine. Multiple logistic regression analysis the decision to take a COVID-19 vaccine was significantly positively associated with younger age (OR = 1.219), male (2.169), having higher education (1.362), vaccinated against seasonal influenza previously (2.706), being non-Kuwaiti (1.329), being healthcare worker (1.366), and working in private sector (1.228). Options to encourage future COVID-19 vaccination were more studies showing the vaccine to be safe and efficacious (68.6%), physician recommendation (41.8%), mandatory travel requirements (39.8%), if a family or friend vaccinated (34.9%) and compulsory by government (33.1%) or for employment (29.8%).

Conclusions:
Considerable vaccine hesitancy persists despite the widespread availability of highly efficacious and safe COVID-19 vaccines

Key Words: COVID-19; Vaccine acceptance Hesitancy, ; Vaccine uptake Barriers;

Funding Agency: None

Virology

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The influence of SARS-COV-2 infection on the production of cytokines by peripheral blood mononuclear cells and neutrophils in COVID-19 ICU patients.

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Introduction:
The COVID-19 pandemic is spreading globally with a worrying mortality rate. There is a crucial necessity for effective therapeutic approaches to fight potentially deadly complications. Unique medical features of severe COVID-19 include neutrophilia, and cytokine storm, besides acute respiratory distress syndrome and severe inflammatory syndrome. Here, we propose investigating the influence of SARS-CoV-2 infection on the cytokines profile of peripheral blood mononuclear cells (PBMC) and neutrophils in COVID-19 patients. This study examines PBMC and neutrophils as a potential target for the immunopathologic complications of severely ill COVID-19 patients.

Methods:
Neutrophils and PBMC were separated by density gradient sedimentation and stimulated with a mitogen. Culture supernatants from 100 COVID-19 patients and 100 sex and age-matched healthy control (HC) were evaluated for levels of Granulocyte-Macrophage Colony-Stimulating Factor (GMCSF), interferon (IFN)- α, IFN-γ, Interleukin (IL)-2, -4, -5, -6, -9, -10, -12, -17A, and tumor necrosis factor (TNF)-α by using the MACSPlex cytokine kit.

Results:
The PBMC cytokine profiles showed significantly lower mean values for IL-6 and IL-10 ($p < 0.0001$) of COVID-19 patients compared to HC. In contrast, COVID-19 patients showed higher mean levels of PBMC cytokine values for IL-5 ($p < 0.05$), and IL-17A ($p < 0.0001$). As for neutrophils, COVID-19 patients showed significantly lower mean values in the levels of GMCSF, IFN-γ, IL-4, IL-6, IL-9, IL-10, IL-12, IL-17A, and TNF-α ($p < 0.0001$).

Conclusions:
Our results suggest that SARS-CoV-2 infection brings about an immunomodulatory effect not only PBMC but also to a greater extent on neutrophils. Such studies may aid in finding novel targets for therapeutic interventions.

Key Words: COVID-19 ; Neutrophils; Cytokines;

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Anaesthesiology

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Percutaneous Dilatation Tracheostomy in Emergency Setting

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CASE REPORT

Background:
Emergency airway securing is crucial and one of the fundamental lifesaving skills. The scenarios of cannot-intubate and cannot-ventilate in critical patients may necessitate emergency surgical airway procedure (cricothyroidotomy or urgent tracheostomy) which mandate trained surgery team that may not be readily available to manage these sudden crises. There is paucity of literature data about the role of percutaneous dilatation tracheostomy (PDT) during these scenarios since introduced for the first time by Ciaglia in 1985. Nonetheless, the implementation of PDT as a routine bedside procedure for selected cases at intensive care units aided by flexible bronchoscopy settled since more than two decades. The bronchoscopy assistance during elective PDT could limit its possible complications but its role in emergency conditions is questionable.

Case Summary:
A 34-year-old male, with worsening dyspnea for 3 days (not respond to treatment) without chest pain presented to medical causality. The patient is a known case of type I diabetes mellitus, chronic heavy smoker and bronchial asthma (BA). The patient had a history of ICU admission with status asthmaticus with history of mechanical ventilation for one week in the last two months. Diagnosis on admission was severe exacerbation of BA. The current medication includes prednisolone methyl sulphate, Ipratropium bromide inhaler, salbutamol inhaler, budesonide nebulization, mucolytic syrup, insulin and antibiotic therapy. The patient got agitated, became hypoxic, and desaturated. The serial arterial blood gases showed gradual deterioration and the attending team decided intubation and mechanical ventilation. The patient sedated with ketamine, propofol, and succinyl choline to facilitate endotracheal intubation. Frequent trials of intubation failed to secure the airway despite use of small size endotracheal tube (ID 2.5) because of sever subglottic tracheal stenosis. The attending team decided to do emergency lifesaving PDT. The trained anesthesia team inserted size 7.0 tracheostomy tube via PDT technique within two minutes without real-time bronchoscopy guidance. The patient improved after securing the airway without procedure related complications and transferred to the ward on the next day in a stable condition.

Conclusion:
The emergency PDT in critical scenarios without bronchoscopy guidance could be feasible in short time and save of dangerous complications that may jeopardize the already critical situation

Key Words: Percutaneous Dilatational Tracheostomy; PDT; Emergency Percutaneous; Dilatational Tracheostomy;

Anatomy

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Periosteal ganglion cyst of the tibia related to pes anserinus: A case report

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CASE REPORT

Background: Ganglions are cystic lesions filled with gelatinous material and surrounded by dense fibrous tissue without synovial lining. They are classified into soft tissue (intra-articular and extra-articular), intraosseous and periosteal ganglions. Periosteal ganglions are rare, with only a few cases reported in the literature. The etiology remains unknown; however, repetitive trauma is speculated. The pathogenesis relates to mucoid degeneration of the periosteum of long bones, particularly the tibia. Their relation to the insertion of pes anserinus has been suggested but not proved yet. We present a case of periosteal ganglion cyst located on the tibia with its MRI showing its relation to pes anserinus and its histopathological and cytological features. Case

