ABSTRACT BOOK

Under the Patronage of the President of Kuwait University

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Conference Program

Wednesday 12th February 2025	**Poster Viewing and Oral Presentations**
Inauguration of the poster conference College of Medicine Lobby	
10.00	**Registration and ID Collection of Presenters**
10:30-11:45	**Poster Viewing & Discussion** Scientific and Judging Committee members will be reviewing the posters on the floor.
12:00-1:15	**Oral Presentations for finalists: HSC Auditorium** Announced finalists will present their poster abstracts in a series of 5-minute oral presentations.
Thursday 13th February 2025	**Keynote Address and Award Ceremony** **HSC Auditorium**
9:30	**Opening Remarks**
9.40	**Welcome Remarks** Vice Dean of Research and Postgraduate Studies Dr. Heba Al Hussaini
9:50	**Keynote Lecture** **Prof. Dr. med. Frank Winkler, MD** Department of Neurology, University Hospital Heidelberg & National Center for Tumor Diseases and Experimental Neurooncology Unit, German Cancer Research Center, Heidelberg, Germany **Title:** **Cancer Neuroscience of Brain Tumors: A New Hallmark of Cancer and a New Pillar of Therapy**
10:50	**Winner Announcement & Distribution of Awards** - Abstract winners - Art competition winners
11:50	**Closing Remarks** **Dr. Rola Ali, Chairperson of the HSC Conference Committee**
12:00	**Opening of the Scientific Poster Presentations**

HSC Conference Central Committee 2025

Central Committee

Dr. Heba Al Hussaini	Vice Dean for Research & Postgraduate Studies, College of Medicine
Dr. Rola Ali	Chairperson, Department of Pathology, College of Medicine
Dr Maryam Al-Qabandi	Director, Centre for Research Support and Conferences, COM
Dr. Danah Al-Tarrah	Department of Public Health, College of Public Health
Dr. Sonia Alhashimi	Department of Anatomy, College of Medicine
Ms. Teena Sadan	Centre for Research Support and Conferences, COM

Scientific Committee

Dr. Rola Ali – Chairperson	Department of Pathology, College of Medicine
Dr. Sulava Malatiali	Department of Physiology, College of Medicine
Dr. Khalid Siddiqui	Department of Biochemistry, College of Medicine
Dr. Reem Al Sabah	Department of Community Medicine, College of Medicine
Dr. Sampath Madhyastha	Department of Anatomy, College of Medicine
Dr. Fatemah Safar	Department of Physiology, COM
Dr. Hind Al Sarhan	Department of Pediatrics, College of Medicine
Dr. Nada Madi	Department of Microbiology, College of Medicine
Dr. Shaima M. Karam	Department of Pharmacology, College of Medicine
Dr. Maysoun Al-Rushood	Department of Pediatrics, College of Medicine
Dr. Afrah Al-Kazemi	Department of Pharmacy, College of Pharmacy
Dr. Yousef Abbas Ali Marwan	Department of Surgery, College of Medicine
Dr. Kawthar Ali	College of Dentistry
Dr. Danah Al-Tarrah	College of Public Health
Dr. Ahmed Al Enezi	College of Allied Health
Dr. Shorouk Dannoon	Department of Nuclear Medicine, College of Medicine
IT Support & Website	
Ms. Ashwaq Derie	DEPT. of Systems Development, Center of Information Systems, KU

Address of Vice-Dean for Research and Post-Graduate Studies, College of Medicine

It is with great pleasure to welcome you all to the 29th Health Science Center Conference, which has become a cornerstone of research innovation and knowledge dissemination in medical advances and health sciences.

This year, our conference has reached new heights, with an impressive total of 180 submitted abstracts. Among these, 151 showcase groundbreaking original research, while 29 are intriguing case reports.

We take immense pride in the awards presented at our conference, which have gained widespread recognition over the years. Each award is a testament to the dedication and brilliance of local and Gulf region researchers. The awards we present today acknowledge individual achievements and highlight the collective effort that drives our field forward.

As we gather here to celebrate excellence in research, let us not forget the core of our conference – the collaborative spirit that fuels advancements in clinical and health science research.

To all attendees, I extend my gratitude for your presence and participation. Let us engage in fruitful discussions, foster new collaborations, and share insights that will propel medicine and health sciences to greater achievements. Just as a final word and a humble reminder that the impact of our research extends far beyond this conference; it resonates in the lives of those we serve and it is through the exchange of ideas and knowledge that we can truly make a lasting impact on healthcare and our nation.

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

Chairperson, Message (Dr Rola H. Ali)

On behalf of the Organizing Committee, it is my great pleasure to welcome you to the 29th Health Science Center Poster Conference. This annual event remains an important platform for showcasing the scientific work produced by our academic institution, with valuable contributions from the Ministry of Health and other collaborators.

This year, we are excited to introduce several positive changes aimed at further enhancing the conference experience. Notably, we have implemented a formal poster viewing session and an oral presentation session for the finalists, offering an opportunity for more in-depth engagement with their research.

We are particularly honored to have Prof. Dr. Frank Winkler, an award-winning clinician and scientist from the Department of Neurology, University Hospital Heidelberg, Germany, as this year's keynote speaker. Dr. Winkler has graciously accepted to deliver the keynote lecture titled, "Cancer Neuroscience of Brain Tumors: A New Hallmark of Cancer and a New Pillar of Therapy." His pioneering work in this area promises to be both informative and inspiring.

For the second consecutive year, we are proud to host a scientifically themed art exhibition, continuing to bridge the worlds of science and creative expression. This exhibition offers a unique perspective on the intersection of science, art, and human experience, and we encourage all attendees to explore its thought-provoking displays.

We hope this year's conference will be a productive and intellectually stimulating experience for all participants.

Thank you

Dr. Rola H. Ali, MD FRCPC
Chairperson, 29th HSC Poster Conference Organizing Committee

Keynote Speaker

Prof. Dr. med. Frank Winkler, MD
Experimental Neurooncology Unit, German Cancer Research Center Heidelberg, Germany
&
Department of Neurology, University Hospital Heidelberg & National Center for Tumor Diseases, Heidelberg, Germany

Professor Frank Winkler is a managing senior physician in the Department of Neurology at the University of Heidelberg and group leader at the German Cancer Research Center. He studied medicine in Hamburg, Freiburg and London, specialized in Neurology at the LMU Munich, spent a 2 year postdoc at Harvard, and was appointed to Heidelberg in 2010. Dr Winklers' work has been published in Nature, Cell, Nature Medicine, Cancer Cell. In 2022 he received the German Cancer Award.
His work focuses on the interaction of the nervous system with cancer, pioneering the field of Cancer Neuroscience, and launching investigator-initiated trial concepts.

Keynote Address

Cancer Neuroscience of Brain Tumors: A New Hallmark of Cancer and a new Pillar of Therapy

Prof. Dr. med. Frank Winkler, MD

Department of Neurology, University Hospital Heidelberg & National Center for Tumor Diseases, Germany; Experimental Neurooncology Unit, German Cancer Research Center, Germany

Abstract: The nervous system has profound influences on cancer. Tumor initiation, growth, dissemination, and resistance against esblished therapies is governed by neural influences. In this talk, I will cover the state-of-the-art of Cancer Neuroscience, and present own published (Osswald et al., Nature 2015; Venkataramani et al., Nature 2019; Venkataramani et al., Cell 2022; Hausmann et al.,. Nature 2023; Messmer et al., Immunity 2024) and unpublished data on how neural influences impact primary and metastatatic brain tumors. The lecture will be of interest for Oncologists, Cancer Researchers, Physicians working in Neuromedicine, Neuroscientists, Students of all biomedical specialities and natural sciences, and quite broadly for many related areas.

180 Poster Presentations & Award Winners

Compete to win Award Categories

- *Dr. Nael Al-Naqeeb Award for Undergraduate Research*
- *Graduate Research Award for Master's Program*
- *Graduate Research Award for PhD Program*
- *Graduate Research Award for Medical Residents*
- *Researcher Award for Basic Sciences*
  (Non-Academic, Assistant Professor, Associate Professor)
- *Researcher Award for Clinical Sciences*
  (Non-Academic, Assistant Professor, Associate Professor)
- *Case Report Award (Registrar, Clinical Academic, MOH Doctors)*

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Online Registration for CME Credits
Category 1: 5 Credits; CME/CPED Reg. No. Reg. No. 006957 / IMEl / Feb25;
Online Registration for CME:
https://bit.ly/PC2025CMERegistration

www.hsc.edu.kw/poster

Past HSC Poster Conference Keynote lectures and Speakers

2024	The Candida Vaccine: From Bench to Bedside; Professor Ashraf S Ibrahim; Professor of Medicine, David Geffen School of Medicine at UCLA, Division of Infectious Diseases, Department of Medicine, Harbor-UCLA Medical Center
2023	Why can we expect a revolution in obesity treatment?; Professor Carel le Roux; Co-Director Metabolic Medicine lab; Diabetes Complications Research Centre, Conway Institute, University College Dublin
2022	**Keynote Lecture 1:** Human iPSC-NSC derived Extracellular Vesicle therapy for Alzheimer's Disease: Promise and Challenges; **Prof. Ashok K. Shetty**, Ph.D., Institute for Regenerative Medicine, Dept of Molecular and Cellular Medicine, College of Medicine, Texas A&M University **Keynote Lecture 2:** Biology or technology? Innovation is the key; **Prof. Pieter A. Doevendans**, Cardiologist UMCU, Utrecht, The Netherlands; Director Netherlands Heart Institute
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 aging. **Prof. 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 Environmental 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

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Barkhan SM*, Alfadhli SM: Assessing DNA Extraction Methods for Effective HPV Detection in FFPE Cervical Cancer Samples

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Abed BS*, Al-Onaizi M, Rawan Kittaneh, Al-Hussaini H: Exploring the Effects of Tempol in Diabetes Induced Retinopathy.

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Abed BS*, Leora D'Souza, Al-Onaizi M, Jeffery G, Al-Hussaini H: Examining the Effects of Long-Term Exposure to Blue Light on Insulin Resistance and Fat Distribution.

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Alduhaimi WY, Abdulrasoul ZS*, Alenezi ET, Alhasawi MN, Albaghli SH, Altarrah DK, Alonaizi MA: The Prevalence of Mild Cognitive Impairment in Patients with Type 2 Diabetes Mellitus: A Systematic Analysis

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Al-Shaheen MH*, Braysh K, D'Souza L, Al-Onaizi MA: Estrous Cycle Characterization in an Alzheimer's Disease Mouse Model: Implications for Cognition

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Behzadi AA *, Alanazi HM, Bakhsh HF, Ibraheem ZA, D'Souza L, Al-Onaizi M: Establishing and Characterizing a Dual-Genotype Mouse Model for Investigating Neuroinflammation and Metabolic Dysfunction in Alzheimer's Disease and Diabetes

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D'Souza L*, Braysh K, Williams MR, Alzaid F, Al-Onaizi M: Metabolic Dysfunction and Tau Pathology: Insights from Genetic and Diet-Induced Models of Diabetes-Associated Dementia

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Eldesouqi SI*, D"Souza L, Alzaid F, Al-Onaizi M: Characterization of Microtubule Dysfunction Associated with Alzheimer's-like Pathology in Mouse Models of Impaired Glucose Metabolism

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1

The Effect of Fatigue on Static and Dynamic Balance in Healthy Young Male Athletes

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Introduction:
Background: Balance is an integral part of any athletes' performance and their ability to be safe during athletic endeavours. Although many studies examined this phenomena, there is a lack of consensus on the issue. Objective: The aim of the study is to assess the effect of running fatigue protocol, on static (SB) and dynamic balance (DB) abilities using Wii balance board (WBB) and Y-balance (YB) tests, respectively, in young male recreational athletes.

Methods:
Young male recreational athletes were recruited and randomized into control and experimental groups. Both groups were examined on static and dynamic balance twice (pre- & post-tests). Then, the experimental group went through a fatigue protocol, in which speed and incline increase one unit each minute passing, and stopped when rate of perceived exertion level reached ≥ 18, and the plasma lactate level differed from the baseline by ≥ 4mmol/L.

Results:
Forty male recreational athletes aged between 18-22 years old participated in the study (experimental group, n=20; control group, n=20). Between groups analysis showed that the control group scored significantly higher score on YB, however, the experimental group scored significantly lower on WBB in all conditions. Regression analysis revealed that, for every one unit increase in SB score, plasma lactate levels will decrease by 0.051 (5.1%).

Conclusions:
Reduced performance on both static and dynamic balance tests after a treadmill running fatigue protocol was observed in recreational young male athletes, measured by RPE and plasma lactate level, compared to randomly-assigned control group of their peers.

Key Words: Balance; Fatigue; Athletes;

Funding Agency: None

2

Factors Affecting Job Satisfaction Among Diagnostic Radiographic Technologists in Kuwait: Quantitative Research Study

Al-Qattan E, Al-Hamad H, Khalaf A, Saeed R, Akhtar N
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Introduction:
Literature showed that job satisfaction (JS) plays an important role in the retention of employees. The main factors that affect the JS include 9 components: pay, promotions, supervision, fringe benefits, contingent rewards, operating conditions, co-workers, nature of work, and communication. This study aimed to determine the factors that affect the JS among diagnostic radiographic technologists (DRTs) in Kuwait.

Methods:
The questionnaire was validated and designed by Paul E. Spector (JS-2) and has been widely used in healthcare studies.The research utilized a quantitative approach. A questionnaire study, which consisted of 32-questions, distributed electronically to the technologists in all public Kuwait's hospitals, and the responses were collected and statistically processed.

Results:
A representative sample size of the DRTs was 314, Fifty-one percent (51%) were satisfied, 37% were neutral, and 11.6% were dissatisfied. Nine domains were analyzed, and it was found that nationality, gender, and education significantly impacted satisfaction levels whereas non-Kuwaiti, males, and graduates with B.Sc. showed higher levels of satisfaction ($p<0.05$).

Conclusions:
The general Satisfaction among the DRTs in the Kuwaiti governmental hospitals was skewed to moderate to high satisfaction levels. The findings suggest that government policymakers should improve promotion programs and career development for radiographers.

Key Words: Radiography, Job satisfaction, Technologists, Emot; Depersonalization; Turnover

Funding Agency: Kuwait University, Research Project No. NRO1/23, supported and funded this work.

3

Assessing DNA Extraction Methods For Effective HPV Detection In FFPE Cervical Cancer Samples

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Introduction:
The optimization of DNA extraction from Formaldehyde Fixed Paraffin Embedded tissue (FFPE) samples is critical for the detection of HPV DNA in such samples. This research had evaluated four different DNA extraction methods to optimize the extraction process and to evaluate DNA yield and purity obtained from FFPE samples.

Methods:
DNA was extracted from HPV-16 Positive FFPE cervical carcinoma sample, confirmed by Immunohistochemistry Staining (IHC). The methods that were assessed: 1) GENFINE Purifier HT Automated Extraction method, 2) QIAamp® DNA Mini kit, 3) Chloroform: Phenol: Isoamyl alcohol method and 4) AllPrep® DNA/RNA FFPE kit. Each method was assessed for DNA yield and purity.

Results:
The first and second methods showed the lowest DNA yield and purity while the third and fourth method showed the highest DNA yield and purity, only the fourth method was able to successfully detect HPV-16 DNA in Real-Time Polymerase Chain Reaction (PCR) analysis, indicating the suitability for downstream HPV testing in FFPE samples.

Conclusions:
Our findings suggest that AllPrep® DNA/RNA FFPE kit is the most reliable extraction method for detecting HPV DNA in FFPE samples, offering a robust option for the extraction of DNA specifically HPV DNA from FFPE samples in clinical and research applications.

Key Words: Human Papilloma Virus (HPV), HPV DNA Extraction; Formaldehyde Fixed

Funding Agency: College of Graduate Studies

Anatomy

4

Exploring the Effects of Tempol in Diabetes-Induced Retinopathy.

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[1] 4th Year Medical Student, Faculty of Medicine, Kuwait University; [2] Department of Anatomy, Faculty of Medicine, Kuwait University

Introduction:
Diabetic retinopathy (DR) is a prevalent complication of hyperglycemia, characterized by increased neural cell apoptosis, gliosis and neovascularization in the retina. Hyperglycemia induced oxidative stress from increased ROS formation plays a role in the pathogenesis of DR. Tempol is a free radical scavenger and an antioxidant, known to provide therapeutic effects in diabetes related tissue dysfunction. However, the exact mechanism is not well understood. The objective of our study is to examine the effects of Tempol on Type1 diabetes induced DR and elucidate its mechanism of action.

Methods:
Streptozotocin (50mg/kg) was injected into 3month old male Wistar rats to induce Type1Diabetes, confirmed by testing blood glucose levels. Age matched controls were injected with sterile PBS. Control and diabetic rats were randomly assigned to receive no drug or Tempol (25mg/kg), dividing them into 4 groups – Control, Tempol treated control, Diabetic and Tempol treated diabetic. Experiment was performed for short term (6weeks) and long term (12weeks), with n□5 in each group. Random blood glucose levels and body weights were recorded biweekly. Western blot was performed against VEGF, Caspase3, GFAP and JNK using neural retina. Image Lab was used to quantify bands, and statistical analysis was performed using unpaired t-test.

Results:
Tempol has no effect on blood glucose levels and body weight in both control and diabetic groups. Caspase3 shows an increase at 6weeks and is significantly elevated at 12weeks in diabetic group as compared to control. Tempol significantly reduced the mild increase in caspase-3 associated with diabetes at 6weeks, but not at 12weeks. VEGF tends to increase in diabetic group at 6weeks, and significantly increased at 12weeks. Treatment with Tempol modulates this increase in VEGF, with a mild reduction at 6weeks and a significant reduction at 12weeks. Total JNK shows no significant changes between the four experimental groups at 6weeks, but is significantly increased at 12weeks in tempol treated diabetic group as compared to diabetic and control groups.

Conclusions:
Tempol potentially modulates diabetic induced retinal neovascularization by activating JNK, which inhibits VEGF-a marker of retinal neovascularization by supressing proangiogenic signalling.

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Key Words: Tempol; Diabetes; Retinopathy;

Funding Agency: RM01/20 and MA01/22 to HAH through KU.

Anatomy

5

Examining the Effects of Long-Term Exposure to Blue Light on Insulin Resistance and Fat Distribution.

Abed BS* [1], Leora D'Souza [2], Al-Onaizi M [3], Jeffery G [4], Al-Hussaini H [3]
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Introduction:
Natural sunlight provides a balanced spectrum of long and short wavelengths, ranging from approximately 300 nm to 2200 nm, with various components influencing physiological processes. In our previous study, we demonstrated that exposing mature (6-month-old) mice to blue light led to weight gain within the first week and, after 8 weeks of exposure, altered serum cytokine levels and induced anxiety-like behavior. Given that blue light is a significant component of LED lighting and computer screens, this study aims to investigate the effects of early and long-term blue light exposure and uncover the metabolic mechanisms driving weight gain.

Methods:
12 week old male C57BL/6 mice were divided into 2 groups – control group was exposed to daylight halogen, and experimental group was exposed to blue LED light of wavelength 450nm (5hours/day) in a 12:12 light/dark cycle for 40 weeks. 1- Fasting blood glucose and body weights were recorded every 2 weeks. 2- Oral glucose tolerance test and insulin tolerance test were performed at 0, 8, 22, 32 and 40weeks. 3-CT scans were performed to analyze body fats. 4- Heart, liver, and kidneys were collected for weight measurement.

Results:
1. Mice exposed to blue light exhibited a trend of weight gain, achieving significant weight increase by 14 weeks post-exposure. 2. These mice also displayed elevated fasting glucose levels at 6 and 8 weeks. 3. Metabolic testing revealed that while they were not glucose intolerant, they developed insulin resistance by 8 weeks of exposure, which persisted until 32 weeks but resolved by 40 weeks. 4. CT scans indicated an increase in total body fat volume in blue light-exposed mice. 5. Heart weight showed a statistically significant reduction in the experimental group, whereas other organs demonstrated only a trend toward reduction.

Conclusions:
Our study demonstrates that long-term exposure to blue light in young mice induces metabolic changes that may underlie weight gain observed in mature animals.
Acknowledgements:
We thank the Animal Resources Centre and Research Core facility (SRUL02/13; GM01/15) at Kuwait University. We also acknowledge Dr. Josely George, Batool Samaro, and Bashayr Alshimari for technical help.

Key Words: Blue LED Light; Insulin Resistance; Fat Distribution;

Funding Agency: Work was supported by grant RM01/20 and MA01/22 to HAH through KU.

6

The Prevalence of Mild Cognitive Impairment in Patients with Type 2 Diabetes Mellitus: A Systematic Analysis

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Introduction:
Cognitive impairment is a recognized complication of type 2 diabetes mellitus (T2DM), adversely affecting patients' quality of life and complicating glycemic control. Mild cognitive impairment (MCI) in T2DM has become increasingly concerning, as it impacts memory and executive functions, posing additional challenges in diabetes management. Recently, the available literature exploring the prevalence of MCI in T2DM has been on the rise, with a wide variety of findings. Thus, conducting a systemic analysis is essential to provide a comprehensive synthesis of the current evidence, helping to address existing gaps and inconsistencies. Here, we aimed to assess the prevalence of MCI in T2DM patients, and to identify key factors contributing to cognitive decline.

Methods:
Conducted according to PRISMA guidelines, this analysis includes published studies from June 2020 to May 2024 in PubMed, Web of Science, and Embase. Observational studies reporting MCI prevalence in T2DM patients, verified by validated neuropsychological assessments, were selected. Studies focusing on dementia or with insufficient data were excluded. Data were extracted on MCI prevalence rates, study characteristics, diagnostic tools, and assessment criteria, with bias assessed using the STROBE checklist.

Results:
A total of 42 studies, including two cohort, two case-control, and 38 cross-sectional studies, involving 14,974 T2DM patients. MCI prevalence ranged widely from 9.94% to 75%, influenced by geographical location, diagnostic tools, and demographic factors. The Montreal Cognitive Assessment (MoCA) and Mini-Mental State Examination (MMSE) were the most commonly used tools, although inconsistencies in cutoff scores were observed.

Conclusions:
Our Findings highlight a variable MCI prevalence among T2DM patients, likely due to methodological differences across studies. Standardizing cognitive and diabetes diagnostic criteria and expanding research in underrepresented regions are essential for accurate understanding. Early identification and intervention are crucial for managing cognitive impairment in T2DM.

Key Words: T2DM, DM, Diabetes, Diabetes Mellitus, Type 2 Diab; MCI, Mild Cognitive

Funding Agency: RM01/19 and RM01/23

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The Impact of Hyperglycemia on Hippocampal Neurodegeneration: Role of Apoptotic Pathways.

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Introduction:
Hyperglycemia has been implicated in neuronal damage in the hippocampus, a brain region vital for memory and learning, potentially through apoptosis. This process involves pro-apoptotic genes and caspase enzymes (3, 6, 9, 12). However, the role of apoptotic pathways in hippocampal neurodegeneration remains unclear. This study investigates hyperglycemia-induced neurodegeneration in the hippocampus, focusing on pro-apoptotic proteins, including caspases, using db/db diabetic and diet-induced obesity models.

Methods:
Mice hippocampal tissue from control and db/db was lysed in RIPA buffer and western blotting was performed against caspase-3 and b-Actin (n=4 per group). Bands were quantified using Image Lab software and Student's t-test was used for statistical analysis. RNA sequencing was performed on 1) forebrain tissue from C57BL/6J mice, fed on a normal chow diet (NCD) or commercial high fat diet (HFDc) 2) hippocampal tissue from 5 months old control and db/db mice 3) hippocampal tissue from mice fed on NCD or HFDc for 27 weeks. Normalised counts were used to analyse the data, and 2-way ANOVA was used to test for statistical significance (n□3 per group).

Results:
Transcriptional analysis of the db/db hippocampus showed an upregulation of pro-apoptotic genes (Cyct, Fas, Braf, Pla2g3) and downregulation of anti-apoptotic genes (Traf1, Ghsr, Arc). Cyct (cytochrome c), when released from mitochondria, contributes to apoptosome formation, while Pla2g3 is linked to Alzheimer's disease. Caspase3 and caspase7 transcripts were upregulated in HFDc-fed mice compared to control, suggesting a potential caspase pathway priming, but no significant changes in caspase transcripts were observed in db/db mice or 27-week HFDc-fed mice. Protein levels of pro-caspase3 were also unchanged in young db/db mice.

Conclusions:
Our study provides a mechanistic insight into apoptotic pathways underlying hyperglycemia-induced hippocampal neurodegeneration. We identify transcriptional upregulation of pro-apoptotic genes alongside downregulation of anti-apoptotic genes, highlighting key proteins potentially involved in the neurodegenerative processes triggered by hyperglycemia.

Acknowledgments:
We thank Animal Resources Centre and Research Core facility (SRUL02/13; GM01/15) in Kuwait University.

Key Words: Hyperglycemia; Hippocampal neurodegeneration; Apoptosis;

Funding Agency: Grant No. RM01/19 and RM01/23 to MAO through KU.

8

The regenerative effects of FB from catfish skin (Arius bilineatus) on carbon tetrachloride-induced hepatotoxicity in a rat model.

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Introduction:
Objectives: Hepatotoxicity, which often results in severe liver damage, is an increasingly significant global health issue with few effective treatments available. This study examined the hepatoprotective effects of Fraction B (FB), extracted from the skin of the catfish Arius bilineatus, on carbon tetrachloride CCl4(where 4 is subscript)-induced hepatotoxicity in a rat model. By investigating the regenerative and anti-inflammatory properties of FB, this research aimed to explore its potential therapeutic benefits for liver disease management.

Methods:
Six groups of male Sprague-Dawley rats were used in this study. These groups included a control group and groups treated with CCl4(where 4 is subscript) to induce hepatotoxicity. Following this treatment, the rats received FB at a dose of 4.5 mg/kg. Histopathological, biochemical, and molecular analyses were performed to evaluate liver function, oxidative stress markers, and inflammatory and apoptotic indicators in liver tissues. Hepatotoxicity was induced by intraperitoneal injections of CCl4(where 4 is subscript) twice weekly at a dosage of 1 ml/kg body weight. Subsequently, the rats received daily intraperitoneal injections of 4.5 mg FB/kg body weight for 4/8 weeks. Liver tissues from all groups underwent histopathological analysis at light and electron microscopic levels, along with immunohistochemical analysis, liver enzyme assays, lipid profile evaluations, oxidative stress parameter measurements, and assessments of inflammatory and apoptotic pathway markers.

Results:
FB treatment significantly reduced CCl4(where 4 is subscript)-induced hepatotoxicity, as evidenced by lower liver enzyme levels (aspartate aminotransferase, alanine aminotransferase, bilirubin). It also improved lipid profiles and decreased markers of fibrosis, inflammation, and oxidative stress (anti-superoxide dismutase, anti-catalase). Furthermore, FB treatment resulted in lower levels of pro-inflammatory cytokines, such as tumor necrosis factor-alpha/beta, nuclear factor-kappa B, interleukin-1, and interleukin-6. It also reduced apoptotic markers (Bcl-2-associated X protein, caspase-3, cytochrome c) while enhancing anti-inflammatory (interleukin-10) and anti-apoptotic (B-cell lymphoma-2) proteins.

Conclusions:
FB treatment of CCl4(where 4 is subscript)-induced liver injury in rats positions it as a promising therapeutic candidate for managing hepatotoxicity. Future research should further elucidate FB's molecular mechanisms and potential clinical applications. Acknowledgments: This research was funded by Kuwait University (Project YM03/22), with the support of the Animal Resource Center at Kuwait University Health Sciences Center and the Research Sector Project Unit.

Key Words: Hepatotoxicity; Catfish Fraction B; inflammation ;

Funding Agency: Kuwait university research administration and college of graduate study YM03/22

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COVID-19 Vaccine-induced Immune Thrombotic Thrombocytopenia syndrome in the long-term: A Case Study

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Introduction:
Vaccine-induced Immune Thrombotic Thrombocytopenia (VITT) is an immunological reaction following COVID-19 vaccines by 2 weeks in which abnormal antibodies (anti-Heparin/Platelet Factor4) are produced causing extreme platelets activation and coagulation markers alterations which in turn, leading to thrombosis and high risk of death. These antibodies can be developed in healthy vaccinated individual in low-titre that is not enough to cause VITT. However, it is still unknown whether they accumulate or continue to form causing coagulation problems in the future. Here we aimed to investigate whether VITT has the possibility to develop in the long-term through a case study.

Methods:
Peripheral blood samples were taken from a thirty-three years old healthy lady before vaccination, three days after first dose Pfizer-BioNTeck, one month after the second dose of the same type and six months after the second dose. Blood samples were analysed for D-dimer and anti-Heparin/Platelet Factor4 antibodies levels determination and morphological observation of the blood platelets. For statical analysis, ANOVA was used and significance was defined as a p-value of less than 0.05.

Results:
Three days post vaccination, the antibodies concentration increased significantly ($p < 0.001$). one month post vaccination, it started to decrease significantly ($p < 0.027$) until it reached to its normal level after 6 months while D-dimer remained constant in all test intervals. No morphological changes were observed in the platelets.

Conclusions:
Significant increase of the antibodies in the short-term is still considered as a low concentration and not enough to increase D-dimer levels or activate the blood platelets. Moreover, it has no ability to accumulate or continue form in the long-term. So, VITT, if not within 2 weeks, may not develop in the long-term.

Acknowledgment: College of graduate studies and research sector (project no. YM04/23) for financial support.

Key Words: COVID-19 vaccine; VITT; anti-Heparin/Platelet Factor4;

Funding Agency: research sector YM04/23

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Estrous Cycle Characterization in an Alzheimer's Disease Mouse Model: Implications for Cognition

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Introduction:
The 5xFAD mouse model remains an invaluable tool for studying Alzheimer's Disease (AD) pathology, particularly due to its close replication of amyloid deposition and gliosis observed in human AD progression. However, data on female 5xFAD mice, especially in older age groups, remain scarce. This gap may be attributed to the estrous cycle in female mice, which induces physiological fluctuations and complicates experimental consistency. Nevertheless, comprehensive analyses of these effects in aged female 5xFAD mice have not been extensively conducted. This study's objective is to investigate the behavioral, metabolic, and neuromuscular phenotypes of aged female 5xFAD mice.

Methods:
In this study, wild type (WT) (n=7), hemizygous (HEM) (n=2), and 5xFAD (n=4) female mice aged 8–10 months were evaluated to investigate behavioral, metabolic, and neuromuscular phenotypes. Behavioral tests included the open field test (OFT) for activity and the forced swim test (FST) for depressive phenotypes, while the hang wire test (HWT) assessed neuromuscular function. Oral glucose tolerance tests (OGTT) were conducted to assess glucose metabolism. Vaginal cytology was used to determine estrous cycle stages, with samples stained using 0.5% Toluidine Blue and examined microscopically. Statistical analyses included Student's t-test and one-way or two-way ANOVA with repeated measures using GraphPad Prism.

Results:
Aged female 5xFAD mice exhibited improved glucose metabolism compared to their WT and HEM counterparts. Interestingly, these mice also demonstrated profound hypoactivity, anti-depressive behavioral phenotypes, and no significant neuromuscular deficiencies, providing novel insights into the physiological and behavioral characteristics of aged female 5xFAD mice.

Conclusions:
Our findings identified unique traits in aged female 5xFAD mice, such as better glucose metabolism, reduced activity, and anti-depressive behavior, with no loss of muscle function. These findings highlight the need for more research on sex-specific factors in AD progression. Considering the estrous cycle emphasizes the importance of hormonal changes in preclinical studies. Future work should include larger groups and long-term studies to explore how metabolism, behavior, and hormones interact in female AD models.

Acknowledgments:
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Key Words: Alzheimer's disease; Behavioral science; Estrous cycle;

Funding Agency: Grant No. RM01/19

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Establishing and Characterizing a Dual-Genotype Mouse Model for Investigating Neuroinflammation and Metabolic Dysfunction in Alzheimer's Disease and Diabetes

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Introduction:
A rodent model combining diabetes (db/db) and Alzheimer's disease (AD; 5XFAD) phenotypes offers a platform to study the intersection of metabolic and neurodegenerative disorders. The 5XFAD genotype, with mutations in APP and PSEN1, leads to amyloid-beta overproduction, mimicking Alzheimer's pathology. The db/db genotype, with leptin receptor deficiency, causes hyperglycemia and insulin resistance, modeling type-2 diabetes. Here, we aimed to generate a dual model to simulate chronic metabolic and inflammatory environments that may accelerate neurodegeneration. By examining the roles of neuroinflammation and CNS myeloid cells, this model enables the study of shared mechanisms and potential therapeutic targets relevant to both diabetes and AD.

Methods:
To produce the desired genotypes, specific breeding crosses were conducted using 5XFAD/+ and db/+ mice, as db/db mice are sterile. Initial crosses included 5XFAD/+ x db/+ and 5XFAD/5XFAD x db/+, with offspring genotyped at 3–4 weeks of age using ear biopsies. Genotyping involved tissue lysis, PCR amplification, and gel electrophoresis to confirm the presence of the 5XFAD and db/+ alleles. At 2.5 months, additional breeding was carried out, including 5XFAD/+ db/+ x 5XFAD/+ db/+ and 5XFAD/+ db/+ x db/+ +/+, to generate the target genotypes. Genotype confirmation through PCR was documented for all offspring.

Results:
We successfully bred 5XFAD mice with db/+ mice to generate 5XFAD/+; db/+ mice, achieving a 25% probability. The survival rate for the first generation was 85%, and for the second generation, it was 84.6%. A subsequent cross between 5XFAD/5XFAD and db/+ mice produced 5XFAD/+; db/+ mice with a calculated probability of 50%, resulting in an actual probability of 45.5%, and 5XFAD/+ mice at 54.5%. By fostering pups born to 5XFAD females, we significantly improved survival from 33% to 90%. Intercrossing and backcrossing the 5XFAD/+; db/+ mice yielded the following genotypes: 5XFAD/+ +/+ (19), 5XFAD/+ db/+ (13), wild type (17), and db/+ +/+ (10).

Conclusions:
The dual-genotype mice provide an invaluable tool for examining the links between AD and diabetes. Continued research will investigate how these conditions influence one another, particularly focusing on neuroinflammation, cognitive decline, and metabolic dysfunction, to aid in the development of therapies targeting both disorders.

Key Words: Diabetes, Alzheimer's disease, Amyloid-beta; Insulin resistance, Mouse model;

Funding Agency: Work was supported by grant RM01/19 and RM01/23 to MAO through KU and Research Core facility (SRUL02/13; GM01/15)

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High Fat Diet Exacerbates the Progression of Amyloid Pathology in 5XFAD Mouse Model

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Introduction:
Alzheimer's disease (AD) is a neurodegenerative disorder characterized by the accumulation of amyloid plaques and neurofibrillary tangles. Metabolic dysfunction induced by high-fat diet (HFD) has been linked to severe cognitive impairment in AD mouse models. However, the extent of these effects and the molecular mechanisms by which HFD exacerbates amyloid pathology remain poorly understood. This study aimed to investigate the impact of HFD-induced metabolic dysregulation on amyloid pathology, cognitive function, and synaptic integrity using the 5XFAD early-onset AD mouse model.

Methods:
Five- to six-month-old 5XFAD mice were compared with age-matched wild-type (WT) controls and grouped based on diet: normal chow diet (NCD) or high-fat diet (HFD; 60% fat). Baseline phenotypic assessments included ^18F-fluorodeoxyglucose positron emission tomography (FDG-PET), behavioral tests (e.g., open field test and recognition memory assessment), and metabolic profiling. Mice were then fed either NCD or HFD for 18 weeks, after which the same tests were repeated. Amyloid pathology was evaluated using immunohistochemistry to measure amyloid plaque number and size, microglial activation, and synaptic marker expression in the hippocampus. Statistical analyses were performed using unpaired Student's t-tests and two-way ANOVA, with results expressed as mean ± SEM (n=22 per group).

Results:
At baseline, 5XFAD mice displayed normal metabolic phenotypes with reduced body weight compared to WT controls, likely due to hyperactivity ($P<0.01$, open field test). Anxiety-like behavior was altered in 5XFAD mice, but recognition memory was unaffected. HFD feeding caused significant weight gain in both WT (70%) and 5XFAD (34.7%) mice, alongside hyperglycemia and glucose intolerance, without inducing insulin resistance. HFD-fed 5XFAD mice exhibited decreased hippocampal postsynaptic marker expression, suggesting synaptic vulnerability.

Conclusions:
These findings suggest that HFD-induced metabolic dysfunction, particularly altered glucose homeostasis, exacerbates amyloid pathophysiology in the 5XFAD model. This may contribute to synaptic vulnerability and cognitive impairment, identifying potential pathways linking metabolic dysfunction to AD progression.

Acknowledgment:
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Key Words: Alzheimer's Disease; Metabolic Dysfunction; Amyloid Pathology ;

Funding Agency: Kuwait University Grant no. RM01/19

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Metabolic Dysfunction and Tau Pathology: Insights from Genetic and Diet-Induced Models of Diabetes-Associated Dementia

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Introduction:
Insulin resistance due to diabetes has been associated with dementia, characterized by Alzheimer's disease like pathology. Diabetes related dementia is characterized by tau hyperphosphorylation and aggregation. Tau is a microtubule associated protein, essential for microtubule stabilization and axonal transport in neurons. The role and mechanism of tau pathology in diabetes related dementia remains unclear. The objective of our study is to delineate the effect of metabolic dysfunction on Tau pathology using a genetic model of diabetes and a diet induced model of insulin resistance.

Methods:
The diabetes mouse model db/db was compared with age matched controls and grouped as young (5 months) and aged (12 months). For diet induced model, C57BL/6J mice were randomly assigned to be fed normal chow diet or commercial high fat diet, composed of 10.48% and 60% calories from fat respectively. OGTT and ITT were performed, body weights were recorded and mice were sacrificed after a short-term diet (12 weeks) and a long-term diet (27 weeks). Cerebral cortex and hippocampal tissue were used to perform western blot analysis against Tau, PhosphoTau (T231, S202/T205, S396), PP2Ac, PP2B, GSK-3b, Akt, □-Actin and GAPDH. Band intensities were quantified and statistical analysis was performed using the unpaired Student's t-test. Only male mice were used in the study and n>3 for all groups.

Results:
HFDc-fed mice exhibited significantly higher body weights compared to controls, alongside marked hyperglycemia and insulin resistance, confirming metabolic dysfunction. In the db/db model, total Tau levels were significantly reduced in both the cortex and hippocampus. Tau hyperphosphorylation at S396 was prominent in the young db/db cortex and hippocampus, whereas hyperphosphorylation at T231 and S202/T205 was observed in the cortex of aged db/db and HFDc-fed mice. Additionally, a notable reduction in the levels of Tau phosphatases, PP2B and PP2Ac, was identified, with a significant decrease in PP2Ac activity in db/db mice.

Conclusions:
Our findings highlight the impact of metabolic dysfunction on Tau pathology, showing region- and age-specific Tau hyperphosphorylation. Decreased Tau phosphatase levels and activity suggest impaired dephosphorylation as a key mechanism. These findings identify potential therapeutic targets for diabetes-related dementia.
Acknowledgements:
We thank the Animal Resources Centre and Research Core facility (SRUL02/13; GM01/15).

Key Words: Diabetes associated Dementia; Tau pathology; metabolic dysfunction;

Funding Agency: Funding Agency - Kuwait University, Grant numbers RM01/19 and RM01/23

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Characterization of Microtubule Dysfunction Associated with Alzheimer's-like Pathology in Mouse Models of Impaired Glucose Metabolism

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Introduction:
Microtubules are critical components of the neuronal cytoskeleton, essential for maintaining neuronal architecture and enabling axonal transport. These structures, composed of tubulin proteins and supported by microtubule-associated proteins like Tau, are susceptible to dysfunction in neurodegenerative diseases, including Alzheimer's disease (AD). Emerging evidence indicates that disrupted glucose metabolism may contribute to similar microtubule-related pathology, linking diabetes to dementia. This study aims to investigate the effects of glucose metabolism impairment on microtubule integrity, highlighting its potential role in diabetes-induced neurodegeneration.

Methods:
We utilized multiple mouse models to study glucose metabolism-related pathology, including 5XFAD/+ mice as a model of Alzheimer's-like amyloidosis for pathological validation, C57BL/6J-db/db mice as a model of type 2 diabetes and insulin resistance, and C57BL/6J-db/m mice as a normoglycemic control. Mice aged 4–5 months were examined. Immunohistochemistry was conducted to detect tau hyperphosphorylation using the phospho-tau S396 antibody, with staining analyzed in cortical and hippocampal regions. Western blotting assessed total alpha-tubulin protein levels in the cortex, while forebrain transcriptomes from high-fat diet (HFD) and normal chow diet (NCD) groups were analyzed via high-throughput sequencing for differential gene expression and pathway enrichment.

Results:
In the db/db mouse model, tau hyperphosphorylation was more pronounced in the cortex and hippocampus compared to controls. Alpha-tubulin protein levels were significantly reduced in the cortex ($p < 0.05$). Transcriptomic analysis of HFD-fed mice revealed significant upregulation of kif3c and Tubgcp6 genes compared to the NCD group, suggesting altered microtubule-related gene expression in response to dietary metabolic stress.

Conclusions:
Our findings suggest that impaired glucose metabolism contributes to microtubule instability through mechanisms involving tau hyperphosphorylation and reduced tubulin protein levels. Hyperphosphorylated tau disrupts microtubule integrity, which, coupled with decreased tubulin, likely impairs neuronal stability. These results highlight a mechanistic link between diabetes-induced cognitive decline and neurodegenerative conditions like Alzheimer's disease
Acknowledgments: We thank the Animal Resource Center and the Research Core facility (SRUL02/13; GM01/15) at Kuwait University.

Key Words: Type 2 diabetes; Microtubule dysfunction; Alzheimer disease;

Funding Agency: Kuwait University, Grant number RM01/19 and RM01/23 to MAO lab

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Wound Healing Depends on Methods of Wound Closure Applied - An Ultra-structural study

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Introduction:
The methods used in surgical wound closure determines the outcome of the wound healing and scar formation. Proper wound healing depends on proliferation of fibroblasts and formation of new collagen fibres in the region of wound closure. Our previous study has shown that the closure of surgical wounds with polypropylene sutures results in better wound healing and less scar formation than wound closure by surgical staples, adhesive strips and adhesive glue.
Objectives: Present study is aimed to compare the ultrastructure of the collagen fibres and fibroblasts in wound closure with polypropylene sutures, surgical staples, adhesive strips and adhesive glue.

Methods:
Three months old male Wistar rats were divided into 5 groups (n=8/group). A longitudinal skin incision was made on the back of the rats. The wounds were then closed using polypropylene sutures, surgical staples, adhesive strips, or adhesive glue. Skin from the same region of the control group was used for comparison. The rats were sacrificed two- and six-weeks after wound closure. Skin from the surgical incision region was collected and processed for transmission electron microscopy.

Results:
Results of the study showed that closure of surgical wound with polypropylene suture results in formation of dense bundles of collagen fibres. Fibroblasts in the wound suture region showed increased number of rough endoplasmic reticulum and large numbers of ribosomes and Golgi apparatus as early as two weeks post wound closure. By six weeks after wounds were sutured, still fibroblasts showed increased ribosomes. In groups where the wound was closed with surgical staples, collagen fibres were less dense, and fibroblasts had less ribosomes compared to suture groups at both two- and six-week time points. In adhesive strips and adhesive glue groups, significantly smaller numbers of collagen fibres were found, and nuclei of fibroblasts were crumpled, and a significantly smaller number of ribosomes was found in the cytoplasm at both time points.

Conclusions:
Effective wound healing found in wounds closed with polypropylene sutures is related to increased collagen synthesised by the fibroblasts in the wound region. Poor wound healing with adhesive glue is related to presence of less ribosomes and mitochondria.
Acknowledgements: Authors acknowledge Electron Microscopy Unit, Faculty of Medicine, Kuwait University, Mrs. Jessy Mathew, Philip George and Smitha Sivanandan for their excellent technical help.

Key Words: Wound closure; Polypropylene sutures; Surgical staples;

Funding Agency: Nil

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Characterization of the PD-1/PD-L1 Pathway in Neuroinflammation Associated with Metabolic and Neurodegenerative Diseases

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Introduction:
Neurodegenerative diseases are often linked to common comorbidities, particularly those with a metabolic etiology such as obesity, cardiovascular disease, and type 2 diabetes (T2D). Systemic immune cells play a critical role in maintaining brain homeostasis and are implicated in the pathogenesis of both neurodegenerative diseases and T2D. The programmed death-1 (PD-1) receptor and its ligand PD-L1, key immune checkpoints, have been shown to contribute to neuroinflammation and Alzheimer's disease (AD). This study aimed to characterize the PD-1/PD-L1 pathway in various mouse models.

Methods:
Mice were divided into groups based on diet and disease model, including control (normal chow diet), diet-induced obesity, control (lean), T2D (db/db), and 5XFAD transgenic AD mice, which rapidly develop amyloid plaque pathology due to five familial AD mutations in APP and PSEN1 genes (fed normal or high-fat diets). Glucose levels and body weights were measured before sacrifice, followed by protein quantification using Western blotting and RNA sequencing of hippocampal tissues.

Results:
Protein analysis revealed significantly increased PD-L1 expression in db/db mice ($p = 0.0047$) and 5XFAD mice, regardless of diet type. In the 5XFAD group, PD-L1 levels were significantly higher compared to controls, both on normal chow diet ($p = 0.0071$) and high-fat diet ($p = 0.0023$). RNA sequencing of high-fat diet models identified upregulation of key immune-related genes, including Apoe ($p = 0.0211$), C4b ($p = 0.0347$), Ifngr1 ($p = 0.0163$), and CD68 ($p = 0.0499$). These genes are involved in lipid metabolism, the complement system, and immune signaling, suggesting that neuroinflammation plays a central role in these models of metabolic and neurodegenerative diseases.

Conclusions:
These findings suggest that the PD-1/PD-L1 pathway plays a significant role in neuroinflammation associated with metabolic and neurodegenerative diseases. The identified molecular targets may offer new therapeutic avenues for addressing neuroinflammatory conditions.

Acknowledgements: We thank the College of Graduate Studies, Research Sector grant number (YM06/23), Animal Resources Centre and Research Core facility at Kuwait University.

ey Words: Diabetes; Alzheimer's disease; 5XFAD;

Funding Agency: college of graduate studies and research sector grant number (YM06/23)

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The Prevalence and Risk Factors of Premenstrual Dysphoric Disorder (PMDD) among Female University Students in Kuwait

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Introduction:
Premenstrual dysphoric disorder (PMDD) is a severe form of premenstrual syndrome (PMS), affecting women of reproductive age. Data on the epidemiology of PMS/PMDD is scarce in Middle Eastern countries. Therefore, this study sought to estimate the prevalence of PMS/PMDD and determine its associated factors among female university students.

Methods:
A cross-sectional study was conducted by enrolling 1,187 female students from various colleges at Kuwait University. Participants self-completed the study questionnaire, which included the premenstrual symptoms screening tool (PSST) that was used to ascertain PMS/PMDD status as: no/mild PMS, moderate to severe PMS, and PMDD. Moreover, anxiety and depression symptoms were ascertained using the Generalized Anxiety Disorder (GAD-7) and the Patient Health Questionnaire (PHQ-9) questionnaires, respectively. Chi-square test was used to assess associations between categorical variables. Multinomial logistic regression was used to estimate adjusted odds ratios (aOR) and their 95% confidence intervals (CI) for the association between PMS/PMDD and anxiety and depression symptoms.

Results:
The prevalence of PMDD and moderate to severe PMS in the study sample was estimated to be 24.9% and 41.5%, respectively. PMDD prevalence was significantly higher in students who ever smoked compared to never smokers (41.0% vs. 24.0%, p = 0.006), frequently consumed caffeinated beverages compared to infrequent consumers (≥4 times per week: 27.7% vs. no/once per week: 21.7%, p = 0.045), and those who had early (<=10 years) compared to late (>=15 years) age at menarche (32.0% vs. 18.9%, p = 0.006). Frequency of never being absent during the week prior to menstruation was lowest among those with PMDD (51.2%) as compared to those with moderate to severe PMS (57.9%) and those with no/mild PMS (68.0%; p <0.001). Moreover, PMDD was associated with increased prevalence of severe anxiety symptoms (aOR: 30.67, 95% CI: 16.33-57.60) and severe depression symptoms (aOR: 65.81, 95% CI: 28.22-153.46).