Case Summary: A 34-year-old man complained of painful swelling in his left leg that had been noted for one month after receiving a trauma. The swelling was not painful until he received a second trauma. Clinical examination showed a lobulated mass (4x4 cm) located at the junction of the upper and middle thirds of the anteromedial aspect of the left tibia. The mass was cystic in consistency and tender to palpitation. It was not attached to the overlying skin but appeared to be fixed to the underlying surface. No lymph nodes were palpable in the inguinal region. The results of hematological and biochemical laboratory tests were normal. Plain Xray showed no periosteal reaction or cortical erosion of the tibia. MRI showed a multilocular cystic lesion at the left tibia related to the insertion of pes anserinus. Through a transverse incision, the mass was exposed and felt underneath the periosteum. On exploration, there was no continuity of the lesion with the knee or the superior tibiofibular joints. The cyst was then incised, and the gelatinous material's retention and leakage were observed. The cyst wall was dissected carefully and completely excised with the overlying periosteum. The wound was sutured in layers. Histopathological and cytological examination confirmed the diagnosis of a periosteal ganglion in an atypical location. Three months later, the patient experienced pain located 10 cm proximal to the operation site, followed by recurrence of the same swelling 5 days later.

Conclusion: Periosteal ganglion cysts of the tibia are rare and are related to the insertion of pes anserinus. The inferior prolongation of the pes anserinus may play a role in the recurrence of the cyst after excision.

Key Words: Periosteal; Ganglion; Pes anserinus;

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Small Cell Neuroendocrine Carcinoma Of The Uterine Cervix: A Case Report Of Cytomorphology Using Liquid Based Cytology

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CASE REPORT

Background: Small cell neuroendocrine carcinoma of the uterine cervix is a rare and aggressive tumor with poor prognosis due to high frequency of lymph node involvement at an early stage. Cytological Liquid-based preparation of the PAP test procedure is performed routinely in out-patient clinics as a screening tool for HPV-related pre-cancerous lesions. It is here the first diagnostic test of a rare cervical tumor.

Case Summary: We present the liquid based preparation finding of cervical lesion from a 33 year old patient with a history of irregular vaginal bleeding. Diagnosed as small cell carcinoma of the cervix, we discuss the cytomorphological, histopathological and immunophenotypical findings with emphasis on specific cytomorphological characteristics and mimickers.

Conclusion: Liquid-based cytology can be the first line of tests for cervical non-squamous, non-HPV related malignant lesions, prompting an urgent biopsy to initiate treatment.

Key Words: Neuroendocrine carcinoma; Uterine cervix; Liquid based cytology;

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Cutaneous Sarcoidosis

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CASE REPORT

Background:
Sarcoidosis is a multisystem granulomatous disease of unknown aetiology. Cutaneous sarcoidosis is seen in up to one-third of patients and may be the first or the only clinical sign of the disease. We report a case of cutaneous sarcoidosis without systemic involvement. Lesions mimicked various other common dermatologic conditions. In this case we describe the clinical and histopathological findings of cutaneous sarcoidosis.

Case Summary:
A 31 years old Ethiopian female patient, presented with multiple asymptomatic lesions of 3 months duration over the face. There was no history of fever, joint pain, cough weight loss, eye complaints or any other systemic complaints. Past and family history was not contributory. There was no significant drug history. General physical and systemic examinations were normal. Dermatologic examination revealed multiple brownish papules all over the face, measuring 1-3 mm, mainly periorbital, perioral and, involving forehead. Some of the papules were coalescence together forming a patch. Lesions were non-tender. Palms, soles, hair, nail and mucosal areas were uninvolved. Ophthalmologic examination was normal. Skin biopsy revealed noncaseating granulomas involving the full thickness of the dermis. The granulomas predominantly composed of epithelioid cells, with Langerhan's giant cells and sparse lymphocytic infiltrate (naked granulomas).

Conclusion:
Sarcoidosis is a disease with multiple organs' involvement. Cutaneous manifestations of sarcoidosis are different and non-specific. The diagnosis is confirmed by the presence of non-caseating epithelioid granulomas in histological findings.

Acknowledgements:
This case was diagnosed in Asaad Alhamad Centre, and special thanks to Dr Humoud Alsabah who provided the histology report. This work was not funded by Kuwait University Research Sector.

Key Words: sarcoidosis; naked granuloma; Langerhan cells;

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A challenging diagnosis: Childhood Leukocytoclastic vasculitis

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CASE REPORT

Background:
leukocytoclastic vasculitis (LCV) is a rare cutaneous small vessel vasculitis, thought to be related to the presence of circulating immune complexes. Childhood LCV is mainly a histopathological diagnosis which is thought to be idiopathic in up to 50% of cases, but sometimes associated with certain antibiotics; infections; collagen-vascular disease; paraproteinemias; and rarely neoplasia. we hereby report a case of a child with bollous haemorrhagic LCV, emphasizing the clinical characteristic features and the management of this disease.

Case Summary:
A nine year old Indian girl presented with ten days history of papulovesicular itchy rash started on her feet then spread to her hips. The rash is painful affecting her movement and gradually produced blisters with bleeding and pus. She is known to be healthy and there was no history of fever, abdominal pain, or joint pain. she received Acyclovir and azithromycin with which the rashes worsen. She had similar event 5 years ago which resolved spontaneously. On examination a healthy obese very well girl with extensive papulovesicular haemorrhgic ulcerated and pustular purpuric rash mainly involving the lower limb but also extending to the trunk and the upper limb. No facial rashes and no mucosal membrane involvement. apart from a weekly positive antinuclear antobody (ANA),all other laboratory tests were negative. Immunofluorescent microscopical study of a skin biopsy showed granular deposition of IgG and IgM in dermal blood vessels confirming the diagnosis of LCV. Patient received IVIG but responded only on IV methyl prednisolone. Short course of oral methyl prednisolone was also given and the patient was free of new lesion within one month.

Conclusion:
Childhood LCV is a rare hypersensitivity vasculitis of small blood vessels of the skin secondary to an often unidentifiable cause. Skin findings of palpable purpura and/or petechiae particularly in the lower extremities with maculopapular ulcerated itchy lesions, that is sometimes haemorrhagic and may be bollous. diagnosis is confirmed by skin boiopsy of the lesion and exclusion of other commmon causes of vasculitis such as Henoch-Schönlein purpura (HSP). Glucocorticoids may be needed for patients with fulminant or progressive disease. Colchicine and dapsone may be used to treat severe recurrent or persistent skin lesions.