Conclusions:
Our study showed that PMS/PMDD affects a large proportion of female university students in Kuwait, with PMS/PMDD being associated with increased symptoms of anxiety and depression.

Key Words: Prevalence; premenstrual dysphoric disorder; Kuwait;

Funding Agency: none

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The Influence of social Media on Eating Habits

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Introduction:
In today's digital age, social media has become an integral part of daily life, profoundly impacting various aspects of behavior, including dietary choices. Our Study delves into the impact of social media on the dietary habits of undergraduate students in Saudi Arabia.The aim of this research is to provide empirical evidence regarding the influence of social media on dietary behavior among Saudi students. By doing so, it aims to offer valuable insights to much needed Data in Saudi Arabia, facilitating informed decision-making and targeted interventions.To achieve this aim, the study outlines several specific objectives. Firstly, it seeks to quantify the impact of social media usage on dietary behavior among the target demographic. Secondly, it aims to explore the correlation between social media usage and food habits among students, shedding light on any potential associations between online engagement and physical health indicators.

Methods:
Data collection done face-to-face collective method by using validated questionnaire adapted from prior research, meticulously crafted to assess the multifaceted relationship between social media engagement and dietary habits. The questionnaire encompasses three distinct sections, first demographic information, an assessment of the impact of social media on dietary choices, and general health indicators such as the presence of chronic diseases.Employing an observational cross-sectional study design with 549 participants to examine the influence of social media influencers on dietary choices,the research focuses on undergraduate students enrolled in various universities across Saudi Arabia,encompassing regions such as Middle Region,Western and Southern Regions,and Eastern Region.

Results:
We divide the participant depends on the degree of impact of social media to high impact moderate impact and low impact.Findings revealed 23.5% of participants have high impact,52.3% have moderate impact and 24.2% have low impact. Individuals with higher BMI the have highest impact of social media overweight have 25.6% and the obese have 28.9%.

Conclusions:
In conclusion, this study endeavors to contribute valuable insights into the nexus between social media utilization and dietary behavior among Saudi university students, fostering a deeper understanding of this phenomenon and its implications for public health policy and intervention strategies.

Key Words: behavior; Social Media; impact;

Funding Agency: None

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High-Density Lipoprotein Signaling via Sphingosine-1-Phosphate Receptors Safeguards Spontaneously Hypertensive Rats against Myocardial Ischemia/Reperfusion Injury

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Introduction:
High-density lipoprotein (HDL) protects against ischemia/reperfusion (I/R) injury via signaling through scavenger-receptor class B type-I (SR-BI) and sphingosine-1-phosphate receptors (S1PRs). We recently reported that HDL protects the hearts of spontaneously hypertensive rats (SHRs) against I/R injury in an SR-BI-dependent manner. Objective: In this study, we examined the role of S1PRs in HDL-induced protection against myocardial I/R injury in hypertensive rats.

Methods:
Hearts from Wistar Kyoto rats (WKYs) and SHRs were subjected to I/R injury using a modified Langendorff system. The hearts were treated with or without HDL in the presence or absence of a receptor- or kinase-specific antagonist. Cardiac hemodynamics and infarct size were measured. Target proteins were analyzed by immunoblotting and ELISA, and nitrite levels were measured using Greis reagent.

Results:
HDL protected the hearts of WKYs and SHRs against I/R injury. HDL, however, was more protective in WKYs. HDL protection in SHRs required lipid uptake via SR-BI and S1PR1 and S1PR3 but not S1PR2. The hearts from SHRs expressed significantly lower levels of S1PR3 than the hearts from WKYs. HDL differentially activated mediators of the SAFE and RISK pathways in WKYs and SHRs and resulted in nitric oxide generation. Blockage of these pathways abrogated HDL effects.

Conclusions:
HDL protects against myocardial I/R injury in normotensive and hypertensive rats, albeit to varying degrees. HDL protection in hearts from hypertensive rodents involved SR-BI-mediated lipid uptake coupled with signaling through S1PR1 and S1PR3. The extent of HDL-induced cardiac protection is directly proportional to S1PR3 expres-sion levels. Mechanistically, the safeguarding effects of HDL involved activation of the SAFE and RISK pathways and the generation of nitric oxide.

Key Words: Hypertension; Ischemia/reperfusion injury; Lipoprotein signaling ;

Funding Agency: KFAS, P116-13MM-05

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The Role of Claudins in the Pathogenesis of Dextran Sulfate Sodium-Induced Experimental Colitis: The Effects of Nobiletin

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Introduction:
The pathogenesis of inflammatory bowel diseases such as Ulcerative Colitis (UC) and Crohn's disease is not well understood. UC is a relapsing inflammatory condition of the GI-tract affecting the colon. Claudins are tight junction (TJ) proteins which provide a vital barrier function in the GI-tract. These proteins are remodelled during mucosal inflammation, and differential expression of the claudin family determines epithelial barrier properties. UC is treated using highly toxic chemicals associated with serious side effects. Therefore, new therapeutics are needed in the management of IBD. Nobiletin, (NOB) a citrus polymethylated flavonoid has attracted much attention recently for its anti-inflammatory effects and as an adjunct treatment. Objective: To investigated the roles and regulation of the claudin-1, -2, -3, and -4 isoforms in the pathogenesis of ulcerative colitis, and the potential therapeutic effects of nobiletin.

Methods:
Colitis was induced in rats by administering dextran sulfate sodium (DSS) in drinking water for seven days. Rats were treated daily with nobiletin (oral, 60 mg/Kg body weight) and studied in four groups, C (non-colitis control), D (DSS-induced colitis), CN (nobiletin-treated non-colitis control), and DN (nobiletin-treated DSS-induced colitis). On day seven, the animals were sacrificed, and colonic tissues were collected and analyzed. Claudin isoforms -1, -2, -3 and -4 expression were measured using western blot analysis, RT-PCR and immunohistochemistry staining.

Results:
Both macroscopic and microscopic findings suggest the progression of colitis. In the inflamed colon, claudin-1 and -4 proteins were decreased, claudin-2 increased, while the claudin-3 protein remained unchanged. Except for claudin-1, these changes were not paralleled by mRNA expression, indicating a complex regulatory mechanism. Uniform β-actin expression along with consistent quality and yield of total RNA indicated selectivity of these changes. Nobiletin treatment reversed these changes.

Conclusions:
Altered expression of the claudin isoforms -1, -2, and -4 disrupts tight junctions, exposing the lamina propria to microflora, leading to electrolyte disturbance and the development of ulcerative colitis. Nobiletin with its anti-inflammatory properties may be useful in IBD.

Key Words: colitis; claudins; tight junctions;

Funding Agency: This work was supported and funded by Kuwait University Research Sector Grants No. YM 10/20 and Research Core Facility, HSC (SRUL02/13).

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JNK is a Potential Modulator of Autophagy and Apoptosis during Testicular Ischemia Reperfusion Injury

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Introduction:
Young boys suffering from testicular torsion (TT) might experience future subfertility issues if not treated by detorsion (D). The underlying mechanism of TTD is testicular ischemia reperfusion injury (tIRI) characterized by excessive production of reactive oxygen species and germ cell apoptosis. We hypothesize that the testis adopts autophagy as a survival mechanism during TT-induced ischemia. The aim is to detect the induction of autophagy during ischemia and tIRI and investigate the role of the c-Jun NH2-terminal kinase (JNK).

Methods:
Male Sprague-Dawley rats (n=48) were divided into 4 groups: sham, ischemia, tIRI and tIRI treated with SP600125, a JNK inhibitor. The tIRI rats underwent an ischemic injury for 1 hour followed by 4 hours of reperfusion, while ischemic rats were subjected to 1 hour ischemia only without reperfusion. Spermatogenesis was evaluated using histological analysis. The mRNA and protein expression of the autophagy biomarkers: LC3B, STX17 and CHMP4B were analyzed by real time PCR and Western blotting, respectively. The immunoexpression of autophagy proteins was also detected by immunohistochemistry (IHC). Caspase 3 activity and ATP concentration were determined by biochemical assays.

Results:
Arrested spermatogenesis and germ cell layer disruption was observed in ischemia- and tIRI-subjected testes. JNK is phosphorylated during both testicular ischemia only and tIRI. The mRNA and protein expression of LC3B, STX17 and CHMP4B was upregulated during testicular ischemia only but not in tIRI. ATP levels were elevated during testicular ischemia only and its levels were not affected by JNK inhibition during tIRI. The tIRI-induced oxidative stress suppresses the expression of autophagy markers, activates caspase 3 and induces germ cell apoptosis, which is regulated by JNK. Inhibition of JNK during tIRI affected the expression of LC3B but not STX17 and CHMP4B.

Conclusions:
Autophagy is only induced during testicular ischemia as a survival mechanism due to the lack of nutrients and oxygen. JNK is identified as a modulator kinase of the molecular switch between autophagy and apoptosis in male germ cells by regulating common proteins.

Key Words: JNK pathway; Autophagy; Apoptosis.;

Funding Agency: CGS-RA Grant YM 04/22, GM 01/15 and SRUL 03/12.

22

Awareness of CV Risk Factors among ACS Patients Before and After ACS Event

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Introduction:
Acute Coronary Syndrome (ACS) refers to a group of conditions characterized by decreased blood flow to the heart, including unstable angina, ST-segment elevation myocardial infarction (STEMI), and non-ST-segment elevation myocardial infarction (NSTEMI). ACS is typically caused by coronary heart disease (CHD) and occurs when a plaque in the coronary arteries ruptures. Risk factors include smoking, hypertension, diabetes, hyperlipidemia, male gender, physical inactivity, and obesity. Aim: To assess the impact of ACS on patients' awareness of cardiovascular risk factors and preventive behaviors in Kuwait.

Methods:
A total of 105 patients with recent ACS were recruited for this study. An interview-based questionnaire assessed their awareness of cardiovascular (CV) risk factors. The questions were obtained from validated questionnaires published in other articles. To accommodate language differences and ensure effective communication, Google Translate was utilized. For data analysis, we used descriptive analysis for the frequencies and percentages, and chi-square to get the p-values.

Results:
Data from 105 participants showed a significant increase in awareness of various risk factors post-ACS. Most participants had completed some level of schooling (92.4%, n=97), while 7.6% (n=8) had no formal education. In terms of nationality, most participants were from South Asia (39%, n=41), followed by East Asia (23.8%, n=25), Africa (19%, n=20), and Kuwait (14.3%, n=15). Awareness of smoking as a risk factor increased from 81.9% pre-ACS to 91.4% post-ACS ($p < 0.001$); hypertension from 58.1% to 90.5% ($p < 0.001$); obesity from 69.5% to 88.6% ($p < 0.001$); diabetes from 53.3% to 75.2% ($p < 0.001$); and hypercholesterolemia from 61.9% to 92.4% ($p < 0.001$). Additionally, improvements were seen in physical activity (73.3% pre-ACS to 91.4% post-ACS, $p < 0.001$), proper nutrition (81.9% to 96.2%, $p < 0.001$), and correct eating habits (35.2% to 87.6%, $p = 0.004$).

Conclusions:
The study highlights improved patient awareness of cardiovascular risk factors and lifestyle changes post-ACS. Productive physician discussions were common, but enhanced education on lesser-known risks and consistent follow-up are needed to sustain long-term cardiovascular health.

Key Words: Acute coronary syndrome; Awarness; Cardiovascular risk factors ;

Funding Agency: Not available

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Prevalence and Characteristics of Patients Diagnosed with SCAD in Middle Eastern ACS Patients: RACE Registry

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Introduction:
Spontaneous coronary artery dissection (SCAD) is a significant yet infrequent cause of acute coronary syndrome (ACS), particularly affecting women without typical atherosclerotic risk factors. The prevalence and prognosis of SCAD remain poorly understood. This study reports the prevalence, characteristics, and short-term mortality outcomes of SCAD patients diagnosed with ACS, using data from the Middle Eastern RACE registry.

Methods:
This retrospective cohort study analyzed female patients from Kuwaiti governmental hospitals who underwent coronary angiography for ACS evaluation between May 2023 and May 2024. Among 452 female patients hospitalized with a primary ACS diagnosis, six cases (1.3%) were confirmed to have SCAD. Four cases were diagnosed via coronary angiography alone; two additional cases required supplemental coronary imaging for confirmation. Thirteen additional cases were initially suspected as SCAD based on angiogram review. Four of these underwent further imaging, which excluded SCAD; the remaining nine cases lacked further imaging, leaving SCAD unconfirmed.

Results:
Baseline characteristics of the six confirmed SCAD patients included a mean age of 52 years. Comorbidities included hypertension in three patients (50%) and diabetes mellitus in two (33%). Presenting symptoms varied; four patients (66%) experienced cardiac chest pain, while two (33%) presented with dizziness and near-syncope. ECG findings showed normal results in two patients; two demonstrated new ST-depression. All patients exhibited normal ejection fractions on echocardiogram. Angiographic findings classified four patients (66%) as having Type I SCAD and two (33%) as having Type IIb SCAD. There were no short-term mortalities among the SCAD patients, although one patient required hospitalization for a non-cardiac condition.

Conclusions:
In conclusion, SCAD represents a critical cause of acute coronary syndrome, particularly in women. Its similarity to atherosclerotic ACS necessitates active consideration during coronary angiography, especially in specific clinical scenarios. Management is predominantly conservative; short-term mortality appears low. However, due to the small sample size and limited data, these findings require cautious interpretation. Future, larger studies are needed to validate these observations and draw stronger conclusions regarding SCAD epidemiology and treatment outcomes.

Key Words: SCAD; ACS; Prevalence ;

Funding Agency: NONE

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Quality of Life and Psychosocial Impact of Chronic Dermatological Conditions Among Adults in Kuwait

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Introduction:
Chronic dermatological diseases can significantly impact patients' quality of life (QoL) due to social disapproval and stigmatization. These diseases also impose a financial burden and can lead to psychological distress, including depression and anxiety.
Aims/objectives: This study aims to assess the quality of life (QoL) of people with different dermatological disease, evaluate the association between sociodemographic factors and disease-related factors with QoL, and assess the psychological, social, and financial impact of various dermatological diseases.

Methods:
This cross-sectional study involved an online questionnaire distributed to adults in Kuwait diagnosed with chronic with a chronic dermatological disease. The questionnaire covered sociodemographic information, disease history, QoL impact using the Skindex-16, financial implications, social implications, and psychological screening tools for depression (PHQ-2) and anxiety (GAD-2). The questionnaire was available in both English and Arabic. Ethical approval was obtained prior to data collection, and participants provided informed consent.

Results:
A total of 445 participants were enrolled in this study. Significant associations were found between chronic dermatological conditions and sociodemographic factors. Alopecia areata was associated with gender and governorate, while psoriasis was linked to education level and employment status. Acne was associated with age, marital status, and employment. Rosacea was significantly associated with gender. Eczema, psoriasis, alopecia, and acne were all associated with depressive symptoms. Eczema and psoriasis were also linked to anxiety symptoms. The study found associations between the frequency of dermatologist visits and having acne and rosacea. Treatment expenses were associated with rosacea. Subjective financial burden was associated with psoriasis and rosacea. Higher numbers of skin conditions were associated with increased symptoms of depression and anxiety, as well as lower quality of life across symptoms, emotions, and functions.

Conclusions:
Chronic dermatological diseases have a significant impact on patients' quality of life, particularly in relation to psychosocial and financial factors. The study found various associations between chronic dermatological conditions and sociodemographic factors, suggesting that certain groups may be more affected than others.

Key Words: Dermatology, acne, psoriasis, alopecia, vitiligo,; Quality of Life, QoL; Prevalence,

Funding Agency: None

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Attitude and Stigma Related to Seeking Psychological Support in Kuwait University Students

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Introduction:
Despite the great burden of mental distress on the individual and the world in general, mental health is still neglected. People who are suffering still hesitate in seeking help due to the stigma and negative attitude it carries. Therefore, the main objective of this study is to explore attitudes related to seeking psychological support, assess the level of public stigma related to seeking psychological support, and to explore factors associated with having a positive attitude related to seeking psychological support amongst students in Kuwait University.

Methods:
During April 2023, a cross-sectional study was conducted for data collection using a structured self-administered questionnaire. A total of 386 responses were collected from Kuwait University students at 5 recruitment sites. Chi-square analysis and logistics regression were utilized to determine correlation and association of studied variables with attitude, stigma, and psychological distress.

Results:
Of 386 participants, most were Kuwaiti (90.7%), females (90.7%), single (86.3%), aged between 18-20 years (56.5%), and have not accessed psychological healthcare previously (91.7%). The significant predictors of positive attitude included female gender (adjusted OR = 3.5; 95% CI: 1.6-7.9; p= 0.002), and previous psychological healthcare access (adjusted OR = 2.6; 95% CI: 1.1-6.0; p = 0.031). The significant predictor of lower stigma was attending scientific colleges (adjusted OR = 0.6; 95% CI: 0.3-1.0; p = 0.031). The significant predictors of low PHQ-4 were Hawally governorate (adjusted OR = 0.3; 95% CI:0.1-0.8; p = 0.018), and attending scientific colleges (adjusted OR= 2.3; 95% CI: 1.4-3.7; p= 0.001). The significant predictor of suggested anxiety was scientific colleges (adjusted OR = 2.2; 95% CI: 1.4-3.5; p = 0.001).

Conclusions:
There was a statistically significant correlation found between attitude and gender as well as a history of accessing psychological healthcare. Furthermore, a significant association was reported between stigma and attending a scientific faculty; gender, marital status, and previous access to healthcare were found significant in other literature. Finally, Hawally governorate residents as well as scientific faculty students are significantly associated with experiencing psychological distress. Gender, marital status, and age were significant in other literature. The main causes for these associations were cultural stereotypes and educational burdens.

Key Words: Cross section; Kuwait university students; Depression ;

Funding Agency: None

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Low Self-esteem among Health Science Center Students in Kuwait: Prevalence and Risk factors.

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Introduction:
Self-esteem, a fundamental aspect of psychological well-being, significantly influences individuals' academic performance, relationships, and overall life satisfaction. This study aims to assess the prevalence of low self-esteem among Health Science Center (HSC) students in Kuwait and explore factors associated with this issue.

Methods:
A cross-sectional study was conducted among HSC students over a five-day period in October 2024. An electronic self-administered survey was sent to all students across the four faculties: Medicine, Dentistry, Pharmacy, and Allied Health. A total of 1,291 students completed the Rosenberg Self-Esteem Scale and questions on demographics, health, academic, emotional, and psychological factors. The prevalence of low self-esteem was calculated, and its variation across different risk factors was analysed through univariable analysis. Multivariable logistic regression analysis was used to further explore the independent relationship between these risk factors and low self-esteem.

Results:
The sample median age was 21 years old. The majority of the participants were Kuwaiti (88.4%), female (86.9%), and single (95.3%). The prevalence of low self-esteem among HSC students was 18%, with significant variations across faculties. Allied Health students had the highest prevalence (20%), followed by Medicine (19%), Dentistry (11%), and Pharmacy (9%). Multivariable logistic regression analysis revealed that dissatisfaction with body image (OR = 8.3, P<0.001), poor physical health (OR =1.82, P <0.001), psychological issues (OR =1.6, P =0.01), high levels of emotional exhaustion (OR=2, P =0.04), and social isolation (OR=3.5, P <0.001) were associated with low self-esteem.

Conclusions:
This study found a high prevalence of low self-esteem among HSC students, especially in Allied Health and Medicine. Factors like body image issues, poor physical and mental health, and social isolation were linked to low self-esteem. These results underscore the need for targeted interventions to address the well-being of HSC students, such as psychological counseling and support groups. Future research should explore the underlying mechanisms of these associations and develop evidence-based interventions.

Acknowledgment: The authors thank Dr. Areej Al-Ali for her guidance, Manal Al-Kandari for data analysis, and Dr. Zainab Al-Mossa for obtaining ethical approval. We also thank the students who participated in this study.

Key Words: Self-esteem; Students; Health Science Center ;

Funding Agency: None

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The Effects of Breast Milk versus Formula on Children's Health during their First Few Years of Life

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Introduction:
Breastfeeding is beneficial for both mother and child as it provides nutrition and protection from illnesses compared to formula-feeding; however, many mothers choose not to breastfeed. The study aimed to assess the health status of breast fed versus formula fed children. It also explored factors influencing a mother's preference for feeding modality and evaluated mothers' knowledge and experiences with breastfeeding.

Methods:
This was a cross-sectional study, in which participants were recruited from various polyclinics around Kuwait and one nursery. A 59-question survey was distributed via a QR code to Kuwaiti and non-Kuwaiti mothers, aged 18–50, with a child aged 1-6, residing in Kuwait. We asked about mothers' demographics, knowledge, attitudes, and barriers to breastfeeding, and the health status of both parents. For mothers' knowledge, two questionnaires were used, one of which was validated and the other wasn't as it approached different demographics. Correct responses for true and false questions were awarded with 1 point, and incorrect ones were rewarded with 0 points. Statistical methods utilized, included chi-square, assessing feeding modality with other variables, and multivariate regression for feeding modality and chronic conditions. The evaluation of both knowledge scores and breastfeeding duration with different variables was done by one-way ANOVA and t-test. Distinguishing differences between groups was done by post-hoc tests.

Results:
Mixed feeding was the most common feeding modality (51.8%). Formula-fed and mixed-fed children were significantly more likely to fall ill ≥5 times annually compared to those exclusively breastfed. Reasons why mothers breastfed included: "best option for my baby", "natural", etc. Maternal education, geographic location, and sources of information on breastfeeding were found to be significant predictors of exclusive breastfeeding. Also, higher knowledge and fewer obstacles made mothers more likely to breastfeed. Health professionals and mothers with higher educational levels showed better breastfeeding knowledge, which positively related to longer breastfeeding duration.

Conclusions:
Exclusively breastfed children were sick fewer times per year compared to formula fed/ mixed fed. Greater knowledge and fewer obstacles increased the likelihood of mothers to breastfeed and the duration of breastfeeding. The health impact of breastfeeding should be further explored in future studies.

Key Words: breastfeeding; child health; knowledge ;

Funding Agency: NONE

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Caffeine Use Disorder among Healthcare Workers in Kuwait: Prevalence and Risk Factors

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Introduction:
Caffeine use disorder (CUD), a growing public health concern, often goes undiagnosed and can lead to significant health consequences. Healthcare workers, especially those in demanding roles, are particularly susceptible to developing CUD due to their reliance on caffeine to maintain alertness and manage stress. This study aims to (1) assess the prevalence and severity of CUD among healthcare workers (HCWs) and to (2) explore risk factors associated with CUD.

Methods:
A cross-sectional study was conducted among HCWs in October 2023 in Kuwait. Data were collected using a self-administered questionnaire distributed to HCWs at seven major general hospitals. The prevalence of CUD were assessed using 11 items adapted from the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) criteria . Chi-square and Mann-Whitney tests were used to examine the association between CUD and demographic, socioeconomic, work-related, behavioral, and other factors. Univariable and multivariable logistic regression were conducted to assess the unadjusted and adjusted associations, respectively.

Results:
The median age of participants was 37 years, with a relatively equal gender distribution. Most participants were non-Kuwaiti (68%) and consumed caffeinated coffee (75%). A significant proportion (66%) were overweight or obese. The prevalence of CUD among HCWs was 37%, with 17% experiencing mild, 10% moderate, and 10% severe CUD. The final multivariable logistic regression model revealed that frequent caffeine consumption (>3 cups compared to zero cups; OR=9.8, $p<0.001$), difficulty initiating sleep (OR=4.1, $p<0.001$), and depression (OR=2.2, $p=0.003$) were significantly associated with CUD. Younger age (OR=0.9, $p=0.001$), and female gender (OR=2.1, $p<0.001$) were also identified as risk factors for CUD.

Conclusions:
This study highlights the significant prevalence of CUD among HCWs in Kuwait, particularly among younger females. Factors such as frequent caffeine consumption, sleep disturbances, and depression were strongly associated with CUD. Future research should explore the underlying mechanisms of these associations and develop evidence-based interventions, such as cognitive-behavioral therapy to prevent and control CUD.
Acknowledgment: The authors thank Dr. Areej AlAli and Dr. Ahmed Alsultan for their guidance, and Dr. Zainab Almossa for obtaining ethical approval. We also thank the participating HCWs for their contributions.

Key Words: Caffeine, Caffeine Use Disorder; Risk factors, health; Healthcare workers ;

Funding Agency: No

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Patients' Perceptions and Attitudes Towards the Use of Artificial Intelligence in Healthcare in Kuwait

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Introduction:
Artificial intelligence (AI) is a system's ability to accurately interpret external data. It has been widely used in healthcare. This study aims to investigate the perceptions and attitudes of patients in Kuwait regarding the use of AI in healthcare and to examine sociodemographic factors associated with positive attitudes towards AI use in healthcare.

Methods:
A cross-sectional study was conducted on 580 participants of both genders. A 30-question Google Forms questionnaire was administered to participants recruited from various Kuwait ministries and malls. The questionnaire was divided into three sections: (a) assessing patients' technical affinity, (b) evaluating perceptions of AI in healthcare, and (c) capturing sociodemographic data. Statistical analysis was performed using SPSS (version 27) with chi-square tests and logistic regression for univariate and multivariate analyses.

Results:
•Theme I: Positive perceptions of AI in medicine are strongly linked to recognizing its advantages in the field.
•Theme II: People with positive views of AI advantages tend to have an overall positive perception of AI in medicine.
•Theme III: Patients who believe physicians lack AI competence are more likely to fear AI in medicine.
•Theme IV: Fear of AI is associated with the perception that physicians have low AI competence.
•Theme V: Those who fear AI in medicine believe it should be controlled to ensure safe use.
•Theme VI: Participants who are somewhat familiar with AI generally have positive feelings
toward its use in medicine, whereas those who perceive physicians as lacking AI competence tend to have negative feelings.

Conclusions:
This study sheds light on patients' perceptions of AI in healthcare, highlighting factors such as gender, technical affinity, fear of AI, and the perceived competence of physicians. Positive attitudes are often tied to recognizing AI's advantages, while fear stems from concerns about physician competence and the need for control. Public education and awareness are crucial to addressing these perceptions and improving acceptance of AI in healthcare.
Acknowledgment:
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Key Words: Artificial intelligence; Perception; Attitude ;

Funding Agency: None

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Prevalence and Risk Factors of Food Allergies Among Adults in Kuwait: A Cross-Sectional Study

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Introduction:
Food allergy (FA) is a globally surging health problem, with manifestations ranging from mild to severe, and in few instances can be life-threatening. While food allergy in childhood is widely studied, food allergy among adults remains understudied. In this study, we investigated the burden of food allergy among adults in Kuwait by (i) estimating the prevalence, (ii) assessing associated health conditions and potential risk factors, and (iii) determining the impact on the quality of life.

Methods:
A cross-sectional study was conducted by enrolling adults living in Kuwait aged 18 years and above via a web-based survey that was distributed through various social media platforms. A previously established criteria was used to ascertain "current convincing clinical history of food allergy" based on information reported by the participants. Statistical analysis involved descriptive statistics, chi-squared tests, non-parametric tests, and multivariable logistic regression models to assess associations between food allergy history and comorbid conditions.

Results:
The study enrolled a total of 474 adults, with 73.4% females. The lifetime self-perceived food allergy prevalence was estimated to be 26.4%, while being higher in females compared to males (30.5% vs. 15.1%, p-value <0.001). The prevalence of current convincing clinical history of food allergy was estimated to be 15.3%, with negligible sex-related differences. Common reported food allergens included cow's milk (11.2%), fruits and berries (9%), shellfish (6.1%), and tree nuts (5.3%). Current convincing food allergy prevalence was higher among participants with family history of food allergy compared to those without family history of food allergy (20.1% vs. 9.4%, p-value <0.001). Comorbid conditions that were associated with food allergy included eczema, asthma, and rhinitis.

Conclusions:
Findings of this study suggest that food allergy is common among adults in Kuwait, with the common food allergens being similar to those reported in western countries.

Key Words: Food Allergy; Prevalence AND Risk Factors; Adults ;

Funding Agency: NONE

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Barriers and Motivating factors towards screening of hypertension among adult in Saudi Arabia

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Introduction:
The early detection of hypertension, though important to prevent complications and reduce their burden is not optimal in the Kingdom of Saudi Arabia (KSA). According to WHO there is about 46% of adults with hypertension are unaware that they have the condition. High blood pressure is a major cause of premature death worldwide. One of the global targets for noncommunicable diseases is to reduce the prevalence of hypertension by 33% between 2010 and 2030.
Aims and objectives:
This study aimed to provide evidence-based information for healthcare decision-makers to reduce the burden of hypertension in KSA through early detection. By measuring hypertension prevalence, evaluating early detection rates, and assessing barriers and motivators to early detection, this study sought to inform strategies for improving hypertension management and control.

Methods:
A cross-sectional survey was conducted among 1185 adults aged 18 and above. Participants were recruited from 10 Primary healthcare centers in different regions of KSA. The data was collected by face to face interviews using a validatedin questionnaire by trained medical students. Hypertension was defined according to WHO criteria. Late detection is retained when patient is diagnosed with high blood pressure after appearance of signs and symptoms or during complication. The respondents self-reported if they have blood pressure without readings.

Results:
A total of 1,185 volunteers participated in the study, with a nearly equal gender distribution (51.6% male and 48.4% female). The majority of participants were young, with 51.6% under the age of 30. Our findings indicate that 15.36% of respondents had hypertension, and encouragingly, 60.7% of these cases were detected at an early stage. There is 76.4% High blood pressure patients with positive family history. The primary barriers to early detection were fear of test results and the misconception that hypertension primarily affects older individuals. Health system sources, such as doctors of the Ministry of Health, were the most common source of information regarding early detection. Notably, social media also played a significant role. Early detection was positively associated with obtaining information from health system sources.

Conclusions:
These findings support the importance of more involvement of health sector in education of patients and communities regarding hypertension and its early detection.

Key Words: HTN, High blood pressure, silent killer; screening program, early detection;

Funding Agency: None

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Knowledge, Attitudes and Use of Antibiotics among the General Population in Kuwait.

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Introduction:
The emergence of bacterial resistance to antibiotics is a major health concern. Overprescription and improper use leads to the spread of antibiotic resistance. This study aims to determine the knowledge, attitudes, and proper use of antibiotics in the general population of Kuwait.

Methods:
This was a cross-sectional study that used a validated questionnaire. Participants had to be 18 years and above residing in Kuwait and of any nationality. A total of 752 individuals participated in the study, with 9 choosing not to consent to answering the questionnaire. All statistical analysis were conducted using SPSS version 29.0 (SPSS Inc., Chicago, IL). Descriptive analysis was used to obtain frequencies and estimate proportions.

Results:
Almost all participants (96.1%) displayed a low to moderate level of knowledge regarding antibiotics. In addition, the mean scores in knowledge were significantly higher in participants with graduate degrees, compared to those of with bachelor's or less. Furthermore, on average, participants with a personal income level above 1500 KD scored considerably higher than those with an income less than that. Attitudes towards antibiotics were positive in 86% of the study population, however, almost half of participants (45.4%) still preferred to use antibiotics when they had a cough that persisted for more than a week. Approximately 53.16% of individuals enrolled in the study do not use antibiotics properly, and people with high scores of knowledge were found to have 3 times higher odds of proper use of antibiotics . More than a third of respondents also claimed that upon prescription of antibiotics, their doctor did not always instruct them on its proper use.

Conclusions:
The overwhelming majority of participants displayed low to moderate knowledge about antibiotics, which is consistent with data from the local region. Participants with higher income levels scored higher than those with lower incomes. However, attitudes towards antibiotics were resoundingly positive amongst participants, showing a substantial increase in positive attitudes when compared to a previous study conducted in Kuwait.

Key Words: antibiotic; resistance; prevention ;

Funding Agency: NONE

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Knowledge and Attitudes of Kuwait University Students Regarding Consanguineous Marriage

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Introduction:
Consanguineous marriages are very common in Kuwait. These marriages increase the risk of genetic disorders such as congenital malformations, intellectual disabilities, and higher child mortality rates. The aim of this study was to assess the attitudes and knowledge of Kuwait University students on consanguineous marriage.

Methods:
This cross-sectional study surveyed 648 Kuwait University students using an online questionnaire available in Arabic and English. The 15 colleges were grouped into "Medical","Science", and "Arts". We purposefully selected three health colleges and randomly chose two colleges from the latter two groups. Data collection occurred from October 13-17, 2024, through classroom visits and on-campus interactions, using a convenience sampling method.

Results:
Among the 648 predominantly female participants (81.3%) from Kuwait University,18.4% reported consanguineous parental marriages, which correlated with lower knowledge scores about genetic risks of consanguinity (p =.005). After conducting a binary logistic regression analysis and adjusting for the possible confounding variables, significant factors related to receiving a high knowledge score (≥9 out of 11) were college, mothers' education, parents' relations, and number of reported hereditary diseases.

Conclusions:
Knowledge of consanguinity-related genetic risks among Kuwait Universitystudents varied, with higher awareness among Health Sciences students and those with a family history of hereditary diseases. Despite cultural acceptance of consanguineous marriages, there was strong support for mandatory premarital screenings, indicating a shift towards health conscious marital decisions. Lower knowledge levels among students from consanguineous parental marriages highlight the need for public health initiatives to raise awareness and support informed decisions on consanguineous marriages.

Key Words: No; No; No;

Funding Agency: NONE

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Prevalence of vaping, short-term symptoms of respiratory, cardiovascular morbidities and factors associated with the initiation of vaping among young adults in Kuwait

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Introduction:
Vaping (electronic cigarettes) use is a public health concern worldwide, especially among young adults, as it leads to nicotine addiction. This cross-sectional study aimed to i) assess the prevalence of vaping among young adults, ii) assess the prevalence of vaping-associated short-term respiratory and cardiovascular morbidities' symptoms, and iii) identify factors associated with vaping status in the study sample.

Methods:
During October 2024, a cross-sectional study was conducted among the students aged 18 years or older from various colleges of Kuwait University. Data were collected using a structured e-questionnaire administered through in-person invitations and online platforms. The prevalence (%) of vaping was computed. A multivariable logistic regression model was used to estimate the adjusted odds ratio (aOR) and corresponding 95% confidence intervals (CI) for the factors significantly associated with vaping status.

Results:
Of the 1144 participants, most were females (78.5%), Kuwaiti (85.5%), and 18-21 years old (70.6%). The prevalence of vaping was 15.5% (177/1144). Moreover, the short-terms symptoms of the selected respiratory and cardiovascular morbidities were significantly ($p < 0.05$) more common among the vapors than the non-vapors including cough (52.0 vs. 41.0%), dry mouth (56.5 vs. 29.5%), chest pain (46.9 vs. 30.8%), palpitation (50.3 vs. 34.4%) and shortness of breath (62.7% vs. 37.4%). Additionally, multivariable logistic regression revealed that after adjusting for the effects of age and total family income (KD/month), the factors that were significantly ($p < 0.05$) and independently associated with vaping status were male gender (aOR = 8.35; 95% CI: 5.66 –12.31), being a student at a literary college (aOR = 1.84; 95% CI: 1.26 – 2.68), a positive belief that 'vaping is less harmful than cigarette smoking' (aOR = 1.69; 95% CI: 1.10 – 2.58), and a 'disbelief that vaping leads to cigarette smoking' (5.23; 95% CI: 2.61 – 10.45), and 'perception about accessibility of vaping products' (aOR = 4.98; 95% CI: 1.29 – 19.24).

Conclusions:
This study showed a moderately high prevalence (15.5%) of vaping. The male gender and some misplaced beliefs and perceptions were significantly associated with vaping status. The higher prevalences of respiratory and cardiovascular symptoms among the vapors than the non-vapors call for targeted interventions. If instituted, future studies may evaluate the impact of such efforts.

Key Words: Vaping; Prevalence; Young adults;

Funding Agency: NONE

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Prevalence of and factors associated with the initiation of vaping among young adults in Kuwait

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Department of Community Medicine and Behavioural Sciences, College of Medicine, Kuwait University

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Vaping (electronic cigarettes) use is a public health concern worldwide, especially among young adults, as it leads to nicotine addiction. This cross-sectional study aimed to i) assess the prevalence of vaping among young adults; ii) assess the prevalence of vaping-associated short-term respiratory and cardiovascular morbidities' symptoms; and iii) identify factors associated with vaping status in the study sample.

Methods:
During October 2024, a cross-sectional study was conducted among students aged 18 years or older from various colleges of Kuwait University. Data were collected using a structured e-questionnaire administered through in-person invitations and online platforms. The prevalence (%) of vaping was computed. A multivariable logistic regression model was used to estimate the adjusted odds ratio (aOR) and corresponding 95% confidence intervals (CI) for the factors significantly associated with vaping status.

Results:
Of the 1144 participants, most were females (78.5%), Kuwaiti (85.5%), and 18-21 years old (70.6%). The prevalence of vaping was 15.5% (177/1144). After adjusting for the effects of age and total family income (KD/month), the factors that were significantly ($p < 0.05$) and independently associated with vaping status were male gender (aOR = 8.35; 95% CI: 5.66 –12.31), being a student at a literary college (aOR = 1.84; 95% CI: 1.26 – 2.68), a positive belief that 'vaping is less harmful than cigarette smoking' (aOR = 1.69; 95% CI: 1.10 – 2.58), and a 'disbelief that vaping leads to cigarette smoking' (5.23; 95% CI: 2.61 – 10.45), and 'perception about accessibility of vaping products' (aOR = 4.98; 95% CI: 1.29 – 19.24).

Conclusions:
This study showed a moderately high prevalence (15.5%) of vaping. The male gender and some misplaced beliefs and perceptions were significantly associated with vaping status. The high prevalences of respiratory symptoms among the participants call for targeted interventions. If instituted, future studies may evaluate the impact of such efforts.

Key Words: Vaping; Prevalence; Young adults;

Funding Agency: NONE

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Psychometric Properties of the Arabic Version of the Maternal Antenatal Attachment Scale in Pregnant Women in Kuwait.

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Introduction:
Maternal-fetal attachment (MFA) is a complex phenomenon with profound implications for maternal and fetal well-being. This study aimed to translate the Maternal Antenatal Attachment Scale (MAAS) from English to Arabic and investigate the psychometric properties of the Arabic version (A-MAAS) among pregnant Arab women in Kuwait.

Methods:
A sample of 182 pregnant women were recruited from the three largest public and the three largest private hospitals in Kuwait. Reliability was estimated using Cronbach's alpha, McDonald's omega, and Guttman's Split-Half methods. Item analysis was conducted to assess individual items' performance while concurrent validity was established by correlating MFA score with social support. Construct validity was investigated using exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to extract and test the factor structure.

Results:
Among 182 women, the median (IQR) age was 31(8) and median pregnancy duration was 32 gestational weeks (11). The overall scale demonstrated good internal consistency, with Cronbach's alpha=0.806, McDonald's omega=0.811, and Split-Half Spearman-Brown Coefficient=0.809. Significant correlations between A-MAAS and social support confirmed good concurrent validity. EFA revealed four factors accounting for 43.1% of the total variance. While CFA provided weak evidence for the one-factor and Condon's two-factor model, the extracted four-factor model showed a good fit with the smallest AIC.

Conclusions:
The A-MAAS is a reliable and valid tool for assessing MFA among Arab pregnant women in Kuwait, contributing to the intricate dynamics of MFA within this specific cultural context. Acknowledgment: The authors would like to thank all the women who graciously participated in this research, and the administrations and staff of various hospitals for their collaboration and assistance during the data collection phase.

Key Words: Maternal-fetal attachment; Psychometric properties; Arabic;

Funding Agency: NONE

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Prevalence of and factors associated with self-reported asthma among adults in Kuwait

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Introduction:
This cross-sectional study aimed to assess the prevalence of self-reported asthma among adults in Kuwait and to examine the sociodemographic and lifestyle factors associated with self-reported asthma status in the study population.

Methods:
The data were collected from January 26, 2021, to February 3, 2021, using an e-questionnaire, which was administered through social media platforms. The prevalences (%) of self-reported asthma was computed. Multivariable log-binomial regression model was used to evaluate the association between the demographic and lifestyle factors with asthma status. The adjusted prevalence ratios (aPR) and their corresponding 95% confidence intervals (CI) were computed from the estimated coefficients of the final model and used for the interpretation of the results.

Results:
Of 3572 respondents included, most participants were females (78.30%), between the ages of 21 and 30 (40.71%), Kuwaitis (89%), college graduates (89.53%), had a family monthly income (Kuwaiti Dinars (KD) of 2000 or more (45.49%), and married (55.15%). Asthma prevalence (%) among the participants was 17.8% (637/ 3572). The final multivariable log-binomial model showed that compared with the 21-30 years old, the participants in age band of 31-40 years had 29% more asthma prevalence (aPR = 1.29; CI: 1.08 - 1.55). Males compared with the female were significantly more likely to be asthmatic (aPR = 1.28; CI: 1.03 - 1.59). The other variables significantly ($p < 0.05$) associated with asthma status were nativity (Kuwaiti nationality vs. non-Kuwaiti non-Arab: aPR = 2.47; CI: 1.21 – 5.07), marital status (widowed vs. single: aPR = 2.23; CI: 1.65 – 3.03), current smoking status (current smoker vs. non-smoker: aPR = 1.96; CI: 1.52 – 2.52) or age at initiation of smoking (age ≥ 15 years vs. < 15 years: aPR = 2.33; 95% CI: 1.39 – 3.90; non-smokers: aPR = 2.69; CI: 1.55 – 4.67).

Conclusions:
This study provides evidence moderately high prevalence of asthma among adults. The male gender, Kuwaiti nativity, marital status as widowed, current tobacco smoking status, age at initiation of smoking 15 years or more were significant predictors of current self-reported asthma status. These findings highlight the moderately high burden of asthma among adults and needs to be considered in designing future treatment and prevention programs.

Key Words: Asthma; Prevalence; Risk factors;

Funding Agency: NONE

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The Effect of Ultrasonic Cleaning Solutions on Different Dental Provisional Materials Color Stability

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Introduction:
The purpose of the study was to evaluate the effect of ultrasonic cleaning solutions on color stability of conventionally and CAD-CAM fabricated dental provisional restoration materials. The null hypothesis was that there will be no difference in color stability following cleaning using different ultra-sonic cleaning solutions and with different dental provisional materials.

Methods:
A total of one hundred and ninety-two provisional specimens were fabricated using one of four materials and fabrication methods (Conventionally Fabricated poly methyl methacrylate [PMMA] n=48, Milled PMMA n= 48, 3D Printed Resin n=48, Bis-Acrylic Composite n-48) Each of the four groups were treated with 4 solutions (water n=12, general purpose cleaner n=12, tar and stain cleaner n=12, cement remover cleaner n=12). Each sample was immersed in the randomly assigned solution for 5 cycles using an ultrasonic water bath. color measurements were Oral cancer, widely prevalent (Text in Arial 20-24) obtained for each sample at baseline, after two cycles, and after 5 cycles. MANOVA test as well as wilcoxon test and paired T tests were used to detect statistical differences in color changes changes between different provisional materials and different solutions before and after two and 5 cycles of ultrasonic cleaning.

Results:
A statistically significant difference in color was found before and after soaking different dental provisional materials in ultrasonic solutions. ($p<0.05$) There was a statistically significant difference between delta E in the second cycle of ultrasonic cleaning in comparison to delta E in the fifth cycle ($p=0.015$) for all groups. Around 73% and 78% of delta E2 and delta E5, respectively, were falling within the acceptability threshold (<2.7). W After 5 cycles, significant differences (<0.001) in delta E between groups were observed.

Conclusions:
- Ultrasonic cleaning solutions affect the color stability of different dental provisional materials.
- Color changes after 5 cycles of ultrasonic cleaning may be acceptable except when soaking printed bisGMA in general purpose cleaner..
- Different dental provisional materials react differently with different dental cleaning solutions and thus solution selection is crucial.
- Printed bis GMA resin material performed more poorly in comparison to other materials

Key Words: PROVISIONAL; Crown; solution;

Funding Agency: Kuwait University. DR02/23

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The Effect of Local Anesthesia with Epinephrine on Blood Pressure and Blood Glucose

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Introduction:
This clinical study investigated the impact of local anesthesia containing epinephrine on blood pressure (BP) and blood glucose (BG) levels in healthy patients undergoing routine dental treatment. The objective was to evaluate changes in systolic BP, diastolic BP, and BG in response to two anesthetic techniques: infiltration and inferior alveolar nerve block (IANB).

Methods:
A total of 99 ASA I patients were recruited and randomly allocated into two groups: 63 received infiltration anesthesia, and 36 received IANB. Each participant received a single 1.8 mL cartridge of 2% lidocaine with 1:100,000 epinephrine. BP was measured at 13 time points using an automated monitor, while BG levels were recorded at baseline (5 minutes pre-injection), 30 minutes post-injection, and 60 minutes post-injection. Mixed repeated-measures ANCOVA was employed to analyze the effects of anesthesia type, time, age (covariate), and gender on BP and BG, with a significance threshold of $p < .05$.

Results:
Significant variations in systolic BP were observed over time ($F(12,1128) = 23.74$, $p < .001$, $\eta p^2 = .202$), influenced by age ($F(1,94) = 57.74$, $p < .001$, $\eta p^2 = .381$), gender ($F(1,94) = 123.48$, $p < .001$, $\eta p^2 = .57$), and anesthesia type ($F(1,94) = 47.20$, $p < .001$, $\eta p^2 = .33$). Diastolic BP also showed significant time-dependent changes ($F(12,1128) = 11.94$, $p < .001$, $\eta p^2 = .11$), with higher readings in females ($F(1,94) = 64.20$, $p < .001$, $\eta p^2 = .41$) and with infiltration anesthesia ($F(1,94) = 94.47$, $p < .001$, $\eta p^2 = .50$). For BG, gender-anesthesia interactions were significant ($F(1,94) = 36.65$, $p < .001$, $\eta p^2 = .28$), with females showing higher BG levels with infiltration, and males with IANB. BG changes over time were non-significant ($F(2,188) = 1.01$, $p = .366$, $\eta p^2 = .01$), remaining within normal clinical limits.

Conclusions:
Both systolic and diastolic BP showed time and gender-specific variations based on the anesthesia type; however, these changes were clinically insignificant. Similarly, BG fluctuations, though statistically significant in certain subgroups, were within normal limits. The findings suggest that local anesthesia with epinephrine is safe for normotensive, healthy patients during routine dental procedures. Further studies with larger sample sizes are recommended to validate these results.

Key Words: Local anesthesia, epinephrine; Blood pressure; Blood glucose;

Funding Agency: None

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Oral Hygiene Habits of Complete Denture Patients at Kuwait University Dental Clinic

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Introduction:
This study aimed to investigate the sociodemographic factors influencing oral hygiene habits among complete denture wearers at Kuwait University Dental Clinic (KUDC).

Methods:
A cross-sectional survey was conducted using a self-administered questionnaire. The study included 61 complete denture patients attending KUDC between January 2019 and December 2023. The inclusion criteria comprised individuals with complete edentulism in one or both jaws and wore polymethyl methacrylate (PMMA). The exclusion criteria were patients with partial dentures, individuals using dentures made from materials other than PMMA, and patient who were unable to provide all necessary information. Sociodemographic data, general health status, and oral hygiene habits were collected. Clinical assessment of denture hygiene was performed using the Budtz-Jörgensen denture plaque index, and statistical analyses were conducted using Fisher's exact test, with a significance threshold set at $p<0.05$.

Results:
Most respondents were completely edentulous (72.13% with both maxillary and mandibular dentures). The majority of participants (37.7%) were aged between 51-60 years, with 46 (75.4%) being males and 15 females (24.6%). Most participants (81.96%) had a high school education or less. Dental caries was the primary cause of tooth loss (83.6%) and 77.04% reported irregular dental visits. Clinical evaluation showed only 46.05% demonstrated optimal or good denture hygiene practice. Toothbrush with toothpaste was the most common cleaning method (79.21%), and 70.62% removed their dentures at night. A significant association was found between the participant's education level and denture wearers ($p=0.035$), as well as between gender and frequency of dental visits ($p=0.024$). However, no significant relationship was observed between gender and denture hygiene ($p=0.52$).

Conclusions:
Unsatisfactory denture hygiene was prevalent among participants, possibly due to limited awareness or inadequate instruction. Education level and gender influenced certain aspects of denture care, highlighting the need for targeted oral health education programs and improved patient guidance from dental practitioners.

Key Words: Complete dentures, Oral hygiene habits, Denture hy; 0; 0;

Funding Agency: NONE

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Special Health Care Needs Patients Adherence to Follow-up Visits After Dental Rehabilitation Under General Anaesthesia: A Multi-center Quality Improvement Project

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Introduction:
Objectives: To assess the adherence of Special Health Care Needs (SHCN) patients/parents and dentists to the 1st and 2nd follow-up visits within the first four months following dental rehabilitation under General Anaesthesia (GA).

Methods:
Standerds were set as 100% of the patients' records of SHCN patients undergoing dental rehabilitation under general anaesthesia, should include the following: date of surgery, date of follow-up appointments given and indicate if they attended, documentation of any communication methods with the caregivers to confirm the appointment and procedures performed in the follow-up visits. For the first cycle retrospective data collection of clinical notes from dental records of all SHCN patients received dental rehabilitation under GA in three dental centres in Kuwait from January 2021 till January 2022. While in the second cycle, prospective data collection of clinical notes of all SHCN patients received dental rehabilitation under GA from December 2022 till February 2023. Files were searched manually, and the required data were collected using google forms. Data were exported and analysed by Microsoft excel. Five patients' clinical notes where piloted and excluded from the final result. Based on the results of first cycle, the following action plan was implemented: GA follow-up list, appointment cards and reminder calls/text. Then to initiate a second cycle after 6 months to assess the progress and act accordingly.

Results:
None of the patients' record included in the project met the standards in the first cycle. A total of 50 patients' files were included in the first cycle representing all SHCN patients received dental rehabilitations under GA in the 3 dental speciality centers. The overall attendence rate of SHCN patients to the first follow-up visit is 30% (n= 15) and 8% (n= 4) for the second follow-up appointment in the three included centers.

In the second cycle, 4% of the patients' record included in the project met the standards. A total of 46 patients' files were included in the first cycle representing all SHCN patients received dental rehabilitations under GA in the 3 dental speciality centers. The overall attendance rates for the 1st and 2nd follow-up visits have both increased by 7% (37%, n= 17) and 14% (21.7%, n= 11), respectively. Documentation increased in the 1st follow-up visit by 11%, but it showed a significant reduction of 17% for the 2nd follow-up visits. Communication methods demonstrated a notable enhancement of 15-20%.

Conclusions:
Despite the variation in the commitment to the action plan among the three centres that has a negative impact on the overall results. The use of GA follow-up list, appointment cards and reminder calls/text helped to improve attendance rate of SHCN patient to the 1st and 2nd follow-up visits after dental rehabilitation under general anaesthesia. A third cycle is recommended to improve the action plan in-order to meet the quality improvement project standards.

Key Words: Quality Improvement Project; dental rehabilitation under General Anaesthesia;

Funding Agency: NONE

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Oral Health in the State of Kuwait

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Introduction:
Oral health issues have received significant attention from most global health agencies, which have integrated these issues into their noncommunicable disease, sustainable development, and universal health coverage objectives.

Methods:
This paper provides an update on the progress made in the last 2 decades and aims to highlight some of the challenges faced by the oral health care system in Kuwait. Secondary data collected from the Ministry of Health, College of Dentistry, Kuwait University and published research papers from Kuwait was used to generate this report. Descriptive analysis of the data were performed.

Results:
As of 2020, there are 956 public oral health clinics in Kuwait providing free oral health care to the Kuwait population, which was delivered by 1990 dentists across all specialties in dentistry. In addition, there are 1715 private oral health clinics with 1062 dentists who serve the private sector. Primary health care polyclinics (317 clinics) with approximately 1500 dentists provide primary oral health care through dental clinics housed within their structures. As of 2020, the MoH has 675 dentists working in specialty dental centers, 1291 dentists working in primary oral health care centers and 274 dentists working in the SOHP. Analyzing the previous 5-year data (2019-2023) from the MoH, majority of the 1171 dentists who joined the workforce were Kuwaitis (84%) and women (51%). Most of the dentists graduated from Egypt (39.5%), followed by Jordan (25.3%), Kuwait (9.9%), the United Kingdom (8.5%) and the United Arab Emirates (6.0%). Currently, there are approximately 76 dentists per 100,000 people in Kuwait, which is more than double the ratio in 2004, with fewer than 35 dentists per 100,000 people. Previous surveys from Kuwait revealed a mean number of DMFT of 2.7, 3, 3.5, and 3.9 in 1982, 1985, 1993 and 2000, respectively, in 15-year-old children. The number of DMFT increased from 7.8 for the 19-24 years age group to 10.7 for the 35-44 years age group and 18.9 for the 65-77 years age group

Conclusions:
Despite the nation’s rising expenditure on oral health care and the increase in the dental workforce, the prevalence of oral diseases remains high in Kuwait.

Key Words: Oral health; Kuwait; Caries;

Funding Agency: None

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Dental Attendance of Children with Untreated Early Childhood Caries (ECC) - A Quality Improvement Project

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Introduction:
Children in Kuwait have high caries experience, with up to 43% of under 6-years-old affected. Attending regular dental visits reduces the prevalence and negative consequences of untreated early childhood caries (ECC).

Objectives
To assess the dental attendance of children with remaining untreated dental caries at one paediatric dentistry unit under Kuwait Ministry of Health.

Methods:
Prospective data collection of walk-in patients under 6-years-old with untreated ECC; from 100 patient records for cycle-1, followed by intervention, then 100 patient records for cycle-2. The set standard is 100% of children with ECC should attend dental appointments for management.

Results:
Children dentally attended in 43% for cycle-1 (13% completed, 30% uncompleted); and 58% of cycle-2 (17%completed, 41% uncompleted). The intervention between the cycles included empowering patients and parents with information and a review card of remaining untreated caries.

Discussion
The majority of children attended for emergency with pain or swelling (66% cycle-1, 84% cycle-2). Although there is a 15% of overall improvement in dental attendance, only 4% of this improvement included children that attended and completed their dental management.

Conclusions:
Dental attendance of children with untreated ECC is poor. The intervention implemented was insufficient to achieve the set standard and should be enhanced, with addition of a further cycle. Expanding this quality improvement project to other units could be benefitial.

Key Words: Dental Attendance; Caries; A Quality Improvement Project;

Funding Agency: None

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Enhancing Knowledge of Tooth Avulsion: Educational Outreach for Middle School children using the "Save your Tooth" poster

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Introduction:
The prognosis of replantation of an avulsed tooth is affected by first aid management after a traumatic incident. Knowledge of the optimal management is crucial to successful replantation.

Objective:
This study aimed to investigate the effectiveness of educational intervention using the Arabic version of the "save your tooth" poster designed by the International Association of Dental Traumatology to improve the knowledge of a sample of Kuwaiti middle schoolchildren about first aid management for avulsions of permanent teeth.

Methods:
An interventional educational study was conducted in one governmental boys' middle school and one governmental girls' middle school in Kuwait between February and April 2024. A total of 200 children aged 11–13 years participated in the study. The Arabic version of the "save your tooth" poster designed by IADT was used in this study. The content of this poster was explained verbally to the children. A structured validated questionnaire was used to assess the children's knowledge before presenting the poster (baseline), after presenting the poster on the same day (immediate), and after 8 weeks from the presentation (post 8 weeks).

Results:
179 schoolchildren completed the questionnaires, in which (n=95) 53.07% were boys and (n=84) 46.93% were girls. Only 30.2% of the participants responded correctly before presenting the poster. But most participants answered correctly immediately (87.7%) and after 8 weeks post-intervention (82.1%). The mean score of knowledge increased significantly from 3.07 (+ 1.15) at the baseline to 5.99 (+1.16) immediately and 5.64 (+1.37) at 8 weeks post-intervention ($P < 0.001$). Girls had significantly higher mean scores of knowledge at baseline (3.27) and immediately post-intervention (6.37) compared to boys (2.88 and 5.65, respectively). However, both genders showed similar mean knowledge scores at 8 weeks post-intervention ($p=0.719$).

Conclusions:
The present study's findings showed that the knowledge level of middle schoolchildren regarding first-aid management of avulsion of permanent teeth was limited at the baseline. However, implementing the "Save Your Tooth" educational poster with verbal explanation significantly enhanced the children's understanding. Expanding educational initiatives to include all Kuwait schoolchildren could be crucial.

Key Words: Tooth Avulsion, dental trauma; school children; educational intervention,

Funding Agency: NONE

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The Response of Human Osteoblasts on Bovine Xenografts with and without Hyaluronate used in Bone Augmentation

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Introduction:
The use of autogenous bone grafts is still considered as the gold standard, amongst these bovine bone derived xenografts (BDXs) are widely used because of their hydroxyapatite high crystalline structure which gives them volume stability and their low or no resorption time.

Objectives: The aim of the in-vitro study was to asses the effect of hyaluronate in conjunction with bovine derived xenografts.

Methods:
The effect was quantified based on the viability, proliferation on day 4, 7 and 10, expression of early osteogenic differentiation marker Alkaline phosphatase (ALP) on day 14 and 21, collagen, calcium deposition on day 14, 21 and 28 and cellular characteristics were assessed through live cell image analysis, confocal laser scanning microscopy and scanning electron microscopy, in primary human osteoblasts (huOBs, InSCREENeX GmbH, Braunschweig, Germany) compared to three bovine xenografts without hyaluronate. Based on a pilot study and available literature all experiments were performed in triplicates (n=9). For each time point different specimens were used for ALP, calcium and collagen analysis. Data were compared between groups and timepoints using one-way analysis of variance (ANOVA). Bonferroni post hoc test were further used for multiple comparison between groups ($p < 0.05$)

Results:
An increase in cell viability ($p < 0.05$) and enhanced ALP activity was observed in all xenografts. Cerabone plus showed a 55.7 % improvement in the cell viability over the time period. ALP activity of cerabone plus was 163.2%. Specimens containing hyaluronate showed a highest significant difference (23755 ± 29953, $p < 0.0001$).. The highest levels of calcium (1.60 ± 0.30) and collagen (1.92 ± 0.09, $p < 0.0001$) deposition were also observed with hyaluronate loaded groups. The osteoblasts were well attached and spread on all xenograft groups. However, a higher number of cells were observed with hyaluronate functionalized xenograft (76.27 ± 15.11, ($p < 0.0001$) in live cell image analysis and they migrated towards the graft boundaries.

Conclusions:
The biofunctionalization of xenografts with hyaluronate improves their in-vitro performance on human osteoblasts. This suggests that hyaluronate might be able to improve the bone regeneration when using such xenografts.

Key Words: bone grafts; bovine;; xenografts; guided bone regeneration;; biofunctionalization;

Funding Agency: Non funded

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Dermatology Education in the Undergraduate Medical Curriculum: The Student Perspective

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Introduction:
Dermatology education is an essential part of medical education, and it should be emphasized at the undergraduate level. At Kuwait University, which follows a seven-year mixed basic sciences and clinical program, students spend only two weeks in the dermatology rotation. This study aims to assess Kuwait University medical students' satisfaction with dermatology education, as well as their confidence in recognizing common dermatological conditions and their management.

Methods:
A review board–approved survey was adapted from a sister study and modified to assess medical students. Students from frist year to seventh year were asked about the extent of medical school training for common dermatological principles, their confidence levels in identifying common dermatological conditions, and their ability to recognize dermatological manifestations of common diseases.

Results:
A total of 735 medical students at Kuwait University participated in the study, with a participation rate of 96.9%. The majority of the participants were females (80%) with a mean age of 21 years. When asked about the importance of a dermatologist as a member of the medical team, 90% of the participants thought that a dermatologist is important. The majority of the students (94%) believed that having a grasp of general dermatological concepts is important for their future medical practice. When asked about the amount of dermatological education offered in their medical curriculum, 82% of students believed it is inadequate. Outside the core dermatology rotation, 72% of students felt that they received no dermatological education during medical training.

Regarding their level of confidence in their ability to adequately interpret basic dermatological principles, such as accurately identifying and describing lesions at the end of their medical training, 57% did not feel confident, which is a relatively high proportion. Students were also asked about their confidence regarding their ability to successfully identify lesions and develop differential diagnoses for them, and 50% of them did not feel confident in that regard. The majority of participants agreed that more teaching is needed during medical training, with 22.1% thinking that much more teaching is needed, and 57% saying that a little more teaching is needed.

When asked about how long they think the core dermatology rotation should be, almost equal proportions of students (33% and 38%) thought that the dermatology rotation should be two and three weeks long respectively, and 21% thought it should be one month long. In addition, 68% of students reported that they would like subspecialties to be taught during their core dermatological rotation. Participants were asked to rank the methods in which they would like to receive dermatological teaching in their curriculum, and most students (77%) thought that it should be provided in the form of hospital-based learning sessions. For the final part of the survey, participants were shown pictures of the hallmark findings in five common skin conditions, and their accuracy was as follows: Vitiligo (65%), Psoriasis (59%), Acne Vulgaris (89%), Bullous Pemphigoid (33%), and Viral Warts (70%). However, they were not confident in making the diagnoses in more than 50% of cases.

Conclusions:
Dermatology is one of the pillars of medicine, and medical doctors should possess the ability to properly identify common skin disorders, as well as the skin manifestations of systemic diseases. Undergraduate training plays a pivotal role in developing a doctor's skillset. Medical schools should consider incorporating dermatology more expansively

Key Words: Dermatology; Medical Education; Kuwait;

Funding Agency: not applicable

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Peptides as Anti-Aging Agents: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

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Introduction:
Skin aging is characterized by the development of wrinkles, loss of hydration, decreased elasticity, and other structural changes. Peptides, bioactive molecules composed of short amino acid chains, have been increasingly investigated for their potential role in reducing these aging-related alterations. We aim to evaluate the efficacy of peptides as anti-aging agents on key dermatological parameters, including wrinkles, skin hydration, elasticity, roughness, brightness, texture, and density.

Methods:
A thorough systematic review and meta-analysis was conducted in accordance with PRISMA guidelines. We employed a random-effects model based on the DerSimonian and Laird technique, using the inverse variance method. Forest plots were generated to illustrate the results, including direct comparisons between different types of peptides and their modes of application. Heterogeneity was assessed using Cochran's Q test, with a significance threshold of $p < 0.005$, and I2. The analysis included 14 randomized controlled trials with a total of 1,523 patients, covering various peptide formulations and application modes.

Results:
Peptide treatment resulted in a statistically significant reduction in skin wrinkles, with a mean difference of 0.3518 (95% CI: -0.0021 to 0.7057, $p = 0.0514$). Subgroup analyses demonstrated that polypeptides exhibited the most pronounced effect on wrinkle reduction (MD = 0.9083) compared to placebo (MD = 0.1837). Peptides also significantly improved skin hydration (MD = 5.7971, $p < 0.0001$), with tripeptides showing the greatest increase (MD = 16.5). The impact on skin elasticity was less marked, with a non-significant mean difference of 0.0996 ($p = 0.1536$).

Conclusions:
Peptides, particularly polypeptides and tripeptides, demonstrate significant efficacy in reducing wrinkles, improving skin hydration, and enhancing brightness, with lesser but positive effects on skin elasticity, roughness, and texture. To conclude, peptides represent a promising intervention for age-related skin changes, though further high-quality studies are needed to clarify their long-term effects and optimize their application in dermatological practice.

Key Words: Peptides; Anti-aging; Skin wrinkles;

Funding Agency: None

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The relationship between eHealth literacy and health outcomes in patients with diabetes mellitus: A cross-sectional study from Jordan.

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Introduction:
Creative strategies to help improve diabetes mellitus care and limit its negative impacts on the quality of life of affected patients must be implemented in light of global high prevalence and detrimental complications. eHealth literacy may directly influence self-care and clinical outcomes by shifting more responsibility to patients. Yet, there is still lack of evidence about the relationship between eHealth literacy and diabetes-related outcomes.

Objective: To determine the relationship between eHealth literacy and health outcomes (including self-care, adherence, and HbA1c levels) in patients with diabetes.

Methods:
Pertinent data for this cross-sectional study was collected from 500 patients with diabetes via face-to-face interviews using three validated tools: (1) eHealth Literacy Scale (eHEALS), (2) Self-Care Inventory-Revised (SCI-R), and (3) Four-item Morisky Medication Adherence Scale (MMAS-4) ©. Besides, the HbA1c level was used as glycemic control indicator. Statistical analysis was performed using SPSS (V22.0), where multiple linear regressions were used to compare between variables.

Results:
Most patients had uncontrolled diabetes (average HbA1c =7.95 mg/dL). Additionally, most participants had low diabetes self-care scores, and (54.8%) had intermediate levels of medication adherence, even though more than half of the participants (54%) had high eHealth literacy levels. Demographic factors affecting eHealth literacy included the patient's age, employed status, and higher educational level ($p<0.001$ for all). Additionally, self-care behaviours were positively associated with younger age, higher education, and improved eHealth literacy, while it was inversely related to medication adherence ($p<0.001$ for all). No direct effect was seen on diabetic patients' glycaemic control reflected by HbA1c levels.

Conclusions:
The findings of this study demonstrated that patients with diabetes had poor levels of eHealth literacy. Further, it highlighted the gap that exists between the level of eHealth literacy and measurable improvement in health outcomes, necessitating further investigations of wise investment in applying reliable online resources to improve such outcomes.

Key Words: eHealth literacy; Diabetes mellitus; Self-care;

Funding Agency: A grant (reference number: 578/2022) from Deanship of Research at Jordan University of Science and Technology, Irbid, Jordan.

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Causal association of elevated blood pressure and blood pressure lowering drugs on breast cancer; a Mendelian randomisation study

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Introduction:
Breast cancer (BC) is the leading cause of cancer incidence worldwide. Results from observational studies on the association between hypertension and BC were inconclusive. We tested whether systolic blood pressure (SBP) and calcium channel blockers (CCBs) influence BC and BC subtypes using Mendelian randomisation (MR) approach.

Methods:
We used 373 genetic variants associated with SBP and 21 variants in CCB genes as instrumental variables. Effect estimates were obtained from the UK biobank (n=469,767) and BCAC consortium (122,977 cases and 105,974 controls). We assessed BC sub-types based on the presence of oestrogen receptors (ER) (ER+, ER-).

Results:
For each 1 mm/Hg increase in SBP the estimated effect was OR 1.01 (0.94, 1.09) for overall BC, OR 1.00 (0.93, 1.08) for ER+ BC, and OR 1.06 (0.96, 1,17) for ER- BC. The MR-estimated effect of a 1 mm/Hg- SBP lowering through CCB was OR 1.00 (0.99, 1.01) for overall BC, OR 1.00 (0.99, 1.02) for ER+ BC, and OR 1.01 (0.99, 1.03) for ER- BC.

Conclusions:
The results of our study did not support a causal effect of SBP on BC overall and on sub-types. We also found that blocking calcium channel receptors does not increase the risk of BC.

Key Words: Blood pressure; Breast cancer; Mendelian randomisation;

Funding Agency: NONE

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Using Machine Learning and Foot-and-mouth Disease Predicted Spatial Distribution to Approximate the Use of Growth Promotors in Food Animals in the Middle East

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Introduction:
Antimicrobial resistance (AMR) continues to significantly affect public health worldwide. Monitoring the use of growth promoters in food animals is critical for establishing antibiotic stewardship programs (ASP). However, this component is lacking in Kuwait and many Middle Eastern countries due to the weak veterinary infrastructure and related data collection activities. Predicting and quantifying the occurrence of animal infectious diseases can be used as a proxy and driver to the increased use of growth promoters. Here, we aim to explore the potential of using machine learning models in predicting the spatial-temporal distribution of infectious diseases in animals, using foot and mouth disease (FMD) as an example and the complex non-linear relationships between its predictors that influence the use of growth promotors.

Methods:
We used a robust multialgorithm machine learning (ML) statistical framework and 22 relevant satellite-based environmental features to fit predictive models to 1,985 outbreaks reported across the Middle East to the World Organization for Animal Health between 2014 and 2024. We applied three relatively popular and robust machine learning models, including random forest (RF), support vector machine (SVM), and boosted regression trees (BRTs), and compared their predictive importance.

Results:
Based on the cross-validation procedure, the RF model performed very well, with an area under the curve (AUC) equal to 0.92. Using all FMD presence data, the highest predicted spatial risk (probability > 0.8) was constrained within Iraq, Kuwait, Egypt, and Libya, where the disease is currently causing significant outbreaks. Based on the mean decrease Gini estimated by the RF model, we found that temperature seasonality, precipitation of the wettest month, and cattle density were the significant predictors of FMD spatial distribution in the Middle East.

Conclusions:
Countries identified by our ML models have voiced major concerns with their local epidemiological situation of AMR, partially due to the circulation of notifiable livestock diseases that force the producers to irregularly use growth promoters due to the lack of veterinary intervention resources. Our approach to using the ML model and high-precision satellite data under the umbrella of one may help guide current improvement in livestock disease surveillance and intervention activities in the Middle East, subsequently enhancing decision-making related to establishing effective ASPs against AMR.

Key Words: Machine learning, Antimicrobial resistance, Foot-a; Disease Surveillance; One

Funding Agency: None

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Cystic Pancreatic Lesions Visualized on Endoscopic Ultrasound in the Gulf Council Countries: An International Multicenter Study

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Introduction:
Pancreatic cystic lesions (PCLs) are a wide group of pathological entities that include neoplastic and non-neoplastic lesions. The characteristics PCLs in the Gulf Council Countries (GCC) is unknown. This international multicenter study aims to investigate the prevalence of PCLs visualized through endoscopic ultrasound (EUS) in the GCC.

Methods:
Retrospective analysis of PCLs assessed by EUS from Jan 2022-Dec 2022. Prevalence of PCLs, morphological characteristics, and associations with demographic and clinical variables were assessed.

Results:
A total of 128 patients (54.7% female, mean age 56 years [SD:16]) at 7 tertiary care centers (Kuwait: 2, UAE: 3, KSA: 2) were included. A total of 19.5% were smokers, and 3.1% reported alcohol intake. Most common symptoms were abdominal pain (52.3%) and weight loss (14.8%), while 41.4% reported no symptoms. Mean lesion size was 32.8mm x 27.8mm (SD 20.8). Lesions were most frequently located in the head of pancreas (38.2%) and body (29.7%). Most cysts contained fluid only (70.3%),while 7.8 % contained a mural nodule. Additionally, 23.4% had a history of acute pancreatitis. Although only 3.9% reported a history of chronic pancreatitis, 7% had features suggestive of chronic pancreatitis on cross-sectional imaging and 14.1% had features suggestive of chronic pancreatitis on EUS. The most frequent diagnosis was SB-IPMN (32.8%), followed by pseudocysts (14.8%), MCN (13.2%), SCA (10.9%), MD-IPMN (4.6 %). Only 3.9% were malignant cysts. The remaining 15.6% had no final diagnosis. MCN was more common in females than males (70.6% vs. 29.4%, respectively). IPMN was also more common in females than males (59.2% vs.40.8%, respectively). Mean age for IPMN was 57 years (SD 15).

Conclusions:
The most common cystic lesions identified were mucinous pancreatic cysts, occurring predominantly in females, similar to current literature. Remaining data and further regional epidemiological studies are needed in order to enhance our understanding of cystic pancreatic lesions and in turn contribute to developing targeted screening and management strategies for affected individuals in the region.

Key Words: Endoscopic ultrasound; Pancreatic cyst; mucinous cyst;

Funding Agency: None

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Investigating the association of selected SOD2 variant and Non-Hodgkin Lymphoma (NHL) among the Kuwaiti Population

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Introduction:
Non-Hodgkin's lymphoma (NHL) is the most common hematological malignancy in the world. Research has reported that oxidative stress is associated with the development of NHL. Oxidative stress is the phenomenon where there is an imbalance between the production of free radicals, such as reactive oxygen species (ROS), and the efficiency of antioxidants. Superoxide dismutase 2 (SOD2), also known as Manganese-dependent superoxide dismutase (MnSOD) is one of the key antioxidant enzymes that help cells under stressful conditions.

Methods:
Recent studies have shown that single nucleotide polymorphisms (SNPs) of SODs might have a role in increasing the NHL risk as they affect the overall function of the protein. Rs5746136 (C/T) is a SNP located in intron 5 in the enhancer region of the sod2 gene with a potential role in gene transcription. Therefore, the objective of our study is to investigate the link between a genetic variant in the sod2 gene and NHL risk to establish a preliminary basis for whether this SNP can be used as a biomarker for the diagnosis and prognosis of NHL.

Results:
Here, we investigated the association of MnSOD SNP rs5746136 with NHL in 141 Kuwaiti NHL patients and 274 controls via SNP genotyping. Allelic discrimination of rs5746136 using TaqMan assay was conducted, and logistic regression analysis was performed to investigate the potential association. The association of rs5746136 and NHL development is preliminary.

Conclusions:
This study is the first in Kuwait to investigate the role of the MnSOD genetic variant and its susceptibility to NHL. Future studies with larger sample sizes may provide conclusive insights into this relationship.

Key Words: NHL; SOD2; SNPs;

Funding Agency: Research Sector, Kuwait University, Grant number YS07/23

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HLA-B Allele Frequencies And Implications For Pharmacogenetics In The Kuwaiti Population

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Introduction:
Objective: This study explores the frequency of human leukocyte antigen (HLA) genes, particularly HLA-B alleles, within the Kuwaiti population. We aim to identify alleles with known associations to adverse drug reactions (ADRs) based on existing literature. We focus on the HLA-B gene due to its well-documented associations with severe cutaneous adverse reactions and the extensive pharmacogenetic research supporting its clinical relevance.

Methods:
Methods: We utilized the HLA-HD tool to extract, annotate, and analyse HLA-B alleles from the exome data of 561 Kuwaiti individuals, sequenced on the Illumina HiSeq platform. HLA typing was conducted using the HLA-HD tool with a reference panel from the IPD-IMGT/HLA database. The major HLA-B pharmacogenetic markers were obtained from the HLA Adverse Drug Reaction Database, focusing on alleles with significant ADR associations in published literature.

Results:
The distribution of HLA-B alleles in the Kuwaiti population revealed that the most frequent alleles were HLA-B*50:01 (10.52%), HLA-B*51:01 (9.89%), HLA-B*08:01 (6.06%), HLA-B*52:01 (4.55%), HLA-B*18:01 (3.92%), and HLA-B*41:01 (3.65%). Notably, alleles HLA-B*13:01, HLA-B*13:02, HLA-B*15:02, HLA-B*15:13, HLA-B*35:02, HLA-B*35:05, HLA-B*38:01, HLA-B*40:02, HLA-B*44:03, HLA-B*51:01, HLA-B*57:01 and HLA-B*58:01 were identified with known associations to various ADRs. For example, HLA-B*51:01 was associated with clindamycin, phenobarbital, and phenytoin, and was found in 18% of individuals.

Conclusions:
Our study enriches the regional genetic landscape by delineating HLA-B allele variations within Kuwait and across the Arabian Peninsula. This genetic insight, along with the identification of markers previously linked to drug hypersensitivity, provides a foundation for future pharmacogenetic research and potential personalized medicine strategies in the region.

Key Words: Pharmacogenetics; HLA; Kuwait;

Funding Agency: KFAS - Kuwait Foundation for the Advancement of Sciences

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Comprehensive analysis of mitochondrial DNA variants, mitochondrial DNA copy number and oxidative damage in psoriatic arthritis

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Introduction:
Previous studies have shown that mitochondrial dysfunction contributes significantly to the Previous studies have shown that mitochondrial dysfunction contributes significantly to the pathogenesis of psoriasis arthritis (PsA) by modulating innate immunity via redox-sensitive pathogenesis of psoriasis arthritis (PsA) by modulating innate immunity via redox-sensitive inflammatory pathways. Oxidative stress is an important source of mitochondrial genomic inflammatory pathways. Oxidative stress is an important source of mitochondrial genomic instability and can induce mtDNA variations and copy number changes, which may lead to instability and can induce mtDNA variations and copy number changes, which may lead to abnormalities in mitochondrial function. Both mtDNA variants and copy number alterations haveabnormalities in mitochondrial function. Both mtDNA variants and copy number alterations have been implicated in various pathological conditions. Objective. Since no previous studies have been implicated in various pathological conditions. Objective. Since no previous studies have analysed the entire mitochondrial genome or evaluated changes in mtDNA copy number analysed the entire mitochondrial genome or evaluated changes in mtDNA copy number (mtDNAcn) and oxidative stress in PsA, the present study aimed to investigate mtDNA variants (mtDNAcn) and oxidative stress in PsA, the present study aimed to investigate mtDNA variants related to PsA and/or associated with the risk of PsA. The present study also aimed to examine related to PsA and/or associated with the risk of PsA. The present study also aimed to examine changes in mtDNAcn as well as evaluate mtDNA oxidative damage in patients with PsA and changes in mtDNAcn as well as evaluate mtDNA oxidative damage in patients with PsA and healthy controls(HC).healthy controls(HC).

Methods:
The present study analysed the entire mitochondrial genome by next-generation sequencing (NGS)The present study analysed the entire mitochondrial genome by next-generation sequencing (NGS) in 23 patients with PsA and 20 HC to identify PsA-related (qPCR) and mtDNA oxidative in 23 patients with PsA and 20 HC to identify PsA-related (qPCR) and mtDNA oxidative damage was measured using an 8-hydroxy-2'-deoxyguanosine assay. Written informed consents damage was measured using an 8-hydroxy-2'-deoxyguanosine assay. Written informed consents were obtained from all participants under protocols approved by Kuwait University and Ministry were obtained from all participants under protocols approved by Kuwait University and Ministry of Health.of Health.

Results:
NGS analysis revealed a total of 435 variants including 187 in patients with PsA only and 122 in NGS analysis revealed a total of 435 variants including 187 in patients with PsA only and 122 in controls only. Additionally, 126 common variants were found, of which 2 variants differed controls only. Additionally, 126 common variants were found, of which 2 variants differed significantly in their frequencies among patients and controls ($P<0.05$) and may be associated withsignificantly in their frequencies among patients and controls ($P<0.05$) and may be associated with susceptibility to PsA. A total of 33 missense variants in mtDNA-encoded genes for complexes I, susceptibility to PsA. A total of 33 missense variants in mtDNA-encoded genes for complexes I, III, IV and V were identified only in patients with PsA. Of them, 25 variants were predicted to be III, IV and V were identified only in patients with PsA. Of them, 25 variants were predicted to be deleterious by affecting the functions and structures of encoded proteins, and 13 variants were deleterious by affecting the functions and structures of encoded proteins, and 13 variants were predicted to affect protein's stability. mtDNAcn analysis revealed decreased mtDNA content in predicted to affect protein's stability. mtDNAcn analysis revealed decreased mtDNA content in patients with PsA compared with controls ($P=0.0001$) but the decrease in mtDNAcn was not patients with PsA compared with controls ($P=0.0001$) but the decrease in mtDNAcn was not correlated with patients' age or inflammatory biomarkers ($P>0.05$). Moreover, a higher level of correlated with patients' age or inflammatory biomarkers ($P>0.05$). Moreover, a higher level of oxidative damage was observed in patients with PsA compared with controls ($P=0.03$).oxidative damage was observed in patients with PsA compared with controls ($P=0.03$).

Conclusions:
The comprehensive analysis of mtDNA in PsA revealed that certain mtDNA variants may be The comprehensive analysis of mtDNA in PsA revealed that certain mtDNA variants may be implicated in the pathogenesis of PsA. The current results also demonstrated that decreased implicated in the pathogenesis of PsA. The current results also demonstrated that decreased mtDNAcn in PsA may be a consequence of increased oxidative stress. These data provide valuablemtDNAcn in PsA may be a consequence of increased oxidative stress. These data provide valuable insights into the contribution of mtDNA defects to the pathogenesis of PsA. insights into the contribution of mtDNA defects to the pathogenesis of PsA.

Key Words: mtDNA variants; mtDNA copy number; 8-OHdG;

Funding Agency: None

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NPM1 Mutation Quantification in Acute Myeloid Leukaemia

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Introduction:
The Nucleophosmin-1 (NPM1) gene is the most frequently mutated gene in acute myeloid leukaemia (AML). The three most common types of NPM1 mutations are Type A (c.860_863dupTCTG), Type B (c.863_864insCATG) and Type D (c.863_864insCCTG) consisting of a four-base-pair insertion. These mutations have been shown to have prognostic significance in AML. Monitoring mutant NPM1 levels during and after therapy allows for assessment of the response to chemotherapy and early detection of disease relapse. Despite the published significance of this molecular biomarker, routine monitoring for mutant NPM1 levels has not been adopted in Kuwait clinical laboratories. Therefore our objective was to validate a quantitative, real-time, reverse transcription PCR-based assay for the detection and quantification of the three common NPM1 mutant transcripts (type A, B and D) for use in clinical practice.

Methods:
Cells were analysed from peripheral blood and/or bone marrow samples from ten patients at various time points (diagnosis, after induction therapy, after the end of treatment). RNA was extracted, reverse transcribed to cDNA then amplified by real-time PCR using primers and probes specific to the three NPM1 alleles (A, B and D) in exon 12 along with standards of known copy numbers. Additional amplification of the housekeeping gene ABL1 was performed to normalise NPM1 copy numbers in samples. Results from this assay were compared to results from alternative methods, including capillary electrophoresis and next-generation sequencing.

Results:
The results showed the detection of the three mutation type status simultaneously, and quantified mutant allelic burden. This assay is sensitive, it can detect up to 50 copies with a limit of detection of 0.01% Normalised Copy Number. The assay output was confirmed by capillary electrophoresis and/or DNA sequencing.

Conclusions:
This assay is a rapid, reliable, sensitive, cost-effective, and easy-to-use method for the detection, quantification and differentiation of NPM1 Type A, B and D mutant transcripts. It is an appropriate method for routine testing in hospitals and can be used for risk stratification, treatment decisions, detection of minimal residual disease and therapeutic monitoring in AML patients with NPM1 mutation.

Key Words: Acute Myeloid Leukaemia; NPM1 Quantification; MRD;

Funding Agency: Ministry of Health

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An Association Study of Type 2 Diabetes Mellitus Genetic Risk Factors in the Kuwaiti Population

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Introduction:
The heritability of type 2 diabetes mellitus (T2DM) is estimated to be 25-80% based on family and twin studies. To date, more than 200 T2DM genetic risk variants have been reported from different populations. Despite the high prevalence of T2DM in Kuwait, replication studies of T2DM genetic risk factors are limited.
Objective: To assess the association of 10 commonly reported T2DM genetic risk factors in a sample of T2DM Kuwaiti population and design a genetic risk score (GRS) model specific to Kuwait.

Methods:
Genotyping of ARDB2 rs1042714, CCND2 rs76895963, CDKAL1 rs7754840, CDKN2A/B rs10811661, FTO rs1421085, IGF2BP2 rs7633675, KCNQ1 rs2237897, PPARG rs1801282 TCF7L2 rs7903146, and VDR rs731236 was performed using Taqman assays in 200 Kuwaiti T2DM patients and 160 Kuwaiti healthy controls. Sample collection was according to the protocol approved by the ethics committees of the Faculty of Medicine, Kuwait University, following Helsinki Declaration guidelines (VDR/JC/87). Unweighted and weighted GRSs were computed.

Results:
Only 3 variants associated with T2DM risk in Kuwaitis (TCF7L2 rs7903146T β=0.133, 95%CI: 0.066–0.199, p<0.001; VDR rs731236G β=0.102, 95%CI: 0.033–0.17, p=0.004; and IGF2BP2 rs7633675G β=0.075, 95%CI: 0.008–0.142, p=0.028). Some variants associated with risk of diabetes comorbidities (Retinopathy: CDKAL1 rs7754840C β=0.123, 95%CI: 0.034–0.213, p=0.007 and ARDB2 rs1042714G β=0.125, 95%CI: 0.024–0.226, p=0.016; Neuropathy: TCF7L2 rs7903146T β=0.284, 95%CI: 0.195–0.373, p<0.001 and VDR β=0.288, 95%CI: 0.194–0.382, p<0.001; Myocardial infarction: TCF7L2 rs7903146T β=0.065, 95%CI: 0.002–0.128, p=0.034 when adjusted for age and BMI). Considering GRS alone, the most accurate (60.4%) GRS in predicting T2DM was the unweighted GRS inclusive of all 10 variants (uwGRS_All) albeit at a compromised specificity (37.7%). Including age and BMI in GRS models significantly enhanced the model's performance metrics, and the best model was the uwGRS_All (83.6% Accuracy 92.7% Sensitivity 65.3% Specificity, β=1.34, 95%CI: 1.12–1.6, p=0.001).

Conclusions:
Although reported T2DM genetic risk factors show inconsistent association with T2DM risk among Kuwaitis, including them in a T2DM prediction GRS model may refine its performance. Moreover, including T2DM risk factors such as age and BMI improves GRS model performance. A T2DM early screening GRS for Kuwaitis should enhance early interventions curbing the T2DM burden on the Kuwaiti healthcare system.

Key Words: Type 2 diabetes mellitus; Genetic Variant; Genetic risk score;

Funding Agency: This study was funded by the College of Graduate Studies, Kuwait University

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The economic burden of premature mortality of COVID-19

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Introduction:
COVID-19 caused a devastating impact on health systems. Addressing the direct cost solely would underestimate the burden of the pandemic, primarily because it would draw conclusions from a narrow-angle and overlook the bigger picture of the influence. Thus, this study aims to assess the burden of premature mortality on Kuwait's economic system.

Methods:
A retrospective observational study explored the burden of premature COVID-19 deaths from a societal perspective over three years (2020-2022). Data on the number of COVID-19 deaths were retrieved from (MOH) Kuwait Health records. Annual earnings and consumption costs were retrieved from the Central Statistics Bureau. We will estimate the economic burden using three economic approaches: (1) the value of statistical life (VSL), which assigns a societal monetary value to each life lost, independent of their potential future earnings and (2) the human capital approach (HCA), which focuses on calculating the economic loss due to premature mortality by summing the discounted future earnings of the deceased individuals over their remaining working years, and lastly the friction cost approach (FCA), which estimates the productivity costs of death from an employer's perspective until another employee takes over the worker who died. Costs are presented in international dollars (PPP$).

Results:
Total deaths were (n=2891), of which 46% (n=1342) were Kuwaiti. Kuwaiti female deaths were (53%) of total Kuwaiti deaths. Non-Kuwaiti males accounted for 71% of all non-Kuwaiti deaths. The total (VSL) costs were 2.8 billion PPP$, with 52% of these costs accounted for Kuwaitis. The mean (VSL) cost per death was 0.9 million PPP$. The total cost using (HCA) was 501 million PPP$ with a mean cost of 173,000 PPP$ per death. The (HCA) cost for Kuwaitis was 58% of the total (HCA). According to (FCA), the total cost was 13 million PPP$, 61% Kuwaiti costs. The mean (FCA) cost per death was 4740 PPP$.

Conclusions:
Findings reveal disparities in mortality and costs between Kuwaitis and non-Kuwaitis. Kuwaiti deaths accounted for a significant share, with females forming the majority among Kuwaitis, while non-Kuwaiti males dominated non-Kuwaiti deaths. The Value of Statistical Life (VSL) approach showed the highest costs, while the Human Capital (HCA) and Friction Cost (FCA) approaches highlighted variations, with Kuwaitis consistently incurring a larger share. These findings are crucial inputs for cost-effectiveness studies.

Key Words: Cost; COVID-19; Indirect cost;

Funding Agency: No

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Manufacture and use of a submarine with 3D artificial intelligence-engineered nano-polymer membranes to dually address water pollution in the Arabian Gulf and reduce CO2 in Air

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Introduction:
Using artificial intelligence engineering and nanotechnology to double sterilize the air and water of the Gulf - for the first time in the world - by manufacturing a submarine with a 3D printer to monitor areas in which the CO2 concentration increases and reabsorb the dissolved part of the gas in the Arabian Gulf to reduce its percentage in the air resulting from human activities by a percentage 40%, through mesh nano-traps that also break down organic pollutants using environmentally friendly, biodegradable materials of Polylactic acid (PLA) and a mixture of carbon nanotubes (CNT) and carbon quantum dot (CQD).

Methods:
1- Manufacturing a submarine from environmentally friendly PLA polymer at Al-Qusour Youth Center using a 3D printer with the following dimensions: length between 80-100 cm Width between 10-20 cm and height between 10-15 cm. 2- Installing a CO2 sensor on the submarine measures the gas percentage between 400-3000 ppm.
3- Installing an IR sensor to determine dimensions up to a distance of 20m and remote control using artificial intelligence to stimulate the CNT in its work as a semiconductor.
4- G6 polymerization of lactose acid from milk using the lactose enzyme in the laboratory of Al-Shujaa bin Al-Aslam School to make PLA.

Results:
A submarine equipped with a carbon dioxide gas sensor and a remote-controlled servo using artificial intelligence to monitor any increase in the percentage of CO2 in the atmosphere in order to absorb it from the sea, which helps make that area of the Gulf capable of absorbing the increase in gas. We also provided the submarine with IR beams for remote control and firing. Energy on a nucleating material network to break down harmful organic compounds in the presence of ultrasound.The submarine that we designed with these dimensions is suitable for sterilizing an area of up to 20,000 cm3 through the dual use of nano-mixtures, infrared rays, and ultraviolet waves.The results we obtained proved that the nano-mixture of CNT and CQD in the presence of infrared radiation and ultrasound is a promising mixture for absorbing CO2 and breaking down most organic compounds at an approximate rate of up to about 80% for these pollutants from wastewater.

Conclusions:
We expect this research to reduce the percentage of carbon dioxide pollution that causes global warming, which will reduce the rise in temperatures and the resulting reduction in the use of air conditioning, which will bring environmental and economic benefits in Kuwait and the world. The nanomaterials used have proven effective in breaking down harmful organic compounds in Gulf waters, which preserves fish wealth and reduces the phenomenon of marine organism mortality.
The submarine with its nanomaterials system was implemented by Kuwaiti students, starting with the manufacture of the submarine and nanomaterials from natural sources with the help of teachers from Al-Shujaa Bin Al-Aslam High School and Al-Qusour Youth Center, and ending with analyzing the results and professional application in the waters.

Key Words: Carbon dioxide; Environment; Polymer;

Funding Agency: No

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Emotional Intelligence of The Health Science Centre Academic and Academic Support Staff at Kuwait University

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Introduction:
Background: Emotional Intelligence (EI) among medical educators plays a crucial role in shaping the intellectual, social, and emotional development of their students, who are the future of our healthcare system. The aim of this study is to assess the level of EI of the academic and support staff at the Health Science Center (HSC) - Kuwait University.

Methods:
This is a cross-sectional study among HSC academic and support staff. An online self-reported questionnaire was administered using the "Leadership Toolkit Emotional Intelligence Questionnaire". The survey assesses the five EI constructs: self-awareness, managing emotions, motivating oneself, empathy, and social skills. Data were analyzed in SPSS software using descriptive and inferential statistics. Ethical approval was obtained from the Joint Health Science Center and the Ministry of Health Research Ethical Committee.

Results:
A total of 115 faculty members participated in this study, with a response rate of 26.4%. The sample consisted of 36 (31.3%) males 79 (68.7%) female respondents, with a median age of 39 years (IQR: 38–50). The overall EI mean was 202 ± 17.46, indicating a good level. Over half of the respondents (53%) displayed a high level of EI. Among the five EI constructs, the highest mean score was detected in the self-awareness domain (42.97 ± 3.43) and the lowest in managing emotions (36.56 ± 5.72). No significant correlations were found between overall EI and gender, age, marital status, faculty type, years of clinical or teaching experience. A statistically significant positive correlation exists between self-motivation and both age and years of teaching experience. Academic rank correlated significantly with overall EI and the domains of self-motivation, empathy and social skills.

Conclusions:
The EI levels of faculty members at HSC are reasonably good, with faculty members exhibiting strong self-awareness but needing improvement in managing emotions. Notably, higher academic rank is linked to higher EI scores. Targeted efforts should focus on enhancing emotional regulation skills for faculty members.

Key Words: Emotional Intelligence; Medical education; Academic staff ;

Funding Agency: NONE

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Interprofessional Education and Collaborative Practice in Kuwait: Attitudes and Perceptions of Health Sciences Students

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Introduction:
Interprofessional education (IPE) equips health students with the competencies they need to provide collaborative care in practice that results in optimal patient outcomes. Assessing health students' baseline attitudes towards IPE and collaborative practice is essential to inform the development of IPE curricula. Kuwait University Health Sciences Center (HSC) is early in its IPE journey but is planning to join the broader global movement towards IPE. The aim of this study was to explore the attitudes and perceptions of health students at Kuwait University HSC towards IPE and collaborative practice.

Methods:
A descriptive cross-sectional survey was conducted to explore the attitudes of HSC students from Faculties of Medicine, Dentistry, Pharmacy, and Allied Health Sciences towards collaborative practice and IPE at early and late stages of their academic study. The students were asked to rate their attitudes towards interprofessional healthcare teams and IPE using validated instruments, including the Attitudes Towards Health Care Teams Scale (ATHCTS) and the Readiness for Interprofessional Learning Scale (RIPLS).

Results:
A total of 770 students completed the survey (81.1% response rate). Students expressed positive attitudes towards interprofessional healthcare teams and IPE (median [IQR] overall attitudes were rated 4.0 [1.0] and 4.0 [2.0], respectively, on a scale of 5). Overall attitudes towards interprofessional healthcare teams and IPE were significantly more positive among pharmacy students than the students from other faculties ($p < 0.001$). Final-year students reported more positive attitudes towards healthcare teams than early- and middle-year students, while early- and final-year students expressed more positive attitudes towards IPE than middle-year students ($p < 0.001$). There were no significant differences in overall attitudes between female and male students towards the two scales ($p > 0.05$).

Conclusions:
Health students at Kuwait University expressed positive attitudes towards interprofessional healthcare teams and IPE, suggesting that they would be willing to engage in IPE whenever it is implemented. The results support the planning of an IPE curriculum in Kuwait University HSC that begins during the early stages of student learning and continues throughout the entire course of academic study. These findings have important implications for engaging students from different health professions in IPE initiatives in Kuwait.

Key Words: interprofessional education; interprofessional collaborative practice; student

Funding Agency: NONE

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Antibiotic Knowledge, Attitudes, and Preparedness for Prescribing Among Health Sciences Students

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Introduction:
Antibiotics are one of the most prescribed medications globally and are essential for managing a wide range of infectious diseases. One of the causes inappropriate antibiotic prescribing is inadequate education and training in infectious diseases and antibiotic use. The study aims to understand the knowledge and attitude of HSC students toward antibiotic use and resistance and to reveal significant insight and means to improve antibiotic practices among students in Kuwait, with broader implications for public health policy and antimicrobial stewardship programs.

Methods:
A questionnaire-based study was conducted among medical, dentistry and pharmacy (n=596) students, who were in there 5th to 7th years at the Medical and Dentistry colleges, as well as those in their 4th to 7th years of studying at the college of pharmacy at Kuwait University. Ethical approval was obtained from the Ministry of Health Research Ethical Committee, Kuwait (MoH/REC/132/2022). Descriptive analysis was performed using Statistical Package for Social Sciences (IBM SPSS Statistics for Windows, Version 29).

Results:
A total of 363 out of 596 completed the questionnaire, yielding a response rate of 60.9%. The median percentage of overall knowledge regarding antibiotics among participants was 62.1% (IQR 17.2%), indicative of a moderate level of knowledge. Participants had high median (IQR) percentage of general knowledge [100% (0)], but exhibited low knowledge about antibiotic resistance [55.6% (22.2)] and clinical scenarios involving antibiotic use [53.8% (30.8)]. The overall median percentage for preparedness for antibiotic prescribing among participants prescribing was 50.0% (IQR 75.0), indicating a low level of preparedness. Respondents' overall knowledge of antibiotics exhibited a significant and positive association with their preparedness for antibiotic prescribing (Spearman's $r = 0.342$; $p < 0.001$), indicating that as knowledge increased, preparedness tended to improve.