Key Words: Small blood vessels vasculitis; Hypersensitivity vasculitis; Cutaneous leukocytoclastic vasculitis;

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WOREE Syndrome: A case report from Kuwait

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CASE REPORT

Background:
WOREE syndrome (WWOX-related Epileptic Encephalopathy) is an autosomal recessive neurodevelopmental disorder characterized by intractable epilepsy and severe developmental delay caused by mutation in WWOX gene located on Chromosome 16 at band 16q23.1-q23.2. Recently, with availability of advanced genetic and molecular testing, the clinical data and the phenotypic spectrum of WWOX-related disorders has been well described. We hereby are reporting our experience with the first case diagnosed to have WOREE syndrome from Kuwait. This case report emphasizes the importance of whole exome sequencing (WES) test in patients with epileptic encephalopathy particularly in a society with high rate of consanguinity such as Kuwait.

Case Summary:
MH is the first child to a healthy young consanguineous parents. He is the product of full term normal delivery, birth weight 3.1 kg. At birth, he was noticed to have abdominal distension and poor feeding with bilious vomiting for which he was operated at one week of age. Presented to us at age of two months with severe constipation, failure to thrive, and repeated convulsions. The patient was managed symptomatically, started on antiepileptic medication but on follow up he continued to have intractable epilepsy, marked global developmental delay, severe constipation with abdominal distension. The patient was fully evaluated, inborn error of metabolism and congenital immunodeficiency were excluded. EEG showed abnormal focal epileptiform discharges. Repeated brain MRI demonstrated progressive brain atrophy. Since the patient was noticed to have facial dysmorphism WES study was performed for him revealing homozygous mutation in WWOX gene. Currently, the patient is two years of age, has global developmental delay, failure to thrive, intractable epilepsy, and severe constipation.

Conclusion:
WOREE syndrome has to be considered in the differential diagnosis in patients presenting with an early onset intractable epileptic encephalopathy, especially in consanguineous families. we recommend WES to be performed to all Kuwaiti patients presenting with early onset unexplained epileptic encephalopathy. Although currently there is no cure of WOREE syndrome, its diagnosis will empower treating physicians for parental counselling and family planning.

Key Words: Early onset epileptic encephalopathy,; WWOX mutation,; EIEE28 (Early Infantile Epileptic Encephalopathy).;

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Increasing trend of mixed infection of Plasmodium falciparum and Plasmodium vivax infections in non-endemic Kuwait

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CASE REPORT

Background:

Malaria is a protozoan infection of global public health concern with most burden experience in sub-Saharan Africa and Southeast Asia where the disease is endemic. Half of the world population - 3.9 billion people - in 91 countries or territories are still at risk of malaria. Malaria killed about 627,000 people and infected 241 million people in 2020, WHO. This represents about 14 million more cases in 2020 compared to 2019, and 69,000 more deaths. Malaria is the third highest infectious disease killer of children in the world. Every two minutes, a child under the age of five dies from malaria.

Case Summary:

Malaria was eradicated from Kuwait in 1963 and no autochthonous cases reported afterward. The cases reported after 1963 are imported among expatriates coming to live or work. We reported the incidence of imported malaria infection during 1992 -1996 and 2015 - 2019 and evaluated the impact of malaria preventive measures in Kuwait, a non-endemic country. The epidemiologic and demographic data of all malaria cases was collected from the Infectious Diseases Hospital, Kuwait where all suspected cases of malaria are referred for confirmation of diagnosis and treatment. Giemsa stained microscopy of thick and thin blood films was done to confirm the diagnosis of malaria species. Selected samples were retested with ICT Malaria rapid test and PCR assay to reconfirm the Plasmodium spp. During 5 years (1992 - 1996) 1,112(0.2%) cases and from (2015 - 2019) 1533 (26.17%) imported cases of malaria were detected, 81.5% were males. During (1992 -1996) the different species of malaria were detected as follows; Pf, 41.27%; Pv, 52.06% and mixed infection of Pf + Pv were 15.1% where as in 2015 - 2019) ; Pf, 25.17%; Pv, 4.43% and mixed infection of Pf + Pv were 69.8%. Only 18 cases reported among Kuwaiti nationals, all with a history of travel to African countries. The majority of malaria cases were detected during May and October.

Conclusion:

The most striking finding of this study was very high incidence of mixed infection with P. falciparum and P. vivax, with almost all (97%) cases among workers from India. The preventive department has been successful in evaluating the incidence of imported malaria infections in Kuwait. The increase in the mixed infection of P. falciparum and P. vivax has to be evaluated carefully to know the reasons of increase.

Key Words: Malaria; Plasmodium falciparum; Plasmodium vivax;

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Disseminated Histoplasmosis in an immunocompetent lady. The first reported case in Kuwait.

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CASE REPORT

Background: Histoplasmoasis is a fungal disease caused by Histoplasma capsulatum. It is AIDS defining illness, where it causes severe infection, but it can also infect healthy individuals though with mild disease. Histoplasmosis was once thought to be geographically restricted to America. With increased interest in epidemiology of fungal diseases and more advanced diagnostics, it became obvious that histoplasmosis is a global fungal disease. Some challenges that mask diagnosis include lack of awareness, clinical similarity with other common infectious diseases such as tuberculosis, and lastly technical difficulties in laboratory diagnosis of Histoplasma. Here, we describe, for the first time in Kuwait, a case of disseminated histoplasmosis in an immunocompetent individual.