Conclusions:
Findings from the current study showed that students at the colleges of medicine, dentistry and pharmacy had a moderate overall knowledge about antibiotics. Their knowledge was the lowest in antibiotic resistance and antibiotic use in clinical scenarios dimensions. This was reflected by students being moderately prepared to prescribe antibiotics. These results highlight potential areas that need further improvement in health science center undergraduate programs.

Key Words: Antibiotic knowledge; Preparedness; Health Sciences Students;

Funding Agency: Not applicable

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Educational System Resilience during the COVID-19 Pandemic: A Literature Review

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Introduction:
The COVID-19 pandemic posed significant challenges to global education systems, disrupting learning, and exposing inequalities in access to resources. This literature review synthesizes findings from 6 studies conducted between 2020 and 2023, focusing on the resilience of educational systems during the pandemic. The review highlights the pandemic's impact on student outcomes, infrastructure, and mental health, and explores strategies that contributed to educational resilience.

Methods:
A systematic review of 6 peer-reviewed studies was conducted, focusing on the impact of COVID-19 on education. Studies were included if they provided data on educational disruptions, resilience measures, student wellbeing, and remote learning initiatives. Relevant studies were identified through key databases such as PubMed, Scope's, and ERIC.

Results:
The literature reveals disparities in educational access due to the pandemic. One study found that students in high-income countries had better access to remote learning tools than their counterparts in low-income regions. Mental health issues, particularly anxiety, were widespread due to the shift to online learning. Successful strategies were employed in countries like Finland, which utilized blended learning models to maintain educational continuity. However, regions with limited infrastructure, such as parts of Africa and India, faced significant challenges in adapting. A case study from Singapore demonstrated a national strategy ensuring that over 95% of students had access to digital tools.

The studies reviewed offered valuable insights, but limitations included small sample sizes and regional biases, which could affect the generalizability of the findings. Further research is needed to explore the long-term impacts of online learning, particularly in regions with limited technological resources.

Conclusions:
This literature review underscores the importance of resilience strategies, such as flexible curricula, mental health support, and digital infrastructure, in mitigating the pandemic's impact on education. The findings highlight the need for equitable access to educational technology and global collaboration to ensure educational sustainability in future crises. These lessons are particularly relevant for regions like the Middle East, where digital learning is rapidly expanding and requires ongoing investment in infrastructure and teacher training.

Key Words: COVID-19; mental health; student outcomes;

Funding Agency: NONE

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Vitiligo And Diet Searching for A Link

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Introduction:
Vitiligo is a common form of localized depigmentation caused by the gradual loss of melanocytes. Worldwide, vitiligo affects 0.5%–1% of people, with about 50% of cases occurring under age 20, affecting both sexes equally. This review aimed to explore the relationship between diet and vitiligo.

Methods:
This article was developed through a comprehensive review of peer-reviewed journal articles, systematic reviews, and clinical studies from reputable databases, including PubMed and Scopus. Relevant literature was identified using keywords such as "vitiligo," "diet," "pathogenesis," "treatment," and "oxidative stress." Studies published in English between 1959 and 2021 were selected based on inclusion criteria emphasizing scientific rigor and relevance. Data were synthesized by categorizing findings into key themes such as clinical features, immunopathogenesis, and emerging therapies, with a focus on integrating insights to provide an up-to-date and reliable review of vitiligo.

Results:
The review identified key dietary components influencing vitiligo management. Vitamin D supplementation showed significant potential in modulating immune responses and promoting melanocyte activity, with studies reporting up to 75% repigmentation in some cases. Zinc reduced oxidative stress and improved outcomes when combined with corticosteroids. Antioxidants like ginkgo biloba and Polypodium leucotomos provided photoprotective benefits, enhancing repigmentation rates when paired with narrowband UV-B therapy. Phenylalanine, combined with UV-A therapy, promoted follicular repigmentation in over 90% of participants. Functional foods such as curcumin and piperine reduced oxidative damage and supported melanocyte proliferation. However, vitamin C was contraindicated due to interference with melanin synthesis. Overall, addressing oxidative stress, immune modulation, and melanocyte health through diet showed potential as a complementary approach to conventional therapies.

Conclusions:
This review highlights the role of diet and functional foods as supportive interventions in vitiligo management. Nutrients such as vitamin D, zinc, and antioxidants demonstrated benefits in reducing oxidative stress and enhancing repigmentation. These dietary interventions should complement, not replace, conventional treatments like phototherapy and topical agents. Future studies are needed to establish dietary guidelines and optimize outcomes for vitiligo patients.

Key Words: Vitiligo; Dietary interventions; Repigmentation;

Funding Agency: NONE

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Smoking Behavior, Predictors of Smoking Initiation, and Prevalence of Chronic Diseases among Adult Smokers in Kuwait

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Introduction:
Smoking is a well-known risk factor for various chronic diseases, including asthma, type 2 diabetes (T2DM), heart disease, and stroke. The prevalence of smoking remains high in Kuwait, with initiation typically occurring during adolescence. Factors such as peer pressure, enjoyment, and family influence significantly contribute to smoking initiation. Recently, e-cigarette use has risen significantly as a perceived safer alternative to traditional cigarettes, but its long-term health effects remain unclear.
Objective:
The aim of this study was to gain insight on patterns of smoking and factors that lead to smoking initiation in adult smokers in Kuwait. This study also examined failed attempts at smoking cessation and explored the correlation between years of smoking and the prevalence of chronic diseases such as asthma, T2DM, heart disease, etc.

Methods:
This cross-sectional study recruited 420 smokers aged 18 years and older from the Ministries of Defense, Education, and Oil in Kuwait. Participants completed a structured, computerized questionnaire with 115 questions divided into four sections: sociodemographic data, traditional cigarette use, e-cigarette use, and dual use. Associations between smoking habits and chronic diseases were analyzed using chi-square tests, univariate, and multivariate binary logistic regression models.

Results:
The majority of participants were male 84.3% and initiated smoking between the ages of 15 and 19 years. Peer pressure 45% and enjoyment 39% were the most commonly reported reasons for smoking initiation. Among e-cigarette users, 48.9% believed e-cigarettes were less harmful than traditional cigarettes. High cholesterol was the most reported chronic disease by our participants, affecting 20.9% of cigarette smokers and 18.9% of e-cigarette users.

Conclusions:
In conclusion, about 97% and 90% of cigarette smokers and e-cigarette smokers agree that smoking is dangerous to their health respectively. Two thirds have tried quitting traditional cigarettes, and the majority were able to abstain from smoking cigarettes for less than a month, then relapsed. A higher number of e-cigarette users have tried quitting in comparison to cigarette users.

Key Words: Smoking initiation; Predictors of smoking; Chronic diseases and smoking;

Funding Agency: None

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Barriers and Limitations for Undergoing Mammography Screenings Among Kuwaiti Women Attending Primary Health Care Centers.

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Introduction:
Breast cancer is a significant public health issue globally, and Kuwait is no exception as it is accounting for 39.8% of the total female cancer cases in Kuwait. Despite the availability of effective screening tools like mammography, low uptake rates (14.6%) persist among Kuwaiti women. This study aims to investigate the factors influencing mammography screening uptake and identify potential barriers to improve screening rates.

Methods:
A cross-sectional study was carried out among 201 women aged 40–69 years attending five primary health centers in Kuwait. Semi-structured interviewing questionnaires were used for data collection. SPSS program was used for data analysis.

Results:
The study found that only 25.4% of the women had undergone mammography screening within the past two years and 84.6% of the women were found to have poor awareness of mammography screening. However, knowledge and awareness were not significantly associated with mammography uptake. Fear of pain and physical discomfort were identified as the primary barriers against uptake. Additionally, the study revealed a significant correlation between being invited to screening by the primary care physician and actual uptake.

Conclusions:
To increase mammography screening rates among Kuwaiti women, targeted campaigns can be implemented to educate the population about the benefits of screening and dispel misconceptions. Addressing concerns about pain and discomfort through effective communication and reassurance can also be beneficial. Furthermore, proactive outreach efforts, such as invitations and reminders, can significantly impact screening uptake.

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Key Words: Mammography screening; Breast cancer; Mammography awareness;

Funding Agency: None

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The use of cap-mounted clips as a primary hemostatic modality in nonvariceal upper gastrointestinal bleeding: A systematic review and meta-analysis of randomized trials

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Introduction:
Cap-mounted-clips, especially Over-The-Scope-Clip (OTSC™), are recommended for recurrent nonvariceal upper gastrointestinal bleeding (NVUGIB). There has been recent interest in their use as an initial hemostatic modality. We performed a systematic review of randomized controlled trials (RCTs) assessing cap-mounted clips' efficacy as a primary hemostatic modality in NVUGIB.

Methods:
A literature search of MEDLINE, EMBASE, and ISI Web of Science databases up to April 2024 identified RCTs comparing cap-mounted clips to standard endoscopic therapy (SET) as a primary hemostatic modality in NVUGIB. The primary endpoint was the composite outcome of further bleeding (persistent or recurrent) at 30 days. Secondary outcomes included persistent bleeding at index endoscopy and 30-day rebleeding, individually. Other pertinent outcomes were also recorded. A meta-analysis was performed to determine pooled risk ratios (RRs), comparing cap-mounted clip to SET. Out of 516 citations, five RCTs (n = 555), all assessing OTSC™, were included.

Results:
The composite outcome of further bleeding was lower with cap-mounted clip versus SET (RR = 0.33 [95% confidence interval {CI}: 0.20–0.54]). There was no difference in persistent bleeding at initial endoscopy (RR = 0.30 [95% CI: 0.07–1.30]), but 30-day rebleeding was lower with cap-mounted clip (RR = 0.38 [95% CI: 0.21–0.70]). There were no differences in other outcomes. Grading of the evidence ranged from very low to moderate, mainly due to risk of bias and imprecision.

Conclusions:
Cap-mounted clips may be an efficacious primary hemostatic modality, associated with a lower further bleeding at 30 days compared to SET in NVUGIB. However, due to limitations in existing evidence, further research must better characterize an optimal subgroup of patients benefiting most from this approach before adopting its routine use.

Key Words: upper gastrointestinal bleeding; Cap-mounted clip; hemostasis ;

Funding Agency: None

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Mitral Stenosis Quantification, Management, and Guidelines: A 2024 Update

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Introduction:
Mitral stenosis (MS) is a leading cause of valvular heart disease worldwide. Given its global prevalence and clinical significance, accurate diagnosis and effective management are essential. This study compares the recommendations for MS diagnosis and treatment outlined in the 2021 European Society of Cardiology/European Association for Cardio-Thoracic Surgery (ESC/EACTS) guidelines and the 2020 American College of Cardiology/American Heart Association (ACC/AHA) guidelines.

Methods:
A systematic review was conducted to analyze and compare the diagnostic and management strategies recommended in the ESC/EACTS and ACC/AHA guidelines. Key aspects, including diagnostic approaches, symptom assessment, and therapeutic options, were evaluated to provide insights for clinical decision-making.

Results:
Both sets of guidelines emphasize a multimodal approach to diagnosing and grading MS. This includes the use of transthoracic and transesophageal echocardiography, evaluation of evolving symptoms, hemodynamic studies via cardiac catheterization, and exercise testing. Both guidelines also advocate for anticoagulation therapy, which has been shown to reduce thromboembolic events in rheumatic MS. However, differences were noted in the criteria used to assess MS severity, reflecting a nuanced divergence in clinical practice recommendations.

Conclusions:
The ESC/EACTS and ACC/AHA guidelines share significant overlap in their recommendations for MS diagnosis and management, particularly in advocating a multimodal diagnostic approach and the use of anticoagulation therapy. However, subtle differences in the criteria for assessing MS severity highlight the importance of tailoring management strategies to the specific clinical context. These findings underscore the need for clinicians to integrate guideline-based recommendations with individualized patient care.

Key Words: Guidelines, management, mitral stenosis, systemati; Guidelines, management, mitral

Funding Agency: NONE

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Seasonal variations and acute kidney injury incidence and outcomes: A prospective observational multi-center study

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Introduction:
Kuwait experiences cool winters and very hot summers. We evaluated the impact of ambient temperature in these two seasons on acute kidney injury (AKI) incidence and outcomes, and assess the difference in incidence and outcomes, if any, between Kuwaitis and expatriates.

Methods:
We prospectively collected demographic (age, sex, nationality), clinical (CKD status, cause of AKI, comorbidities), management (fluids, diuretics, inotropes, ventilatory support, dialysis), and 30-day patients and kidney outcome data for all adult nephrology consultations for AKI in seven major public hospitals in Kuwait during Jan, Feb, Mar/2021 and compared them to those of Jun, Jul, Aug/2021. COVID-19 related AKI was excluded.

Results:
Total number of AKI cases during both seasons was 1,493. AKI incidence was the same in both seasons (50.0% each). However, Kuwaitis who represent one third of the population accounted for 56.7% of cases. More AKI cases were seen in winter for Kuwaitis (52.4% of 846 Kuwaiti patients) while more occurred in summer for expatriates (53.2% of 647 expatriate patients). Patients with AKI in winter were significantly older (64.8 vs. 62.0 years, $p = 0.001$), had lower baseline eGFR (57.7 vs. 69.4 ml/min, $p < 0.001$), and exhibited higher incidences of cardiovascular disease (60.1% vs. 50.6%, $p < 0.001$), and chronic kidney disease (59.3% vs. 43.6%, $p < 0.001$). Fluid utilization was higher among summer cases (83.1% vs. 75.3%, $p < 0.001$), however, no difference in inotropic support, mechanical ventilation and dialysis was observed. Continuous dialysis was the modality of choice in 84.0% of the cohort with no difference between the two seasons. Dialysis was more frequently utilized in the summer cases of AKI (39.5% vs. 30.5%, $p < 0.001$), with significantly higher utilization of dialysis for expatriates in the summer (34.3% vs. 20.6% for Kuwaitis, $p < 0.001$). Mortality rate was 26.1%, and complete kidney recovery occurred in 56.1% of cases with no difference between the groups. Age above 65 was a risk factor for mortality, but not eGFR < 60 ml/min.

Conclusions:
Despite an extremely hot summer and a cool winter, evidence do not support a seasonal variation in the incidence and outcome of AKI in Kuwait. However, in winter, AKI occurred more frequently in Kuwaitis who were better off socioeconomically but were older with more comorbidities, while in summer, they occurred more frequently in the younger, healthier expatriates who were socioeconomically disadvantaged. It is essential to initiate measures that reduce exposure to heat and facilitate early and easy access to health care.

Key Words: Seasonal variation; Acute kidney injury; Kuwait;

Funding Agency: None

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Non-Alcoholic Fatty Liver Disease in People with Type 1 and Type 2 Diabetes with a BMI > 25 kg/m²: A Cross-Sectional Study

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Introduction:
Obesity and type 2 diabetes (T2D) are significant risk factors for development of non-alcoholic fatty liver disease (NAFLD). This study aimed to compare the liver fat fraction and NAFLD between obese people with type 1 diabetes (T1D) and those with T2D, matched for body mass index (BMI).

Methods:
This cross-sectional study included 90 participants with T1D (55.6% male) and 69 participants with T2D (58.0% male). Liver fat fraction was assessed using magnetic resonance imaging (MRI). NAFLD was defined as liver fat fraction ≥5%. Logistic regression analyses were conducted to evaluate associations with liver fat fraction with biomedical variables, adjusted for sex, BMI, and diabetes duration. This study was conducted after receiving ethical approval from the Institutional Review Board, and it followed the guidelines set out in the Declaration of Helsinki.

Results:
Participants with T1D had a mean ± SD BMI of 30.5 ± 4.5 kg/m², diabetes duration of 20.5 ± 9.8 years, and HbA1c of 8.2 ± 1.4%. Participants with T2D had a BMI of 30.8 ± 4.6 kg/m², diabetes duration of 11.7 ± 7.8 years, and HbA1c of 7.3 ± 1.4%. The mean liver fat fraction was 3.7 ± 6.3% in T1D and 10.6 ± 7.9% in T2D ($p < 0.001$). NAFLD prevalence was 13.3% in T1D and 69.6% in T2D. Liver fat fraction was significantly higher in T2D, with an odds ratio of 1.2 (95% CI: 1.1–1.3; $p < 0.001$). Elevated liver fat fraction was associated with AST, ALT, GGT, and triglycerides in both groups.

Conclusions:
People with obesity and T1D exhibited significantly lower liver fat fraction compared to those with T2D, despite having a similar BMI, longer diabetes duration, and poorer glycemic control. This study underscores important clinical differences in liver fat accumulation between people with T1D and T2D who have obesity.

Key Words: Type 1 diabetes; Type 2 diabetes; Non-alcoholic fatty liver disease;

Funding Agency: The manpower was funded by the Kuwait Foundation for the Advancement of Sciences (KFAS) and the Ministry of Health, Kuwait.

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A Homozygous Founder ELAC2 Mutation in Kuwaiti Infants with Fatal Cardiomyopathy and Resistant Severe Lactic Acidosis: A Retrospective Review of the Clinical, Radiological and Molecular Findings.

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Introduction:
Inherited infantile cardiomyopathy is a genetically heterogeneous condition with various underlying genetic etiology. This study aims to investigate the role of ELAC2 biallelic pathogenic variants in infants diagnosed with cardiomyopathy and lactic acidosis in Kuwait and to describe the associated clinical presentations and outcomes.

Methods:
A retrospective analysis was conducted on the data registry in Kuwait Medical Genetics Center for all individuals diagnosed genetically with pathogenic variants in ELAC2 detected in Kuwait. Targeted mutation testing was performed for all suspected cases.

Results:
Twenty-seven Kuwaiti individuals were diagnosed with deleterious biallelic ELAC2 variant based on targeted genetic testing. All individuals were found to be homozygous for the previously reported Saudi founder homozygous variant, c.460T>C; p(Phe154Leu) in the ELAC2 gene. The age of diagnosis varied between patients from newborn to 3 years. DNA results take 3–6 weeks to come out and sometimes can take longer, which is why some patients were diagnosed after they passed away. We report these 27 cases from 6 consanguineous families from several related Bedouin tribes. Twenty-seven individuals were deceased during the first year of life except one individual who is alive at 1-year-old. The cause of death in all of them was cardiogenic shock and severe metabolic and lactic acidosis, associated with multi-organ failure. All individuals presented with hypertrophic cardiomyopathy with or without other cardiac features such as dilated cardiomyopathy and pericardial effusion diagnosed by echocardiography, associated with resistant lactic acidosis.

Conclusions:
We conducted a comprehensive analysis of all cases with ELAC2 pathogenic variants in Kuwait to determine the outcomes for those affected. This is the first study that details ELAC2 mutations in children with early-onset and severe cardiomyopathy from different tribes in Kuwait, bringing the total number of reported cases to 69. Due to the aggressive nature of the disease and poor outcomes observed in our study, targeted genetic testing for ELAC2 founder mutation is highly recommended in infants in this region with idiopathic cardiomyopathy and persistent metabolic or lactic acidosis. Additionally, it is advisable to implement early parental counseling and premarital screening for this disorder. This approach would offer families prognostic information and assist them in making informed decisions about future reproductive planning.

Key Words: ELAC2 mutation; Cardiomyopathy; Genetic testing;

Funding Agency: NONE

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Percutaneous Transhepatic Right Renal Mass Biopsy - Safety and Efficacy

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Introduction:
Purpose: To evaluate the efficacy and safety of percutaneous transhepatic biopsy for right renal masses.

Methods:
Retrospective analysis was conducted on patients who underwent percutaneous transhepatic renal mass biopsies at three tertiary hospitals between January 2007 and August 2023. Patient demographics, procedural details and sample histopathological results of the biopsy were collected. Diagnostic rate of transhepatic biopsy was calculated. Complications were categorized using Society of Interventional Radiology (SIR) new adverse event classification..

Results:
Forty-nine patients (27 males, 22 females, mean age 67 ± 15 years) underwent transhepatic biopsy of right renal masses. The mean size of the renal masses size was 2.4 cm, with 55% located in the interpole (55%), 39% in the upper pole and 6% in the lower pole (6%). Patient were positioned either in the supine (57%) or in lateral decubitus position (43). Sonographic guidance was predominantly used (89.8%), while ultrasound and CT guidance was utilized in the remaining cases (10.2%). Co-axial technique was employed in 82% of cases, with either 18-gauge (94%) or 22-gauge needle (6%). On average, 3.5 (±1.5) cores were obtained. Histologic diagnostic rate was 88.4%. No moderate or severe adverse events related to the biopsy were reported.

Conclusions:
Transhepatic approach proves to be a safe and effective method for sonographic guided right renal mass biopsy that would otherwise be inaccessible through an extrahepatic approach.

Key Words: RCC; Transhepatic; Biopsy;

Funding Agency: None

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Characteristic Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA): Insights from the Kuwait Heart Foundation Acute Coronary Syndrome Registry

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Introduction:
Background: Patients with Myocardial Infarction with Non-Obstructive Coronary Arteries (MINOCA) present diagnostic and therapeutic challenges due to limited evidence-based strategies. This study aimed to evaluate the burden and characteristics of MINOCA in the Kuwait Heart Foundation Acute Coronary Syndrome (KHF-RACE) registry to raise awareness and improve management.

Methods:
Data from the KHF-RACE registry (15 May 2023–3 April 2024) included patients with chest pain, elevated troponin, and non-obstructive coronary arteries on angiography. Patient data were analyzed for clinical, hemodynamic, and short-term outcomes during hospitalization and at one-month follow-up.

Results:
Among 3,202 acute coronary syndromes (ACS) patients, 86 (2.69%) were diagnosed with MINOCA. These patients were significantly younger ($p < 0.001$) and predominantly female (37.21% vs. 14.51%, $p < 0.001$). Comorbidities were less prevalent, including hypertension (40.70% vs. 53.95%, $p = 0.015$) and diabetes (23.26% vs. 48.01%, $p < 0.001$), . Prior myocardial infarction (5.81% vs. 23.01%, $p < 0.001$), PCI (8.14% vs. 21.60%, $p = 0.003$), and CABG (0.00% vs. 4.49%, $p = 0.044$) were less frequent in MINOCA. MINOCA patients received no primary PCI (0.00% vs. 22.37%, $p < 0.001$) and were largely managed without reperfusion (80.23% vs. 61.81%, $p < 0.001$). Nearly all MINOCA patients were discharged alive (100% vs. 97.36%, $p = 0.127$), with higher rates of discharge home (95.35% vs. 85.93%, $p = 0.043$).

Conclusions:
MINOCA represents a distinct ACS subgroup, primarily affecting younger females with fewer traditional cardiovascular risk factors. These patients showed atypical symptoms, lower preventative therapy use, and were conservatively managed. Despite differing profiles, short-term outcomes, including survival and hospitalization duration, were comparable to non-MINOCA patients. Findings emphasize the need for greater clinician awareness and tailored diagnostic and therapeutic approaches to optimize MINOCA management.

Key Words: MINOCA; Kuwait MINOCA; KHF-RACE registry

Funding Agency: None

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Molecular Features of an Extensively Drug-Resistant Escherichia Coli O99 H30 ST38 Strain Identified in a Wound Infection in an ICU.

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Introduction:
Whole-genome sequencing (WGS)-based in silico methods have become essential for detailed epidemiological investigations and pathogen tracking, particularly in analyzing outbreak strains. In this study, we utilized WGS to characterize E. coli C91 (ST38), a highly drug-resistant clinical strain isolated from the ICU of one of Kuwait's largest hospitals. The primary aim of this research was to identify the resistance mechanisms of the isolate and prevent its further spread.

Methods:
Minimum inhibitory concentrations (MICs) were determined for a range of antibiotics against E. coli C91. WGS was conducted using the Illumina MiSeq platform, followed by assembly, annotation, and in silico detection of multi-locus sequence typing (MLST), resistance genes (using ResFinder), and virulence factors.

Results:
The isolate E. coli C91 was classified as O99 H30 ST38 and was resistant to all tested antibiotics, including colistin (MIC >32 mg/L). It showed intermediate resistance to imipenem and meropenem (MIC = 8 mg/L). Genome analysis confirmed the presence of several resistance genes, including mcr-1, blaCTX-M-14, blaCTX-M-15, and blaOXA-1, but did not detect blaNDM. Additionally, a range of acquired resistance genes were identified, including aac(3)-IIa, aac(6')Ib-cr, aadA1, qnrS1, catB4, tetA, mphA, ermB, and dfrA1. Point mutations were found in chromosomal resistance genes, including gyrA, parC, pmrB, and the ampC promoter, leading to amino acid substitutions. Neither blaNDM nor blaVIM was detected. This isolate also exhibited various virulence factors, including genes associated with fimbriae, biofilm formation, and capsule synthesis. It harbored five plasmids—IncY, IncI2(Delta), IncFIC(FII), IncI1-I(Alpha), and IncFIBIncF—and 17 mobile genetic elements (MGEs), including Tn7, which carried some of the resistance genes. However, no antibiotic resistance genes were present in the prophage regions, though one partially sequenced prophage contained the emrE gene, encoding an ethidium multidrug resistance protein (SMR family). Several multidrug efflux pumps, including mdf(A), were also identified.

Conclusions:
This E. coli isolate possesses a diverse set of antimicrobial resistance genes and virulence factors, and as an ST38 strain with O99 H30 antigens, it poses a significant risk in clinical environments. The main challenge now is to quickly identify the source and contain its spread.

Key Words: Antimicrobial resistance; WGS; Escherichia coli;

Funding Agency: Not applicable

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Cognitive Performance Indicators in Patients with Type 1 Diabetes: Insights from the REVADIAB Study

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Introduction:
Individuals with Type 1 Diabetes (T1D) are more likely to experience cognitive dysfunction than those without T1D. Previously identified cognitive risk factors for cognitive dysfunction in patients with T1D include younger age of diabetes onset, longer diabetes duration, and presence of diabetes-related complications. Given independent associations of inflammation with cognitive decline, we hypothesise that inflammatory markers are sensitive biological correlates of cognitive function that may have important translational value.

Methods:
We used data from the REVADIAB study (NCT03821753), a study that examined effects of glycaemic variability on cognitive and vascular complications of T1D. Out of 50 participants, 23 were assessed by the Wechsler Adult Intelligence Scale (WAIS)®-4, and were classified based on the cohort median score as relative "low" (IQ≤121) or "high" cognitive performers (IQ>121). We analysed hospital record immune cell counts, and expression of the pro-inflammatory transcription factor (IRF5).

Results:
Median age was 39 years (IQR=29-56), with 39% female, mean HbA1c of 7.85% (SD=1.02), mean diabetes duration of 23.8 years (SD=9.76), and mean BMI of 24.9 kg/m²,. No significant differences were found between low and high performers in age, gender, BMI, or diabetes-related variables. High cognitive performance was associated with increased IRF5 expression in innate natural killer cells (p=0.01), myeloid dendritic cells (p=0.01), monocytes (p=0.01), and monocyte subtypes (classical p=0.01, intermediate p=0.01, non-classical p=0.03).

Conclusions:
Monocytes and monocytes subtypes may be valuable indicators of cognitive performance in T1D. Future longitudinal study with larger sample size will validate these findings and address potential causal relationships.

Key Words: Type 1 Diabetes; Inflammation; Cognitive Performance;

Funding Agency: The French National Research Agency (Agence Nationale de la Recherche; ANR) ANR-PRCI grant ANR-23-CE14-0088-02; and by the Kuwait Foundation for the Advancement of Sciences (KFAS) and Dasman Diabetes Institute (DDI; RA HM-2023-019).

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IL-6 Knockout Mice Show Improved Glucose Tolerance and Insulin Resistance with High-Fat Diet

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Introduction:
Background: Interleukin-6 (IL-6) is a major cytokine that plays a role in inflammation and metabolism. Its role in adipose tissue, as well as in obesity-induced impairment in glucose homeostasis and insulin resistance, remains elusive.
Aim: We aimed to investigate the effect of a global knockout of IL-6 (IL-6 -/-) on glucose homeostasis in mice fed high-fat diets.

Methods:
C57BL/6 male mice (n=20) and IL-6 -/- male mice (n=20) were randomly assigned to two dietary interventions, including Chow (n=10) or HFD (n=10), for 22 weeks. Intraperitoneal glucose tolerance tests (IP-GTT) and intraperitoneal insulin tolerance tests (IP-ITT) were performed. Blood samples were collected for metabolic hormone measurements.

Results:
IL-6 -/- mice fed with a high-fat diet showed significantly ($P > 0.0001$) lower fasting blood glucose concentrations (6.3 ± 0.2 mmol.L-1) than wild-type mice fed on the same high-fat diet (8.9 ± 0.4 mmol.L-1). During IP-GTT and IP-ITT, IL-6 -/- mice fed with a high-fat diet showed significantly ($P = 0.007$ and $P > 0.0001$, respectively) lower area-under-the-curve (AUC: 1610 ± 140 and 493 ± 62.2, respectively) than wild-type mice fed on the same high-fat diet (2203 ± 120 and 956 ± 45, respectively). IL-6 -/- mice fed a high-fat diet showed significantly ($P = 0.037$ and $P = 0.045$, respectively) lower serum leptin and MCP-1 concentrations (9820 ± 1174 and 322 ± 113 pg.mL-1, respectively) than wild-type mice fed the same high-fat diet (13196 ± 940 and 344 ± 99 pg.mL-1, respectively). Fasting insulin concentrations were significantly ($P = 0.027$) higher in IL-6 -/- mice fed with a high-fat diet (8427 ±746 pg.mL-1) than in wild-type mice fed the same high-fat diet (6349 ±438 pg.mL-1).

Conclusions:
Our findings suggest that a global knockout of the IL-6 might improve insulin resistance and glucose intolerance in mice nutri-stressed with a high-fat diet.

Key Words: Interleukin-6 (IL-6); insulin resistance; high-fat diet;

Funding Agency: This work was supported and funded by the Kuwait Foundation for the Advancement of Sciences (KFAS) grant No. (RA-AM- 2016-007)

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Tracking of Trimethoprim Resistance Determinants in MRSA: A Genetic Analysis of Hospital Isolates in Kuwait

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Introduction:
Trimethoprim (TMP) is an antifolate antibacterial agent that prevents the synthesis of bacterial DNA by inhibiting bacterial dihydrofolate reductase, an enzyme which catalyzes the formation of tetrahydrofolic acid. Trimethoprim has been used to treat infections caused by Methicillin-resistant Staphylococcus aureus (MRSA) and has resulted in the emergence of TMP resistance among MRSA isolates. Resistance to TMP in S. aureus is mediated by different genes, dfrA, dfrK, dfrG, and dfrD, that encode the enzyme dihydrofolate reductase. This study investigated the genetic mechanisms of TMP resistance in MRSA isolated from patients in public hospitals in Kuwait.

Methods:
A total of 1364 non-duplicate isolates of MRSA were obtained from different clinical samples in 14 hospitals in 2021 and tested for susceptibility to antibiotics by the disk diffusion method and the minimum inhibition concentration method (Etest). Of the 1,354 isolates, 611 (45.1%) were resistant to TMP. The genetic mechanism of TMP resistance was obtained by DNA microarray analysis and PCR amplification of genes for dihydrofolate reductases, dfrA, dfrK, dfrG, and dfrD using known primers. Genetic backgrounds of the isolates were studied using DNA Microarray analysis. Sanger sequencing was performed on representative isolates carrying dfrA and dfrG

Results:
A total of 335 isolates (54.8%) were positive for dfrA, 197 isolates (32.2%) were positive for dfrG, while 14 (2.3%) isolates were positive for both dfrG and dfrA. No isolate was positive for dfrD or dfrK. The isolates belonged to 19 clonal complexes (CCs) dominated by CC5 (n=370; 60.5%), followed by CC22 (n=89; 14.5%), CC361 (n=66; 10.8%), CC1 (n=16; 2.6%), CC7 (n=15; 2.4%), CC30 (n=11; 1.8%), CC8 (n=11;1.8%) and CC88 (n=10; 1.6%). The other CCs occurred sporadically. There was no correlation between TMP resistance mechanisms with MRSA genotypes. The TMP-resistant isolates were also resistant to fusidic acid (72.0%), ciprofloxacin (57.1%), tetracycline (29.6%), chloramphenicol (28.1%), erythromycin (24.5%), kanamycin (20.9%), Inducible clindamycin (19.3%) and gentamicin (8.6%). DNA sequencing of representatives of the dfrG and dfrA revealed 100 percent similarity with similar genes obtained in S. aureus, and S. epidermidis.

Conclusions:
This study revealed the high prevalence of dfrA and dfrG in TMP-resistant MRSA. It also highlights the increasing burden of antibiotic- resistant MRSA in hospitals in Kuwait.

Key Words: Trimethoprim resistance; MRSA; Antibiotic resistance;

Funding Agency: None

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TLR4 KO Mice Display Selective sensitivity and Increased Adiposity to Metabolic Stress

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Introduction:
Toll-like receptor 4 (TLR4) is a key component of the innate immune system, activated by bacterial lipopolysaccharides (LPS) and free fatty acids (FFAs). TLR4 activation initiates either MyD88-dependent or -independent pathways, and chronic activation of these pathways leads to sustained inflammation and oxidative stress, both hallmarks of insulin resistance and obesity. TLR4 knockout (KO) mice show protection against a myriad of metabolic disorders, including hyperglycemia, hyperlipidemia, obesity and insulin resistance when fed a high-fat diet (HFD). Due to the role of TLR4 in both adipogenesis and gluconeogenesis, its interaction with dietary sucrose remains unclear.

Methods:
wild-type (WT) and TLR4 KO mice (n=5/group) were fed either a chow, HFD with normal sucrose (HFDNS) or HFD with high sucrose (HFDHS). Mice were weighed weekly; oral glucose tolerance tests (OGTT) and insulin tolerance tests (ITT) were at week 11 and 12 of feeding. After 12 weeks of feeding, mice were scarified to assess inflammation and fat accumulation via immunohistochemistry and RT-PCR. Student T test's or Mann-Whitney tests were performed where appropriate.

Results:
TLR4 KO mice on HFDHS diet showed similar weight gain to WT but on HFDNS gained significantly less weight than WT (mean ± SD: 27.55g ± 0.34g vs. 32.60g ± 3.08g, p = 0.0004). TLR4 KO mice on HFDHS developed liver inflammation and steatosis comparable to WT mice, while TLR4 KO mice on an HFDNS were protected from these conditions (mean %Inflammation ± SD, 4.35 ± 0.80 vs 2.16 ± 0.27, p-value= 0.0004). Furthermore, there was a significant difference in the glucokinase (GCK) expression in TLR4 KO mice on HFDNS compared to WT(mean ± S.D, 32.99 ± 27.47 vs 5.68 ± 2.30, p-value= 0.016), and in cluster of differentiation 36 (CD36) expression in TLR4 KO mice on HFDHS diet compared to WT (mean ± S.D, 23.28 ± 10.57 vs 9.06 ± 4.67, p-value= 0.029) and Peroxisome proliferator-activated receptor gamma (PPARgamma) (mean ± S.D, 40.77 ± 23.93 vs 12.85 ± 5.83, p-value= 0.040).

Conclusions:
These findings suggest that the protective effects of TLR4 deletion against obesity, liver steatosis, and insulin resistance are negated in the presence of high dietary sucrose. This highlights the critical role of dietary composition in metabolic health and suggests that excessive sucrose intake may activate alternative pro-inflammatory or metabolic pathways independent of TLR4.

Key Words: Obesity; Inflammation; TLR4;

Funding Agency: RA AM 2020-007, KFAS

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Molecular Detection of gyr A and par C Mutations in Clinical Isolates of Pseudomonas aeruginosa Obtained from Farwaniya Hospital in Kuwait

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Introduction:
Pseudomonas aeruginosa is a common causative agent of nosocomial infections. The World Health Organization (WHO) has recognized P. aeruginosa as a multidrug-resistant bacterium that presents a global threat to hospitalized patients in intensive care units (ICU) or on medical devices. This study aimed to examine mutations in the quinolinone resistance-determining region (QRDR) of gyr A and par C genes in P. aeruginosa isolates.

Methods:
A total of 100 P. aeruginosa isolates were cultured on MacConkey agar from various specimens from patients admitted to ICUs and wards in Farwaniya Hospital. Species identification and sensitivity/resistance testing were performed for each isolate using the VITEK® 2 system. Minimum inhibitory concentrations of ciprofloxacin were evaluated by the broth microdilution method. Subsequently, QRDRs of gyrA and parC were amplified from MDR isolates and were assessed after sequencing by Sanger method.

Results:
Among the 100 P. aeruginosa isolates tested, 15 MDR P. aeruginosa isolates were detected by using phenotypic methods; 14 isolates were from the wards while one isolate was from the ICUs. DNA sequencing results for the MDR isolates showed that 14 isolates had Thr-83> Ile mutation in gyrA, and 12 isolates had Ser-87>Leu mutation in parC genes. Furthermore, only silent mutations were detected in gyrA or parC genes of the ciprofloxacin susceptible isolates.

Conclusions:
The findings of this study suggest that the prominent mechanisms of resistance to fluoroquinolone for clinical strains of P. aeruginosa include mutations in gyrA and parC genes. The limitation of this study is the inclusion of only one general hospital in Kuwait, therefore limiting the ability to generalize the findings to all hospitals in Kuwait. Whole-genome sequencing is recommended since some of the isolates in this study appeared resistant phenotypically, but the resistance genes were not detected by molecular methods.

Key Words: Psudomonas aeruginosa; MDR; Mutations ;

Funding Agency: College of Graduate Studies and Research Sector (Project Number: YM02/23).

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Molecular Characterization of Methicillin-resistant Staphylococcus aureus Colonizing Pregnant Women in a Tertiary Hospital in Kuwait.

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Introduction:
Background: Methicillin-resistant S. aureus (MRSA) can colonize the genital tract of women during pregnancy. Vaginal tract colonization during pregnancy can lead to vertical transmission of MRSA from the mother to the fetus during delivery. MRSA can cause invasive and non-invasive infections in neonates requiring treatment with antibiotics, and can lead to a high mortality rate. MRSA colonization is usually detected accidentally by rectovaginal swabbing or during screening for Group B Streptococcus. There are no protocols to screen for MRSA during pregnancy.
Objective: The aims of this study were to investigate MRSA obtained from high vaginal swabs (HVS) of pregnant women for susceptibility to antibacterial agents, distribution of clonal types, compare the results with those obtained in the general population, and make a case for the routine screening for MRSA colonization during pregnancy.

Methods:
A total of 119 MRSA isolated from HVS of pregnant women at a tertiary hospital from 1 November 2021 to 31 October 2022 were investigated for antibiotic resistance and genetic backgrounds. Antibiotics susceptibility testing was performed with disk diffusion, and MIC methods. The clonal distribution was investigated by spa typing, Multi Locust sequence typing, and DNA microarray analysis following standard protocols

Results:
The isolates were resistant to fusidic acid (70.6%), trimethoprim (40.3%), erythromycin (14.3%) tetracycline (35.3%), chloramphenicol (26.1%), gentamycin (17.6%) and kanamycin (22.7%), and harboured fus(C), dfrS1, erm(C)/ msr(A)., tet(K), tet(M), fexA, aacA-aphD, and aphA3. The isolates belonged to 15 clonal complexes (CCs), 37 spa types and 19 sequence types (ST). The common genotypes were t688-ST5 (N= 48), and t304-ST6 (N=21) followed by t127-ST1 (N= 10), t084-ST1535 (N=8), t267-ST97 (N=7), t008-ST8 (N=6), t044-ST80 (N=3), t3481-ST672 (N=3) and t503/t903-ST1153 (N=2),

Conclusions:
The MRSA population in this study were multidrug resistant and belonged to diverse genetic backgrounds similar to those circulating in other hospitals in Kuwait. Since MRSA colonization is a significant concern for pregnant women and their newborn, there is an urgent need to develop and initiate routine screening programs for MRSA during ante natal care to prevent MRSA transmission to the newborn.

Key Words: Antibiotic resistance; MRSA; Molecular typing;

Funding Agency: College of Graduate Studies and Research Sector Kuwait University Grant YM05/23.

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Antibiotic Resistance and Genotypic Diversity of Clonal complex 45 MRSA Isolates in Kuwait Hospitals.

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Introduction: Methicillin-resistant Staphylococcus aureus (MRSA) belonging to clonal complex 45 (CC45-MRSA) is rare in Kuwait. This study aimed to characterize MRSA isolates identified as CC45-MRSA by DNA microarray for antibiotic resistance and genetic backgrounds.

Methods:
A total of 91 CC5-MRSA isolates obtained from clinical samples between 2016 and 2022 were investigated. Antibiotic resistance was determined by disc diffusion, and MIC determination. Staphylococcal protein A (Spa) typing was used to investigate genetic relatedness.

Results:
The isolates were resistant to penicillin G (n=91), fusidic acid (n=71), erythromycin (n=16), inducible clindamycin (n=15), trimethoprim (n=4) and gentamicin (n=2), and harboured the respective resistance genes, blaZ, fusC, erm(C), dfrS1, and aacA-aphD. The isolates belonged to 25 spa types, dominated by t362 (29.6%), t132 (14.2%), followed by t004 (3.3%), t026 (2.2%), t050 (2.2%), t1575 (2.2%) and t2674 (2.2%), and nine genotypes with CC45-MRSA-IV+SCCfus (n=27), CC45-MRSA-[VI +fus] (n=22), CC45-MRSA-IV, Berlin EMRSA (n=17) and CC45-MRSA-[IV+fus] (n=9) constituting 93.4% of the isolates, CC45/agrIV-MRSA-V (n=5), CC45-MRSA-IV(tst1+) (n=3), CC45-MRSA-V (n=3), CC45-MRSA-V [tst1+], WA MRSA-4 (n=4), and CC45-MRSA-V [PVL+] (n=1). Eighty-six (94.5%) isolates belonged to accessory gene regulator type 1, while five isolates belonged to type IV. All CC45-MRSA isolates harboured genes for capsular polysaccharide type 8, immune evasion cluster (staphylokinase, chemotaxis- inhibiting protein and staphylococcal complement inhibitor), but harboured varied enterotoxins, and toxic shock syndrome toxin genes. One isolate was positive for Panton-Valentine Leukocidin.

Conclusions:
The diverse genetic backgrounds suggest independent acquisition of the CC45-MRSA isolates. The high prevalence of fusidic acid resistance in the dominant genotypes is disturbing.*Key Words: Antibiotic resistance; MRSA; Molecular typing;*

Funding Agency: None

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Isolation of antibiotic-producing bacteria from seawater in Kuwait Bay

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Introduction:

Antibiotics are known to originate from microorganisms, including environmental bacteria.The primary goal was to identify and screen seawater-isolated bacteria that possibly produce antibiotics.

Methods:

Antibiotic activity was detected in three out of the fifty (50) microorganisms that were isolated from seawater. Agar-well diffusion tests were used to screen Pseudomonas guguanensis (KD1) for antibacterial activity against the ESKAPE pathogens. Using solvent extraction tests, P. guguanensis (KD1) was chosen for the process of fermentation and extraction of antimicrobial compounds.

Results:

The maximum antibacterial activity was obtained by P. guguanensis (KD1) after 36 hours of cultivation, which inhibited S. aureus, E. fecium, A. baumannii, and E. cloacae. The sensitization assay revealed that K. pneumoniae was impermeable to all of the supernatant collected from P. guguanensis (KD1). Zones of inhibition formed by ethyl acetate extracts sgainst against S. aureus, E. faecium, and E. cloacae were recorded as 20.1 ± 0.432, 17.8 ± 0.121, and 16 ± 0.162 mm, respectively. A. baumannii and S. aureus were inhibited by acetonitrile extract from the supernatant, which formed inhibition zones of 18.2 ± 0.323 mm and 18 ± 0.234 mm. The acetonitrile extract had a minimum bactericidal concentration of 12.5-25 mg/mL while the ethyl acetate extract had a minimum inhibitory concentration of 1.56 to 6.25 mg/mL.

Conclusions:

P. guguanensis (KD1) is a possible antibiotic source for infections caused multidrug-resistant bacteria. Its genetic potential in antibiotic synthesis will be explored through bioinformatics research in the future.

Key Words: Antibiotic; Antibiotic resistance; Pseudomonas;

Funding Agency: No

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Modulatory Effects of Gut-Derived SCFAs on THP-1 Cells Exposed to Glucose and Palmitate

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Introduction:
THP-1 cells, a human monocytic cell line, can differentiate into proinflammatory (M1) or anti-inflammatory (M2) macrophages in response to specific stimuli, adapting cellular metabolism to support their effector functions. For instance, high glucose exposure promotes an M1 state by supporting glycolysis, while high palmitate exposure favors an M2 state by supporting mitochondrial metabolism. Short-chain fatty acids (SCFAs), such as acetate, propionate, and butyrate, produced by gut microbiota during dietary fibers fermentation, are known to have anti-inflammatory properties. SCFAs also influence glucose and lipid metabolism, potentially improving insulin sensitivity and reducing ectopic lipid storage, thereby mitigating metabolic diseases. Here we hypothesized that, SCFAs could alter the metabolic response of THP-1 cells to glucose and/or palmitate, influencing their polarization states.

Methods:
To investigate this hypothesis, we treated THP-1 cells with SCFAs following acute or chronic exposure to high glucose, high palmitate or a combination of both. Mitochondrial respiration was assessed using metabolic flux analysis (Agilent Seahorse).

Results:
In acute exposure, butyrate led to the highest ATP production and oxygen consumption with glucose, while acetate showed the same effects with palmitate. Propionate showed the highest ATP production and oxygen consumption under combined glucose and palmitate exposure. In chronic exposure, propionate increased oxygen consumption with glucose, while acetate and butyrate enhanced oxygen consumption with palmitate. They also increased ATP production under combined glucose and palmitate exposure.

Conclusions:
Exposure duration and the type of stress inducers modulate cellular responses, indicating that the effects of SCFAs on cellular function are influenced by both exposure time and metabolic conditions.

Acknowledge: This work was supported by the Kuwait Foundation for the Advancement of Sciences (KFAS) and conducted at Dasman Diabetes Institute (DDI).

Key Words: SCFAs; THP-1; metabolic flux analysis;

Funding Agency: NONE

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Investigating the Impact of Hepatitis C Virus Mutations on Protein Structure and Binding Dynamics: A Protein Docking Approach to Understanding Drug Resistance

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Introduction:
Background: Mutations in the hepatitis C virus (HCV) genome can lead to significant structural alterations in viral proteins, impacting their stability, folding, and functionality as well as drug binding, resulting in antiviral resistance and complicating treatment strategies.

Objective: To understand how mutations in HCV contribute to both viral adaptation and therapeutic challenges. This study aimed to identify NS5A variants using protein modeling that may contribute to resistance and pose challenges for effective treatment.

Methods:
A total of 30 residual serum samples received for routine viral load testing from chronic hepatitis patients attending the Gastroenterology Clinic at Mubarak Al Kabeer Hospital were used to extract RNA. HCV NS5A protein-coding regions were amplified using RT-PCR followed by Next Generation Sequencing (ion torrent S5 Platform, ThermoFisher). Mutations were further analyzed using Pyryx virtual screening to evaluate the binding affinities of various direct-acting antiviral agents against a mutated HCV receptor.

Results:
Among 30 patients with hepatitis C infection, NS5A amino acid substitutions/RASs were identified in 16.6% of patients with HCV-genotype 4a, the most prevalent genotype in Kuwait. Significant mutation patterns were detected in NS5A protein reflecting H to D amino acid changes at position 58 in 98.94% of the samples followed by A30K in 33.86% of the samples and Y93H in 17.88% of the samples, respectively. Our findings revealed that Elbasvir (MK-8742) exhibited no binding to the mutated receptor. Additionally, Ombitasvir (ABT-267) and Velpatasvir demonstrated reduced binding affinity, suggesting potential resistance to the mutated receptor. In contrast, Daclatasvir and Ledipasvir (GS-5885) showed increased binding affinity compared to the wild-type receptor, indicating their potential efficacy against the mutated HCV strain.