Case Summary: A 52year old Bangladeshi lady had developed multiple head and neck swellings for 3 months duration, associated with fever, and weigh loss A fine needle aspirate from cervical lymph node revealed granulomatous lymphadenitis. However, pus culture did not show any bacterial or mycobacterial growth. Other laboratory investigations showed marked eosinophilia and high Ig E. Despite being empirically treated with 1st line anti-TB drugs, her swellings became deeply ulcerated and the scalp bone was slightly exposed. A new pus sample was sent to mycology reference laboratory, and subsequently, there was a growth in cultures after 10 days incubation, which was later identified as Histoplasma capsulatum var. capsulatum, based on typical microscopic morphology, confirmed by PCR-sequencing of rDNA. An MRI brain has showed multiple parenchymal abscesses. In addition, PET/CT scan has shown widespread bone involvement including skull, femur, ribs, iliac spine, and humeral head. Accordingly, patient received L-amphotericin B. As a result, she showed a remarkable improvement both clinically and radiologically. She was discharged home and continued he antifungal in form of oral voriconazole. On follow up visit, she was doing well and brain imaging revealed regressive course.

Conclusion: s: Histoplasmosis is underrecognized fungal disease especially in our region. It can mimic common infectious diseases such as tuberculosis. Failure to diagnose such disease can be fatal. Awareness of the epidemiology of histoplasmosis and its global distribution, and direct communication with clinical microbiologists facilitate early diagnosis.

Key Words: Histoplasmosis ; fungal ; Kuwait ;

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A rare case of cutaneous mucormycosis in a patient with Acute lymphoblastic leukemia

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CASE REPORT

Background: Mucormycosis is a rare highly aggressive fungal infection affecting the rhino-orbital, respiratory, gastrointestinal, skin and subcutaneous tissue. Primary cutaneous mucormycosis is often acquired by direct inoculation, contaminated dressings, surgery and burns.

Case Summary: A 54 year old male reported with loss of appetite, abdominal distension, bleeding gums and epistaxis of 15 days duration. He had no history of any other co-morbidities. Complete hemogram revealed bicytopenia and leukocytosis with around 90% circulating blasts. After evaluation, he was referred to Kuwait Cancer Control Centre. Bone marrow aspiration revealed 87% blasts, confirming acute lymphoblastic leukemia (ALL). As per protocol, chemotherapy was started for ALL. He was febrile and was started on IV meropenem. After one week, a nodular and painful lesion was noticed in the left forearm at the site of previous cannula. The surrounding area was erythematous and black, hence cellulitis was suspected. Punch biopsy revealed ulcer with granulation tissue. The patient continued to be febrile, for which vancomycin and voriconazole was added empirically. MRI revealed left forearm inflammatory process with features suggestive of bone involvement. There was dry gangrene on the lateral side of the left forearm. Urgent extensive desloughing and wound debridement was done. Tissue and bone were sent to microbiology laboratory for bacterial, fungal stains and culture. KOH stain was negative, the next day culture grew filamentous fungus which was identified as Rhizopus species. Histopathological examination of the debridement tissue showed numerous broad based hyphae, suggestive of mucormycosis. The patient was started on high dose of intravenous liposomal amphotericin B. Despite regular multiple debridements, the wound continued to worsen, with necrosis and sloughing of the surrounding tissues, hence amputation was planned.

Conclusion: Cutaneous mucormycosis is a rare but fulminant fungal infection mostly affecting immunosuppressed patients. Early diagnosis and prompt treatment proves beneficial to prevent mortality in this otherwise fatal disease.

Key Words: Mucormycosis; Acute lymphoblastic leukemia; Cutaneous;

Neurology/ infectious diseases

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Acute Disseminated Encephalomyelitis (ADEM) due to co-infection of human herpesvirus- 6: A case report of a child from Kuwait:

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CASE REPORT

Background: Acute disseminated encephalomyelitis (ADEM) is an inflammatory demyelinating disorder of the central nervous system of children occurs in relation to some infectious illnesses and immunizations. The role of human herpesvirus-6 (HHV-6) as a causative co-infection in children presented with multifocal neurologic disease and diagnosed to have ADEM is yet to be established. This case report demonstrates the diagnostic challenges and difficulties in managing post-infectious neurological syndromes (PINS) in an acutely sick child.

Case Summary: A two years old kuwaiti girl product of full-term normal delivery, known to be healthy with normal development. Presented with fever and inability to talk plus inability to walk. She is the second child a consanguineous parents. there is no family history of chronic, metabolic, or neurological diseases. On examination the patient was found to be encephalopathic, with generalized hypotonia, and brisk deep tendon reflexes. The CSF (cerebrospinal fluid) examination revealed 70 WBC, 50 RBC, 524 Protein, and 3.4 glucose(Blood Sugar at the time: 5.4).CSF also showed positive HHV6 virus PCR. CT brain reported as normal but MRI brain showed multiple hyperintense lesions in the cerebral white matter, thalami, brain stem, and spinal cord, consistent with the diagnosis of ADEM disease., the patient received intravenous Claforan/ Vancomycin, and Ganciclovir for 15 days. She also received IVIG 1gram/kg/day for 2 days, followed by IV methylprdnisolone 30mg/kg/day for 5 days, followed by oral steroids tapering dose. The patient showed marvelous response with no neurological sequel.

Conclusion:
This case is clinically compatible with ADEM disease. Diagnostic workup includes MRI brain demonstrating multiple hypo dense lesions confirming the diagnosis. In this immunocompetent child, the detection of HHV-6 DNA by polymerase chain reaction (PCR) in CSF, raised the possibility that ADEM is due to coinfection by HHV-6. Gancyclovir in addition to high dose intravenous corticosteroid led to a successful recovery of this patient. We assume that antiherpesvirus drugs has a role in the management of ADEM in children.

Key Words: Acute disseminated encephalomyelitis (ADEM); Post-Infectious Neurological Syndromes (PINS), ; Herpesvirus-6 (HHV-6);

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A Case of Discordant [F-18] FDG PET/CT and In-111 WBC SPECT/CT Scan Findings in Post-Traumatic Surgery of the Ankle. A Call for Judicious Use of [F-18] FDG PET/CT in Musculo-Skeletal Infection

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CASE REPORT

Background: [F-18] FDG (fluoro-deoxy glucose) PET/CT has been widely used for evaluation of tumors in terms of initial staging and follow up. Its use in non-neoplastic disease especially inflammation has been advocated and tried in various conditions such as vasculitis and sarcoidosis. Other inflammatory conditions such as abscesses and especially musculoskeletal affections seen in orthopedic settings have been rather inconclusive. The advantage of simple technique and high spatial resolution compared to radiolabeled white blood cell scans are beset by non-specific localization of [F-18] FDG in the involved tissue. A case of post-traumatic surgery of the right lower leg with persistent pus discharge from the foot that was evaluated with [F-18] FDG PET/CT then In-111 white blood cells emphasizes the judicious use of [F-18] FDG PET/CT in such cases and the resorting to more conventional imaging methods of bone and radiolabeled white cell scan to confirm the presence of infection and to localize it accurately.

Case Summary: A 41-year-old male who had a past history of RTA trauma to the right lower leg and surgical fixation of a tibiotalar fracture nearly 20 years before he presented with right lower leg pain, swelling and purulent discharge from the foot. [F-18] FDG PET/CT scan was performed for evaluation of active osteomyelitis versus a non-healed fracture. The scan showed areas of increased uptake in the soft tissues of the right ankle and adjacent of the hardware in place. Further evaluation of the above findings with an indium-111 labeled white blood cells showed focal localization of the radiotracer at the site of insertion of the hardware with no other findings as seen on the [F-18] FDG PETCT scan. Additionally, a focal collection of the WBCs was noted in the lower right abdomen denoting the presence of an intraabdominal abscess that was not seen on the PET/CT scan.

Conclusion: Accurate evaluation of musculoskeletal infection is done with imaging using In-111 WBC scan. The use of [F-18] FDG PET/CT can provide erroneous results due to its non-specific uptake in structures in the involved area such as muscles, inflammatory foci and tissue undergoing repair.

Key Words: [F-18] FDG; PET/CT; Radiolabeled white blood cells;

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Feasibility and Clinical Impact of 3D Computer Modeling in Preoperative Workout of Broken Ankle and Internal Fixation.

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CASE REPORT

Background: 3D computer modelling and printing has the potential for significant impact within the healthcare and has shown its value in several areas of medicine, including training and patient education to diagnostic and therapeutic applications; reduced procedure and theatre time. we used an innovative 3D computer modelling technology to reconstruct the details of trimalleolar fractures in a patient and evaluated its effectiveness in the surgical planning for the fracture repair time management.

Case Summary: A 54-year-old female admitted to the A&E -ADAN Hospital having a high impact trauma. Non-enhanced MDCT images of the left foot in bone algorithm, suggested comminute fracture involving the distal tibia and fibula with intra articular extension into tibio-talar articulation and osteoarthritis changes. A pixelated quantitative CT density map (QCTDM) using MATLAB of the left foot was produced for setting up accurate threshold values to generate a 3D model: bone (124-1626), soft tissue (-700-225), fat (-205- -51), compact bone (662-1626). The Materialize Mimics Care Suite were then utilized to generate an unrestricted 360 degree viewing model of the foot, in a virtual reality concept, to see through the extent of shattered ankle bone and its localization. A see-through 3D 360-degree cross section of the ankle clearly showed embedded broken pieces in the region of interest, enabled the surgeon to plan a direct approach to remove the broken bone in a minimal time planning. The QCTDM display provided a useful information as to where fixing screws be applied to avoid any loosening post internal fixation. The operative time was reduced by 50% due to sufficient preoperative observation and practice in a virtual reality concept and minimized exposure to anaesthesia procedures caused faster post-op recovery time.

Conclusion: The method provided preoperative global visualization, quantification for metal insertion and minimized the surgery time.

Key Words: Preoperative surgery; 3D visualization; Ankle ;

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Giant Cell-Rich Solitary Fibrous Tumor of the Lacrimal Gland with Prominent Angiomatoid Cystic Changes and an Underlying NAB2ex3-STAT6ex18 Fusion

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CASE REPORT

Background: Solitary fibrous tumor (SFT) is an uncommon neoplasm of mesenchymal fibroblastic origin known to arise at numerous anatomical locations. Giant cell-rich solitary fibrous tumor (GCR-SFT) is a rare variant of SFT with a predilection for the orbital region. GCR-SFT is notorious for its histological diversity and unpredictable clinical course. Accurate diagnosis is largely dependent on having a high index of suspicion and appreciation of the protean radiological and pathological features. Similar to conventional SFT, GCR-SFTs harbor NAB2-STAT6 fusions but seem to have more genetic heterogeneity. These tumors are richly vascular making them prone to bleeding and, therefore, may be difficult to manage surgically necessitating preoperative planning. Herein, we present a case of orbital GCR-SFT that was missed radiologically and histologically, culminating in suboptimal surgical removal.

Case Summary: A 47-year-old man presented with a right eye proptosis, associated with a protruding lesion, of several years' duration. The lesion had been slowly increasing in size over the years with recent acceleration in growth. MRI revealed a cystic-solid heterogeneous mass arising from the right lacrimal gland and displacing the eye globe. A biopsy was attempted but was unsatisfactory. The patient underwent surgery to excise the mass, but due to the unanticipated hypervascularity the tumor started to bleed intraoperatively hindering its complete removal. Upon histopathological evaluation of the excised specimen, a vascular neoplasm was suspected initially. The diagnosis of GCR-SFT was eventually made following careful evaluation and demonstration of CD34 and STAT6 expression on immunohistochemistry. Molecular studies revealed a pathognomonic but rare NAB2ex3-STAT6ex18 fusion variant as well as a TP53 mutation suggestive of an aggressive phenotype. The patient had a complete resolution of the proptosis but the clinical picture remains guarded due to the incomplete resection.

Conclusion: This report raises awareness to this unusual tumor among radiologists/ ophthalmologists/ pathologists and provides insight into the molecular genetics underlying it. GCR-SFT should be considered in the differential diagnosis of any cystic orbital lesion mimicking a vascular neoplasm. Complete surgical excision may potentially be hindered by profuse intraoperative bleeding necessitating preoperative embolization.

Key Words: Solitary fibrous tumor; Giant-cell rich; Lacrimal gland;

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Fine Needle Aspiration Cytology of Osteoclast-like Giant Cell Tumor of Liver- A Case Report With Review Of Literature.