Conclusions:
This study investigates alterations in NS5A protein structure due to existing mutations evidenced by protein modeling. The results indicated that Elbasvir (MK-8742) showed no binding to the mutated receptor, while Ombitasvir (ABT-267) and Velpatasvir exhibited reduced binding affinities, suggesting a potential resistance to the mutated receptor. Such insights underscore the importance of early detection and personalized treatment approaches in managing chronic viral infections, particularly when structural alterations may enhance viral survival and resistance.

Key Words: Hepatitis C Virus NS5A receptor mutations; Next Generation Sequencing; Protein

Funding Agency: none

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Changing Trends in Uropathogens and Antibiotic Resistance: A Comparative Study of Hospital and Community Urinary Tract Infections at Maternity Hospital in Kuwait

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Introduction:

Background: Urinary tract infections (UTIs) are among the most common infections in both hospital and community settings, posing significant healthcare challenges. Over time, the bacterial resistance to commonly used antibiotics has risen, necessitating regular evaluation of antimicrobial susceptibility patterns. This study aimed to examine the distribution of uropathogens causing UTIs and assess differences in antibiotic resistance between hospital-acquired (HA) and community-acquired (CA) UTIs over a six-year period.

Methods:

This retrospective study analyzed urine samples collected at a maternity hospital in Kuwait from January 2017 to December 2022. Bacterial identification and antimicrobial susceptibility testing were conducted using standard laboratory methods.

Results:

A total of 3,235 urine samples were processed, yielding organisms in 50.2% (1623) of CA cases and 49.8% (1612) of HA cases. The predominant pathogens were Gram-negative bacteria (64.8% in HA vs. 68% in CA), followed by Candida spp. (19.7% in HA vs. 17.7% in CA) and Gram-positive bacteria (15.5% in HA vs. 14.2% in CA). Escherichia coli was the most frequently isolated organism (46% in HA vs. 51% in CA), followed by Candida albicans, Klebsiella pneumoniae, and Enterococcus spp. E. coli exhibited high resistance to ampicillin, amoxicillin/clavulanic acid (AMC), and cefotaxime in both settings, with notable HA resistance rates of 77.4% in 2018 and 74.8% in 2019. Piperacillin/tazobactam resistance peaked at 40% in CA isolates in 2021. Amikacin, gentamicin, and meropenem consistently demonstrated the highest susceptibility in both CA and HA cases. Klebsiella pneumoniae showed 100% resistance to ampicillin and AMC across both settings while maintaining susceptibility to amikacin and gentamicin. Enterococcus faecalis is susceptible to AMC and piperacillin/tazobactam.

Conclusions:

Monitoring antimicrobial resistance patterns is essential for implementing effective infection control measures and optimizing empiric UTI treatment. Tailoring therapy to local susceptibility data can enhance treatment outcomes and mitigate the spread of resistant uropathogens.

Key Words: Urinary tract infections; Antimicrobial resistance; Hospital-acquired infections

Funding Agency: None

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Web-based prediction and experimental validation of antibody reactive epitopes in major antigenic proteins of RD1 and RD9 of Mycobacterium tuberculosis

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Introduction:
The region of difference (RD)1 proteins PE35, PPE68, ESXA, ESXB, and the RD9 protein ESXV of Mycobacterium tuberculosis are major antigens in cell-mediated immunity assays and have been considered useful for the diagnostic and/or vaccine applications in T-cell based assays. However, recent studies indicate that optimal protection against tuberculosis requires the induction of both cellular (T cell) and humoral (antibody) responses. The aim of this study was to predict the antibody reactivity of the above proteins and their peptides using web-based prediction methods and experimentally validate them in antigen-specific antibody responses using sera from three different mammalian species.

Methods:
The antibody reactivities against the RD1 and RD9 antigens were predicted by using six web-based methods available at IEDB Analysis Resource. For experimental validation of antibody reactivities, sera were tested from immunized mice, rabbits, tuberculosis patients, and healthy humans using enzyme-linked immunosorbent assays (ELISA).

Results:
All six web-based methods suggested antibody reactivity for PE35, PPE68, ESXA, ESXB, and ESXV proteins with epitopes ranging from 8 to 68 amino acids in length. The predicted epitopes were scattered throughout the sequence of each protein. The maximum numbers of epitopes were predicated in PPE68 (n= 8), followed by ESXA (n = 5), Rv2346c (n=4), PE35 (n = 3), and ESXB (n = 2). The ELISA results with sera from rabbits showed positive antibody reactivity with all five immunizing proteins, their synthetic peptide pools, and multiple peptides of each protein. The sera from mice showed positive antibody reactivity with all proteins but only to one peptide of PE35 and two peptides of PPE68. In humans, five peptides of PPE68 and three peptides of ESXV showed positive reactivity with sera from tuberculosis patients and healthy subjects.

Conclusions:
The web-based prediction methods suggest the presence of multiple antibody epitopes in each protein, but variations in the epitopes recognized were observed among rabbits, mice, and humans, which could be due to mammalian species differences and/or mode of antigen delivery and processing in vivo.

Key Words: Web-based prediction; M. tuberculosis-specific antigens; Antibody epitopes;

Funding Agency: Not applicable

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Whole Genome Sequence Comparisons of Brucella melitensis Isolates from Kuwait and other Countries of the world for Phylogenetic Analysis

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Introduction:
Objective: The identification of Brucella genotypes is essential for epidemiological studies. The whole genome sequencing is currently the most suitable approach for genetic characterization of infectious agents. The aim of this study was to compare the genomes of B. melitensis isolates from Kuwait and other parts of the world for phylogenetic analysis using whole genome sequences and bioinformatics analysis.

Methods:
Genomic DNA purified from heat-inactivated isolates (n=15) of B. melitensis were used to prepare sequencing libraries and sequenced on a MiSeq instrument from Illumina. For phylogenetic analysis, genomes of 105 B. melitensis, from different regions of the world were downloaded from NCBI dataset. All genomes were analyzed using the 'nucmer' option in the dRep (version 3.5.0) command-line program. The distance matrix obtained from dRep was subsequently used to construct a dendrogram, employing hierarchical clustering through the "ape" (version 5.8) package in R (version 4.3.3). X

Results:
The bioinformatics analysis of the Kuwaiti strains from this study (n=15) with 105 global B. melitensis strains revealed that despite the phylogenetic dispersion of Kuwaiti strains throughout the tree, which includes a wide range of strains from multiple countries, an obvious clustering occurred with strains from the Middle Eastern countries, including Iraq, Syria, and Turkey.

Conclusions:
Our results comparing the whole genome sequence data using appropriate bioinformatics tools showed that the Kuwaiti isolates of the present study shared phylogeny mainly with strains from the Middle Eastern countries.

Key Words: Brucella melitensis; Whole genome sequence Analysis; Phylogeny;

Funding Agency: MI04/15

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Multiple Drug Resistance Genotypes in Clinical Isolates of Acinetobacter baumannii

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Introduction:
Acinetobacter baumannii is a notorious nosocomial pathogen in worldwide healthcare settings. Its natural transformable characteristics disseminate it at an unprecedented rate and render it untreatable through commonly used antibiotics. Hence, it becomes of utmost importance to characterise the A. baumanii genomes for multidrug resistance carriage. In this study, we have screened the clinical isolates of A. baumannii from Kuwait for the presence of antibiotic-resistance genes.

Methods:
A total of twenty morphologically characterized A. baumannii clinical isolates were obtained from two major hospitals in Kuwait. Whole genomic DNA was isolated and subjected to 16S rDNA sequencing for species confirmation. Twenty genomic libraries were prepared employing the Nextera XT DNA Illumina protocol and sequenced on an Illumina MiSeq (2 x 150 bp paired end). Raw fastq sequences were analysed through the Chan Zuckerberg (CZ-ID) pipeline available at the Comprehensive Antibiotic Resistance Database (CARD) and antibiotic resistance genes were filtered.

Results:
All the isolates possessed antibiotic resistance genes (ARGs). More than seven ARGs were present in each sample. Genes offered resistance against multiple drugs. The most common gene in all the isolates was abeS belonging to the gene family small multidrug resistance (MDR) antibiotic efflux pump. It is known to confer resistance against macrolides and aminocoumarin.

Conclusions:
The results imply the prevalence and circulation of multidrug resistant A. baumannii strains in the healthcare settings of Kuwait. Antimicrobial resistance monitoring programs should be launched on a regular basis for surveillance, contact tracing, and potential mitigation.

Key Words: Acinetobacter baumannii; Whole genome sequencing; Multidrug-resistance genes ;

Funding Agency: The College of Graduate Studies and Research Sector grant YM07/16

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Sucrose-free LFD Causes Colon Inflammation and Liver Fat Accumulation in Mice

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Introduction:
Low-fat diets are advocated as part of healthy eating practices, often involving reduced or no sugar intake. Despite this, the specific impacts of such diets on the colon and liver, particularly in the absence of sucrose, have yet to be fully explored. Objective: to investigate the effect of sucrose-free low-fat diet (SF-LFD) on metabolic parameters.

Methods:
C57BL/6 mice (8–10 weeks old) were randomly assigned to two groups: sucrose-free low-fat diet (SF-LFD) and control low-fat diet (C-LFD) (5–6 mice per group). Both groups were fed their respective diets for 16 weeks. Body weight and food intake were recorded weekly. At the end of the intervention, oral glucose tolerance tests (OGTT) and insulin tolerance tests (ITT) were conducted, and tissues were collected for histological, biochemical, and molecular analyses to evaluate inflammation, metabolic markers, and liver steatosis.

Results:
SF-LFD-fed mice exhibited significantly increased colon inflammation, with upregulated IL-1β (2.1-fold) and IL-6 (2.5-fold), and hepatic inflammation with elevated IL-1β (2.4-fold) and IL-6 (2.7-fold) ($p < 0.05$). Despite no significant differences in body or liver weights ($p > 0.05$), SF-LFD-fed mice showed higher hepatic fat accumulation and impaired glucose tolerance (OGTT AUC: 28.5% higher) and insulin resistance (ITT AUC: 23.4% higher) ($p < 0.05$). Plasma insulin, glucose, GLP-1, GIP, ghrelin, and resistin levels were elevated, while leptin, amylin, PP, and PYY levels remained unchanged ($p > 0.05$).

Conclusions:
Our findings reveal that a sucrose-free low-fat diet induces significant colon inflammation, leading to hepatic steatosis and inflammation, and exacerbating insulin resistance. These results underscore the complex metabolic interactions influenced by dietary composition and suggest caution in the implementation of sucrose-free low-fat diets without consideration of broader metabolic consequences.

Key Words: Sucrose-free low-fat diet; Inflammation; Insulin Resistance;

Funding Agency: Kuwait Foundation for the Advancement of Sciences through Dasman Diabetes Institute, RAAM2016-007

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Relative importance of defined Mycobacterium tuberculosis antigens in the T cell recognition repertoire of latently infected individuals not progressing to active disease

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Introduction:
ntroduction &Objective: We have in this study mapped the relative importance of well-defined recombinantly expressed M. tuberculosis antigens in the T cell recognition repertoire of latently infected individuals not progressing to active disease.

Methods:
Methods: Peripheral blood mononuclear cells from 20 healthy but latently infected long term non-progressors (purified protein derivative and Quantiferon Gold assay positive subjects) were screened for antigen-induced proliferation and Th1 cytokine (IFN-γ) responses. A panel of 16 well-defined recombinant antigens were used to test for the Th1 responses.

Results:
Results: The panel of antigens tested showed a clear spectrum of responsiveness and lead to the identifications of a subgroup of frequently recognized antigens (MPT59, CFP7, CFP10, CFP21, TB37.6 /PPE68, ESAT-6, MPT51, and DnaK) with a high cellular response level as measured in both proliferation and IFN-γ assays. Among a subgroup of antigens also screened for responses in tuberculosis patients, CFP21 was identified as differentially recognized in non-progressors. For both cellular assays, we found a positive correlation between responder frequency and magnitude of response. A significant correlation between the level of antigen-specific proliferation and INF-γ secretion was also observed.

Conclusions:
Conclusion: We have identified a defined set of M. tuberculosis antigens frequently recognized by T cells at a high response level from latently infected non-progressors which warrant further investigation for a potential role in immune regulation and protection against progression to active disease.

Key Words: M tuberculosis; T cell antigens; Latent infection;

Funding Agency: Not applicable

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Prevalence and Genetic Insights into Fusidic Acid and Mupirocin Resistance in Staphylococcus aureus Isolates from Bahrain

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Introduction:
Staphylococcus aureus is a common pathogen that causes community and hospital-acquired infections. Its ability to rapidly develop resistance to different antibiotics complicates the treatment strategies. Mupirocin and fusidic acid are bacteriostatic antibiotics that inhibit protein synthesis. While both are used topically, fusidic acid can be given orally and intravenously to treat some infections. However, the prevalence of resistance genes towards these antibiotics is rising globally, which might decrease the efficiency of these antibiotics. In Bahrain, the prevalence rate is unknown and has not been studied yet.The aim of this study is to assess the prevalence of fusidic acid and mupirocin resistance genes in clinical isolates of S. aureus from Bahrain.

Methods:
A total of 161 clinical isolates were collected from Al-Salmaniya Medical Complex (SMC) from various clinical samples including pus (119), blood (20), urine (4), and tissue biopsy (10). Polymerase chain reaction (PCR) was employed to detect the presence of the fusidic acid and mupirocin resistance genes which includes: fucC, fusB, mupA and mupB. Results of RAPD genotyping and WGS are under process.

Results:
The findings revealed that the prevalence rates of fusidic acid-resistant S. aureus (FRSA), fusidic acid-resistant MRSA (FRMRSA), and fusidic acid-resistant MSSA (FRMSSA) were 18.63 %, 27.83% and 4.69%, respectively. In comparison, the global prevalence rates were 0.5%, 2.6%, and 6.7%. For mupirocin, the prevalence of mupirocin-resistant S. aureus (MuRSA) and mupirocin-resistant MRSA (MuRMRSA) was 1.86% and 3.09% respectively, compared to the global prevalence rates of 7.6% and 13.8%.

Conclusions:
The prevalence of fusidic acid resistance genes in Bahrain is significantly higher than the global prevalence, potentially due to frequent or inappropriate use in outpatient and hospital setting. Conversely, the prevalence of mupirocin resistance genes in Bahrain is lower than the global rates, suggesting that mupirocin is still relatively effective in Bahrain. This research shed light on the importance of monitoring the prevalence of resistance genes in S. aureus to guide therapeutic strategies and public health interventions.

Key Words: mupirocin; fusidic acid; Staphylococcus aureus;

Funding Agency: NA

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Prevalence and Mechanisms of Colistin Resistance in Acinetobacter baumannii Isolates from Bahrain: Evaluation of Diagnostic Methods and Clonal Relationships

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Introduction:
Acinetobacter baumannii (A. baumannii) is a significant nosocomial pathogen associated with multiple nosocomial infections, particularly in intensive care units. Its resistance to multiple antibiotics has made it a global concern. Colistin is the last-resort antibiotic used to treat infections caused by multidrug-resistant (MDR) strains. However, the emergence of colistin resistance due to different mechanisms creates a significant challenge.
Objective: This study aims to determine the prevalence of colistin resistance in A. baumannii isolates in the Kingdom of Bahrain, evaluate the consistency of different antibiotic susceptibility testing (AST) methods, and explores resistance mechanisms and clonal relationships among resistant isolates.

Methods:
A total of 104 A. baumannii isolates were randomly collected from four major hospitals in the Kingdom of Bahrain. Of these isolates, 27 were carbapenem-sensitive (CSAB) and 77 were carbapenem-resistant A. baumannii (CRAB) isolates. AST was performed using broth microdilution test (BMT), colistin agar test (CAT), gradient strip test (E-Test), and disc diffusion methods to compare the results, as CLSI only recommends BMT. PCR targeting mcr1 and mcr4 genes were conducted to identify genotypic AST. Clonal relationship among resistant isolates were assessed by ERIC/BOX PCR, and whole genome sequencing (WGS) was performed on select resistant isolates, results are awaited.

Results:
Of the 104 isolates, 17 (16.3%) were resistant to colistin as determined by BMT. Among these, 15 (88.2%) grew as colistin-resistant in CAT, 1 (5.9%) on E-test, and 3 (17.6%) on disc diffusion. PCR revealed that 12 (70.6%) of the resistant isolates harbored the mcr-4 gene. ERIC/BOX PCR PCR showed a significant clonal relationship among the resistant isolates.

Conclusions:
This study highlights a high prevalence of colistin resistance in A. baumannii isolates in Bahrain, with most resistant isolates harboring the mcr-4 gene, which indicates the presence of a plasmid-mediated mechanism for colistin resistance in Bahrain. The findings also highlighted the superior sensitivity, and the reliability of CAT compared to E-test and disc diffusion in detecting colistin resistance. This puts it as a potential alternative for screening for colistin resistance in resource-limited settings. The ongoing WGS will provide more insights on additional resistance mechanism, enabling more effective interventions and understanding of resistant mechanisms.

Key Words: Acinetobacter baumannii; colistin; mcr;

Funding Agency: NONE

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Ceftaroline, Vancomycin and Linezolid in-vitro activity against Methicillin susceptible Staphylococcus aureus (MSSA) and Methicillin-resistant Staphylococcus aureus (MRSA) isolates at a tertiary care hospital in Kuwait

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Introduction:
The superior activity of Ceftaroline, a novel fifth generation cephalosporin in comparison to other β-lactams has been attributed to its affinity for altered penicillin binding protein targets associated with β-lactam resistance. We evaluated the in-vitro activity of ceftaroline and comparator antibiotics against clinical isolates of methicillin- resistant (MRSA) and methicillin-susceptible (MSSA) Staphylococcus aureus isolates.

Methods:
This study was done at the Ibn Sina Microbiology Laboratory on all MRSA and MSSA isolates from various specimens including blood, respiratory samples and wound swabs received from March to October 2024 from Ibn sina hospital and its allied centers. Identification and susceptibility testing was done by BD Phoenix (Becton Dickinson) and Ceftaroline E-test(bioMerieux) was also performed. The MIC results for ceftaroline were interpreted as susceptible (≤1 mg/L), intermediate (2 mg/L) and resistant (≥4 mg/L) according to Clinical and Laboratory Standards Institute (CLSI 2024). MIC of the comparator antibiotics vancomycin and linezolid were determined by Phoenix only. The MIC50 and MIC90 of MRSA and MSSA isolates to ceftaroline was also evaluated.

Results:
A total of 51 isolates of Staphylococcus aureus consisting of 34 MRSA and 17 MSSA strains were evaluated. The sources of those isolates were wound swabs (32), respiratory tract specimens (11) and blood (8). All the MRSA and MSSA isolates exhibited susceptibility to ceftaroline at MIC of ≤1 mg/L. MIC50 and MIC90 values of ceftaroline for MRSA was found as 0.5 µg/ml for both, with a MIC range of 0.25 - 0.5 µg/ml. The MIC50 and MIC90 values of ceftaroline for MSSA was found as 0.125 µg/ml and 0.5 µg/ml, respectively, with a MIC range of 0.125 – 0.5 µg/ml. All isolates tested were found to be susceptible to linezolid (MIC≤1 µg/ml) and vancomycin
(MIC≤1 µg/ml).

Conclusions:
Treating MRSA infection remains a great challenge for clinicians, because of limited treatment options. In-vitro activity of ceftaroline was found to be the same as vancomycin and linezolid. Ceftaroline is a valuable option for treating life threatening MRSA infections with rapid target attainment and safety profile.

Key Words: CEFTAROLINE; MRSA; MSSA;

Funding Agency: NONE

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Sunflower-based HFD Leads to Gut Dysbiosis and impaired metabolic markers in mice

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Introduction:
High-fat diets (HFDs) influence the gut microbiota and promote obesity, inflammation, and metabolic dysregulation. Dietary sucrose is also a co-player in modifying the gut microbial ecosystem toward dysbiosis. Fish and sunflower are generally considered sources of healthy fats. Gut microbiota changes from high intake of either fat, in absence of the additive effect of sucrose, remain unclear.

Methods:
To address this, we compared effects of sucrose-free, sunflower high-fat diet (S-HFD) and fish (F-HFD) feeding (24 weeks) on gut microbiota composition, obesity, hepatic inflammation, and insulin resistance in C57BL/6 mice. Mice were housed in a temperature-controlled room (23 °C) and maintained on a 12-h dark/12-h light cycle. All experiments were performed using 8–10 weeks old male mice. The mice were randomly divided into 2 groups, 5–6 mice per group per cage. Mice were placed on a constant high fat diet (45% fat composition) for up to 24 weeks. Body weight and food intake of mice were recorded on a weekly basis. During the 21 &22 weeks of dietary intervention, oral glucose tolerance test (OGTT) and insulin tolerance test (ITT) were performed. The mice were sacrificed at the end of dietary intervention (24 weeks) and all tissues and organs were collected. Both diets had comparable effects on body weight. 16S rRNA sequencing of fecal pellets and diversity analysis revealed that gut microbial communities were differentially expressed between two groups.

Results:
Firmicutes were highly-abundant in S-HFD (40%) compared with F-HFD group (3%), while Verrucomicrobia were abundant in F-HFD(26%) compared with S-HFD (<1%) mice. Firmicutes/Bacteroidetes ratios in S-HFD and F-HFD were 1.32 and 2.45, respectively. MicrobiomeAnalyst and MIAOME analyses identified that highly-abundant gut microbial taxa (g_Oscillospira, s_guilliermondii, g_Allobaculum, g_Yaniella, g_Ruminococcus, s_gnavus, g_Staphylococcus, g_Clostridium, g_Adlercreutzia, f_Aerococcaceae, g_Anaeroplasma, f_Mogibacteriaceae, f_Christensenellaceae, and o_RF39) in S-HFD mice had predicted associations with host genes related to metabolic disorders and pathways linked to inflammation and immune dysregulation. S-HFD mice showed increased body weight and fasting glucose, hepatic macrophage infiltration (F4/80 expression), macrovascular steatosis, lobular inflammation, and enhanced expression of genes associated with de novo lipogenesis (Acaca, Fasn, and Scd1) and monocyte chemotaxis (Ccl2), compared with F-HFD mice.

Conclusions:
S-HFD feeding induces gut dysbiosis which is consistent with moderate steatohepatitis and impaired glycemic control. Funding/Acknowledgements: This work was supported and funded by the Kuwait Foundation for the Advancement of Sciences (KFAS), grant No. (RA AM-2023-023).

Key Words: sunflower, fish oil,; gut dysbiosis,; liver steatosis, insulin resistance;

Funding Agency: KFAS

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The Effects of Electro-osmosis in the migration and quality of capillary gel electrophoresis in QIAxcel Advanced System

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Introduction:
The QIAxcel Advanced Instrument is a cutting-edge tool that utilizes capillary electrophoresis to achieve high-resolution and sensitive nucleic acid separation. Its size-based separation is enabled by the application of voltage, which directs the migration of nucleic acids to a detector that measures fluorescence signals. This study aims to optimize the system's performance by determining the most effective injection voltage for superior migration and separation.

Methods:
Nucleic acids were extracted, amplified, and diluted using the QIAxcel-provided dilution buffer. Migration efficiency was tested at various injection voltage settings (5, 10, 13, and 15 seconds) using the QIAxcel ScreenGel software. Purge and injection voltages were set according to the guidelines provided in the software brochure.

Results:
The results demonstrated that an injection voltage of 13 seconds provided the best migration performance. This optimized setting enhanced the electroosmotic flow, improving the separation range and overall resolution. Both purge and injection voltage adjustments, facilitated by the ScreenGel software, contributed to these improved outcomes.

Discussion The findings highlight the importance of precise voltage optimization in nucleic acid separation. The QIAxcel Advanced Instrument, combined with its companion ScreenGel software, offers a robust and user-friendly platform for fine-tuning electrophoresis parameters to achieve high-quality results.

Conclusions:
The QIAxcel Advanced System is a powerful and intuitive tool for nucleic acid analysis. By optimizing injection voltages, it enhances separation efficiency and simplifies workflow, making it a valuable asset for researchers in molecular biology.

Key Words: QIAXCEL; ELECTROPHORESIS; ELECTRO OSMOSIS;

Funding Agency: SRUL02/13

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Safety & Efficacy of Percutaneous Transhepatic Ablation of Right Renal Masses

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Introduction:
Purpose: To evaluate the safety and efficacy of percutaneous transhepatic ablation for the treatment of right renal masses.

Methods:
A retrospective analysis was conducted on patients who underwent percutaneous ablation of right renal masses using a transhepatic approach at two tertiary hospitals between January 2007 and August 2023. Patient demographics, pre-procedure and post-procedure estimated glomerular filtration rate (eGFR), renal mass characteristics (size and location), and procedural detail s were collected. Follow-up imaging and clinic notes were reviewed to evaluate technical success rate (complete tumor ablation), residual/recurrent tumor, and complications. Complications were categorized using the Society of Interventional Radiology (SIR) new adverse event classification.

Results:
A total of 39 percutaneous transhepatic ablation procedures (36 radiofrequency ablation and 3 cryoablation) were performed on 34 patients (26 males, 8 females) with a mean patient age of 67 ± 12 years. Mean follow-up was 55.1 months (range 2 months -15. 5 years). The mean size of the renal masses was 2.4 cm (± 0.7), with 55% located in the upper pole and 45% in the interpolar region. Nearly all ablated lesions were renal cell carcinoma (97.2%) except for one lesion which was an oncocytoma. All ablated renal cell carcinomas were stage 1a except one lesion was stage 1b. Patients were positioned either supine (57%) or left lateral decubitus (43%). Sonographic guidance was predominantly employed to guide ablation needle placement into the lesion (94.4%) confirmed with pre-ablation CT, while only CT guidance was utilized in the remaining cases (5.6%). Tract ablation was only performed in two ablations (5.1%). Primary efficacy on follow-up was achieved in 92.3% of cases (n = 36), with only one patient developing recurrent disease among those initially deemed to have had primary efficacy. Estimated glomerular filtration rate did not significantly change post-procedure (mean pre-procedure eGFR was 73, with mean post-procedure eGFR 71, p = 0.3). No moderate or severe adverse events related to the ablation procedures were reported.

Conclusions:
The transhepatic approach demonstrates excellent safety and efficacy in percutaneous radiofrequency ablation and cryoablation of right renal masses that may otherwise be inaccessible via an extrahepatic approach.

Key Words: Percutaneous Transhepatic Ablation; Right Renal Masses; Interventional Radiology;

Funding Agency: None

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The Impact of Hydroxyurea on Osteonecrosis of the Femoral Head in Sickle Cell Disease: A Long Term Follow-Up Study

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Introduction:
Sickle cell disease (SCD) is characterized by frequent vaso-occlusive crises (FVOC) and hemolytic crises. Osteonecrosis is common in SCD, frequently affecting the femoral head (ONFH). The effect of hydroxyurea (HU) therapy on ONFH remains unclear. This study explores the relationship between HU therapy and ONFH progression.

Methods:
This retrospective study analyzed baseline and follow-up magnetic resonance imaging (MRI) of the hips in 55 SCD patients in Mubarak Al Kabeer Hospital, Kuwait. Their mean age was 32.1 years (range 12–63 years). Follow-up period ranged from 1-18 years with 42% of patients having a follow-up MRI beyond 6 years. ONFH stages were determined according to the FICAT classification system (Stages 1-4).

Results:
At baseline, 20 of the 55 patients (36.4%) were positive for ONFH, while the remaining 35 (63.6%) were negative. During follow-up, ONFH progression was observed in 16 patients (29.1%), with 38 patients (69.1%) remaining stable and one patient (1.8%) showing improvement.
The distribution of initial ONFH-positive cases was as follows: Stage 1 = 7, Stage 2 = 5, Stage 3 = 5, and Stage 4 = 3. At follow-up, the stages of ONFH-positive cases shifted to Stage 1 = 9, Stage 2 = 11, Stage 3 = 4, and Stage 4 = 7. The highest rates of progression were seen in patients at intermediate Stage 2. Of the total 55 patients, 38 were treated with HU and the remaining 17 were without HU. ONFH was more prevalent in HU-treated patients, with 26 out of 38 (68.4%), being ONFH-positive compared to 5 out of 17 (29.4%) in patients without HU (OR: 5.2, p = 0.01). Among the 35 initially ONFH-negative patients, 11 developed new ONFH during follow-up, with 10 out of 22 HU-treated patients (45.5%) and 1 out of 13 patients without HU (7.7%) developing ONFH (OR: 10, p = 0.027).

Conclusions:
HU therapy is significantly associated with increased disease burden, including ONFH and FVOC, likely reflecting its use in more severe patients. ONFH progression was observed across all stages in HU-treated patients, including early stages, with the highest rates in intermediate stages. These findings challenge previous assumptions about HU's protective effects against ONFH progression and highlight the need for further research to optimize management strategies.

Acknowledgement:
Prof Adekunle D. Adekile and KFAS Funding CR17-13MM-01

Key Words: Osteonecrosis the Femoral Head (ONFH); Magnetic Re; Hydroxyurea (HU);

Funding Agency: KFAS CR17-13MM-01

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Optimizing Imaging of the Diabetic Foot by Dual Tc-99m HDP 3-Phase Bone and In-111 WBC Scan for Diagnosis of Active Osteomyelitis

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Introduction:
Diagnosis of active osteomyelitis in the diabetic foot is crucial as aggressive management is required (IV antibiotics and surgical intervention, including amputation). The role of the bone scan and white blood cell (WBC) scan has been established to evaluate this condition with recent advent of SPECT/CT resulting in better image quality and contrast in addition to anatomical details by CT. However, imaging protocols are still not well worked out requiring optimization of the imaging sequence. The objectives are to evaluate critically imaging data obtained from dual Tc-99m HDP 3-phase bone and In-111 WBC scan with SPECT/CT for active osteomyelitis in a view of streamlining the imaging sequence and adding simple image analysis tools to help in the interpretation of the images.

Methods:
10 dual Tc-99m HDP 3-phase bone and In-111 WBC scan with SPECT/CT studies were selected from PACS. Each study had: a flow phase (1 sec/frame for 60 sec) followed immediately by a blood pool phase as 5 planar images of the feet, and post injection of In-111 WBCs after the blood pool images at 3 and 24 hr of the bone and In-111 WBCs distribution. Dual-window SPECT/CT was also acquired at 3 & 24 hr. The images were inspected visually and quantitative analysis was done on a Xeleris, GE workstation using regions of interest (ROIs) over the feet to compare count rates from Tc-99m HDP bone and In-111 WBC radiotracers. Statistical analysis of the imaging data was done using paired t-test and descriptive statistics for non-imaging data using SPSS.

Results:
Mean age was 58.36±7.45 yr. There were 9 males (90%). Clinically, all patients were diabetics evaluated for active osteomyelitis of the foot. The flow images showed increased radiotracer distribution on the affected side with a sharply rising curve (slope: 7) versus a flat curve (slope: 0.2) on the non-affected side. The planar images showed high uptake of the radioactivity on the affected side: blood pool 55.4 cpm vs 5.6 cpm, Delayed 3 hr: bone 500 vs 46, WBC 7 vs 2, Delayed 24 hr: Bone 48 vs 6, WBC 2 vs 1. SPECT/CT 24 hr: Bone: 1265 vs 90, WBC 25 vs 9 (all differences were statistically significant to the 95% confidence level).

Conclusions:
Dual bone and WBC scan performed with flow, blood pool and 24 hr SPECT/CT provides the optimal imaging sequence for evaluation of active osteomyelitis by eliminating unnecessary imaging steps and matching the imaging time of SPECT/CT for both the bone and WBC radiotracers.

Key Words: Diabetic foot; Dual bone WBC scan; Osteomyelitis;

Funding Agency: NONE

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Whole-Body CT in Trauma: National Insights into Clinical Utility, Overuse, and Radiation Risk

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Introduction:
Whole-body computed tomography (WBCT) is frequently used in trauma cases, often without adequate consideration. This study aims to assess the potential overuse of WBCT in patients with blunt or penetrating trauma in Kuwait's emergency departments and to estimate the actual incidence of critical injuries and the effective radiation dose.

Methods:
This multicentric retrospective study included all seven radiology departments in Kuwait, reviewing 1367 polytrauma patients from 2022-2024 who underwent WBCT following American College of Radiology guidelines. Dose length product was calculated for each patient, and data on age, gender, mechanism of injury, clinical requests, and WBCT findings were collected. IBM SPSS version 25.0 was used for data analysis.

Results:
Among 1367 patient referrals, 578 patients (42.3%) had no significant findings, while 789 patients (57.7%) showed positive trauma-related radiological results. Of these, 530 patients (38.8%) had major injuries, including solid organ and vertebral column injuries. WBCT referrals were predominantly due to road traffic accidents (RTAs) (911 patients, 66.6%), followed by falls from height (FFH) (178 patients, 13%), simple falls (82 patients, 6%), head trauma (32 patients, 2.3%), buggy accidents (28 patients, 2%), and other causes making up less than 2%. Patients with negative WBCT results had a mean radiation dose of 19.98 ± 10.26 mSv, highlighting substantial radiation exposure and the associated risk of radiation-induced cancer.

Conclusions:
With 42.3% of scans yielding no significant findings, this study emphasizes the need to revise and optimize the use of WBCT to avoid overuse of radiology resources. The findings stress the importance of thorough clinical evaluations in the era of evidence-based medicine, to ensure timely and effective patient management. Limitations: (a)The retrospective design of this study. (b) The influence of the injury severity was not considered.

Key Words: Major trauma; WBCT; Emergency department (ED);

Funding Agency: Kuwait Foundation for the Advancement of Sciences (KFAS) and the grant number is: (PN22-13MM-1695)

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Extracranial internal carotid artery Doppler ultrasound imaging findings in Kuwaiti Children without neurological symptoms

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Introduction:
The time-averaged mean of the maximum velocity (TAMMV), obtained by transcranial Doppler imaging (TCDI), is frequently elevated in the intracranial internal carotid artery (iICA) in patients with sickle cell disease (SCD) and it is a risk factor for stroke. Extracranial internal carotid artery (eICA) stenosis is also an independent risk factor for stroke in SCD. The present study investigated the relationship between TAMMV in the iICA and eICA and with other anthropometric and laboratory variables.

Methods:
This was a cross-sectional study of steady state Kuwaiti children with sickle cell disease (SCD) of 59 patients. TCDI was performed with a GE er7, USA ultrasound machine with a 1-3 MHz phased-array transducer for iICA and 9L 3.3-10MHz linear array transducer for eICA. Complete blood count (including reticulocytes), serum bilirubin and lactate dehydrogenase were all done with routine methods. The correlation of TAMMV in the two ICAs with age and laboratory parameters was investigated. Linear regression analysis was done to examine the relative contributions of these parameters to TAMMV in the iICA and eICA individually.

Results:
There were 59 patients in the study, made up of 24 males and 35 females, 26 with HbSS, 29 HbS□0 and 4 with HbSD. Their average age±SD was 11.4±3.4. None of the patients had abnormal TAMMV values i.e., >200 cm/s in the iICA or >160 cm/s in the eICA. The patients were divided into three age groups: □10, 11 -15 and >15 years. There were no significant differences except for HbF which was highest ($p<0.05$) in the youngest age group. The values of TAMMV in the iICA and eICA were generally highest in the youngest age group and the difference reached significance in the eICA. There was no significant correlation between TAMMV in the iICA (average±SD=72.4±11.3) and eICA (average±SD=63.4±125.8). Age, platelets, neutrophil count (ANC), LDH, and bilirubin did not correlate significantly with TAMMV in the iICA, but they did in the eICA ($P<0.05$). Linear regression also confirmed this relationship in the eICA.

Conclusions:
There is more relationship between markers of SCD severity (age, hemolysis related indicators) and TAMMV in the eICA and not iICA in Kuwaiti patients with SCD. This necessitates additional, in-depth research. Although the study is limited by its small sample size, it is significant in being the first of its kind among Gulf Arabs and has, nonetheless, established a benchmark to which future research can compared.

Key Words: Sickle cell disease; Transcranial Doppler Imaging; Stroke;

Funding Agency: Kuwait University Research-Grant No. NR02/21.

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Evaluation of Heterotopic Ossification Maturity using SPECT/CT and PET/CT in Preclinical Model

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Introduction:
Heterotopic ossification (HO) is the formation of bone within soft tissue where bone normally does not exist. In general, it is characterized by highly active tissue with high bone turnover and rapid bone formation. It is of an utmost importance to precisely identify and accurately diagnose the maturity of HO as early surgical intervention may result in its recurrence. The objective of this work is the experimental evaluation of HO maturity stage using advanced noninvasive nuclear medicine techniques. The use of PET radiopharmaceuticals may result in a more specific diagnosis between the phases due to their higher sensitivity and better resolution compared to bone scan.

Methods:
8-week-old Balb/c male mice underwent dual injury procedure, tenotomy and concurrent burn injury on the left side, to induce HO. The progression of HO was monitored by SPECT/CT and PET/CT weekly imaging with 99mTc-MDP, [18F]NaF and [18F]FDG for up to 16 weeks.

Results:
There was a statistically significant increase of [18F]FDG uptake from week 1 to 2 and from week 2 to 6 with p values of 0.01 and 0.005; respectively, while there was a statistically significant decrease from week 7 to 14 with a p value of 0.008. There was a statistically significant increase of [18F]NaF uptake from week 2 to 5 and statistically significant decrease between weeks 7 and 14 with p values of 0.016 and 0.003; respectively. As for 99mTc-MDP, the increase in the uptake from week 1 to 2 and from week 2 to 5 were not statistically significant with p values of 0.15 and 0.19; respectively. The decrease of uptake between week 7 and 14 was not statistically significant with a p value of 0.08.

Conclusions:
Based on these findings, the use of noninvasive nuclear imaging modalities may assist in distinguishing between the immature and mature phases. The uptake of mainly [18F]FDG may indicate the early inflammatory phase, while the uptake of both [18F]FGD and [18F]NaF may suggest the immature phase, and an uptake of mainly [18F]NaF may indicate the maturity phase of HO.

Key Words: Heterotopic Bone Formation; Heterotopic Ossfiication; Nuclear Medicine;

Funding Agency: This work was supported and funded by Kuwait University Research Grant No. MN01/18.

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Measuring and evaluating the safety of the Cosmic radiation exposure that pilots receive every year

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Introduction:
Cosmic ray is a high energy ionizing radiation that bursts the earth atmosphere. It comes from galactic cosmic rays (GCR) and solar particle events (SPEs). Altitude, latitude and solar activity are factors affecting the amount of cosmic ray that reach us. Cosmic ray can be absorbed by body cells which may lead to a direct and indirect interaction. These interactions may affect the stability of cells structure. During flights, aircrew members are exposed to cosmic radiation, this is considered as an occupational hazard and has to be monitored regularly. The aim of the research is to evaluate the cosmic radiation dose on pilots, and generate further recommendation for pilots scheduled.

Methods:
Methods: 20 pilots (from Kuwait Airways) wore ThermoLuminescent Dosimeter (TLD) to measure there radiation exposure during 40 flights. These were used to calculate there dose during a month and then during a whole year.

Results:
The results showed that the highest radiation dose received per year is 5.3251 mSv/yr which is received by captain 2. The lowest received radiation dose per year was 0.2799 mSv/yr which is received by captain 18. The average calculated dose for pilots is 1.5177 mSv/yr. this value is below the occupational exposure dose (i.e. 20 mSv).

Conclusions:
This is conclusion, Pilots that follow the flights scheduled in Kuwait airways are safe from radiation over exposure.

Key Words: cosmic radiation; pilot safety; occupational radiation exposure;

Funding Agency: none

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Factors delaying presentations of breast cancer among Arab females in Kuwait: A qualitative study

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Introduction:
Breast cancer (BC) is considered the second most frequently diagnosed cancer in 2022 and the leading cause of cancer death among women worldwide. Similarly, in Kuwait, BC is the most prevalent type of cancer among females. Early BC diagnosis is critical to a better prognosis and clinical outcomes. This is accomplished by increasing the community's knowledge of BC risk factors, signs, symptoms, and screening criteria.
Objective: This study aimed to investigate the factors beyond delayed presentation of BC among Arab females living in Kuwait after self-realization of its symptoms and to explore facilitators and barriers of health-seeking behavior, specifically those attributable to prolonged patient intervals.

Methods:
Cross-sectional semi-structured interviews were conducted for Arab females diagnosed with BC.

Results:
A total of 21 patients with BC stage> 2b (N>1) were interviewed. The patient interval, which is the time between first symptom recognition and seeking medical attention, was between a few days and more than 2 years. Different factors contributing to delayed presentation were identified and grouped into two key themes. One is patient-related factors, including lack of knowledge and awareness about BC risk factors, signs and symptoms, and proper screening methods. The second theme emerged around healthcare system-related factors represented by miscommunication, poor guidance, and lack of appropriate health promotions.

Conclusions:
Since the early diagnosis of BC has a higher cure rate and better prognosis, it is fundamental to raise the community's awareness about the disease to overcome the barriers of seeking early medical help. This is achieved by adequately educating females about the signs and symptoms of BC and the risk factors that may lead to BC development. Moreover, it is essential to consider improving the screening program in terms of advertisement to ensure that the targeted population undergoes regular screening to detect any abnormalities in breast tissue as early as possible, thus preventing delayed presentation.

Key Words: Delayed presentation; Breast cancer; Qualitative study;

Funding Agency: None

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Effect of lactate supplementation on the expression profile of molecules involved in various effector functions of breast cancer cells.

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Introduction:
Cancer cells tend to have high demands on anaerobic respiration for energy production. Therefore, increased lactate levels is a characteristic of cancer cells, and it has been associated with poor prognosis. We have previously shown enhanced lactate levels in the highly aggressive estrogen receptor (ER) –ve compared to the less aggressive ER +ve breast cancer cells, and lactate supplementation enhanced the motility of the ER +ve breast cancer cells. The underlying mechanisms of this effect is not well defined.
Aim: To investigate the effect of lactate supplementation on various markers involved in cell proliferation, motility, and invasion such as epithelial and mesenchymal markers, growth factors, and downstream signaling molecules.

Methods:
The ER +ve breast cancer cell line YS1.2 was used in this study. The effect of lactate supplementation (20 mM) on cell morphology and cell motility were assessed by light microscopy and wound healing assay respectively. The expression profile of various tested molecules was determined by western blotting, immunofluorescence and proteomic profiling.

Results:
Lactate supplementation did not induce morphological changes in YS1.2 cells, but significantly enhanced cell motility. This was in part mediated through enhanced expression profile of mesenchymal markers (vimentin, snail, and N-cadherin), and reduced expression profile of the epithelial marker E-cadherin and the cell adhesion molecule JAM-A. The expression profile of ER was not modulated with lactate supplementation. _

Conclusions:
Lactate plays an integral role in enhancing breast cancer cell motility in part through modulating the expression profile of epithelial and mesenchymal markers and some adhesion molecules. Drugs which target lactate production and/or transport may play a key role in cancer treatment.

Key Words: breast cancer; lactate; emt markers;

Funding Agency: PT 04/21

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The effect of probiotics on biofilm formation and transcription of virulence- associated genes in low-abundance oral bacteria

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Introduction:
Probiotics have been investigated in periodontal health in many earlier studies. However, not much is known about their effect on low-abundance species.
Objective: The aim of this study is to investigate the effect of probiotics on the biofilm formation and transcription of putative virulence-associated genes in low-abundance oral bacteria.

Methods:
Reference Prevotella species and L. casei were cultured as biofilms in monospecies and dual-species settings. After 2 days of anaerobic incubation, the biofilms were quantified by crystal violet staining. For gene expression analysis, mRNA was converted to cDNA followed by quantification using a reverse-transcriptase RT-PCR method. Statistical analysis was made using Mann Whitney U test to compare means between groups.

Results:
Co-culturing with L. casei reduced P. intermedia biofilms significantly (mean OD value 1.28 ± 0.05, P=0.02). L. casei had the highest biofilm formation (mean OD value 2.06 ± 0.18), but P. intermedia had the highest among Prevotella species (1.78 ± 0.05). P. melaninogenica, P. loescheii, and P. oulorum formed weak biofilms. However, co-culturing with L. casei significantly increased biofilm quantities for all three species ($P<0.05$). The highest reduction in hemolysin gene expression was observed in P. melaninogenica (0.21) followed by P. intermedia (0.3). All species except P. loescheii showed significantly reduced expression ($P<0.05$). Regarding the peptidase gene, P. intermedia exhibited the most pronounced reduction (0.16), followed by P. melaninogenica (0.35) and P. oulorum (0.34).

Conclusions:
Dual-species biofilms co-culturing with L. casei significantly influenced biofilm formation and virulence gene expression in Prevotella species, enhancing biofilm quantities while reducing hemolysin and peptidase gene expression, particularly in P. melaninogenica and P. intermedia. The findings provide insights into the ability of L. casei to modulate the expression of virulence genes in Prevotella species, potentially attenuating their pathogenicity. Understanding the interplay between probiotic bacteria and oral pathogens holds promise for therapeutic applications.

Key Words: Probiotics; Low-abundance bacteria; oral infections;

Funding Agency: SRUL01/14

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Identification of novel genes involved in the virulence of Aggregatibacter actinomycetemcomitans by random transposon mutagenesis

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Introduction:
Periodontitis is an oral infectious disease characterized by bone loss and destruction of the supporting tissue. Aggregatibacter actinomycetemcomitans is considered one of the major bacterial species associated with periodontitis. A. actinomycetemcomitans an early colonizer, evades host defenses by upregulating complement resistance genes and producing leukotoxins, promoting pathobiont proliferation and inflammatory cytokine release, which leads to the onset of periodontal disease.
Objective: This study aimed to identify novel virulence factors of A. actinomycetemcomitans using transposon mutagenesis.

Methods:
The SA269 strain, a serotype-d variant with high transformation efficiency, was electroporated with the EZ-Tn5 transposon kit using Eporator® (Eppendorf). Transformant colonies were selected on kanamycin-containing media and confirmed by PCR using primers targeting kanamycin-resistance region. Phenotypic screening assessed biofilm formation, autoaggregation, and coaggregation characteristics. Mann Whitney U test was used for comparing means between
the groups.

Results:
Of the 40 transformants, 12 exhibited significantly reduced biofilm formation ($P<0.001$). Further, 3 out of 5 transformants displayed decreased autoaggregation, while 4 showed enhanced coaggregation with Fusobacterium nucleatum.

Conclusions:
Ez-Tn5-Kan transposon mutagenesis yielded random mutants affecting key virulence traits such as biofilm formation, auto- and co-aggregation in A. actinomycetemcomitans. We are in the process of identifying insertion sites gene expression changes, with functional studies aiming to elucidate potential therapeutic targets to mitigate bacterial colonization and biofilm-associated infections.

Key Words: Aggregatibacter actinomycetemcomitans; Periodontitis; Transposon mutagenesis;

Funding Agency: SRUL 01/14

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The Feasibility of C2 Pedicle and Lamina Screws in Arabs: Computed Tomography-Based Morphometric Study

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Introduction:
In cases of atlantoaxial instability, C2 pedicle or lamina screw fixation has proven to be reliable techniques. However, anatomical variability in morphometric characteristics of the C2 exists which in turn could limit the use of pedicle and lamina screws in some patients. The aim of this study is to analyze the morphometric features of the C2 pedicle and lamina among the Arab population.

Methods:
A retrospective computed tomography (CT)-based morphometric analysis of C2 pedicle and lamina of 100 Arab skeletally mature patients (200 pedicles and laminas) was done. All included patients had normal C-spine. A diameter of 4.5 mm was considered safe for placement of a 3.5 mm pedicle or lamina screw.

Results:
The mean age of the patients was 45.6 ± 16.7 years. Males were 52.0% (52) of the sample. The mean lamina diameter and length were 5.4 ± 1.1 mm and 32.4 ± 3.0 mm, respectively, while the mean pedicle diameter and length were 5.9 ± 1.1 mm and 21.1 ± 2.2 mm, respectively. Overall, 162 (81.0%) and 182 (91.0%) laminas and pedicles could fit a 3.5 mm screw safely. A significant difference in the feasibility of C2 pedicle screw was noted between males and females, where pedicle screw is feasible in 101 (97.1%) male pedicles and 81 (84.4%) female pedicles ($p = 0.002$).

Conclusions:
C2 lamina and pedicle screw for is feasible for most Arabs in our sample; however, pedicle screw is a better match in comparison with laminar screw. Detailed preoperative radiological planning is critical to avoid complications related to screw placement in the pedicle or lamina of C2.