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CASE REPORT

Background: Osteoclast like giant cell tumor (OGCT) of the liver is reported with or without the presence of hepatocellularcarcinoma or cholangiocarcinoma or a cystadenocarcinoma. Very few cases of OGCT without a mixed history have been reported. A review of the literature revealed only seven cases of OGCT of the liver without a mixed histology. We report a case of OGCT on endoscopic ultrasound guided (EUS) guided fine needle aspiration (FNA) in a 64-year-old female. To the best of our knowledge, this is the first case reported in English literature.

Case Summary: A 64-year-old woman with a past medical history of hypertension and dyslipidemia presented with mild intermittent abdominal pain associated with nausea at the Mubarak Al-Kabeer hospital, surgical outpatient department. Computed tomography (CT) scan showed a heterogeneous focal mass measuring 11x7cm occupying the 4th and 5thsegments of the liver with areas of necrosis and prominent vessels passing through it. The mass infiltrated the gallbladder wall. There was a lesion measuring 2.5 x1.6 cm seen within the gall bladder lumen along with suspicious looking lymph nodes in the porta hepatis. A EUS guided transgastric FNA showed clusters and sheets of pleomorphic cells with round to oval to spindly nuclei having irregular nuclear outline prominent nucleoli and moderate cytoplasm. Numerous multinucleated osteoclasts like giant cells and atypical mitotic figures were noted. The immunocytochemical study done on cell block showed that the tumor cells stained positive for vimentin and negative for PAN-CK,CEA, CD117,HMB45, Hep Par-1, CD31, CD34, CD45, Desmin and Chromogranin. Ki67 was positive in 70% of the cells. A diagnosis of Osteoclast like giant-cell rich sarcoma was made. Liver biopsy showed malignant giant cell rich hepatic tumor favoring an OGCT with no evidence of epithelial differentiation.

Conclusion: We report a rare case of aggressive malignant OGCT without mixed histology in the liver along with the review of all seven cases in the literature. The present case is noteworthy because of rapid and early diagnosis on EUS guided FNA along with immunocytochemistry which was subsequently confirmed on histopathology.

Key Words: Osteoclast like giant-cell tumor; Liver; Fine-needle aspiration cytology;

Pathology

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Cholangiocarcinoma: A diagnostic dilemma on cytology

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CASE REPORT

Background: Cholangiocarcinoma is a relatively rare form of adenocarcinoma which may resemble adenocarcinoma of pancreatobiliary origin or adenocarcinomas from many other sites in the body. As a result, its diagnosis relies mainly on clinical history and morphology.

Case Summary: A 64-year-old male with cirrhosis and worsening liver failure underwent fine needle aspiration of a radiologically detected liver mass. Cytological material showed a monomorphic population of cells arranged singly and in clusters, reminiscent of a neuroendocrine tumor(NET). Cell block morphology added to the diagnostic dilemma by showing a delicate vasculature among the tumor cells. Immunohistochemistry on the cell block revealed that cells were positive for CK7 and CK19 and negative for synaptophysin and chromogranin, thereby pointing towards a pancreatobiliary origin for the tumour and excluding a NET.

Conclusion: In the case of liver aspirates, even when encountering confusing morphological entities, it is imperative to keep in mind the possibility of a rare neoplasm such as cholangiocarcinoma. In the absence of core needle biopsy, cell block sections prepared from aspirated material can provide appreciable immunohistochemistry resultsto resolve the diagnostic dilemma.

Acknowledgements: I would like to thank the Department of Cytopathology, Mubarak hospital for helping me in finalizing this article.

Key Words: cholangiocarcinoma ; endoscopic ultrasound guided aspiration cytology; Neuroendocrine tumour;

Pediatrics

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Interstitial Deletion of 3q21 in a Child with Multiple Congenital Anomalies; Expanding the Phenotype

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CASE REPORT

Background:
Interstitial deletions in the long arm of chromosome 3 although relatively rare, have been reported to be associated with several congenital anomalies and developmental delays. Around eleven individuals with interstitial deletion spanning the region 3q21 have been reported with overlapping phenotype, including craniofacial dysmorphism, global developmental delay, skeletal manifestations, hypotonia, ophthalmological abnormalities, brain anomalies (mainly agenesis of corpus callosum), genitourinary tract anomalies, failure to thrive and microcephaly.

Case Summary:
We present here a male individual from Kuwait with a 5.438Mb interstitial deletion of the long arm of chromosome 3 (3q21.1q21.3) detected on chromosomal microarray with previously unreported features including feeding difficulties, gastroesophageal reflux, hypospadias, abdomino-scrotal hydrocele, congenital anomalies of the kidney and urinary tract, kidney disease, transaminitis, hypercalcemia, hypoglycemia, recurrent infections, inguinal hernia and cutis marmorata.

Conclusion:
Our report expands the phenotype associated with 3q21.1q21.3 while summarizing the cytogenetics and clinical data of the previously reported individuals with interstitial deletions involving 3q21, providing a comprehensive phenotypic summary. It also emphasizes the importance of chromosomal microarray analysis as a first tier testing in evaluating dysmorphic child with developmental delay and multiple congenital anomalies. Reaching a molecular diagnosis in such case has facilitated the understanding of the disease mechanism and helped in providing an adequate management plan.

Key Words: chromosome 3; interstitial deletion, microarray ; congenital anomalies, dysmorphism;

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Disseminated BCG disease in an infant with severe combined immunodeficiency

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CASE REPORT

Background: BCG is a live attenuated vaccine that protects from miliary tuberculosis and tuberculous meningitis. Severe combined immunodeficiency (SCID) is the most severe form of primary immunodeficiency characterized by block in T-lymphocyte differentiation associated with abnormal development of other lymphocyte lineages i.e., B and NK lymphocytes. Patients with SCID are predisposed to live attenuated vaccines related complications, especially BCG leading to disseminated disease (BCGiosis). We report an infant presented with persistent fever, weight loss & anemia. He received BCG vaccine at 3 months of age. He was diagnosed as SCID with BCGiosis. The case highlights the possible risk of such rare lethal complication of BCG & emphasizes the need for neonatal screening for SCID.

Case Summary: A 7 months old boy born to non-consanguineous parents with positive family history of immunodeficiency. He was admitted with 23 days history of fever which did not respond to multiple oral antibiotics. There was no history of skin rash, abnormal movements, cough, vomiting or loose motions. There was no history of raw milk ingestion, travelling abroad or contact with sick patients. On examination he was vitally stable, hydrated, pink in RA with no respiratory distress or dysmorphism. His growth parameters on the 10th centile. He had mild hypotonia & hepatosplenomegaly. Septic work up was normal including blood, urine and CSF cultures. CBC showed lymphopenia with normocytic anemia. Immunology work up showed very low IgG with absent T & B Cells by lymphocyte phenotyping, giving the picture of SCID. The boy started monthly IVIG plus septrin and fluconazole prophylaxis till arranging hematopoietic stem cell transplantation (HSCT). The fever persisted & CT chest and abdomen showed pericardial effusion, moderate ascites and multiple micro-abscesses in the liver and lung bases with hepatosplenomegaly. He was started on anti-TB therapy including isoniazide, rifampicin, ethambutol and Moxifloxacin with marked response in his fever and general condition.

Conclusion: BCG disease is an important presentation of primary immunodeficiency, especially SCID after BCG vaccine. Neonatal screening should be considered to avoid late diagnosis of SCID and organ damage. We recommend delaying BCG vaccine to be after 6 months of age especially for those with family history of immunodeficiency or recurrent infections.

Key Words: tuberculosis; disseminated; vaccine;

Pediatrics

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Type 1 Diabetes (T1D) Onset and COVID-19 Infection in a Child with Sanjad Sakati Syndrome: A case From Kuwait

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CASE REPORT

Background:

Sanjad Sakati Syndrome (SSS) is an autosomal recessive multisystem disorder characterized by hypoparathyroidism, growth and mental delay, and hypocalcemia seizures. It has not been linked with autoimmune disorders such as Type 1 Diabetes (T1D). Viral infections may play a role in triggering the development of T1D. Contracting the SARS-CoV-2 virus may induce an autoimmune response by damaging the pancreatic β cells and accelerating the onset of T1D (1). To the best of our knowledge, no case studies of SSS have been reported to develop T1D. The aim of this report is to describe a child with SSS who was newly diagnosed with T1D and SARS-CoV-2 infection (COVID-19). Data on the patient were extracted from the Childhood-Onset Diabetes electronic Registry(CODeR)

Case Summary:

The child was diagnosed early in life with SSS by tubulin-specific chaperone E (TBCE) gene mutation. The child is under multidisciplinary care and managed by alfacalcidol treatment. In May 2021, she presented with a history of fever, cough, polyuria, polydipsia, and poor appetite. On investigations, random blood sugar level was 22 mmol/l and HbA1c level was 10%. There was no evidence of diabetic ketoacidosis. Autoantibodies to glutamic acid decarboxylase (GAD), islet cell antibody (ICA), and thyroperoxidase antibodies were positive. Serum insulin and c-peptide levels were low (2.03 uiu/ml, 28 pmol/l respectively). Thus, a T1D diagnosis was made, and insulin therapy was started. No family history of diabetes was reported. On admission, the child tested positive for SARS-CoV-2 PCR and has positive contacts with family members with COVID-19 infection. As per WHO COVID-19 infection severity criteria, the child's condition was classified as mild. She was discharged home with no short-term sequelae of COVID-19 infection; diabetes and dietary education were provided.

Conclusion:

To the best of our knowledge, this is the first case reported in the literature of a patient with SSS and presented with T1D onset along with COVID-19 infection. Viral infections such as the SARS-CoV-2 virus may trigger the development of autoimmune diseases such as T1D. Exploring the relationship between COVID-19 infection and T1D onset is needed to better understand the effect of COVID-19 infection and outcome on pediatric patients with comorbidities.

Funding:
Ministry of Health MoH Ref# (1569/2020) & Kuwait Foundation for the Advancement of Sciences RA 2011-006

Key Words: type 1 diabetes ; children ; SARS-CoV-2 virus ;

Pediatric Neurology

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COG6- congenital disorder of glycosylation is associated with Arthrogryposis: A Case Report

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Background:
Golgi apparatus (GA) is an intracellular membrane-bound organelle consisting of five to seven flattened interconnected cisternae. The GA glycosylates proteins and lipids received from endoplasmic reticulum before exporting them to their targets. Consereved oligomeric Golgi (COG) complex is a hetero-octameric complex essential for GA intracellular transport capacity. COG consists of eight proteins subdivided into two subcomplexes: lobe A (COG1-4) and lobe B (COG5-8). Deficiency in COG6 is associated with two disorders inherited as autosomal recessive traits: Shaheen syndrome (MIM:#615328), characterized by syndromic intellectual disability, and congenital disorder of glycosylation (CGD) type Ill (COG6-CGD; MIM:#614576), characterized by severe multisystemic involvement. Twenty-three COG6-CDG cases are described to date and arthrogryposis is a rarely-reported feature. Here we report a Kuwaiti female with COG6-CDG and arthrogryposis due to a novel COG6 variant.

Case Summary:
The subject was female born at preterm to first degree-cousin consanguineous cousins. Prenatal course was complicated by intrauterine growth restriction. Examination after birth showed microcephaly (SD < -2), severe talipus equinevarus, clenched hands, arthrogryposis, hypotonia, dysmorphic facial features and ambiguous genital. Brain MRI showed brain atrophy. Course was complicated by failure to thrived. She died at age 2 months due to respiratory failure. cES identified a novel homozygous COG6 nonsense variant [c.1884T>G; p.(Tyr628Ter)] segregating with the phenotype. The variant was absent from internal and public control (GnomAD v2.1.1) databases, predicted deleterious by in silico, and had a CADD score of 36.

Conclusion: s
Our case expands COG6-CGD genotypic and phenotypic spectrum and suggest it should be considered in the differential diagnosis of arthrogryposis and ambiguous genitalia.