Key Words: Spine; Surgery; Orthopaedic Surgery;

Funding Agency: None

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The Feasibility of Condylar Screws for Occipitocervical Fusion in Arabs: Computed Tomography-Based Morphometric Study

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Introduction:
Occipitocervical fusion is indicated for various conditions. Some techniques require placement of screws in the occipital condyle. The objective of this study was to analyze the morphometric features of the occipital condyle among Arabs.

Methods:
Computed tomography (CT)-based morphometric analysis of occipital condyles of 200 Arab skeletally mature patients (400 condyles) was done. Axial width of at least 8 mm and coronal height of at least 6.5 mm are the cutoff values for feasibility of condylar screw placement.

Results:
The mean age of the patients was 48.0 ± 18.3 years. Males were 53.5% (107) of the sample. The mean axial condylar width and length were 8.5 ± 1.5 mm and 20.3 ± 2.6 mm, respectively, while the mean axial screw angle was 35.9° ± 5.5° from midline. The mean sagittal condylar length and height were 16.1 ± 1.9 mm and 8.8 ± 1.5 mm, respectively. The mean condylar coronal height was 8.2 ± 1.4 mm. Based on axial width and coronal height measurements, 150 (37.5%) condyles could safely fit a 3.5 mm condylar screw. One hundred and four (55.9% female condyles) condyles cannot fit a screw in females, while 46 (21.5% male condyles) condyles cannot fit a screw in males.

Conclusions:
Condylar screw for occipitocervical fusion is feasible for the majority of Arabs in our sample; however, this applies to slightly less than half of the female condyles. Detailed preoperative radiological planning is critical to avoid complications related to occipital condyle screw placement.

Key Words: Spine; Surgery; Orthopaedic Surgery;

Funding Agency: None

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Glucagon-like Peptide-1 Receptor Expression in Thyroid Lesions

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Introduction:
Glucagon-like peptide-1 receptor (GLP1-R) is a target of many drugs currently used for the treatment of common conditions, such as type 2 diabetes mellitus and obesity. There is evidence that activation of GLP1-R by its agonist might influence thyroid cells' growth and function. However, this effect on the thyroid is still controversial, and it is dependent on the expression of the receptor in thyroid follicular cells. The objective of this study is to investigate the availability and localization of GLP1-R in thyroid tissue.

Methods:
50 formalin-fixed paraffin-embedded tissues from the pathology department archive, including benign and cancer samples, were studied. Immunofluorescence staining was performed using GLP-1R antibody according to standard procedures. Expression and subcellular localization of the receptor were analyzed using confocal microscopy (LSM 700).

Results:
GLP1-R was expressed in all thyroid lesions, predominantly in follicular cells and some infiltrating cells within the microenvironment, with variation in the pattern and cellular localization. In papillary thyroid cancer (PTC) tissues, expression was confined to the cytoplasm with a granular pattern. In benign lesions, such as the non-invasive thyroid neoplasm (NIFTP) and follicular nodular disease (FND), expression was cytoplasmic and membranous. Normal-looking follicular cells showed variable expression patterns.

Conclusions:
The expression of GLP1-R in benign and malignant thyroid tissues indicates its possible contribution to thyroid follicular cells' growth mechanisms. As new drugs targeting GLP1-R emerge, further functional studies are crucial to understand their long-term effect on thyroid health.

Key Words: GLP1 receptor; Thyroid neoplasm; Immunofluorescence;

Funding Agency: NONE

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ADAM9 Genetic Variants and their Role in Modulating Enzyme Activity in Diabetes and Metabolic Traits

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Introduction:
A Disintegrin and Metalloproteinase Domain 9 (ADAM9) is a zinc-dependent protease that contributes to many biological processes; nevertheless, its role in the pathophysiology of metabolic syndrome is poorly understood. This study aims to investigate the relationship between ADAM9 gene polymorphisms and metabolic traits, specifically regarding metabolic syndrome.

Methods:
A genome-wide association study was conducted on a random sample of the Kuwaiti population (n=1298) and found ADAM9 polymorphisms associated with metabolic syndrome traits. A replication study (n = 859) was then conducted to validate these findings using TaqMan genotyping assays. The cohorts of both studies consisted of adults from Kuwait, and the metabolic parameters analyzed included HbA1c levels, blood pressure, waist-to-hip ratio, fasting blood glucose, triglycerides, and cholesterol levels. An in-vitro system was established to investigate the effect of significant variants on ADAM9 proteolytic activity.

Results:
Two ADAM9 variants, ADAM9-E76K (rs61753672) and ADAM9-P750L (rs144750648), are significantly associated with metabolic parameters, including HbA1c levels, systolic blood pressure, waist-to-hip ratio, fasting blood glucose, triglycerides, and cholesterol levels ($P<0.05$). The replication study validated the correlation between ADAM9-P750L and HbA1c and found associations with other metabolic traits. Functional investigation revealed that both variants exhibited reduced proteolytic activity.

Conclusions:
Our findings propose a potential association of ADAM9 polymorphisms with key metabolic traits and may play a vital role in developing metabolic syndrome and type 2 diabetes. The reduced proteolytic activity of these variants could have significant implications for understanding the molecular mechanisms underlying metabolic disorders.
Acknowledgments:
The researchers want to acknowledge the research sector and the College of Graduate Studies at Kuwait University for funding this study [Research Project No. YM07/21].

Key Words: ADAM9; Genetic variants; Diabetes;

Funding Agency: The research sector and the College of Graduate Studies at Kuwait University [Research Project No. YM07/21].

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Wild-type p53 stability and activity are suppressed in papillary thyroid cancer by importin-7 mediated regulation of ribosomal proteins and MDM2 nucleocytoplasmic trafficking

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Introduction:
Background: Thyroid carcinogenesis has multiple hallmarks, including evasion of tumor suppressors. Reactivation of wild-type p53 function is an ultimate goal in cancer therapy, which requires an understanding of the p53 suppression mechanism specific for the cancer type. IPO7 is a nuclear transport protein implicated in the pathogenesis of several human diseases. This work demonstrates the role of IPO7 supported by miR-7-5p in p53 regulation in papillary thyroid cancer cells.

Methods:
Primary cultured thyroid cells and FFPE thyroid tissues from PTC and benign cases were used. Functional experiments were performed by transfection with IPO7 siRNA or miR-7-5p mimic/inhibitor, followed by apoptosis and luciferase reporter assays, immunoblot assays and RT–PCR. The expression and subcellular localization of IPO7, p53, MDM2, and ribosomal proteins (RPL11 and RPL5) were studied by immunofluorescence staining and confocal microscopy.

Results:
The results show that IPO7 is overexpressed in PTC and regulated by miR-7-5p. Modulation of IPO7 expression in cultured thyroid cells altered the nucleocytoplasmic shuttling of p53, MDM2, RPL11 and RPL5 in addition to the p53 protein level and activity. The expression pattern of IPO7, p53 and MDM2 in cultured thyroid cells and clinical thyroid tissue specimens confirmed the association between IPO7 overexpression and reduced p53 stability in PTC.

Conclusions:
In conclusion, the data here show that p53 level and activity are differentially controlled in malignant and benign thyroid cells through IPO7-mediated regulation of RP-MDM2-p53 nucleocytoplasmic trafficking. In PTC, the overexpression of IPO7 might be a protective mechanism used by cancer cells to evade p53 growth suppression during carcinogenesis.

Key Words: Papillary thyroid cancer; p53; Importin 7;

Funding Agency: Kuwait University, Research sector grant # MG04/19

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Pilomatrixoma- A Diagnostic Challenge On Fine Needle Aspiration Cytology- A Retrospective Study.

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Introduction:
Background: Pilomatrixoma, a slow growing, benign skin adnexal tumor originating from matrix cells of hair follicles commonly affects females more than males. Generally located in the head and neck region, extremities and trunk with a few unusual locations. Exact cause is unknown, but some link it to a mutation in exon 3 of the beta-catenin gene (CTNNB1). Pilomatrixomas pose a challenge on fine needle aspiration cytology (FNAC) and often a histopathological confirmation is needed.

Methods:
Over a period of 10 years (2014-2024) seven cases of pilomatrixoma were diagnosed on FNAC. Age, sex, site of tumor and cytological findings were documented. A histopathological correlation was done where available.

Results:
All the patients were males, age ranged between 15 and 65 years. Four of seven cases were located in the head and neck region with one each in the arm, forearm and inguinal region. Cytological criteria used for diagnosis were presence of clusters of basaloid cells, nucleated and anucleate squames and numerous ghost/shadow cells. In six, five and three of seven cases in our study basaloid cells, anucleate and nucleated squamous cells and ghost cells were identified respectively. Other features noted in the smears were multinucleated giant cells, cholesterol crystals, ill-defined granulomas and calcifications. Five of the seven cases were diagnosed as pilomatrixoma on FNAC while one was reported as squamous cell carcinoma and another had a differential diagnosis of proliferating trichilemmal cyst with atypia. Histopathology was available in four cases.

Conclusions:
Pilomatrixoma, previously known as calcifying epithelioma of Malherbe, is a rare benign skin appendageal neoplasm. Head and neck are common sites of pilomatrixoma. Extremities, trunk in children and other rare sites such as eyelid, ear, digits and breast have been reported in literature. Cytological findings of pilomatrixoma may show similarities with many benign and malignant tumors and non-tumor lesions and are often reported as squamous cell carcinoma.Wang et al. reviewed 51 cases of pilomatrixoma and rendered an incorrect diagnosis on FNAC in 45 percent of cases. In our study 71 percent were correctly diagnosed. An accurate diagnosis of this benign lesion on cytology is imperative, considering that excision is curative.

Key Words: Pilomatrixoma; FNAC; retrospective study;

Funding Agency: None

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Toddlers newly diagnosed with Type 1 diabetes in Kuwait: Report on clinical, biochemical and immunological characteristics.

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Introduction:
The incidence of Type 1 Diabetes (T1D) has had a widespread increase among younger age groups.

Objectives:
- To estimate the prevalence of toddlers with T1D diagnosed between 2011 – 2022.
- To describe the clinical and biochemical characteristics of toddlers newly diagnosed with T1D in Kuwait

Methods:
This retrospective cross-sectional study includes children (aged 12 years or less) registered in the Childhood Onset Diabetes Electronic Registry (CODeR) between the years 2011 and 2022. Toddlers were defined as those newly diagnosed with T1D at less than 3 years of age.

Results:
A total of 3481 children aged ≤ 12 years were diagnosed with T1D between 2011-2022 of which 350 (10.1%) were toddlers. Baseline characteristics of the study cohort are shown. After adjusting for gender, toddlers had lower HbA1C at diagnosis (Coefficient -1.24, CI95% -1.49 - 0.991, p<0.001). Furthermore, they had higher odds of presenting with DKA (OR 2.05, CI95% 1.96 - 3.19, p<0.001) and being admitted to the PICU on admission (OR 4.22, CI95% 3.22-5.54, p<0.001). Toddlers had higher Vitamin D levels at diagnosis (74.8 nmol/L (55.4-96.1) in comparison to children diagnosed at age 3 years or older (36.9 nmol/L (25.0-52.0)) (p<0.001). No significant difference was observed between the two groups with regards to gender, C-peptide levels, celiac and thyroid autoimmune antibodies.

Conclusions:
Our study identified significant differences in HbA1C and Vitamin D levels in toddlers at diagnosis, as well as higher probabilities of DKA and PICU admissions. Future research is required to comprehend the mechanism behind the development, presentation, and possible associations of T1D at early onset.

Key Words: Pediatric; Endocrinology; Type 1 diabetes ;

Funding Agency: NONE

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Characteristics of Children with Positive SARS-CoV-2 Infection at Diagnosis of Type 1 Diabetes in Kuwait

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Introduction:
The COVID-19 pandemic has impacted the presentation and diagnosis of Type 1 Diabetes (T1D) in children.

Objectives: This study investigates the characteristics of children with SARS-CoV-2 infection at the time of T1D diagnosis in Kuwait.

Methods:
We conducted a cross-sectional study of children (≤12 years) newly diagnosed with T1D and registered in the Childhood-Onset Diabetes electronic Registry (CODeR) in Kuwait during the COVID-19 pandemic. The duration of the COVID-19 pandemic was defined from February 24, 2020, the date of the first identified positive COVID-19 case, to December 31, 2022. Positive COVID-19 status was defined by positive SARS-CoV-2 reverse transcription polymerase chain reaction (RT-PCR) and/or serology tests. Results from COVID-19 testing conducted prior to or at the time of diagnosis were included in this analysis.

Results:
During the study period, 684 children were newly diagnosed with T1D, of which 459 had testing done for SARS-CoV-2 prior to or at diagnosis and were included in the analysis. Approximately half of the study population were males (214, 46.6%) with a median age of 8.1 years (IQR 5.5-9.8). Baseline characteristics of the study cohort as per the status of SARS-CoV-2 infection are illustrated in Table 1. Out of 459 children with SARS-CoV-2 testing, 76 (16.6%) had a positive COVID-19 status. After adjusting for age and gender, there was no significant difference in the presentation of DKA, DKA severity, and PICU admission. Children with positive COVID-19 status had lower HbA1C at diagnosis (Coefficient -0.53, CI95% -1.01--0.041, p= 0.034). Furthermore, children with positive COVID-19 status at diagnosis had doubled odds of having positive thyroid autoimmunity (OR 2.26, CI95% 1.10-4.65, p= 0.026). There was no difference with regards to celiac autoimmunity status, C-peptide levels, and Vitamin D levels between the two groups at diagnosis with T1D.

Conclusions:
This study identifies significant characteristics in children with T1D who were also SARS-CoV-2 positive at diagnosis, including lower HbA1C levels and increased odds of thyroid autoimmunity. Future prospective studies are needed to further investigate the impact of COVID-19 on T1D and its associated complications.

Key Words: SARS-CoV-2 Infection; Pediatric; Type 1 Diabetes ;

Funding Agency: This study was funded by the DDI (RA- 2022-1971).

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Clinical Characteristics of Children with CMPA in Kuwait

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Introduction:
Cow's Milk Protein Allergy (CMPA) is the most common food allergy in children. The reaction is classified into immediate reactions, such as anaphylaxis and urticaria, or delayed type-reactions, defined as non-immediate gastrointestinal symptoms or atopic dermatitis. The aim of the present study is to report on the clinical characteristics of children with cow's milk protein allergy (CMPA) in Kuwait, and to elaborate on the factors affecting such presentation.

Methods:
A retrospective chart review of children, aged 0-12 years, presenting with CMPA to allergy clinics in two secondary/tertiary hospitals in Kuwait, Amiri and Mubarak Al Kabir. The diagnosis was made clinically, and with appropriate allergy testing when indicated. The patients were divided into two groups based on presentation. Demographic and clinical information was collected.

Results:
A total of 86 children with CMPA were included in the study. Children with unclear diagnosis, incomplete information or who lost follow up were excluded. Most of the patients were males (M:F=1.7:1), and the mean age at presentation was 4.3 months. Most of the patients had family history or personal history of atopy, 59% and 58%, respectively. Sixty-three percent of the sample were breast-fed and 51% had concomitant food allergy, mostly eggs (32.6%). Delayed-type reactions (group 1), of which the most common was diarrhea, were reported in 60 (69.8%) patients, while immediate reactions (group 2) were reported in 26 (30.2%). Anaphylaxis was the first presentation in 14% of the patients. When comparing both groups, there were not statistically significant differences in demographic or clinical characteristics between the two.

Conclusions:
While most children with CMPA in Kuwait presented with delayed-type reactions, anaphylaxis comprises a significant proportion of the presentation. Larger studies are needed to elucidate the factors affecting such presentation.

Key Words: CMPA, Kuwait; food allergy; anaphylaxis;

Funding Agency: None

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Tumor necrosis factor-alpha and Interleukin-6 gene polymorphisms contribute significantly to the genetic susceptibility of juvenile idiopathic arthritis in Kuwaiti Arab children

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Introduction:
Juvenile idiopathic arthritis (JIA) is a complex multifactorial disease which manifests in genetically susceptible children following exposure to the environmental factors. A number of immune-system mediators have been associated with JIA. These include single nucleotide polymorphisms (SNPs) in some cytokine genes which are thought to influence their serum levels and thus can impact the disease-onset and/or progression. The objective of this study was to investigate the role of Tumor necrosis factor-alpha (TNF-alpha) and Interleukin-6 (IL-6) gene polymorphisms in genetic susceptibility of JIA in Kuwaiti children.

Methods:
The frequency of TNF-alpha gene (-308A/G; rs1800629) and IL-6 gene (-174G/C; rs1800795) polymorphism genotypes were identified in 78 Kuwaiti children with JIA and compared it to that in approximately 200 healthy controls of the same ethnicity. The diagnosis of JIA was based on the American College of Rheumatology (ACR) criteria. The genotypes for TNF-alpha and IL-6 gene polymorphisms were determined by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) methods and confirmed by DNA sequencing.

Results:
The frequency of GG genotype of TNF-alpha gene polymorphism showed a strong association with JIA in both co-dominant and dominant models of genetic analysis ($p = 0.0004$ and 0.003 respectively). In contrast, the GG genotype of IL-6 gene polymorphism showed a significant association with JIA only in the dominant model ($p = 0.01$). Amongst the two clinical subgroups of JIA patients, 98% of oligoarticular and 100% of the polyarticular JIA patients had at least one 'G' allele of the TNF-alpha gene polymorphism. The distribution of IL-6 gene polymorphism genotypes in JIA subgroups showed that 35% of the oligoarticular and 13% of the polyarticular JIA patients carried at least one 'G' allele.

Conclusions:
Our data showed significant association of two cytokine gene polymorphisms (i.e. TNF-alpha gene -308A/G, rs1800629 and IL6 gene -174G/C; rs1800795 polymorphism) with JIA in Kuwaiti children highlighting their significant contribution in genetic susceptibility of this chronic disease possibly along with other factors.

Key Words: Cytokine gene; genotype; polymorphism; juvenile idiopathic arthritis;

Funding Agency: none

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Onasemnogene Abeparvovec Gene Replacement Therapy for Spinal Muscular Atrophy: A Kuwaiti Experience of efficacy and safety

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Introduction:
Spinal muscular atrophy (SMA) is a genetic neuromuscular disorder inherited in an autosomal recessive manner, caused by mutations in the SMN1 gene on chromosome 5q13. These genetic alterations result in insufficient levels of survival motor neuron (SMN) protein, resulting in progressive degeneration of motor neurons in the spinal cord, muscle weakness, and atrophy. SMA is one of the leading genetic causes of infant mortality, but it represents a spectrum of severity, ranging from early-onset, life-threatening forms to milder, later-onset phenotypes. The advent of gene therapy, Onasemnogene abeparvovec, has significantly improved the prognosis for individuals with SMA. This study aims to review the clinical characteristics of the Kuwaiti infants diagnosed with SMA who received gene therapy since its approval in May 2019.

Methods:
A retrospective analysis was conducted on the data registry in Kuwait Medical Genetics Center for 15 individuals diagnosed with SMA who underwent genetic therapy with Onasemnogene abeparvovec since its approval in May 2019.

Results:
Fifteen individuals (14 Kuwaitis and 1 Iraqi) diagnosed with spinal SMA through targeted genetic testing (homozygous exon 7 deletion) received gene therapy in Kuwait. Among them, 7 were males and 8 were females, representing various tribes. Eleven individuals had consanguineous parents, and 9 had a family history of SMA. The age at symptom onset ranged from 3 weeks to 22 months, while the age at gene therapy infusion varied between 2 and 29 months. All patients presented with generalized hypotonia, with or without additional features such as absent deep tendon reflexes, respiratory failure, and tongue fasciculations.

Conclusions:
This study provides a comprehensive analysis of 15 SMA cases in Kuwait who underwent gene replacement therapy. It is the first study to report the description of the individuals receiving Onasemnogene abeparvovec gene therapy in Kuwait, though longer follow-up is necessary to assess the long-term impact. Given the disabling nature of SMA and its high prevalence in Kuwait, early parental counseling and pre-marital screening for SMA are advisable, as they offer families crucial prognostic information and support informed decision-making regarding reproductive planning.

Key Words: Spinal muscular atrophy; Gene replacement therapy; Kuwait;

Funding Agency: None

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Stability-Indicating Assay of Novel Oxazolidinone Hydroxamic Acid Derivatives with 5-Lipoxygenase Inhibitory Activity

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Introduction:
Structural modification around the oxazolidinone scaffold has resulted in derivatives useful as anticoagulants and psychoactive agents. We recently discovered that novel oxazolidinone derivatives, PH-series (PH-211, PH-251, PH-247, and PH-249) with hydroxamic acid moiety, are potent inhibitors of 5-lipoxygenase (5-LO). This enzyme is involved in the production of leukotrienes (LTs), which are implicated in various allergic and inflammatory disorders.
Objectives: Synthesize representative derivatives and develop fast and reliable analytical stability-indicating assays using the Ultra High-Performance Liquid Chromatography (UHPLC) system with UV detector to investigate the stability of these novel compounds.

Methods:
PH-211 and PH-251 were synthesized by literature procedures and characterized. Fast, reliable, and validated UHPLC-UV methods were developed using ACE C4 (150 × 3.0 mm, 3 µm) analytical columns for the determination of these novel derivatives in plasma and under various force degradation conditions including acid, base, oxidation, and thermal degradation, and degradants were identified using LC-QToF-MS. The mobile phase consisted of filtered and degassed 0.1% formic acid in acetonitrile and 0.1% formic acid in water (PH-211 15:85, flow rate 1ml/min), (PH-251 50:50, flow rate 0.4ml/min), (PH-247 45:55, flow rate 0.4ml/min), (PH-249 50:50, flow rate 0.4ml/min). Column temperature was set at 50°C throughout the study. The separations for the compounds were achieved in a very short times, ranging from 3.6 to less than 7 minutes.

Results:
The developed methods showed linearity in concentration range of 0.01-0.1 mg/ml for PH-211, PH-251, and PH-249, while 0.005-0.08 mg/ml for PH-247. All compounds were stable in plasma at 37°C and under thermal degradation condition, but unstable in acidic, basic, and oxidative condition and degradants were identified.

Conclusions:
The developed analytical methods were rapid, accurate and validated according to ICH guidelines in bulk and human plasma. Moreover, it can be utilized for determining the plasma concentrations of these compounds and related derivatives which could serve as potential compounds for further development as useful agents for treating allergic and inflammatory diseases. Therefore, the developed methods can be utilized for oxazolidinones pharmacokinetics and pharmacodynamics studies.

Key Words: Oxazolidinone; Ultra High-Performance Liquid Chromatography; Stability-

Funding Agency: College of Graduate Studies and the General Facilities Science (GF-S) grants GS01/03 and GS01/05 from Research Sector, Kuwait University.

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Economic burden of dialysis on Kuwait healthcare system

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Introduction:
End stage renal disease (ESRD) is defined as having aneGFR of less than 15 ml/min.. Therapy options available for ESRD patients are hemodialysis, peritoneal dialysis, and renal transplant. Although the latter is the most effective option, there is insufficient organ supply, with only a few patients eligible for transplant. Patients can receive dialysis in a hospital, satellite center, or home. Moreover, dialysis is a costly life sustaining therapy, with billions worth of increase in cost through the years. According to 2019 statistics, 2230 people are on dialysisin in Kuwait. Though all dialysis methods are free of cost for Kuwaitis, the influence of ESRD on the healthcare system is significant. This study focuses on studying the direct cost of dialysis on Kuwait health care system.

Methods:
Cross-sectional retrospective study involving six hospitals in Kuwait. Patients undergoing dialysis for at least one year and aged 21 years or above were recruited between June 2023 and June 2024. Demographic variables as well as clinical charatrestics of patients, and resource utilization were all collected and entered in Google Sheets. Direct costs were collected from Ministry of Health (MOH), Central Medical Stores (CMS) for drugs and consumblles, and for other direct costs as in hospital stay, outpatient visit, and Emergency Department (ED) visit were retreived from MOH annual resource utilization report. This study was approved by Health Sciences Center (HSC) and MOH ethical approval committees.

Results:
This study included 349 patients, their mean age was 58 ± 17. Males were 55% of the study population. Hypertension was highly prevelant in our study population (91%), while diabetes was 59%. Majority of the patients had tunneled catheter as their type of access for hemodialysis. Almost 15% of the patients use the ED once or twice a year, and 49% visited the outpatient clinic at least once a year. The total annual direct cost per patient on dialysis was KD 14,904 ± 30,993 respectively. The majority of the cost was spent on hospitalization, accounting for 69% of the overall cost.

Conclusions:
In conclusion dialysis burdens the health care system significantly. More interventions needed to prevent patients to reach end stage renal disease where they are candidate to dialysis, and more attention to patients to prevent them from further complications.
Acknowledgments: For MOH staff who facilitated the study.

Key Words: Economic; Kuwait; Kidney;

Funding Agency: NONE

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Utilisation Patterns and Quality of Lipid Control Among Patients Prescribed Lipid-Lowering Therapies in Primary Care Settings in Kuwait: A Nationwide Cross-sectional Study

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Introduction:
In 2023, cardiovascular diseases (CVDs) were the leading cause of mortality in Kuwait, with a rate of 67.75 per 100,000 inhabitants. Uncontrolled lipids remain a significant modifiable risk factor for CVDs. Primary healthcare centres (PHCCs) serve as the first point of contact for managing non-communicable diseases (NCDs), including lipid disorders.

Objective: To analyse lipid-lowering therapy (LLTs) prescribing patterns and evaluate the extent of lipid control among patients attending PHCCs in 2023.

Methods:
A nationwide, cross-sectional study was conducted across six randomly selected PHCCs, each representing one of the six governorates. Patients from NCD clinics prescribed at least one LLT were included. The sample size was determined based on the population size from the Public Authority for Civil Information (PACI). Primary lipid parameters included LDL-C and non-HDL-C, which were recorded from the patient's electronic medical record. The CV risk categories and corresponding lipid treatment goals were defined based on the 2021 Middle East consensus (extreme, very-high, high, and moderate risk). The main outcomes were prescribing patterns stratified by the class of LLT and the proportion of patients achieving therapeutic goals.

Results:
A total of 434 patients were included, with a mean age of 54.3 +/- 9.7 years and comparable gender distribution. Statins were the most prescribed LLT (98.8%, n= 429), with only 3.2% (n=14) combining statins with ezetimibe. Simvastatin was the most frequently used (73.9%, n= 317), and 90.4% (n= 388) of patients were on moderate-intensity statin therapy (MIST). Achievement rates for LDL-C and non-HDL-C goals were 20.4% and 26.6%, respectively.

Conclusions:
Despite widespread statin use, suboptimal lipid control persists. These findings highlight the urgent need for interventions to optimise lipid control, including adherence-improving strategies and more aggressive, intensified LLT regimens.

Acknowledgments: We would like to express our gratitude to the MOH for their support in facilitating this study. Special thanks are extended to the heads and staff of the six PHCCs for their cooperation and assistance throughout the data collection process.

Key Words: Utilisation, prescribing patterns; lipid-lowering therapies; LDL-C, non-HDL-C ;

Funding Agency: Ministry of Health, (2172/2022)

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The Vasoconstriction Effect of Thyroxin Metabolite (3-Iodothyronamine) in the Isolated Perfused Rat Kidney

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Introduction:
The naturally endogenous compound known as 3-iodothyronamine (T1AM) derived from the thyroid hormone thyroxine by decarboxylation and deiodination. This endogenous agonist is detected in most rodent and human tissues. The biological effects of T1AM include renal, endocrine, and neurological effects. These biological effects, which are generally opposite to those of thyroxine, are non-genomic and are rapid in onset. The objective of this study was to investigate the possible role of the T1AM in the isolated perfused rat kidney in normotensive and hypertensive conditions.

Methods:
Male Wistar Kyoto (WKY, n=61) and Spontaneously Hypertensive Rats (SHRs, n=56) age 12-14 weeks were used in this investigation. Animals were sacrificed on the day of the experiment. The left kidney with renal artery intact was isolated and placed in a temperature-controlled perfusion chamber and perfused with Krebs' solution. Dose-response curves were established for T1AM before and in the absence of trace amine associated receptor 1 (TAAR1) antagonist EPPTB (1 µM). Similar experiments were performed in the presence and in the absence of the nifedipine (1 µM), Y-27632 (1 µM), and GF109203X (1 µM). Changes in perfusion pressure were recorded through a transducer connected to a Lectromed. TAAR1 mRNA expression in the kidney was assessed using real-time polymerase chain reaction. Data were statistically analyzed by Student's t-test.

Results:
T1AM induced significant increase in perfusion pressure (vasoconstriction) of kidney preparations from normotensive and hypertensive rats ($p < 0.05$). Perfusion of the isolated kidney with EPPTB had a significant effect ($p < 0.05$) in lowering perfusion pressure. The high perfusion pressure induced by T1AM were also significantly reduced by nifedipine, Y-27632 and GF109203X in both WKY rats and SHRs. The expression of TAAR1 was significantly greater in SHRs than in WKY rats ($p < 0.05$).

Conclusions:
The results obtained from this study would suggest that T1AM activate TAAR1 receptors causing vasoconstriction in the WKY and SHR rats perfused kidney. The vasoconstriction is related to calcium influx and calcium sensitization. The expression of TAAR1 is higher in SHRs compared to WKY.

Key Words: 3-Iodothyronamine; Perfusion Pressure; Renal vascular activity ;

Funding Agency: Kuwait University (YM02/21) and KFAS (CB22-63MR-01)

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Insights into the role of P2X7R/DUSP6/ERK1/2 and SIRT2/MDM2 signaling in the nephroprotective effect of berberine against cisplatin-induced renal fibrosis in rats

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Introduction:
Several signaling events have been identified for mediating cisplatin (CP)-induced chronic inflammation and progressive renal fibrosis, but the majority of them have not yet been established as therapeutic targets. This study investigated the modulatory effects of berberine (BBR) on purinergic 2X7 receptors (P2X7R) and some potential intracellular profibrogenic signaling as molecular mechanisms that could hinder renal fibrosis associated with cisplatin administration in rats.

Methods:
Fifty female Wistar 9-week-old rats, were categorized into five groups (n = 10 rats each) as follow: Group 1 (Normal): Rats received 1 % Tween 80 in normal saline. Group 2 (BBR 200): Rats received berberine orally at a dose of 200 mg kg daily for 14 days. Group 3 (CP): Rats received cisplatin intraperitoneally at a dose of 1 mg/kg daily for 14 days to induce chronic renal injury. Group 4 (CP + BBR 100): Rats received berberine at a dose of 100 mg/kg orally and cisplatin intraperitoneally at a dose of 1 mg/kg daily for 14 days. Group 5 (CP + BBR 200): Rats received berberine at a dose of 200 mg/kg orally and cisplatin intraperitoneally at a dose of 1 mg/kg daily for 14 days. Berberine was administered concurrently with cisplatin during the 14 days of renal injury induction. The gene expressions of P2X7R, dual-specificity phosphatase 6 (DUSP6), and murine double-minute 2 (MDM2) were determined. The expressions of alpha smooth-muscle actin and tumor necrosis factor alpha (TNF-α) were assessed by immunohistochemical staining. Phosphorylated extracellular signal-regulated kinase 1/2, (p-ERK1/2) was evaluated by western blotting. Sirtuin 2 (SIRT2), kidney injury molecule-1, and galectin-3 were measured by enzyme-linked immunosorbent assay. The degree of renal fibrosis was assessed by microscopic examination and picrosirius red staining.

Results:
Statistical analysis: Data were analyzed by one-way analysis of variance (ANOVA) followed by multiple comparisons using the Tukey–Kramer test and expressed as the mean ± SD. The level of statistical significance was set to $p < 0.05$. Statistical analysis and the graphical presentations were performed using GraphPad Prism software version 7.04 (San Diego, CA,USA). Key findings: Berberine effectively inhibited cisplatin-induced renal histopathological changes, enhanced renal function, and markedly mitigated inflammatory and fibrotic alterations as well asTNF-α protein expression. Additionally, P2X7R, p-ERK1/2, MDM2, and SIRT2 were suppressed and DUSP6 was upregulated by berberine.

Conclusions:
Significance: The nephroprotective effects of berberine were mediated in part by downregulating P2X7R and modulating DUSP6-mediated inactivation of ERK1/2 as well as by suppressing SIRT2/MDM2-triggered renal fibrosis.

Key Words: Berberine, Cisplatin; Galectin-3, P2X7R; DUSP6, SIRT2;

Funding Agency: none

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Notoginsenoside R1, a Metabolite from Panax Notoginseng (Burkill) F.H.Chen, Inhibits Monoacylglycerol Lipase Activity and Prevents Paclitaxel-Induced Mechanical Allodynia in Mice.

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Introduction:

Paclitaxel-induced mechanical allodynia (PIMA) severely affects patients' quality of life and may lead to treatment discontinuation, compromising effective cancer therapy. One key factor in PIMA pathogenesis is the elevated activity of monoacylglycerol lipase (MAGL), an enzyme that metabolizes the endocannabinoid 2-arachidonoylglycerol (2-AG). Thus, inhibiting MAGL may serve as a potential analgesic target. Notoginsenoside R1 (NGR1), a metabolite of Panax notoginseng, has shown promise in reducing oxidative stress and neuronal apoptosis in nerve injury models. However, its effects on PIMA and MAGL activity, remain unexplored.

Objectives: This study investigated the antiallodynic effects of NGR1 on paclitaxel-induced mechanical allodynia (PIMA) in mice and examined its impact on MAGL activity in human and mouse paw skin.

Methods:

Female BALB/c mice were randomly assigned to three groups: control, paclitaxel, or NGR1 + paclitaxel. NGR1 was administered twice daily for 5 days before and 5 days during paclitaxel administration. Mechanical allodynia was assessed using a dynamic plantar aesthesiometer. In vitro evaluations of NGR1 on MAGL activity were determined using human MAGL Inhibitor Screening Assay Kit (Cayman Chemicals) and mouse MAGL assay kit (Abcam).

Results:

As expected, the paclitaxel-treated group exhibited a significant decrease in force intensity compared to the vehicle group ($p < 0.0001$), confirming the development of PIMA. Pre-treating mice with NGR1 resulted in a concentration-dependent increase in force intensity in comparison to paclitaxel-treated group. The increase in force intensity was significant at NGR1 concentrations of ≥ 2.5 mg/kg ($p<0.001$). Additionally, NGR1 reduced paclitaxel-induced increases in MAGL activity in the paw skin of mice. At a concentration of 1 µM, NGR1 also reversibly inhibited human MAGL activity in vitro.

Conclusions:

NGR1 prevents the development of PIMA, reduces MAGL activity in mouse paw skin, and inhibits human MAGL activity in a reversible manner.

Key Words: Notoginsenoside R1; paclitaxel; PIMA;

Funding Agency: This research project was supported by Kuwait University College of Graduate Studies and Research Sector grant #YP01/24.

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Investigating Neuromodulatory Effects of the Bicyclic Sesquiterpene Beta-Caryophyllene Derived from Cannabis sativa Essential Oil on STZ-Induced Diabetes Rat Model.

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Introduction:
Diabetes mellitus can cause neuronal damage that adversely affects the central nervous system (CNS). Beta-caryophyllene (BCP) a natural bicyclic sesquiterpene, possesses anti-inflammatory, antioxidant, and neuroprotective properties. This project aims to isolate and purify BCP from a BCP-rich fraction derived from the essential oil of Cannabis sativa L. using various chromatographic techniques. The identity of the purified BCP will be confirmed through spectral analyses. Furthermore, the neuroprotective effects of BCP will be evaluated in a streptozotocin (STZ)-induced diabetic rat model to assess its potential in mitigating CNS damage.

Methods:
Thin-layer chromatography (TLC) was utilized to analyze the fraction and identify an appropriate solvent system for the isolation process. TLC was performed on pre-coated silica gel 60 F254 plates. Three solvents with different polarities were tested, and the Rf values for the selected mobile phase were calculated. The optimized solvent system was then used to isolate and purify BCP using a flash silica gel 60 column. Eluation was carried out under an isocratic protocol. The collected fractions were analyzed, and those exihibting similar TLC profiles were combined and evaporated yielding purified BCP. The identity of pure BCP was confirmed using various spectral techniques, including mass spectroscopy (MS) and 1D and 2D nuclear magnetic resonance (NMR) analyses.

Results:
Hexane proved to be the most appropriate solvent for separation, resulting in the appearance of four distinct compounds labeled A, B, C, and D. Among these, compounds C and D were identified as the major components, with C showing the highest intensity, suggesting it is the predominant compound and is most likely BCP. Starting with 2668.5 mg of the BCP-enriched fraction, a total of 30 fractions were collected. Fractions corresponding to compound C were pooled and evaporated to yield a colorless oily compound (2171.1 mg, 81.4% yield). This compound was spectrally identified as pure BCP.

Conclusions:
The successful chromatographic isolation and purification of BCP from its abundant fraction were achieved, and the identity of the isolated BCP was confirmed through spectral analyses. The next phase of this study will focus on exploring the neuroprotective effects of BCP on the CNS in a rat model of STZ-induced diabetes.

Key Words: Beta-caryophyllene; Diabetes mellitus; Neuroprotective ;

Funding Agency: This work was funded by the College of Graduate Studies and Research Sector (YP02/24). Spectral analyses were done at RSPU, Research Administration, Kuwait University, supported by Grant number GS01/01 and GS01/03.

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Assessment of the Relevance of a Prescribing Competency Framework in Kuwait - An e-Delphi study.

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Introduction:
Prescribing is a key intervention in patient management and competency frameworks have been developed to standardize prescribing practice across healthcare disciplines globally. In Kuwait, research on prescribing for chronic diseases has revealed inconsistencies in patient care quality. This study assesses the relevance of the Australian National Prescribing Service (NPS) MedicineWise Prescribing Competency Framework statements in Kuwait as a step toward developing a National Prescribing Competency Framework.

Methods:
The study followed an adopt and adapt approach. Phase one involved translating the NPS framework into Arabic through parallel translation. Phase two employed a 2-round e-Delphi method to assess the relevance of 48 statements (across 7 Competency Areas) for Kuwait. A 4-point Likert scale survey was developed using Google Forms and distributed to experts, including doctors, dentists, and pharmacists working in MOH, using purposive and snowballing methods. Participants were asked to rate their agreement with the relevance of the statements to Kuwait and provide feedback. Statements achieving a consensus level ≥90%, with no answer as "strongly disagree", were deemed relevant.

Results:
The translation phase resulted in a bilingual framework. Round 1 of the e-Delphi survey involved 36 experts, and Round 2 included 20. After two rounds, five competency areas achieved 100% consensus (areas 1, 2, 4, 5, and 6), while 80% consensus was reached in Competency Area 3 (4 out of 5 statements, excluding statement 5), and 85.7% consensus for Area 7 (6 out of 7 statements, excluding statement 6). Statements on patient engagement received the least consensus.

Conclusions:
This is the first study to explore adapting a prescribing competency framework in Kuwait. The Lack of agreement on prescribing competency standards relating to patient-centeredness is consistent with current published literature in Middle Eastern and North African regions, reflecting a need to standardize the prescribing process to ensure safe and effective prescribing.

Key Words: Prescribing; Competency Framework; Delphi;

Funding Agency: KFAS PO23-13NH-1834

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Assessment of a Patient Safety Culture: A Nationwide Survey Comparing Private and Public Hospitals in Kuwait

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Introduction:
Several international health bodies advocate measuring patient safety culture within an organisation as an effective strategy for sustainably improving safety. This study aims to assess and compare patient safety culture across public and private hospitals in Kuwait.

Methods:
A descriptive cross-sectional study was conducted utilising the Hospital Survey of Patient Safety Culture. The questionnaire was distributed among clinical staff in public general and private hospitals. Data analysis using Microsoft Excel and SPSS 23 (α level = 0.05) provided an overview of participant characteristics and patient safety culture scores. A model for predicting the determinants of patient safety culture score was constructed from a regression analysis.

Results:
A total of 890 questionnaires were distributed equally between the public and private sectors. The overall response rate was 94.9%. Assessment of the positive percentage of patient safety culture showed that nationally, five composites were areas of strength: “Teamwork within Units” (87.2%), “Organizational Learning—Continuous Improvement” (87.5%), “Management Support for Patient Safety” (77.8%), “Feedback & Communication about Error” (75.8%) and “Teamwork across Units” (75.0%). Private hospitals showed these same areas of strength, whereas public hospitals had fewer. Private hospitals scored statistically significant higher positive percentages than public hospitals in most of the composites. Benchmarking against a 2015 study in Kuwait indicates that the positive percentages of six composites increased at the national level, whereas four remained the same. “Staffing” and “Non-punitive response to errors” were strikingly low.

Conclusions:
This is the first national study to assess and compare patient safety culture in public and private hospitals in Kuwait. Many areas of safety culture had improved at the national level. However, some areas require special attention. The difference in the patient safety culture between the two sectors might be relevant to the guidelines governing them. Policymakers should set unified guidelines governing both sectors and devise intervention strategies to improve patient safety and quality of care.

Funding/Acknowledgements:
The authors declare that they have not received any funding. We acknowledge all respondents from the selected hospitals.

Key Words: Safety Culture; Secondary Care; HSOPSC;

Funding Agency: None

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Development of stability-indicating assays for novel oxazolidinones with anticonvulsant activity using UHPLC-MS-MS

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Introduction:
Oxazolidinone heterocycle is an identifiable scaffold that is clinically useful as antimicrobial, psychotropic and anticoagulant drugs. We identified a novel series of triazolyloxazolidinones (PH 66, PH 166, PH 162) with anticonvulsant activities, showing protection on in vivo rat model of electrically-induced seizure.
Objectives: The objectives of the study are to develop reliable analytical stability-indicating assays using the UHPLC system with tandem mass detector to investigate the stability of these novel compounds.

Methods:
Rapid, sensitive and selective UHPLC-MS-MS methods were developed for the determination of these novel anticonvulsant agents in plasma. The validated method utilized UHPLC BEH C18 column and quantification of the analytes was by multiple reaction monitoring (MRM) scanning mode. Stability studies of the compounds were performed in rat plasma, and under various force degradation conditions including acid, base, and oxidation at 900C for 90 min, and degradants were identified using LC-QToF-MS. Typically, the mobile phase consisted of water with 0.1% formic acid and acetonitrile with 0.1% formic acid (PH66 (60:40, flow rate was set at 0.2ml/min with column temp at 350C), PH166 (50:50, flow rate at 0.250ml/min and column temperature and sample temperature at 260c and 50c), PH162 (40:60, flow rate at 0.2 ml/min and sample temp at 50C). Quantitative determination was performed using multiple reaction monitoring scanning mode of the transition (precursor-product mass ion) of PH 66 m/z 441.2700 → 95.0300, PH 162 m/z 510.2027 → 150.0203 and PH 166 m/z 508.200 → 347.1300

Results:
The developed method was found to be linear in concentration range 5-30 □g/ml for plasma and 100-5000 ng/ml for brain. The intra-day and inter-day validation shows the precision, and accuracy was within acceptable range. All compounds were stable in plasma at 370C, but were unstable in acidic, basic, and oxidative condition and degradants were identified.

Conclusions:
The validation results proved that the developed method correlated with precision, accuracy for the concentration range to be found in rat plasma, hence, the developed method can be utilized to determine the concentrations of the compounds in plasma and different tissues.

Key Words: Oxazolidinone; stability-indicating assays; UHPLC-MS-MS;

Funding Agency: This research is funded by research grant PP02/19 and the General Facilities Science (GF-S) grants GS01/03, GS01/05, and GS02/10 from Research Sector, Kuwait University.

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Vincamine Metabolites Produced by Cunninghamella echinulata and their Potential Anticancer Effects

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Introduction:
Biotransformation has been a tool to study drug metabolism. In addition, bacteria, fungi, and actinomycetes can perform specific unconventional changes to a drug and produce new derivatives that may be more effective, less toxic, or more bioavailable. Vincamine (VCN) is a monoterpene indole alkaloid isolated from lesser periwinkle Vinca minor. VCN has several biological activities, including antioxidant, anti-inflammatory, cerebral vasodilator, and neuroprotective effects. Recent studies address the anticancer effect of vincamine. Caspase-3 is a protease that is known to contribute to apoptosis. Recently, caspase-3 has been linked to promoting oncogene-induced malignant transformation. This work aims to isolate and identify vincamine metabolites by Cunnighamella echinulata and to predict the binding of these metabolites to caspase-3.

Methods:
Two-stage fermentation protocol was used in screening and preparative scale fermentation. Forty different species of fungi and actinomycetes were screened for their ability to metabolize vincamine, of them, Cunnighamella echinulata 1382 was selected as a definite hit for preparative scale fermentation and isolation of metabolites. The isolation of metabolites exploited different chromatographic techniques. The isolated metabolites were identified using various spectroscopic methods (HRMS, 1D, 2D-NMR, and single crystal x-ray diffraction). The binding modes of these metabolites to caspase-3 enzyme were predicted using autodock 4. 2. 6 program.

Results:
Cunnighamella echinulata gave four metabolites, which were identified as 14-epi-vincamine, 20-hydroxyvincamine, vincamine N-oxide, and 14-epi-vincamine N-oxide. All four metabolites showed free binding energies to caspase-3 of -6.93, -6.85, -6.66, and -6.86 kcal/mol, respectively, compared to -7.25 kcal/mol of vincamine.

Conclusions:
Four metabolites of vincamine were produced by Cunninghamella echinulata 1382. These metabolites show potential as lead compounds for development into anticancer agents, as they exhibit binding affinity to caspase-3.

Acknowledgements: Spectral analyses were done at RSPU, Research Administration, Kuwait University, supported by Grant number GS01/01 and GS01/03. Dr. Mikki Vinodh of RSPU facilities is acknowledged for running the single crystal X-ray analyses; projects numbers GS 01/03 and GS 03/08.

Key Words: biotransformation; vincamine; Cunnighamella echinulata;

Funding Agency: GS01/01 and GS01/03

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Evaluation of Prescribing Patterns of Antimicrobial Agents in Ahmadi Hospital Following Antimicrobial Stewardship Committee Initiatives

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Introduction:
Antimicrobial resistance (AMR) presents a significant global health challenge, necessitating effective antimicrobial stewardship to optimize the use of antimicrobials.
Objective: This study assessed prescribing patterns and adherence to local stewardship protocols through a retrospective review of 50 randomly selected patient records each month.

Methods:
This is a before and after study. Two clinical pharmacists collected data from Hospital Information System (HIS) regarding approximately 50 patients every two months. Data collected with regard to prescribing patterns included de-escalation, IV to PO switch, double anaerobic coverage. Data collection also included consumption of certain antimicrobial agents over three year period (2021 - 2023). The Antimicrobial Stewardship Committee implemented initiatives over seven months including educational lectures and ward rounds and improve practices. Awareness emails regarding IV to oral swich, de-escalation from broad- to narrow- spetrum antimicrobials following culture results and double anaerobic coverage were sent to prescribers in this period.

Results:
Key findings over seven months included fluctuating de-escalation rates (peaking at 39% in August, dropping to 8% in June), slight increases in IV to PO transition rates (15% in November), varying adherence to guidelines (max 42% in November, min 8% in June), and double anaerobic coverage rates ranging from 6% to 26%.

Conclusions:
The results highlight the need for ongoing education and interventions to enhance adherence to stewardship protocols and combat AMR.
Acknowledgement:We would like to acknowledge Ph. Shahad Al-Ghareer, TL. Pharmacy for her continuous support and guidance. We would also like to acknowledge the guidance and support of our Snr. Pharmacists; namely Snr. Ph. Fatemah Nasrallah, Snr. Ph. Nour Al-Khalaf, Snr. Ph. Maryam Malak and Snr. Ph. Ghaida Al-Sharif. Our gratitude is also extended to clinical microbiologists Dr. Mohammad Sadeeqi and Dr. Salma Al-Ajmi.

Key Words: Antimicrobial agents; stewardship; Antibiotics;

Funding Agency: NONE

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Investigation of the pharmacokinetics and anticonvulsant effect of selected novel oxazolidinone derivatives in rats

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Introduction:
We previously reported that one of the oxazolidinone derivatives safely protected majority of rats from chemically and electrically induced seizures, but only for 30 minutes. Objectives: The objective of this work was to investigate whether the novel oxazolidinone derivatives PH066, PH162, and PH166 with potentially favorable physicochemical and pharmacokinetic properties, will result in prolonged anticonvulsant effects in rats.

Methods:
The pharmacokinetics, brain distribution and anticonvulsant activity of the three derivatives, PH066, PH162, and PH166, were investigated in Male SD rats (120-150 g; age 21-25 days), obtained from Kuwait University Animal Resource center. The rats were pretreated with IP injection of 100 mg/kg of each of the three compounds at 0, 15, 30, 60, 120, 180 minutes prior to induction of seizures with electrical shock. Seizures were staged based on the classification described by Mares and Kubova. Rats experiencing stages 1 or 2 seizures are considered protected while rats experienced stages 4 or 5 are taken as full seizures. Immediately after evaluating the anticonvulsant effects, rats were euthanized, then blood and brain tissue samples were obtained and frozen at -80 °C until analysis. Quantitative determination of the concentration of the three compounds in rat plasma and brain tissue were measured using LC/MS/MS method.

Results:
The average maximum plasma and brain tissue concentrations for PH066, PH162, and PH166, were 14.6, 15.0, and 18.1 µg/ml and 2.7, 2.0, and 1.99 µg/gm, respectively. A rough estimate for the average brain to plasma distribution ratios for PH066, PH162, and PH166 were 0.186, 0.156, and 0.131, respectively. This relatively good brain distribution for the three oxazolidinone compounds resulted in 80% protection of rats from electrically induced seizures during the first hour and 40%, 60%, and 60% protection after 180 min for PH066, PH162, and PH166, respectively.

Conclusions:
The results demonstrate that the three investigated oxazolidinone compounds displayed anticonvulsant activity for three hours in most rats. This may be due to their more favorable physicochemical and pharmacokinetic characteristics.

Key Words: oxazolidinone; anticonvulsant; pharmacokinetics;

Funding Agency: This research is funded by research grant PP02/19 and the General Facilities Science (GF-S) grants GS01/03, GS01/05, and GS02/10 from Research Sector, Kuwait University.

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Bridging the Gap: Knowledge, Practices, and Perceived Barriers to Research Among Health Science Students at Kuwait University

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Introduction:

Research is the most reliable strategy to advance scientific understanding and enhance multiple healthcare services. Integrating undergraduate health science students into research at an early stage is an important step towards improving critical thinking and problem-based solving, enhancing patient health outcomes. This study aimed to assess undergraduate health science students' knowledge, attitudes, practices and perceived barriers towards research at Kuwait University.

Methods:

A cross-sectional study was conducted among undergraduate health science students from the Colleges of Pharmacy, Medicine, Allied Health, Dentistry, and Public Health at Kuwait University. A self-administered online questionnaire was used to examine students' demographic characteristics, knowledge of basic research, attitudes toward research, perception of the barriers toward research, and their research practices. The questionnaire was pilot-tested prior to distribution, and the sample size was calculated using Raosoft (344 students). Descriptive and ordinal regression analysis was conducted.

Results:

A total of 364 students participated in the study. The results showed that most participants have either low or moderate knowledge, comprising 43.4% of the sample (158 participants each), with a median of 40.6% (IQR: 28.1% - 57.8%). Most students had neutral attitudes (N=216; 59.3%). The majority of students agreed that the lack of time is a barrier towards conducting research (N=237; 65.1%). Nearly half of the study participants were involved in research projects (N=175; 48.1%), while a notable proportion of students had publications or poster presentations (N=67; 18.4%).

Conclusions:

Undergraduate health science students at Kuwait University exhibit low to moderate research knowledge and predominantly neutral attitudes towards research. Time constraints were the most frequently reported barrier to participation. Although nearly half of the students participated in research projects, implementing mandatory research projects and providing research methodology workshops could enhance their knowledge, attitudes, and future research engagement.

Key Words: Research; Undergradute; Students;

Funding Agency: None

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Macrophage-Targeted Lipid Nanotherapeutics for The Treatment of Tuberculosis

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Introduction:
Effective treatment of tuberculosis (TB) demands progression control in line with TB elimination. The study herein aims at the formulation of nebulized lipid nanocarriers loaded with the antitubercular linezolid (LNZ) and actively targeting alveolar macrophages (AM) for efficient TB treatment.

Methods:
Mannosylated solid lipid nanoparticles (MN-SLNs) and nanostructured lipid carriers (MN-NLCs) incorporating LNZ were prepared by film hydration technique using compritol and stearic acid as lipids and lipoid S100 as emulsifier. Stearylamine was added to impart positive charge and facilitate surafce immobilization of mannose. Nanoparticles were characterized in terms of morphology (Transmission Electron Microscopy, TEM), colloidal (size, zeta-potential and polydispersity index) and thermal properties (Differential Scanning Calorimetry, DSC) as well as Fourier Transform Infrared Spectroscopy (FT-IR). LNZ was quantified by UV-spectroscopy to determine the encapsulation efficiency (EE), drug loading and in vitro release in acetate buffer (pH 4.5) and phosphate buffer saline solution (PBS, pH 7.4). The nebulization efficiency (NE) was assessed using jet nebulizer. The cytotoxicity and uptake were investigated by MTT assay and Confocal Laser Scanning Microscopy (CLSM), respectively, on A549 cells and murine alveolar macrophages.

Results:
MN-SLNs ensured 930-969 nm diameter, 5–54 mV zeta-potential and > 96 % EE in addition to pH-independent sustained release (84% within 24h). Jet nebulization showed 51% NE within 20 min. Viability assay on MH-S cells warranted concentration-dependent cytotoxicity with an IC50 < 0.02 mg/mL. At SLN concentration 1.5 mg/mL, 70 % of A549 cells were viable, compared to ≈2 % viability for MH-S cells. CLSM proved phagocytosis by MH-S cells as revealed by 4-time higher fluorescence for MN-SLNs versus MN-NLCs.

Conclusions:
Data confirmed the potential of mannosylated nanocarriers for targeted LNZ delivery to AM giving promises of effective TB therapy.

Key Words: Pulmonary delivery; Antitubercular ; Nebulized nanocarriers;

Funding Agency: None

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Healthcare costs awareness among physicians working in Kuwait's public hospitals and their attitudes towards controlling costs

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Introduction:
Cost-consciousness refers to the awareness of an individual regarding the expense and cost-effectiveness of intervention such as the cost of the drug, lab testing, and imaging. Purpose: The aim of conducting this study is to assess the level of consciousness among physicians in Kuwait and their attitudes toward controlling healthcare costs, to identify factors influencing physicians' cost-consciousness level, as well as to identify barriers to implementing cost-consciousness behavior among physicians in Kuwait.

Methods:
A cross-sectional study of all physicians working in public hospitals in Kuwait was conducted using a convenient sampling technique. Practicing physicians from different specialties and levels of decision-making in the six governorates of Kuwait were approached and invited to participate in the study using both electronic and paper-based survey tools. The data was analyzed using SPSS software, version 29. Descriptive statistics were used to describe the participants' characteristics, and the mean cost-consciousness score among physicians was calculated. Independent t-tests and ANOVA were conducted to check the relationship between the cost-consciousness score and each variable.

Results:
A total, of 160 physicians responded to the survey, of whom 67.5% were males, and 57.5% were non-Kuwaiti. When the participating physicians in this study were asked about whose responsibility it was to reduce the cost of healthcare, most of them answered that the major responsibility for reducing the cost of healthcare falls on the government (62.5%). Participants showed a moderate level of cost-consciousness 31.69 (SD: 5.636) out of 48, in which physicians who got their first medical degree from outside Kuwait had higher cost-consciousness scores than those who got their first medical degree from Kuwait (p-value 0.020). However, there was no significant difference between the other variables regarding their cost-consciousness score.

Conclusions:
This study was conducted in a setting where healthcare expenditures are among the highest in the world. A moderate level of cost-consciousness was found in practicing physicians who are working in the public hospitals of Kuwait. Most of the participating physicians agreed that costs should be borne in mind when considering any healthcare intervention and service. Moreover, they believe that they are not overly confident about their knowledge of healthcare costs. Our findings highlight the importance of raising physicians' awareness of healthcare costs so they can use the medical resources most effectively and promote cost-effectiveness, which leads to better patient outcomes as it will reduce overall costs related to non-adherence and wasting of limited resources.

Key Words: Public healthcare system ; Cost-consciousness ; Awareness;

Funding Agency: no

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Diclofenac Sodium/Famotidine Novel Gastroretentive Dosage Form: Formulation and Characterization Studies

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Introduction:
Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly prescribed for the management of pain due to their analgesic and anti-inflammatory properties. Their long-term use is associated with numerous side effects, such as gastric bleeding and ulceration. These side effects can be reduced by using a gastroprotective agent(s). The main objective of this study is to prepare and characterize a bilayer tablet containing famotidine (FA); a gastroprotective agent and diclofenac sodium (DS); an NSAID in a single tablet dosage form. This combination is intended to reduce the gastrointestinal complications associated with the long-term use of DS, improve the bioavailability of both medications, and increase patient compliance.

Methods:
A gastric floating tablet was prepared by mixing 40 mg FA with 80 mg HPMC K15M, 20 mg sodium bicarbonate, and other excipients to reach 200 mg. The enteric tablet was prepared by mixing 100 mg DS, 37.5 mg Eudragit® L100-55, 37.5 mg HPMC K15M, and other excipients to reach 250 mg. The powder blend was assessed for flowability and compressibility. FA and DS tablets were compressed using a single punch machine and were characterized for uniformity of weight, thickness, drug content, hardness, friability, and drug release in 0.1 N HCl for FA and phosphate buffer pH 6.8 for DS. As FA tablets are intended to remain in the stomach, they were evaluated for in vitro buoyancy. The bilayer tablet was prepared by stacking the sustained enteric layer, middle separating layer, and floating gastroretentive layer in the die cavity of the single punch compression machine. DSC and FTIR analysis were performed to determine the tablets' physicochemical compatibility. The design of experiments (DOE) was applied to reach the optimized formulation.

Results:
The powder blend showed acceptable flowability and compressibility. The characterization results of the prepared tablets were within the pharmacopeial limits. The cumulative percentage of drugs released after 12 hours was 98% for DS and 95% for FA. The bilayer tablet was separated into two tablets in a few seconds after immersion in 0.1N HCl.

Conclusions:
Formulating a bilayer tablet containing FA and DS is expected to yield significant outcomes that will enhance therapeutic efficacy, safety profile, and patient compliance. Acknowledgments: The College of Graduate Studies is acknowledged for funding this research.

Key Words: Bilayer tablet, gastroretentive dosage form; Famotidine, diclofenac sodium; Enteric

Funding Agency: The College of Graduate Studies

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Healthcare Cost Awareness Among Primary Care Physicians and Their Attitudes Towards Controlling Costs in Kuwait

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Introduction:
Physicians have an important role in regulating healthcare costs. It is important to assess the current situation of physicians in Kuwait and determine their awareness of healthcare costs. This study aims to assess sociodemographic factors that might affect physicians' cost-conscious behavior and identify any barriers that may prevent physicians from considering cost in their daily practice.

Methods:
A cross-sectional study of physicians working in primary care was conducted using a an online and paper-based questionnaire, from February 20 to April 25, 2024. The questionnaire consisted of 5 domains that addressed: Socio-demographic information, physician responsibilities and society, physicians' enthusiasm for cost reducing strategies, physician's role in containing health-care costs, and barriers to implementing cost-conscious behavior and considering medication costs in practice. Independent t-test and ANOVA were used to assess the relationship between physicians' characteristics and their cost-conscious behavior.

Results:
A total of 130 physicians participated in this study. According to physicians, the government (72.3%), health insurance companies (40.8%), hospitals and health systems (40.8%), and pharmaceutical and device manufactures (33.8%) were the main entities mentioned having major responsibility for reducing healthcare costs. Ultimately, physicians appeared to be very enthusiastic for all cost reducing strategies, with a mean percentage of 63.3% (SD: 12.59). When analyzing physician's responses to cost-consciousness statements, 50.0% of physicians strongly agreed that doctors need to take a more prominent role in limiting use of unnecessary tests. The majority (79.2%) agreed that physicians should adhere to clinical guidelines that discourage the use of interventions that have a small proven advantage over standard interventions but cost much more. The barriers preventing physicians in implementing cost-conscious behaviors and considering medication costs in practice were alternative availability (55.8%), workload and lack of time (54.3%), and lack of knowledge and resources about cost (53.5%).

Conclusions:
Physicians in Kuwait showed a moderate level of cost-consciousness. Decision-makers should provide an environment that enables physicians to practice cost-conscious behaviors. Additionally, targeted interventions should be considered to increase the level of cost-consciousness of physicians and improve the healthcare delivery system.

Key Words: Cost-conscious; Physicians; Prescribing behaviors;

Funding Agency: None

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Cytotoxicity-Guided Fractionation of Cakile arabica Ethanol Extract

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Introduction:
Cancer poses a major challenge to global health. It ranks the second most common cause of death worldwide. Herbal medicine serves as a valuable resource in the prevention and treatment of cancer. The Brassicaceae family includes vegetable crops, medicinal and nutritional plants. It has been reported that a significant consumption of Brassica vegetables lowers the risk of cancer, and chronic inflammation. Cakile arabica Velen., an annual herb belonging to the family Brassicaceae, has been traditionally used to treat gastric disorders. This study aims to evaluate the anticancer activities of different fractions of Cakile arabica ethanol extract.

Methods:
The aerial parts of Cakile arabica were collected in April 2007 from the Subiya Desert, located north Kuwait. The dried aerial parts were coarsely powdered and extracted with ethanol (96%). Part of the ethanol extract was screened for its cytotoxic activities against different carcinoma cell lines, HepG-2, HCT-116, MCF-7, A-549, in addition to the normal human lung fibroblast, MRC-5 using the MTT assay. The ethanol extract was then fractionated using a reversed-phase C18 column, initially eluted with 100% water, followed by increasing increments of methanol, to afford 12 fractions. The cytotoxic activities of the fractions were assessed against HepG-2 and HCT-116 carcinoma cell lines. The most potent fraction was further chromatographed on a normal-phase silica gel column, initially eluted with chloroform, followed by a gradual increase in polarity using methanol up to 20% methanol/chloroform, yielding 3 major subfractions. These subfractions were re-evaluated against HepG-2 and HCT-116 carcinoma cell lines. IC50 values in
µg/mL were determined.

Results:
Cytotoxicity evaluation showed that C. arabica ethanol extract was active against HepG-2 and HCT-116 carcinoma cell lines with IC50 values of 60.89 ± 2.07 and 67.49 ± 3.62 µg/mL, respectively. Moreover, fraction 10 (80% methanol/water) was the most potent cytotoxic fraction against both cell lines with IC50 values of 9.89 ± 0.43 and 7.63± 0.27 µg/mL, respectively. However, further partitioning of fraction 10 revealed lower activities compared to the original fraction.

Conclusions:
This study showed that C. arabica ethanol extract exhibited cytotoxic activities against liver and colon cancer cells. Out of the 12 obtained fractions, fraction 10 revealed the most potent cytotoxic activity against both cell lines.

Key Words: Cakile arabica; Bioactivity-guided fractionation; Cytotoxicity;

Funding Agency: None

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Osteoporosis in persons with spinal cord injury Kuwait experience

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Introduction:
Spinal cord injury (SCI) is accompanied by loss of bone mass caused by accelerated bone remodeling, with bone resorption exceeding bone formation. This leads to osteoporosis which is usually observed in the paralyzed limbs and increase the risk of fracture. This study was performed to evaluate the bone mineral density (BMD) values in SCI patients aiming to determine the effects of the etiology, duration, severity, the level of injury and spasticity on BMD values.

Methods:
A total of 41 patients with SCI, were included in the study. Neurological examination was performed including American Spinal Injury Association criteria (ASIA) scale and muscle tone was evaluated using Modified Ashworth scale (MAS). BMD values were measured using dual energy x-ray absorptiometry (DEXA). The biochemical markers were also analyzed. The patients were diagnosed to have osteoporosis according to World Health Organization criteria.

Results:
The study included 41 patients 24 males (58.5%) and 17 females (41.5%). Their mean age 46 years. Low BMD values were detected in 51.2% of subjects below the level of injury, and fractures occurred in 9.75% following minor trauma. A positive correlation was noted between time since injury and development of osteoporosis. Detection of osteoporosis was significant in patients with motor complete lesion (ASIA A-B) and wheel chair dependent patients (p-value < 0.05). The effect of spasticity showed a significant inverse correlation between the MAS and T- Z scores (p< 0.001). Spasticity was studied in 20 motor complete SCI patients and a significant relation was found between flaccid complete SCI patients and osteoporosis (P 0.03). The etiology and level of injury did not significantly affect BMD values.

Conclusions:
SCI patients are at high risk of osteoporosis that can be complicated by fracture. The BMD values of proximal femurs decreased as the duration of SCI increased. Patients with motor complete SCI and wheel chair dependent have greater risk for developing osteoporosis. Spasticity had a preserving effect on bone density in patients with SCI. The etiology and neurological level did not significantly affect BMD values. According to our results osteoporosis and fracture risk should be investigated in SCI patients. Prevention and treatment of osteoporosis is important to avoid additional functional impairment.

Key Words: SCI, Osteoprosis, Spacticity; Retrospective study; BMD;

Funding Agency: none

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Efficacy of Laser Acupuncture in Treatment of Chronic Musculoskeletal Pain Syndrome.

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Introduction:
Acupuncture is one of the most commonly used complementary therapies for managing musculoskeletal pain. Laser acupuncture (LA), practiced as a part of complementary and alternative medicine since the 1970s, is a modern adaptation of traditional needle acupuncture. It involves the use of non-thermal, low-intensity laser irradiation to stimulate acupuncture points. Red and infrared wavelengths (0.6–1.5 microampere) are most commonly used in LA due to their low absorption and high transmission properties. Objective: This study aims to evaluate the effectiveness of LA in improving pain and functional outcomes in individuals with chronic musculoskeletal disorders.

Methods:
A retrospective study was conducted at the Physical Medicine and Rehabilitation Hospital in Kuwait. Data from 112 patients who attended the LA Clinic between January 2022 and January 2024 were analyzed. The primary outcome measure was the Visual Analogue Scale (VAS) for pain. The cohort included 101 females and 11 males, with a mean age of 55. The two main conditions treated were low back pain (LBP) in 64 patients and osteoarthritis (OA) of the knee in 48 patients. Patients received twice-weekly treatments for 5 weeks using the Weberneedle Compact device, which accommodates up to 12 laser needles simultaneously. These needle-like fiber ends were not inserted into the skin

Results:
Before treatment, the majority of patients reported a VAS score of 8–9 out of 10. Following LA treatment, VAS scores decreased to 2–3 in 57.8% of LBP cases and 31% of OA knee cases. Patients underwent 8–10 sessions on average. At a 2-year follow-up, sustained improvement was observed in 57% of LBP cases and 31% of OA knee cases.

Conclusions:
LA effectively reduced pain levels, particularly in patients with musculoskeletal disorders. Its appealing features, including minimal sensation, short treatment duration, low risk of infection or complications, and suitability for all ages, make it a viable adjunct therapy for pain management. To further explore and maximize the potential of LA, future studies are warranted.

Key Words: laser acupuncture, low intensity laser, low back p; retrospective study; VAS;

Funding Agency: none

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A Kv1.1 tetramerization domain mutation identified in a child with lower limb dystonia alters channel voltage-dependence and kinetics

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Introduction:
The KCNA1 gene encodes the 496 amino acids that make up the potassium voltage-dependent alpha-subunit Kv1.1. The Kv1.1 channel consists of four such subunits. Heterozygous KCNA1 mutations that lead to Kv1.1 loss-of-function cause episodic ataxia 1. We investigated a KCNA1 mutation found in a child who did not present with episodic ataxia symptoms but had lower limb stiffening and inability to walk. The child harbored an arginine to glutamine substitution at position 86 (R86Q) in the alpha-subunit's tetramerization domain (T1). While mutations in various Kv1.1 domains have been investigated, this is the first study to characterize a Kv1.1 T1 mutation.

Methods:
Electrophysiological outcomes of R86Q were characterized by expressing human Kv1.1 channels in Xenopus laevis oocytes. Currents were recorded using two-electrode voltage-clamp techniques. Structural investigations and in silico mutagenesis were performed with PyMol (Schrodinger, LLC).

Results:
T1 is predicted to play a role in subunit tetramerization and channel assembly, yet mutated α-subunits were able to form functional channels that pass delayed rectifier currents. 1. Oocytes injected with mutated cRNA showed a significant reduction in Kv1.1 current and a positive shift in voltage-dependence of activation. In addition, activation kinetics were significantly slower while deactivation was faster, implying a reduction in time the channel spends in its open state. This novel finding points to a clear role of T1 in Kv1.1 voltage dependence and gating. 2. Oocytes co-injected with both mutated and WT cRNA in equal amounts, to mimic the heterozygous condition, showed a decrease in current only at -10 mV when compared to currents from oocytes injected with only WT cRNA. A positive shift in activation voltage-dependence and faster deactivation kinetics were also observed. There was no significant change in activation kinetics. This explains the milder symptoms observed in the child that improved with acetazolamide. 3. R86Q changes the channel's cavity structure. Removing the positive charge at R86 results in loss of polar bonds decreasing subunit-subunit interactions and destabilizing the open channel form.

Conclusions:
This study reveals novel roles for T1 in channel function and supports the emerging concept that a mutation's location within a channel's α-subunit influences the phenotype presented.
Acknowledgements: This research was funded by Kuwait University Grant No. YM01/23.

Key Words: Channelopathy; Potassium current; Electrophysiology;

Funding Agency: Kuwait University College of Graduate Studies, and Research Sector, Grant YM01/23

139: Oral

The Relationship between Serum Cortisol, Insulin, ACTH, and Blood Glucose Levels of Pregnant Women with Gestational Diabetes Mellitus in the Kingdom of Bahrain.

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Introduction:
Gestational diabetes mellitus (GDM) can be defined as hyperglycemia that develops during pregnancy. GDM poses both maternal and fetal potential risks. Elevated maternal cortisol levels have been linked to maternal hyperglycemia and insulin resistance. The present study aimed to investigate the relationship between GDM and serum cortisol levels in Bahraini and non-Bahraini pregnant women in the Kingdom of Bahrain. We also investigated the relationship between age and ethnicity in the development of GDM.

Methods:
Data were collected from a total of 75 pregnant women; 41 of which were diagnosed with GDM and 34 had normal blood glucose levels. Serum cortisol, insulin, adrenocorticotropic hormone (ACTH), fasting (FBG), and random (RBG) blood glucose levels were measured. This study received ethical approval from the Research and Ethics Committee at AGU (E1-P1-10-22).

Results:
FBG, RBG, and insulin blood levels were significantly higher in the GDM group when compared to the control group. Serum cortisol and ACTH levels tended to be higher in the GDM group; however, they were statistically insignificant. Within the GDM group, there were no statistically significant differences in serum insulin, cortisol, and ACTH levels between Bahraini and non-Bahraini patients or between patients less than or more than 30 years old.

Conclusions:
Our results suggest that cortisol may not have a major role in the development of GDM in our patients. Further research is needed to confirm these results. This study highlights the necessity to better understand the underlying mechanisms of the development of GDM in pregnant women.

Key Words: Cortisol ; Gestational Diabetes; Bahrain;

Funding Agency: None

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Prevalence of Body Dysmorphic Disorder and the Associated Risk Factors in Kuwait

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Introduction:

Body dysmorphic disorder (BDD) is a psychiatric condition characterized by an excessive preoccupation with perceived defects in appearance, causing some degree of psychosocial impairment. It is associated with a high rate of suicide attempts, with many attributing their psychological distress to a dissatisfaction with their appearance. BDD is also highly comorbid with major psychiatric disorders, such as major depressive disorder, and anxiety disorder. There are no published studies on this topic in Kuwait. This study aims to assess the prevalence of and risk factors for BDD in the adult population of Kuwait.

Methods:

This cross-sectional study enrolled 422 employees aged ≥ 21 years. Data was collected using a self-administered questionnaire composed of 32 items, categorized into three sections: questions regarding socio-demographics, the Dysmorphic Concern Questionnaire (DCQ), and presupposed associations with BDD. The DCQ is a validated seven-item screening tool intended to quantify the severity of appearance-related concerns and behaviors to assess BDD symptoms; a score of nine was the cut-off point for a positive screen for BDD. The other items in our questionnaire were evaluated by the Chi-square test and quantified by the odds ratio, for which multivariate logistic regression was utilized to adjust for potential confounding.

Results:

The mean age of participants is 34.37; 74.2% were female, and 85.1% were Kuwaiti. The participants' scores ranged from 0 – 16, with a median DCQ score of 3, and IQR of 5. The prevalence among the Kuwait general population was 10.2%. It was found equally in both sexes, consistent with previous reports. After statistical adjustments, it was found that a self-reported history of negative comments and injury or medical conditions, as well as anxiety, were all negatively associated with BDD. No association with Age, BMI, or social media use was found.

Conclusions:

The prevalence of BDD in the adult population of Kuwait is 10.2%, higher than reports in regional and international studies. It was associated with anxiety and a history of negative comments or previous injury. These findings may aid public health professionals in designing educational programs to increase BDD awareness and its risk factors. Also, these findings may help guide future research in investigating whether this prevalence of BDD is associated with psychological disorders and suicide attempts among the Kuwaiti population.

Key Words: Body Dysmorphic Disorder; Major Depressive Disorder; Social Media USA;

Funding Agency: None.

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Exploring the Effects of Social Media on Body Dysmorphic Disorder Among Citizens of Bahrain: a Cross-sectional Study

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Introduction:
Body dysmorphic disorder (BDD) is a mental health condition characterized by a preoccupation with perceived flaws in one's appearance, leading to functional impairment. The growing popularity of social media highlights the importance of understanding its impact on mental health conditions such as BDD. This study assessed the relationship between BDD and social media use in a sample of 444 participants. The prevalence of BDD in our sample was calculated and factors that may be associated with BDD were explored. Sociodemographic characteristics assessed were age, gender, marital status, educational level, nationality, occupation, and household income. Additional factors analyzed were body image perspectives, content explored by users, and specific social media platforms including Instagram, Whatsapp, Snapchat, Twitter, Facebook, and Youtube. The aim of this study was to address the research gap regarding the relationship between BDD and social media use.
Objectives: Identify the relationship between social media, sociodemographic factors, and BDD.
Estimate the prevalence of BDD in our sample.

Methods:
This was a cross-sectional online survey that utilized the standardized screening scale called Body Dysmorphic Disorder Questionnaire (BDDQ). Data on social media use were collected through self-reported usage patterns. Statistical analysis was conducted on R program to identify associations. Chi-square and Fischer's exact tests were used to assess the associations between categorical variables. Odds ratios were calculated for statistically significant results to assess effect sizes of these associations.

Results:
Among the 444 paticipants, the prevalence of BDD was 1.8%. Increased overall social media use was associated with BDD (p=.030). Age, being single and being a student were associated with BDD, with p values of .004 (OR=14.294), .023(OR=9.956), and <.001 (OR=15.318), respectively. BDD was associated with comparing one's body image with that of people on social media (p=.001, OR=9.416). BDD was associated with judging other people based on their appearance (p<.001, OR=20.317). Specific uses of social media, such as consuming content related to celebrities (p=.020), fashion (p=.025), music and songs (p<.001) were also linked to BDD.

Conclusions:
Increased social media use is associated with BDD, particularly in users engaging in body image comparison and appearance-based judgements. Although these results are compelling, the study relies on self-reported data with potential bias highlighting the need for further research in this field.

Key Words: Body dysmorphic disorder; Social media; Digital wellbeing;

Funding Agency: NONE

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Psychometric Properties of the Arabic version of Ten Item short version of the Big Five Inventory (BFI-10)

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Introduction:
The Ten Item short version of the Big Five Inventory (BFI-10) is a brief instrument designed to assess the Five-Factor-Model (FFM) of personality i.e., neuroticism, extraversion, openness, agreeableness, and conscientiousness. The BFI-10 appears to be a better alternative to the Ten-Item Personality Inventory (TIPI).

Objectives: To examines the psychometric properties of the Arabic (BFI-10).

Methods:
The BFI-10 was administered jointly with the TIPI to 1370 (610 males, 760 females) Kuwait University undergraduates with a mean age = 21.01 ± 6.84. The internal consistency reliability, factor structure, and convergent validity of the BFI-10 with TIPI & BFI-2 were assessed.

Results:
Cronbach's alpha was satisfactory for the Neuroticism, Extraversion, and Openness to Experience, Agreeableness, and Conscientiousness subscales respectively were ranged (.82, .77, .81, .79, .83). The results revealed significant gender differences in N & A with a favor for females, and in E & C with a favor for males. PCA showed that BFI-10 five factors explain 62.88% of the total variance. However, the mean convergent correlations between the BFI-10 and TIPI scales, with coefficients of (0.84) for the N, (0.57) for the E, (0.59) for the O, (0.57) for the A and (0.69) for the C. Moreover, mean correlations between the BFI-10 and BFI-2 scales, with coefficients of (0.64) for the N, (0.60) for the E, (0.49) for the O, (0.47) for the A and (0.66) for the C.

Conclusions:
This study provided evidence for the reliability and validity of the Arabic BFI-10 for Kuwaiti undergraduates.

Key Words: Psychometric Properties ; BFI-10; Arabic version ;

Funding Agency: none

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Varicella Trends in Kuwait; A Successful Control

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Introduction:
Kuwait hosts one of the most modern healthcare infrastructures in the Middle East with well-established immunization program that began in the 1960s, as frequent campaigns against fatal infectious diseases, such as smallpox, polio, and measles, followed by the development of the vaccination program in 1972 when the national immunization committee was first established. Vaccination is mandatory for children, adolescents, healthcare workers, food handlers, newly coming expatriates, foreign students, and pilgrims. All vaccines are administered free of charges (FOC) regardless of nationality or area of residence. The coverage levels are calculated annually based on an administrative method and coverage surveys measuring vaccine coverage at the district level is performed every 5 years. Varicella vaccination (VV) was first introduced in Kuwait voluntarily in 2005, by the private sector; vaccination rates were not known accurately. Later two doses of VV regimen were added to the national immunization schedule in 2017 to be given to all children at age 1 & 2 years old.
Aim: Analysis to explore trends in varicella incidence and changes in case characteristics before and after the implementation of varicella vaccination policy.

Methods:
This study was an observational ecological study design with a retrospective secondary analysis of reported varicella cases from January 2011 to December 2022, the data was provided by the Communicable Diseases Department– Public Health Directorate, and VV vaccination data available from the EPI Department – Public Health Directorate. Varicella is a reportable disease according to Kuwait routine surveillance system; cases characteristics can be extracted and studied but investigations as per source of infection, genotyping were not possible. Cases were analyzed according to Vaccine introduction in the following two time periods: 2011–2017 “pre-vaccine” and 2018–2022 “post-vaccine”.

Results:
Varicella infection used to be very high in Kuwait; the annual reported incidence rate reached more than from 250/ 100,000 population peaking during May and June. Incidence was slightly greater in males than females (M:F ratio 1.2) and cases among Non-Kuwaitis were more than Kuwaitis. The number of reported varicella cases declined (-74.7%) during the 5 years following the introduction of Varicella Vaccination. Cases declined in all age groups (62% – 84%), but the greatest decline was observed in the target age group 1-4 years (-84.1%). Declines observed among the non-targeted population including infants (-78.2%), adolescents and adults (-70.5%) not eligible for vaccination indicating the effect of herd immunity during post-vaccination period. Admission to the Infectious Diseases Hospital reflecting severity of cases dropped by -97% from 47.3 in 2011 to 3.4 in 2022 per 100,000 population. Nationality specific incidence rate was higher among Kuwaitis although the number of cases was higher among non-Kuwaitis.

Conclusions:
A study over a 15-year span shed light on Varicella infection epidemiology and the impact of vaccination on disease trends. This is important in developing vaccination strategies and other public health measures to minimize the healthcare and economic impact.

Key Words: Varicella, Vaccine; Epidemiology; Trend;

Funding Agency: none ; self funded

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Evidence of gene-nutrient interaction association with waist circumference, cross-sectional analysis.

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Introduction:
Waist circumference (WC) is a significant indicator of body adiposity and is associated with increased mortality and morbidity of cardiovascular diseases. Although, single nutrient intake and candidate genes were previously associated with WC. Little is known about WC association with overall diet quality, genetic risk score and gene-nutrient interaction. This study aims to investigate the influence of overall diet quality and multiple WC-associated single nucleotide polymorphisms on WC. In addition to investigating gene-nutrient interaction association with WC.

Methods:
This study explored cross-sectional data from the Airwave Health Monitoring Study (n=6,502) as a representation of the UK population. Diet quality was evaluated based on the Mellen Index for Dietary Approaches to Stop Hypertension (Mellen-DASH). The genetic risk score for WC (GRS-Waist) was calculated by screening the population genotype for WC-associated single nucleotide polymorphisms. Multivariate linear regression models were built to explore WC association with diet quality and genetic risk score. Gene-nutrient interaction was explored by introducing the interaction term (GRS-Waist X Mellen-DASH score) to multivariate linear regression analysis.

Results:
The prevalence of high WC (Female > 80 cm, Male > 94 cm) was 46.5%. Diet quality and genetic risk score of WC were significantly associated with WC. There was no evidence of interaction between GRS-Waist, DASH diet scores and nutrient intake on WC.

Conclusions:
This study's findings provided results on waist circumference association with diet and genetics and tested the possibility of gene-nutrient interaction. These results are successful in building the foundation for using diet and genetics for early identification of those at risk of having high WC and WC-associated diseases. In addition, evidence on gene-diet interactions on WC is limited, therefore our findings may guide future research in investigating this interaction and investigating its application in precision nutrition.

Key Words: Diet quality score,; Waist circumference; Genetic risk score;

Funding Agency: The Airwave Health Monitoring Study is funded by the Home Office (grant number 780-TETRA) and the Medical Research Council (grant number MR/L01341X/1)

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Evaluation of Cancer Risks Factors linked to Alpha and Beta Radioactivity in Kuwait's Public Water Networks

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Introduction:
Cancer is a growing public health concern globally, with risk factors linked to environmental exposures, including water quality. The geographical vulnerability of Kuwait to pollutants from the Gulf and the heavily relies on seawater desalination for its drinking water production, underscores the importance of simple qualitative screening techniques for rapid monitoring of any radiation contamination that may occur. This study evaluates the gross alpha and beta radioactivity, acidity, and total dissolved solids (TDS) in water across Kuwait's six governorates, aiming to confirm that the water meets international safety standards and is safe for human consumption.

Methods:
Six samples were collected from the six governorates in Kuwait, considering random sampling to avoid self-selection bias. The samples were filled in 1-litre polypropylene containers with 20 ml of concentrated nitric acid to minimize radiation loss. Ultra-low background gas-flow proportional counting system (XLB) and the Thermo Orion Versa Star Pro device for pH and TDS measurements. The US-EPA 900 method was used for sample analysis.

Results:
The gross alpha activity in Kuwait's water samples was consistently low at 0.03 Bq/L, while gross beta activity ranged from 0.038 to 0.047 Bq/L, with an average of 0.041 ± 0.001 Bq/L. The highest beta activity was recorded in the Al-Asimah governorate. All measurements were below the WHO reference levels (0.5 Bq/L for alpha and 1 Bq/L for beta). pH levels in public-pipe water samples ranged from 8.07 ± 0.08 in Al-Asimah to 8.23 ± 0.03 in Mubarak Al-Kabeer, all within the WHO recommended range (6.5–8.5). Total dissolved solids (TDS) ranged from 118.9 ± 3.62 mg/L in Al-Jahra to 147.9 ± 15.62 mg/L in Al-Asimah.

Conclusions:
These findings underscore the effectiveness of the desalination processes implemented by the Kuwait Ministry of Electricity and Water in providing high-quality drinking water. Moreover, the consistently low levels of radioactivity and other measured parameters indicate that cancer risk factors associated with the public water supply are minimal, further ensuring its safety for human consumption. No funding was granted for this work.

Key Words: Cancer risk factors; Kuwait public water networks; Gross alpha and beta ;

Funding Agency: NA

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Development of a Machine Learning Model for Spatial Surveillance West Nile Virus in the Middle East, Northern Africa and Europe

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Introduction:
West Nile virus (WNV) is a notifiable vector-borne zoonotic disease of humans and animals that causes life-limiting illness and subsequent public health implications. Lack of vaccination necessitates the development of risk-based surveillance systems to limit mosquito bites and disease spread across regions. However, the complexity of WNV epidemiology and the non-linear relationships between its environmental and demographic predictors hinder effective and efficient disease interventions.

Methods:
Thus, we used a robust multialgorithm machine learning (ML) statistical pipeline and 24 relevant satellite-based features to fit predictive models to 1,024 outbreaks reported across the Middle East, Northern Africa and Europe to the world organization for animal health between the 20th of July 2010 to the 19th of September 2024. We used three common and robust ML models, including random forest (RF), support vector machine (SVM), and gradient boosting (GBM), and compared their predictive importance.

Results:
Based on the cross-validation procedure, the GBM model performed very well with an area under the curve (AUC) higher than 0.96. Using all WNV presence data, the highest predicted spatial risk (probability > 0.6) was constrained within Italy, Greece, Turkey, Syria, Iraq, Jordan and Algeria. Our inferred mean decreases Gini estimated by the GBM revealed wild bird abundance, precipitation seasonality, wind speed, and mosquito abundance were the top four important predictors of WNV spatial distribution in the study region. The most important interaction was identified between precipitation seasonality on one side and the remaining selected features on the other.

Conclusions:
We mapped the predicted high-risk areas of WNV outbreaks using a robust analytical approach to untangle the complex spatial epidemiology of the disease in the study region. Furthermore, we identified the most important predictors and their non-linear interrelationships that shape the spatial risk of WNV. The results will help guide current WVN surveillance preparedness activities in the region, subsequently improving future control efforts and reducing future outbreaks' devastating public health impact if they were introduced into Kuwait.

Key Words: Machine learning; Vector-borne disease; West Nile Virus;

Funding Agency: NONE

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The prevalence of anxiety and depression among cancer patients and their associated risk factors in the state of Kuwait.

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Introduction:
Cancer, a life-threatening disease, has a significant impact on mental health, resulting in increased inclinations toward depression and anxiety among those affected. Depression and anxiety can raise medical costs and lead to difficulty in managing and controlling conditions. This study assessed the prevalence of anxiety and depression among adult cancer patients in Kuwait.

Methods:
Data were collected from inpatients and outpatients at the Kuwait Cancer Control Center (KCCC) using a self-administered questionnaire with purposive and snowball sampling methods. The questionnaire assessed demographic and clinical characteristics, fatigue using The Brief Fatigue Inventory (BPI), and physical activity status as potential predictors of depression and anxiety. Depression, Anxiety, and Stress Scale - 21 Items (DASS-21) questionnaire was used to measure depression and anxiety prevalence. Descriptive statistics, univariate analyses, and multivariate logistic regression using the backward elimination method were conducted to assess the association between depression and anxiety and independent variables. Because depression and anxiety were measured using self-reported scales, there was potential for information and reporting bias.

Results:
A total of 512 cancer patients living in Kuwait participated in the study. The percentage of women participating was 79.3% and Kuwaitis were 59.96%. The findings revealed that the prevalence of depression and anxiety were 40.04% and 61.72%, respectively. Income level, employment status, treatment type, physical activity, past anxiety diagnosis, fatigue severity, and fatigue interference were significant predictors (p-value <0.05) of depression or anxiety among cancer patients.

Conclusions:
This study demonstrated how prevalent anxiety and depression are among cancer patients in Kuwait. Various factors, including income level, employment status, treatment type, physical activity, prior anxiety diagnoses, fatigue severity, and fatigue interference, showed a strong correlation with depression and anxiety. Stakeholders can enhance the quality of life of cancer patients and provide them with greater assistance by implementing effective and targeted interventions.

Acknowledgment: This study was not funded.

Key Words: Depression; Anxiety; Cancer;

Funding Agency: None

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Splint versus no splint after ankle fracture fixation; Results from the multi-centre post-operative ankle splint trial (PAST)

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Introduction:
There is considerable variation in the rehabilitation of ankle fractures. Ankle fractures treated surgically are often immobilized or splinted in the early post-operative period, despite the lack of robust evidence supporting this intervention. Thus, this randomized controlled trial aims to investigate the anecdote that splinting reduces pain and oedema.

Methods:
A prospective multi-centre randomized controlled trial was performed in three trauma centres. Eligible patients were over 18 years of age that have sustained an isolated unilateral ankle fracture requiring surgical intervention. Patients were randomized to two groups receiving either; a plaster of Paris posterior back-slab or compressive bandage dressing. The post-operative rehabilitation protocol was standardized across both groups. Baseline demographics and fracture characteristics and classifications were analysed. Primary outcomes included; oedema measured by the figure-of-eight-20 technique and pain at multiple time points. Secondary outcomes included; the American Orthopaedic Foot and Ankle Society (AOFAS) score, satisfaction, unplanned emergency room (ER) visits and complications.

Results:
A total of 104 comparable participants were included; 54 in the non-splint group and 50 in the splint group. There was no significance difference in ankle oedema, ankle oedema compared to contralateral ankle and pain scores between the two groups ($P = 0.56$, $P = 0.25$, $P = 0.39$ respectively). Patient satisfaction was higher in the early postoperative period in the non-splint group ($P = 0.016$). The AOFAS score was not significantly different across any time point ($P = 0.534$). In the splint group, there was a 46% rate of splint-related complaints and complications. Unplanned ER visits occurred in 46% of the splint group and 7.4% of the non-splint group ($P < 0.001$). There were 2 wound infections, 1 non-union and 1 deep vein thrombosis in the splint group. There was 1 wound infection and 1 deep vein thrombosis in the no-splint group ($P = 0.481$)

Conclusions:
The routine use of a splint does not add any perceivable benefit to the postoperative course of an ankle fracture fixation, particularly in the reduction of oedema and postoperative pain. Another key finding is that the absence of a splint does not appear to result in higher complication rates, instead leads to higher unplanned ER visits and lower early satisfaction rates.

Key Words: Ankle fracture; Brace; Rehabilitation; Splint.;

Funding Agency: None

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Reliability and Validity of the Arabic Language Version of the International Consultation on Incontinence Questionnaire – Female Lower Urinary Tract Symptoms (ICIQ-FLUTS)

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Introduction:
The International Consultation on Incontinence Questionnaire-Female Lower Urinary Tract Symptoms (ICIQ-FLUTS) is an instrument designed to evaluate lower urinary tract symptoms and their impact on quality of life. This study aimed to translate the ICIQ- FLUTS into Arabic language and confirm the reliability and validity of the Arabic translationamong Arabic-speaking female patients.

Methods:
Following approval from the advisory board of the ICIQ, two bilingual translators translated the questionnaire from English into Arabic and back to English. Two experts proficiently compared the Arabic ICIQ-FLUTS with the original version of ICIQ-FLUTS. The questionnaire, thereafter, got distributed in urology and outpatient clinics at two general hospitals. Two hundred and seventy-eight participants completed the Arabic-translated ICIQ- FLUTS (n:278); The questionnaire was answered by one hundred and thirty-nine female patients presented with LUTS (n:139) and one hundred and thirty-nine of healthy individuals served as a control group (n:139). The collected data was analyzed to assess content validity, construct validity, internal consistency, and test-retest reliability.

Results:
The mean age of patients was 44.92 years. The internal consistency of filling, voiding, and incontinence were tested using Cronbach's alpha, yielding a score of 0.73, 0.75, and 0.87, respectively. Test-retest reliability was assessed through Kappa coefficient, resulting in scores of 0.62 for filling, 0.65 for voiding, and 0.57 for incontinence. The test discriminated well between the patients and control groups, with the patients group exhibiting mean filling score of 6.43 compared to 2.27 in the control group, mean voiding score of 2.85 compared to 1.14, and mean incontinence score of 7 compared to 1.07. The P-values for filling, voiding, and incontinence were all less than 0.0001.

Conclusions:
The study concluded that the Arabic version of the ICIQ-FLUTS is a robust assessment tool for evaluating lower urinary tract symptoms in female patients. It showed good content validity, construct validity, internal consistency, and test-retest reliability.

Key Words: Incontinence,; Female LUTS, ICIQ; Questionnaire;

Funding Agency: No funding

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Local Recurrence Rates of Head and Neck Non-Melanomas: A Systematic Review and Meta-Analysis of Wide Local Excision Versus Mohs Micrographic Surgery

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Introduction:
Non-melanoma skin cancers (NMSC), particularly Basal Cell Carcinoma (BCC) and Squamous Cell Carcinoma (SCC), are highly prevalent, especially in the head and neck region, where cosmetic and functional outcomes are critical. Two primary surgical treatments for NMSC in these areas are Mohs Micrographic Surgery (MMS) and Wide Local Excision (WLE). This systematic review and meta-analysis aims to investigate the local recurrence rates of head and neck NMSC treated by these two approaches.

Methods:
This meta-analysis followed PRISMA guidelines and included studies published up to May 2024. A comprehensive search of MEDLINE, WoS, ClinicalTrials.gov was conducted. Studies eligible for inclusion involved adult patients diagnosed with head and neck NMSC treated with either MMS or WLE. Cohort studies, randomized controlled trials, and case series were considered. Primary outcomes included local recurrence rates, while secondary outcomes assessed margin status, recurrence-free intervals, cosmetic outcomes, and progression-free survival (PFS). Heterogeneity was assessed using the I^2 statistic, and the DerSimonian and Laird random-effects model was applied.

Results:
A total of nine studies were included in the meta-analysis. MMS demonstrated significantly lower local recurrence rates compared to WLE, with a pooled risk ratio (RR) of 0.42 (95% CI: 0.27–0.64, $P < 0.0001$, $I^2 = 0\%$). Subgroup analyses revealed that for SCC, MMS significantly reduced local recurrence rates compared to WLE (RR = 0.28, 95% CI: 0.10–0.81, P = 0.02, $I^2 = 52\%$). In BCC, MMS showed lower recurrence rates, but this was not statistically significant (RR = 0.60, 95% CI [0.24–1.51], P = 0.28, $I^2 = 0\%$). Similarly, for dermatofibrosarcoma, MMS showed a trend toward lower recurrence rates, but this was not statistically significant (RR = 0.22, 95% CI [0.04–1.09], P = 0.06, $I^2 = 0\%$).

Regarding metastasis rates, MMS showed an insignificantly lower rate of metastasis compared to WLE (RR = 0.45, 95% CI [0.14–1.47], P = 0.19, $I^2 = 0\%$). Subgroup analysis for SCC also found no statistically significant difference in metastasis rates between MMS and WLE (RR = 0.49, 95% CI [0.13–1.81], P = 0.29, $I^2 = 0\%$).

Conclusions:
MMS was associated with a reduced risk of local recurrence in head and neck NMSC compared to WLE, particularly for BCC and SCC. While the pooled estimate showed a significant benefit of MMS, subgroup analyses by gender, tumor site, and tumor type did not reveal statistically significant differences.

Key Words: Mohs Micrographic Surgery; Wide local Excision; Non-melanoma Skin Cancer;

Funding Agency: None

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Comparing the Concordance of Actual and Virtual Crossmatches to Identify Pre-existing Donor-specific Human Leukocyte Antigen (HLA) Antibodies in Kidney Transplant Patients.

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Introduction:
One of the most important aspects of kidney transplantation is human leukocyte antigen (HLA) gene matching. HLA genes are located on the short arm of chromosome 6. There have been only a few studies that have evaluated concordance between virtual (VXM) and actual crossmatch (AXM) methods, therefore there was a need for this evaluation in a centre specific study that may be influenced by institute specific protocols, techniques as well as instrumentation.
Objectives: The main goal of this study was to compare the concordance of results between AXM and VXM to identify pre-existing donor-specific Human Leukocyte Antigen (HLA) antibodies in kidney transplant patients in Kuwait to evaluate the utility of the virtual crossmatch as a tool for pretransplant risk assessment and kidney allocation.