Key Words: Genetic disorder; Congenital Disorders of Glycosylation; Arthrogryposis;

Funding Agency: N/A

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Bilateral femoral nerve neuropathy due to psoas hematomas occurring during ECMO for COVID-19 ARDS: first reported case

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CASE REPORT

Background:
Literature have been growing rapidly ever since the Coronavirus disease (COVID-19) causing virus emerged in 2019. Over the last two years more and more is being learnt about this illness. Although COVID-19 is well known for its pulmonary manifestations, the extrapulmonary manifestations are being still being characterized. Systems affected include but are not limited to the cardiovascular, renal, gastrointestinal, and neurologic as well as ocular and dermatologic manifestations. Neurological manifestations, both central nervous system (CNS) and peripheral nervous system (PNS) disorders were reported in association with COVID-19. CNS manifestations include strokes and meningoencephalitis while the PNS manifestations include Guillain-Barre syndrome and peripheral mononeuropathies. Multiple mechanisms have been associated with these manifestations. They can occur as a result of the illness itself or present as a complication of it. In this paper we aim to present a patient with bilateral femoral nerve neuropathy occurring in associated with COVID-19 ARDS secondary to psoas hematomas.

Case Summary:
A 41 year old known diabetic and asthmatic was diagnosed with COVID-19 pneumonia. His condition deteriorated rapidly as he developed acute respiratory distress syndrome. He required to be mechanically ventilated and he eventually required extracorporeal membrane oxygenation. During his intensive care unit (ICU) stay, he developed hemoglobin drop which prompted imaging. His CT abdomen and pelvis demonstrated the development of bilateral psoas hematomas, which were treated conservatively. He had a prolonged and complicated course in the ICU. He was discharged after spending 39 days in the ICU. He was alert and consciousness on discharge and was complaining of weakness of both upper and lower limbs as well as numbness affecting the ventral aspect of the entire lower limb. He was thought to have critical illness neuropathy and was referred to our side for rehab. On electrodiagnostic testing, he was found to have bilateral femoral nerve neuropathy, likely due to the hematomas developed during his ICU course.

Conclusion:
Much attention has been given to the thrombotic complications of COVID-19, however hemorrhagic complications are also life-threatening and associated with lifelong disability. Care should be taken to detect and possibly actively manage hematomas especially if they occur around the course of nerves.

Key Words: Femoral; Neuropathy; COVID-19;

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Post COVID-19 large vessel Ischemic stroke in 15-year-old patient.

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CASE REPORT

Background:
There is increasing evidence in literature that Coronavirus disease (COVID-19) is associated with large vessel strokes among patients younger than 50 years with no previous vascular risk factors. The state of hypercoagulability in patients affected by COVID-19 favors the formation of small and/or large blood clots in multiple organs, including the brain, potentially leading to cerebrovascular disease.

Case Summary:
We present here a case of a previously healthy 15-years old schoolgirl who developed right hemiplegia following a posterior circulation ischemic stroke on 6/3/2021. She tested positive for COVID -19 infection without displaying any symptoms of active COVID-19 infection at the time of the stroke. She did not have any cardiac/cerebrovascular risk factors. Thrombophilia and vasculitis screening tests were negative. MRI brain showed acute infarcts in pons and left cerebellar hemisphere and CT angiogram of cerebrovascular system
showed occluded left vertebral and basilar arteries. She underwent a comprehensive rehabilitation program in Physical Medicine and Rehabilitation Hospital and showed significant neurological recovery within a period of six months post stroke. At the time of discharge, she was able to walk unaided and became independent in all activities of daily living.

Conclusion:
The young age of the patient and the absence of cerebrovascular risk factors make the present case unique and interesting as it can help demonstrate that COVID-19 is an independent risk factor for acute ischemic stroke. Hence the treating physician should have a high index of suspicion for stroke when confronted with persons presenting with neurological deficits post COVID infection and carry out the appropriate investigations.

Key Words: Stroke; COVID-19; Cerebral infarction, hypercoagulabilty;

Urology

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Inflammatory myofibroblastic tumor of the urinary bladder

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CASE REPORT

Background:
Inflammatory myofibroblastic tumor (IMT) is a rear benign reactive proliferation of myoblasts that may present as bladder mass. IMT occurs mainly in the lungs, but it can also be found in the head and neck soft tissue, abdominal cavity, omentum, retroperitoneum, and other organs. This disease shows a diagnostic dilemma for both the urologists and pathologists because of the histological features often mimic those of malignant neoplasm and the clinical course is benign; the tumor grows slowly and does not metastasize or undergo malignant transformation, its morphologically, clinically and radiologically difficult to distinguish it from other malignant neoplasms.

Case Summary:
A 53-year old male presented to the emergency department by frank painless hematuria with passage of blood clots of two days duration. Hematuria was associated with dysuria, frequency and weak interrupted urinary stream. Patient was known to have benign prostate hyperplasia and on alpha one adrenergic blocker. Digital rectal examination revealed mild prostatic enlargement with benign feeling. His PSA was 10.3 ng/ml. Ultrasound done for the patient, but it was suboptimal. The hematuria continued and did not improved, so urgent cystoscopy was considered, which revealed large bladder mass in the right bladder wall encroaching on the anterior wall, trans-urethral biopsy and hemostasis ware carried out. The histopathology report concluded with favor the diagnosis of inflammatory myofibroblastic tumor. Immediately post-operative, hematuria persisted in spite of continuous bladder irrigation and more drop of hemoglobin occurred. A second look cystoscopy was carried out after two days and trans-urethral resection of most of the mass was done with good hemostasis. After three days CT abdomen and pelvis revealed diffuse bladder wall thickening (14.6 mm) less prominent in the left wall with residual bladder mass. After the second trans-urethral resection of the bladder mass, the urine became clear and his low hemoglobin was corrected by blood transfusion. The patient did well post-operatively and was discharged with follow-up, which was scheduled for him.

Conclusion:
Inflammatory myofibroblastic tumor is a rare disease of the urinary bladder, where further research is needed to establish a correct diagnosis of this lesion, which has a varying biological potential. Also it is important to study the efficacy of different therapeutic options and prognostic pattern of the disease.

Key Words: Inflammatory myofibroblastic tumor; hematuria; bladder;

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