Methods:
HLA typing was performed using Luminex technology. The AXM were performed using complement dependent cytotoxicity (CDC) and flow cytometry. In other hand, the VXM was extrapolated from HLA typing and the Luminex single antigen (LSA) assays.

Results:
This involved looking at data from 103 patient donor pairs recruited between 2019-2020. The principal criterion for inclusion in this study was patient/donor pairs on whom both a virtual and an actual crossmatch has been performed along with HLA typing data, a pre-requisite for crossmatch. Moreover, this retrospective analysis of 103 kidney transplant patients and donor pairs provided a numerical value of concordance between virtual and actual crossmatch (74%) and the percentage of non-concordance between virtual and actual crossmatches was (26%).

Conclusions:
Our results demonstrate that the VXM is a useful tool in predicting donor-recipient immunologic compatibility. This is especially useful when harvesting a kidney from a deceased donor as it reduces the time needed for evaluation of compatibility when time is a scarce commodity.

Key Words: Transplantation; HLA typing ; Crossmatch ;

Funding Agency: 'NONE

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Determination of gender- dependent references interval for coagulation

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CASE REPORT

Background:
Cerebro-Oculo-Facio-Skeletal (COFS) syndrome is a rare genetic disorder affecting 1 in 1,000,000 born fetuses. With an autosomal recessive (AR) mode of inheritance. COFS syndrome affects various systems within the body and is characterized by congenital cataracts, retinopathy, microphthalmia, congenital microcephaly, severe developmental delay, facial dysmorphism with prominent nasal root and/or overhanging upper lip, sensorineural hearing loss, and many other morbidities similar to trisomy 13 and 18. The exact incidence of COFS syndrome is unknown. To date, fewer than 20 cases have been described, and the identified mutations mainly occur in the ERCC6/CSB gene. The life span of children born with the disease is between 3-5 years, and respiratory infections and feeding difficulties.

Case Summary:
Here we report the case of a 24-year-old female (G4P0+3+1+0) with a previous cesarean section and a complicated obstetric history. Her first pregnancy was spontaneously conceived in 2015 which was complicated by multiple congenital anomalies, IUGR and preterm labor owing to polyhydramnios. Eventually, she gave birth to a stillborn baby. She returned for follow-up in her second pregnancy, which was also spontaneous, in 2016. However, the same unfortunate events. Her last pregnancy was in 2018, which followed the same previously mentioned course. However, she gave birth to a live baby girl weighing 1. 7 kg with an APGAR score of 5 and 6 via cesarean section and died three days after. A karyotype was obtained from the fetus and both parents. Both parents were carriers of COFS syndrome. In her last pregnancy she underwent IVF to perform PGT. Intracytoplasmic sperm injection (ICSI) was performed followed by PGT to select disease-free embryos for transfer. In the first trial, she got pregnant with DCDA twins and delivered at 32 weeks owing to preterm labor via cesarean section with a good outcome.

Conclusions:
In Conclusions, Management of suspected cases of COFS syndrome antenatally should be a shared decision between the parents and the treating physician, and the parents' decision should be honored in all cases. These children should be managed postnatally by a multidisciplinary team (MDT) including neonatologists, pediatricians, and gastroenterologists for enteral feeding, ear, nose, and throat (ENT) specialists, dermatologists, ophthalmologists, neurologists, dietitians, and physiotherapists.

Key Words: Reference interval ; Coagulation profile tests; Coagulation cascade;

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Wells' Syndrome Associated with Idiopathic Hypereosinophilic Syndrome In A Child: A Case Report

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CASE REPORT

Background
Wells' syndrome (eosinophilic cellulitis) is a rare inflammatory disorder characterized by erythematous plaques and histological flame figures. Its association with Idiopathic Hypereosinophilic Syndrome (IHES), a multisystem eosinophilic disorder, is uncommon and presents diagnostic and therapeutic challenges. This overlap highlights the complexity of eosinophilic disorders, which often mimic other conditions.

Case Summary:
We report a 9-year-old boy with a one-year history of pruritic, annular plaques on his legs and peripheral hypereosinophilia. Skin biopsy revealed eosinophilic infiltrates with flame figures, consistent with Wells' syndrome. Further evaluation showed persistent hypereosinophilia and bone marrow eosinophilia, leading to a diagnosis of Wells' syndrome associated with IHES. Treatment with topical corticosteroids provided slight improvement, but the case emphasizes the need for systemic therapies in such overlapping eosinophilic conditions.

Conclusions:
This case highlights the diagnostic complexity of eosinophilic disorders like Wells' syndrome and IHES. It underscores the importance of histopathological evaluation and a multidisciplinary approach in management. The co-occurrence suggests a possible shared pathogenic mechanism involving eosinophilic dysregulation. Further research is needed to better understand and treat such rare disorders.

Acknowledgment
We thank the patient's family for their cooperation and the multidisciplinary team for their invaluable contributions.

Key Words: Wells' Syndrome; Idiopathic Hypereosinophilic Syndrome; Hypereosinophilia;

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Quality of Life and Self-Esteem of a Healthcare Professional Post Diabetes Vasculopathy and Toe Amputation

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CASE REPORT

Background:
Healthcare professionals are often perceived as models of health compliance, yet this assumption is challenged in real-life scenarios. This reflective case report describing a nurse with poorly controlled type 2 diabetes mellitus who developed vasculopathy and a toe amputation highlights critical issues related to treatment compliance, quality of life, self-esteem.

Case Summary:
A 64 year old healthcare worker, struggled with adherence to prescribed treatment regimen and developed vasculopathy and underwent toe amputation despite her professional knowledge of diabetes management and potential complications. Her experience was assessed using the Quality-of-life short form (36) health survey (SF-36) and the Rosenberg Self-Esteem Scale. The SF-36 questionnaire is used to assess eight health domains which are not specific to age, disease, or treatment group. The questionnaire assesses the individual's perception of their situation in life within the cultural and value context where they live, related to their goals, expectations, values, and interests, as well as the impact on their health status. The resulted scores of SF-36 domains for this patient are as follows (0 is the worst quality of life and 100 is the best quality of life): bodily pain (25) , physical functioning (0), role limitation due to physical problems (100), role limitation due to emotional problems (20), Vitality (100), social functioning (37. 5), mental health (75), and general health perceptions (65). The Rosenberg Self-Esteem Scale (RSE) is a 10-item self-report questionnaire that assesses overall personal self-esteem on a summary scale rated on a four-point Likert scale from 1 (strongly agree) to 4 (strongly disagree), producing a cumulative score of 0 to 30. The patient had a full score of 30 indicating a very high self-esteem. One major finding in this case is the extreme psychological stress due to financial burden of healthcare expenses while being in the hospital for more than 5 weeks. The patient indicated that she started spending from savings for her future retirement.

Conclusions:
This case illustrates the need for a patient-centered approach that addresses not only medical but also psychosocial and economic factors in managing chronic diseases. It also provides an educational opportunity to fostering empathy and understanding of the real-world barriers to treatment compliance and the impact of chronic diseases on quality of life.

Key Words: Quality of life; Self-esteem; Ethics;

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Appraising Excellence in Informed Consent: A Medical Student's Reflection on Accurate Documentation, Intricate Processes, and Effective

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CASE REPORT

Background:
Informed consent (IC) is a cornerstone of ethical medical practice, with clinical, professional, and legal requirements. The process of IC dictates clear communication, patient and family engagement, and comprehensive documentation.

Case Summary:
This reflective case report presents a medical student's appraisal of an IC process and documentation for evacuation of subdural hemorrhage procedure conducted by a young neurosurgery resident. This exercise was conducted as part of the extracurricular 'Moral Journal' activities analyzed the reasons for an excellent appraisal of the IC by the family. There were two main elements of this excellent appraisal: (I) Process related elements and (II) Documentation related elements.
(I) Process related elements:
1- The resident discussed the case in a quiet and private environment demonstrating respect of patient's privacy and confidentiality
2. The Language used was simple tailored to the patient's and family's understanding
3. Detailed explanation of the proposed surgery, including its benefits, alternatives, risks, and potential complications
4. Active listening, addressing questions and ensuring understanding
5. Family engagement through inclusion of the patient's family in the discussion, respecting their role in decision-making
6. Demonstration of empathy, respect, and transparency during the explanation of the procedure to the patient who was conscious -yet confused- and stressed out by the diagnosis

(II) Documentation related elements in compliance with regulatory, accreditation, and legal requirements:
1. Patient identification
2. Description and purpose of the procedure using layman's terms when possible
3. Risks and potential complications
4. Benefits and the expected outcome
5. In addition to written evidence of presenting the alternatives, use of anesthesia and its associated risks, use of blood products or transfusions
6. Name and signature of the practitioner
7. Statement confirming that the patient has understood the information provided
8. The patient's (and/ or their legally authorized representative's) signature and the date

Conclusions:
This case provides medical students and residents with a valuable opportunity to reflect on the quality of informed consent documentation and procedures. It highlights the need to integrate reflective exercises into medical education, residency training, and continuous professional development to improve patient-centered care and communication skills.

Key Words: Informed Consent; Patient-centered care; Medical Education;

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COFS Syndrome in a Non-Consanguineous Marriage

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CASE REPORT

Background:

Cerebro-Oculo-Facio-Skeletal (COFS) syndrome is a rare genetic disorder affecting 1 in 1,000,000 born fetuses [1]. With an autosomal recessive (AR) mode of inheritance [1]. COFS syndrome affects various systems within the body and is characterized by congenital cataracts, retinopathy, microphthalmia, congenital microcephaly, severe developmental delay, facial dysmorphism with prominent nasal root and/or overhanging upper lip, sensorineural hearing loss, and many other morbidities similar to trisomy 13 and 18 [1]6]. The exact incidence of COFS syndrome is unknown [2]. To date, fewer than 20 cases have been described [2], and the identified mutations mainly occur in the ERCC6/CSB gene [1]. The life span of children born with the disease is between 3-5 years, and respiratory infections and
feeding difficulties [1].

Case Summary:

Here we report the case of a 24-year-old female (G4P0+3+1+0) with a previous cesarean section and a complicated obstetric history. Her first pregnancy was spontaneously conceived in 2015 which was complicated by multiple congenital anomalies, IUGR and preterm labor owing to polyhydramnios. Eventually, she gave birth to a stillborn baby. She returned for follow-up in her second pregnancy, which was also spontaneous, in 2016. However, the same unfortunate events. Her last pregnancy was in 2018, which followed the same previously mentioned course. However, she gave birth to a live baby girl weighing 1. 7 kg with an APGAR score of 5 and 6 via cesarean section and died three days after. A karyotype was obtained from the fetus and both parents. Both parents were carriers of COFS syndrome. In her last pregnancy she underwent IVF to perform PGT. Intracytoplasmic sperm injection (ICSI) was performed followed by PGT to select disease-free embryos for transfer (Figures 2-4). In the first trial, she got pregnant with DCDA twins and delivered at 32 weeks owing to preterm labor via cesarean section with a good outcome.

Conclusions:

In **Conclusions:** , Management of suspected cases of COFS syndrome antenatally should be a shared decision between the parents and the treating physician, and the parents' decision should be honored in all cases. These children should be managed postnatally by a multidisciplinary team (MDT) including neonatologists, pediatricians, and gastroenterologists for enteral feeding, ear, nose, and throat (ENT) specialists, dermatologists, ophthalmologists, neurologists, dietitians, and physiotherapists.

Key Words: Cerebro-Oculo-Facio-Skeletal (COFS) syndrome ; Congenital Anomalies; Trisomy 13, Trisomy 18;

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Premature Ovarian Failure and Fragile X syndrome

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CASE REPORT

Background:
Fragile X syndrome (FXS) is the most common inherited cause of mental impairment and autism (1). Fragile X syndrome affects approximately 1/4000 males and 1/8000 females (2). This X-linked disorder is caused by the absence of a protein coded by the fragile X mental retardation 1 gene (FMR1) on the X chromosome. The genetic determinants of FMR1 are complex and are related to the length of a polymorphic expansion of CGG trinucleotides in the 5' untranslated region of the gene. The lengths of repeats define the severity. If number of alleles is < 40 then its normal, intermediate is between 41-60, premutation between 61-199, and full mutation ranges alleles > 200. Premutation alleles have a high probability of expanding to full mutations after one to three generation. In females, this mutation has been linked to reduced ovarian reserve. Decreased antral follicular pool or an accelerated follicular atresia and apoptosis may account for this depletion.

Case Summary:
20-year-old female presented to the outpatient department after being referred from the primary care with secondary amenorrhea. Physical examination done, baseline investigations done which were all normal except for her hormonal profile which showed abnormally elevated levels of Follicle Stimulating Hormone (FSH) and Luteinizing Hormone (LH) for her age. A pelvic ultrasound revealed anteverted uterus with normal endometrial cavity and streaks of gonads seen. Magnetic resonance imaging done (MRI) which was unremarkable however both ovaries could not be visualized. Karyotype was obtained and showed female karyotype 46 XX. Genetic study revealed that the patient has two Fragile X Messenger Ribonucleoprotein (FMR-1) alleles one is normal with 19 CGG repeats and the other with 51 CGG repeats which is considered of intermediate risk. Bone densitometry done and was unremarkable. The patient and her family were counseled about the diagnosis and offered symptom relief in the form of combined oral contraceptive pills (COCP).

Conclusions:
In patients with FMR-1 mutation menopause seems to be shifted 5 years earlier than the general population thus symptom relief in the form of hormonal replacement therapy (HRT) (1). Finally, women with signs of ovarian insufficiency are at increased risk of having FMR1 alleles and further efforts should be put into studying the incidence of FMR1 expansions in patients with ovarian insufficiency and unexplained infertility (1).

Key Words: Premature ovarian failure (POF); Fragile X syndrome; X linked dominant inheritance ;

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Patient Safety, Better Knowledge for Safer Care: A Reflective Audit on Students' Hepatitis B Vaccination Status

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CASE REPORT

A group of 4, year five medical students enrolled in the ethics and professionalism course titled Patient Safety - Better Knowledge for Safer Care participated in reflective exercises. The course introduced patient safety concepts and emphasized the well-being of healthcare providers and recipients. Reflective cycles were the main educational tool.

Background

The hepatitis B vaccine offers long-term protection, lasting 20-30 years or more. At-risk groups, including medical students, are advised to receive booster doses. In Kuwait, infants are vaccinated at birth, 4 months, and 6 months, as per the Ministry of Health (MOH). This report emphasizes the importance of adhering to vaccination schedules to prevent HBV, a significant occupational risk for students. The Medical Schools Council recommends pre-admission health screenings, vaccination records, and titer testing to confirm immunity. Key vaccines include MMR, tuberculosis, polio, meningitis, and hepatitis B, alongside infectious disease screenings like HIV, HBV, and HCV.

Case Summary:

The vaccination status of four clinical students was evaluated. All had received infant vaccinations per the Kuwait schedule, but none underwent pre-university admission health screenings to ensure readiness for clinical practice. Only one student had initiated the hepatitis B vaccine series, receiving two doses, with the third scheduled soon. This occurred without prior assessment of hepatitis B surface antibody (anti-HBs) titers, critical for evaluating immunity.

During the course, one student received the first vaccine dose and scheduled subsequent doses. Two others began their vaccination series, also without prior titer testing. One student remained unvaccinated but was advised to undergo titer testing. These gaps in compliance highlight a lack of awareness and insufficient institutional support for health screenings.

Conclusions:

This report reveals significant lapses in vaccination adherence and health screening among medical students, endangering safety. Stricter implementation and monitoring of vaccination policies in healthcare education are needed. Addressing these gaps will promote a culture of safety and accountability in healthcare training. Recommendations The National Legal and Regulatory requirements in Kuwait mandates Hepatitis B vaccine for medical students; a policy that needs to be adhered to.

Key Words: Ethics; Medical Education; Hepatitis B;

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Successfully Treated Dissected Mycotic Aneurysm in a Renal Transplant Patient: A Case Report

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CASE REPORT

Background:
Mycotic aneurysm is a rare but life-threatening condition that results from invasive vascular infection. Vast majority of mycotic aneurysms are bacterial in origin with Staphylococcus aureus, Streptococci and enteric organisms being the commonest etiologies. Age, atherosclerosis and immunosuppression are among the highest determinants of increased risk of mycotic aneurysms.

Case Summary: A 62-year-old female presented to the organ transplant center casualty with fever and chest pain. Complete septic workup was done. Her blood cultures came positive for Salmonella enterica. Meropenem was started on admission and continued for 2 weeks with rapid clearance and clinical improvement. After one month, the patient presented with the same symptoms and her blood cultures came positive again with Salmonella enterica. The patient was started on meropenem and then she was de-escalated to ceftriaxone according to in vitro susceptibility. Low-grade fever continued over 3 days with worsening stitching chest pain and sudden onset of haemoptysis. CT angiography was done urgently and revealed saccular aneurysm at the junction of the aortic arch and descending aorta with no active extravasation. Upon diagnosis, the patient was immediately transferred to a specialized vascular surgical center where she underwent thoracic endovascular aortic repair (TEVAR) and stenting. The patient had a smooth recovery postoperatively and was discharged with a plan to complete 8 weeks of Ceftriaxone (2g IV OD) and then cotrimoxazole for at least 6 months with no evidence of relapse or further complications upon more than 2 months follow up.

Conclusions: Mycotic aneurysm is one of the fatal complications of Salmonella blood stream infection (BSI). High index of suspicion is required to ensure early diagnosis and rapid management for better patient outcome.

Key Words: Mycotic aneurysm; Salmonella ; Renal transplant;

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Conservative Management of Incarcerated Gravid Uterus

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CASE REPORT

Background:
An incarcerated uterus is a rare obstetric complication, with a reported incidence of 1 in 3,000 to 10,000 pregnancies. It occurs when the uterine fundus remains entrapped below the sacral promontory after the first trimester of pregnancy. Risk factors include: A retroverted uterus, history of prior incarceration, uterine anomalies, multifetal gestation, deep sacral concavity, prominent sacral promontory and pelvic adhesions. Uterine incarceration can occur in nongravid patients. Symptoms are usually related to pressure effect on adjacent organs. The diagnosis of an incarcerated gravid uterus is based on history, physical examination and imaging findings.

Case Summary:
28-year-old female G7P3+0+3+3 12+4 weeks of gestation previously healthy with insignificant past history presented to the emergency department with complete urinary retention thus the patient admitted to the hospital and Foleys catheter was inserted. A pelvic and abdominal ultrasound revealed an acutely retroverted uterus with a fetus matching gestational age and urinary system. She was evaluated by the urology team, who recommended maintaining the urinary catheter until her symptoms improve. If no improvement occurs, it was advised to keep the Foley catheter in place until delivery.

The patient was managed conservatively until her condition spontaneously resolved at 13+2 weeks of gestation. The patient was discharged with an outpatient follow-up appointment. She reported resolution of her symptoms and attended her next scheduled visit per hospital protocol. At 40 weeks of gestation, she was admitted in labor and delivered a healthy baby girl with a favorable outcome.

Conclusions: Conservative management of incarcerated uterus include either expectant management or a trial of knee-chest position done few times a day. In severe cases, manual reduction may be done by inflation of the rectum through a colonoscopy/flexible sigmoidoscopy and as a last resort laparoscopy or laparotomy. If a large myoma is present a myomectomy can be considered. In **Conclusions:** , uterine incarceration is associated with spontaneous abortion, preterm labor, pre-labor rupture of membranes, intrauterine growth restriction, uterine dystocia, uterine rupture, postpartum hemorrhage (PPH) and in case of delivery by cesarean section an accidental transection of the bladder, cervix or the vagina can be done in cases of unrecognized incarceration of the uterus.

Key Words: Conservative Management of Incarcerated Gravid Ute; Incarcerated Gravid Uterus; Management of Incarcerated Gravid Uterus;

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Threatened Miscarriage in a Bicornuate Uterus: With the Baby in the Right Cornua and Subchorionic Hematoma in The Left Cornua

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CASE REPORT

Background:
A bicornuate uterus has a fundus that is indented >1 cm. It results from partial rather than complete fusion of the Mullerian ducts. The diagnosis is based on ultrasound findings of two usually moderately separated or divergent endometrial cavities and three-dimensional ultrasound[1]. The incidence of congenital uterine anomalies is approximately 6. 7% in the general population[2]. A bicornuate uterus accounts for 10-25% of all congenital uterine anomalies[3]. It is often asymptomatic and diagnosed incidentally[1]. Symptomatic patients may present with cyclic or noncyclic pelvic pain, abnormal vaginal bleeding, and/or infection. It can affect both the obstetric and gynecological populations. In the obstetrical population it has been associated with recurrent pregnancy loss, malpresentation, increased cesarean section rate, fetal growth restriction and preterm labor with its associated complications on the preterm born fetus and postpartum hemorrhage (PPH)[4].

Case Summary:
30-year-old female G3P1+1+0+2 14+2 weeks of gestation previous one cesarean section due to failure to progress and a known case of bicornuate uterus presented to the emergency department with picture of threatened miscarriage. Ultrasound was showing bicornuate uterus with single living fetus matching date in the right cornua and a sub chorionic hematoma (SCH) in the left cornua (as shown in figure 1). The patient was admitted to the hospital for observation. She received progesterone supportive therapy then she discharged from the hospital and was managed in the antenatal clinic as per hospital protocol. She opted for elective repeat cesarean section which was done when she reached 38 weeks of gestation. She delivered alive baby boy 2. 9 kg APGAR score 8 and 9.

Conclusions:
Surgical indications for corrective surgery include: recurrent pregnancy loss after exclusion of other contributing causes and dysmenorrhea if medical therapy is not effective [2]. Strassman metroplasty is the procedure of choice for uterine reunification of uterine cornua restoring the normal anatomical structure [8]. Surgical intervention might improve reproductive outcomes but was fund to be associated with increased risk of placenta previa, morbidly adherent placenta, and severe PPH [9]. Finally, the cervical length should be assessed during pregnancy before 24 weeks in patients with bicornuate uterus[1].

Key Words: Threatened Miscarriage; Bicornuate Uterus; Mullerian Anomalies;

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Resistant Prurigo Nodularis - New era of treatment

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CASE REPORT

Background: Prurigo Nodularis (PN) is an uncommon, chronic skin disorder affecting primarily middle-aged adults. [1] PN is considered to have a female predominance. [2]. The clinical course of PN tends to be more aggressive in females. [3]PN affects approximately 1 in 300 to 1 in 450 pregnancies. [4]It is characterized by symmetrically distributed, multiple, firm, pruritic nodules typically localized on the trunk and the extensor surface of the extremities. [1][5][6]

Case Summary:
31-year-old female P1+0+0+1 with previous one cesarean section known case of prurigo nodularis initially presented with sever pruritis and appearance of multiple dome shaped lesions on the extensor surfaces. She was commenced on topical emollients and corticosteroids. However, there was no improvement in her symptoms thus was given a trial of oral corticosteroids with no improvement. She became pregnant and her symptoms were worsened by the pregnancy. She was following up with dermatology, general obstetrician and obstetric medicine. As advised by both teams a skin biopsy was performed and she was given a higher dose of oral corticosteroids. All other causes of pruritis and skin rash were excluded. Skin biopsy results was matching with a diagnosis of prurigo simplex. She gave birth at term by elective repeat cesarean section with good outcome. Postpartum her symptoms got worse and she was prescribed multiple biological treatments with no improvement in her symptom profile. Finally, after consultation with senior dermatologist she was commenced on Janus kinase 3 inhibitor (Rinvoq) and dose was titrated according to her clinical response. Initially her pruritis dramatically improved however, the skin lesions remained with no change. After increasing the dosage of Rinvoq her pruritis and skin lesions improved.

Conclusions:
It is crucial to have a clinical exposure or knowledge to this condition especially in pregnancy as it may be confused with intrahepatic obstetric cholestasis (ICP). This may lead to categorizing the pregnancy into a high-risk pregnancy due to the associated increased risk of developing intrauterine fetal death (IUFD) and stillbirth. In addition, further risks associated with induction of labor, failure of induction, fetal distress and increased rate of cesarean section delivery and its associated complications to both mother and fetus.

Key Words: Prurigo nodularis (PN); Pruritis in pregnancy ; Itching in pregnancy ;

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Obstructed HemiVagina with Ipsilateral Renal Agenesis (OHVIRA)

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CASE REPORT

Background:
Obstructed HemiVagina with Ipsilateral Renal Agenesis (OHVIRA), also known as Herlyn-Werner-Wunderlich syndrome is a rare congenital defect of the Müllerian ducts characterized by uterus didelphys, unilateral obstructed hemivagina, and ipsilateral renal agenesis[1]. The incidence of OHVIRA syndrome varies from 0. 1% to 3. 8%[1]. Patient may present with dysmenorrhea or pelvic pain[1].
Magnetic resonance imaging (MRI) is the gold standard for diagnosis[1].

Case Summary:
17-year-old unmarried female presented with sever ?? lower abdominal pain. Baseline investigations and an ultrasound was done revealing enlarged ?? ovary and ovarian can't be ruled out. Emergency diagnostic laparoscopy done. Intraoperatively two uteri visualized with normal looking ovaries. Post operatively patient parents informed about findings and need for further investigations. MRI was done revealing didelphys uterus with normal endometrial cavities with two separate cervices and vaginal canals. Right vaginal hematocolpos indicating imperforate hymen. Right and left ovary well visualized with no abnormalities. Right kidney visualized however, left kidney could not be visualized. She sought advice from a specialist dealing with uterine anomalies and underwent laparoscopic laparoscopic resection of the vaginal septum with no complications and was discharged on postoperative day one.

Conclusions:
The gold standard management for OHIVRA syndrome is septum resection either by hysteroscopy or laparoscopy and vaginoplasty. Nevertheless, in some cases, a surgeon may consider hemi-hysterectomy or even hysterectomy[1]. Due to the high association between Müllerian and renal abnormalities, it is recommended to screen females with prenatally detected renal abnormalities also for Müllerian anomalies. [1] The presence of menarche does not exclude obstructive anomalies of the gynecologic tract, because the obstruction can be unilateral [1]. Proper diagnosis is important to avoid pyohematocolpos and pyohematometra secondary to obstruction which may lead to sepsis [1]. Finally, due to the outflow obstruction, retrograde blood flow can occur leading to endometriosis in 23% of OHVIRA cases. Fertility in women with uterus didelphys was not found to be notably impaired, especially with early surgical treatment [1].

Key Words: OHVIRA Syndrome; Mullerian agenesis; Imperforative hymen, Renal agensis ;

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Challenges in Managing Asymptomatic Vitreomacular Traction: A Reflective Case for Patient-Centered Communication and Decision Making

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CASE REPORT

Background:
One of the most important aspects of any screening tests or programs is that they should be ethical. Screening tests must be consistent with the four principles of ethics, namely beneficence, non- maleficence, justice, and autonomy. Routine ocular screening can identify asymptomatic conditions which may necessitate careful management and treatment. This reflective case report highlights the clinical, psychological, and ethical challenges in managing asymptomatic findings in routine screening tests.

Case Summary:
A 74-year-old asymptomatic patient was diagnosed with mild Vitreomacular Traction (VMT) during a routine diabetes ophthalmological screening utilizing Optical Coherence Tomography (OCT). Despite her lack of symptoms, she was advised to undergo an urgent intravitreal injection of anti-vascular endothelial growth factor (anti-VEGF) therapy despite having been told that she doesn't have diabetic retinopathy. Notably, no alternative treatment options were offered or explained at the time. The patient expressed apprehension regarding the idea of an injection directly into the eye and refused the recommended treatment. A series of subsequent OCT examination over two years revealed that the VMT stabilized, and the patient continued to be asymptomatic. This case highlights several key issues in patient-centered communication and management including ethical requirements for screening, respect for patient preferences, and effective communication especially with elderly patients and their care givers. Since most cases of mild VMT like this one can resolve spontaneously, ophthalmologists may opt to monitor the condition through regular follow-up appointments. Additionally, patients should be instructed to assess their own vision daily at home using an Amsler grid, after their ophthalmologists explaining the correct usage of it. In contrast, severe presentation of VMT with macular edema and or macular hole can pose significant risk to vision. In such situations, intra vitreal injections and/or vitrectomy may be advised.

Conclusions:
This case provides a valuable teaching opportunity for medical students and residents in training to reflect on the requirements of ethical screening and the importance of respecting patient's preferences, and shared decision-making. It also highlights the ethical implications of recommending treatments without full disclosure of alternatives and risks, emphasizing the need for a patient-centered approach especially when managing asymptomatic findings.

Key Words: Vitreomacular traction; Patient-centered care; Ethical screening tests;

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A case of nutritional rickets – managing aesthetic concerns.

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CASE REPORT

Background:
Vitamin-D deficiency rickets is a disorder of calcium and phosphate homeostasis. It may manifest as bone deformities, fractures, slow growth and seizures. Aetiology includes poor nutrition and lack of sun exposure. It can present with enamel defects and may lead to aesthetic concerns.

Case Summary:
A 7-year-old girl attended with her father following referral from her general dentist. She was concerned about the appearance of her upper permanent central incisor teeth which were brown in colour. Family history was negative for a similar presentation. Past medical history was notable for a diagnosis of vitamin D deficiency resulting in rickets at the age of two years. Extra-oral examination was unremarkable. Intra-orally she presented with enamel hypoplasia and brown discolouration of all primary and permanent teeth on a background of a class II division I incisal relationship with a 6 mm overjet and anterior open bite. All primary molars were grossly carious.

Clinical Management started with Intensive prevention in line with the DBOH prevention toolkit. UR1 and UL1 were restored using direct composite veneers. UR6, UL6, LL6 and LR6 were managed using gold onlays. Carious primary teeth were extracted under general anaesthesia. The patient will be referred for orthodontic assessment when her permanent dentition is established.

Conclusions:
Rickets, whilst rare in the western world, may present with a range of detrimental systemic and dental morbidities. Importantly, children may present first with this condition to their GDP. This case describes the classic dental features of rickets which are important for dental practitioners to recognise and act upon.

Key Words: Pediatric dentistry; Rickets; Enamel hypoplasia;

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A Giant Mucinous Ovarian Tumor in a Young Female: A Case Report

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CASE REPORT

Background:
Primary ovarian mucinous tumors represent a heterogeneous group of neoplasms grouped into benign, borderline and malignant categories. The majority of these tumors are benign cystadenomas, followed by mucinous borderline tumors and mucinous carcinomas, in decreasing frequency. Usually, the diagnosis of these tumors is not problematic, however, some overlaps and grey zones do exist.

Case Summary:
A previously healthy 33 year-old female presented with a large pelvi-abdominal mass. She underwent a left salpingo-oophorectomy, which revealed a large multiloculated cystic ovarian mass filled with mucoid material, solid areas and a well-circumscribed whitish mural nodule. The outer surface is smooth and the capsule is intact. Frozen section examination showed predominantly benign and borderline mucinous tumor, with foci of intraepithelial carcinoma and microinvasion. Paraffin sections revealed invasive carcinoma of expansile type, seen as intra-cystic confluent papillae that are closely arranged without any intervening stroma. The papillae show nuclear stratification, atypia, hyperchromasia and frequent mitotic activity. Also, poorly circumscribed multiple mural nodules composed of mixture of pleomorphic epithelioid cells, spindle cells, rhabdoid cells, giant cells and inflammatory cells are identified, in addition to areas of lymphovascular invasion, hemorrhage and necrosis. The case was diagnosed as primary ovarian mucinous adenocarcinoma, with expansile-type of invasion and multiple malignant mural nodules of anaplastic carcinoma type, in a background of benign and borderline mucinous tumor.

Conclusions:
Mucinous ovarian tumors represent a heterogeneous group of tumors that are often encountered. Interestingly, the whole spectrum of the ovarian mucinous tumors exists in this young female: benign, borderline, intraepithelial carcinoma, microinvasion, invasive carcinoma and mural nodules of anaplastic carcinoma type.

Acknowledgments:
I would like to thank Dr. Surendra Nayak, histopathologist from maternity hospital, for giving me the opportunity to present this interesting case.

Key Words: Mucinous ; Ovary; Tumor ;

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A Rare Case of Collision Tumors Of The Ovarian Fibroma And Serous Surface Papilloma Mimicking Carcinoma

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CASE REPORT

Background:

A collision tumor is a rare phenomenon wherein two histologically distinct tumors coexist in the same anatomical location. Ovarian fibroma is the most common ovarian stromal tumor, whereas serous surface papilloma is a rare benign variant of serous ovarian tumors, sharing similarities with borderline and malignant papillary ovarian tumors. The collision of these two tumors is particularly rare and can mimic malignancy.

Case Summary:

In this report, we describe a case of a 59-year-old postmenopausal female who presented with a right ovarian solid mass. A total abdominal hysterectomy with bilateral salpingo-oophorectomy revealed a 2. 5 cm well-demarcated, firm, white-yellow solid mass with whorled cut surface and a single grey sessile growth with a cauliflower-like appearance (2. 5 cm) on the surface of the right ovary. Histomorphologically, the solid mass showed an encapsulated bland spindle cell lesion arranged in a fascicular and storiform pattern with collagenous stroma and hyaline plaques. The spindle cells displayed variable cellularity with hypo- and hypercellular areas, ovoid to spindle nuclei, scant eosinophilic cytoplasm and pericellular reticulin staining. Rare mitotic figures were observed (1/10 HPF). There were also focal cystic changes, stromal edema, and ischemic surface necrosis. The surface tumor showed a serous papilloma in the form of papillae with a relatively broad fibrous core lined by a monolayered ciliated tubal-type epithelium and benign bland nuclear features. There was no evidence of atypia, borderline changes, or malignancy. A final diagnosis of a collision tumor consisting of benign components: ovarian fibroma and surface serous papilloma was made.

Conclusions:

Pathologists, surgeons, and oncologists should be aware of this rare entity and consider tailored treatment strategies based on the biological behavior of each tumor component. Adequate surgical excision and meticulous histopathological examination are crucial to avoid misdiagnosis of malignancy.

Key Words: Collision tumor ovary ; Fibroma; Serous surface papilloma;

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Four Synchronous Renal Tumors of Distinct Histological Subtypes: A Case Report

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CASE REPORT

Background:
Synchronous renal tumors are rare and present a unique diagnostic challenge. While most kidney tumors are solitary, multiple renal tumors in a single kidney are unusual, especially involving different histopathological subtypes and including both benign and malignant entities.

Case Summary:
This is a 57-year-old male, who underwent a left laporoscopic radical nephrectomy for radiologically detected renal cysts during investigating incidental hematuria. Macroscopic examination of the surgical specimen revealed multiple gross lesions. The largest lesion (Lesion 1) (3. 5cm) is in the cortex of the upper pole and shows a well-demarcated smooth surface; cut section shows a multilocular cyst with thin fibrous septa and serous-gelatinous light brown content. Another two well-demarcated cysts are seen in the junction between mid-zone and lower pole of the kidney, the first cyst (Lesion 2) (2. 5cm) is located within the renal medulla and has a solid, fleshy, hemorrhagic and cystic appearance, and the second cyst (Lesion 3) (3. 0cm) is located within the renal cortex with multiple loculations/cysts of variable sizes. Multiple simple cysts (0. 3-1. 5 cm in diameter) are also seen scattered within the renal parenchyma. An additional solid, fleshy, hemorrhagic nodule (Lesion 4) (1. 5cm) is seen within the renal cortex. Histopathological examination and immunohistochemical studies revealed that lesions 1 and 3 and two of the simple cysts are multilocular cystic clear cell renal cell neoplasms of low malignant potential (G1), and lesion 2 is a clear cell papillary renal cell carcinoma (G1). Lesion 4 is found to be an oncocytic lesion. Additional lesions found microscopically include renomedullary interstitial cell tumor and multiple papillary adenomas. Molecular testing is performed, however, in our case revealing no clinically significant genetic alterations.

Conclusions:
The rare occurrence of multiple renal tumors is significant as it demands a thorough macro- and microscopic evaluation. Moreover, such occurrences raise important considerations for genetic testing and counseling as multiple renal tumors can be associated with various hereditary syndromes. Identifying a hereditary component not only aids in guiding treatment but also informs surveillance strategies and risk assessment for family members.
Acknowledgement: I would like to thank the Pathology and the Surgical Departments in Amiri Hospital for allowing me to present this case.

Key Words: Renal; Tumor; Synchronous;

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Skin In Inflammatory Bowel Diseases: Report Of Two Cases

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CASE REPORT

Background:
Inflammatory bowel disease (IBD) is a chronic inflammatory disease typically involving the gastrointestinal tract and encompasses Crohn's disease (CD) and ulcerative colitis (UC). Extraintestinal manifestations (EIMs) are observed in up to 47% of patients with IBD, with skin involvement being the most frequent, and pyoderma gangrenosum (PG) and erythema nodosum (EN) are the two most common disease entities. The existence of cutaneous EIMs may occur alone or in conjunction with intestinal disease activity. Here we report two cases of IBD with cutaneous manifestations, one of which was a dermatologic emergency.

Case Summary:
Case 1: A 39-year-old female with a known history of CD on infliximab presented with various skin symptoms, including a scaly erythematous plaque on bilateral buttocks, the left lateral thigh, and an indurated plaque on the mid-lower back. Skin punch biopsies from the buttocks showed non-necrotizing granulomata of the superficial and deep dermis. Special stains were negative for microorganisms. A diagnosis of cutaneous CD was rendered. Case 2: A 41-year-old female with a known history of UC presented with left forearm cellulitis, which progressed despite multiple incisions and drainage. Skin biopsies revealed neutrophilic dermatosis with ulceration and granulation tissue. Special stains were negative for microorganisms. PG with the possibility of pathergy phenomenon was raised, which was later confirmed by dermatology evaluation.

Conclusions:
Extra-intestinal skin manifestations of IBD are common and can range from mild to severe (e. g., PG). Diagnosing PG through histology can be challenging due to the lack of distinctive pathological features, making it a diagnosis of exclusion. This complexity can lead to frequent misdiagnoses, which have significant implications for treatment. These cases highlight the importance of considering the cutaneous manifestations in patients with IBD and the need for interdisciplinary collaboration for optimal patient care.

Key Words: Inflammatory bowel disease; Cutaneous manifestations; Pyoderma gangrenosum;

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EWSR1: : CREM Fusion Tumor: A Potentially Aggressive Rare Supraglottic Soft Tissue Neoplasm in A Young Male

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CASE REPORT

Background:
EWSR1: CREM gene fusions are being recognized as an expanding spectrum of EWSR1:: ATF1 fusions with the increasing use of Next generation sequencing (NGS) in soft tissue pathology, particularly in neoplasms not fitting any World Health Organization (WHO) category. Although recurrent EWSR1:: ATF 1 fusions were initially limited to a triad of mesenchymal neoplasms including clear cell sarcoma of soft tissue, angiomatoid fibrous histiocytoma and malignant gastrointestinal neuroectodermal tumor (MGNET), this family has been expanding. We report a rare case of young male who presented with parapharyngeal soft tissue who underwent surgery for obstructive airway mass showed overall morphology and immunophenotype that recapitulate that of the emerging EWSR1:: CREM fusion associated intra-abdominal epithelioid/round cell neoplasms.

Case Summary:
A 20-year-old young male patient presented to emergency with difficulty in breathing as a result of postoperative airway edema and necrotic tissue on partially resected supraglottic mass. CT of the head and neck revealed large soft tissue mass adjacent to the supraglottic larynx and the paralaryngeal tissue. This paralayngeal soft tissue lesion was seen extending from left arytenoid to epiglottis and further debulking was performed. On gross examination we received multiple grey white soft tissue fragments. Microscopy revealed striking similarity to sclerosing epithelioid fibrosarcoma. This is an infiltrative spindle cell tumor showing round to spindly cells. Focal spindling of cells with transition to sclerosis, fine reticular fibrosis entrapping single or aggregates of few cells and confluent amorphic hyaline fibrosclerosis. Strong and diffuse expression of EMA with patchy pancytokeratin expression. The tumor cells are negative for S100, CD99, ALK, desmin and SOX10. NGS molecular testing was performed at CLEVELAND CLINIC revealed EWSR1:: CREM fusion and also sent to Germany for Soft tissue, Head and neck pathologist for expert opinion.

Conclusions:
These observations point to the existence of rare extra abdominal tumor of soft tissue, driven by EWSR1:: CREM fusions which is potentially aggressive without established therapy. Recognizing this tumor type is mandatory to delineate any inherent biological and/or therapeutic distinctness from other, better-known sarcomas in the differential diagnosis including sclerosing epithelioid fibrosarcoma.

Key Words: Next generation sequencing(NGS); Soft tissue neoplasm; Aggressive tumor;

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A rare incidental finding: Ovarian fibroma with minor sex-cord elements

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CASE REPORT

Background:
Ovarian fibroma with minor sex cord elements is a rare entity first described by Young and Scully in 1983. This tumor has a distinct microscopic appearance and an excellent prognosis. Accurate identification of these elements is crucial for differentiating it from histologically similar tumors and tumor-like conditions.

Case Summary:
A 57-year-old female presented with postmenopausal bleeding and grade 2-3 rectal prolapse. Imaging studies revealed a thickened, irregular endometrium and a right adnexal mass. She underwent total hysterectomy and bilateral salpingo-oophorectomy.

Gross and Microscopic Findings: Gross examination showed a solid, whitish-yellow right ovarian mass with intact capsule and endometrial thickness was increased. Microscopy revealed a well-circumscribed ovarian lesion composed of uniform bland spindle cells, clusters of granulosa cells (<10%), and luteinized cells. Mitotic activity was low (0-1/10 HPF). Endometrium showed features of endometrial hyperplasia.

Ancillary Studies: Reticulin staining showed a pericellular pattern in the fibroma and a nested pattern in the minor sex cord elements. Inhibin was expressed diffusely in both the fibromatous component and sex cord elements.

Conclusions:
Postmenopausal bleeding with increased endometrial thickness often raises suspicion for endometrial malignancy. Awareness of ovarian fibroma with minor sex cord elements is essential, as it can contribute to a hyperestrogenic state with similar presentation.

Key Words: Fibroma; Minor sex-cord elements; Endometrial hyperplasia;

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Cytomegalovirus Infection Presenting as an Isolated Inflammatory Polyp of Gastrointestinal Tract in an Immunocompetent Host: A Case Report

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CASE REPORT

Background:
The gastrointestinal tract is a common site for cytomegalovirus (CMV) infections, especially in patients with underlying immunosuppression related to steroid intake, chemotherapy and solid organ transplantations. We report a case of 70-year-old, immunocompetent patient in whom an unusual CMV associated isolated inflammatory polyp was identified in ascending colon as a part of evaluation of high risk CRC screening.

Case Summary:
A 70-year-old female patient presented with diffuse abdominal pain related to meals. Her bowel habits were normal. No history of inflammatory bowel disease or reflux symptoms. She underwent high risk CRC screening colonoscopy as there was family history of colonic disease. Colonoscopy revealed ascending colon showing one sessile polyp (Paris Is) about 8 mm removed by cold snare and retrieved. The rectum showed few hyperemia mostly related to preparation. On retroflection small internal hemorrhoids were seen, otherwise normal rest mucosa. Pathological examination was reported as an inflammatory polyp with stromal and endothelial cells showing characteristic eosinophilic intra-nuclear inclusion bodies, with immunohistochemistry positive for CMV.

Conclusions:
This case highlights the detection of CMV infection with suspicious endoscopic, histological features and should be more aware of the unusual presentation as an isolated inflammatory polyp of gastrointestinal tract and consider it in any host including immunocompetent one.

Key Words: Cytomegalovirus (CMV); Immunocompetent Host; Inflammatory Polyp;

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A Rare Case of Adrenal Pseudocyst Arising From Adrenal-Renal Fusion.

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CASE REPORT

Background:
The adrenal gland is formed of two embryologically-distinct layers: the cortex and medulla. The adrenal cortex is derived from mesoderm and the medulla originates from neural crest cells. Around 52 days post-conception, the adrenal gland begins to separate from the mesenchymal cells and becomes encapsulated by fibrous tissue. Adrenal-renal fusion is a rare entity, defined as incomplete encapsulation of the adrenal gland and kidney with histologically adjacent functional tissue. They are usually discovered incidentally in autopsies and surgical specimens and are of no clinical significance. However, in certain situations, adrenal- renal fusion may pose a diagnostic challenge as in our case. Rokitansky first described adrenal - renal fusion, as two types, congenital lesions and secondary acquired lesions. It has been hypothesized that the congenital form arises from failure of adrenal capsule formation by the retroperitoneal mesenchyme tissue during development, which leads to a lack of a physical barrier separating the adrenal tissue from the kidney. Secondary changes leading to adrenal-renal fusion are post-inflammatory fibrous reactions that extend to the underlying renal parenchyma. An adrenal pseudocyst is a lesion that contains clotted blood and hyalinized thrombus with attenuated adrenal cortex in the outer fibrous wall. It has been suggested that it arise on the basis of a vascular anomaly.

Case Summary:
A 70-year-old lady, known case of HTN, DM, DLP, hypothyroidism, paroxysmal atrial fibrillation and ESRD, underwent right mastectomy for breast cancer 30 years ago. She has regular follow ups with nephrology, an US was done showing incidental right renal mass, CT showed heterogenous enhanced mass in the right upper pole of the kidney measuring 58x47x53 mm. Patient underwent right open radical nephrectomy. Grossly the mass were well-circumscribed filled with blood and debris arising from the adrenal gland. Histologically, a cystic lesion with no lining within the adrenal gland, it contains haemorrhage and debris, the adrenal tissue seen in direct contact with renal parenchyma with no fibrous capsule. Case were labelled as adrenal pseudocyst arising from adrenal-renal fusion.

Conclusions:
Adrenal-renal fusion with adrenal pseudocyst is a rare entity, and usually an incidental finding, but should remain in the differential for an upper pole renal mass with cystic enhancement as it may mimic cancerous lesions.

Key Words: Adrenal gland; Adrenal-Renal fusion; Pseudocyst;

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FH-deficient Uterine Leiomyomas: Pathological Insights Into a Rare Tumor

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CASE REPORT

Background:
Uterine leiomyoma's represent a widespread health challenge for women in the general population. Fumarate hydratase-deficient uterine leiomyomas (FH-def ULs) are a rare form of uterine smooth muscle tumors, accounting for 0. 5–2% of cases. These tumors are distinguished by their unique histological features and the inactivation of the fumarate hydratase (FH) gene. While most FH-deficient ULs arise sporadically due to somatic mutations in FH, a smaller subset occurs as part of the hereditary leiomyomatosis and renal cell carcinoma (HLRCC) syndrome, which is caused by inherited germline mutations in FH.

Case Summary:
A 29-year-old unmarried woman visited gynecological clinic with symptoms of gradual abdominal distention and epigastric pain for nearly 10 months. A CT done show uterine mass likely fibroid 16. 7 x 19. 5 x 32 cm with possibility of sarcomatous changes and bulky ovaries. The patient underwent total transabdominal hysterectomy and bilateral salphingo-oophorectomy. The pathological features were consistent with fumarate hydratase (FH) deficient leiomyoma. Immunohistochemistry results demonstrated FH deficiency. Genetic testing revealed a somatic pathogenic FH variant (Heterozygous, c. 956_957insTGA, p. Asp319dup).

Conclusions:
This case is presented to underscore the importance of recognizing atypical presentations, which rely heavily on the pathologist's skill in identifying unique histopathological features and overcoming the challenges of differential diagnosis. Once these features are detected, referral to a gynecologist for potential germline genetic testing should be considered. Effective management of FH-related uterine fibroids demands a collaborative, multidisciplinary approach, including comprehensive genetic screening and continuous monitoring.

Key Words: Fumarate hydratase-deficient leiomyoma; Fumarate hydratase; Leiomyoma;

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Endocrinological Complications In A Child Small For Gestational Age With Review Of The Literature: A Case Report

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CASE REPORT

Background:
Children born small for gestational age (SGA), preterm, and as part of a twin gestation are at higher risk for endocrinological complications, including under-virilization, short stature, and precocious puberty. SGA is defined as a birth weight and/or length below the 10th percentile for gestational age. This report describes a 12. 5-year-old male referred to paediatric endocrinology at 45 days of age for SGA and under-virilization, later developing precocious puberty.

Case Summary:
A male born preterm at 36 weeks as part of a twin pregnancy presented with SGA (birth weight 1. 6kg). Neonatal history was unremarkable, and maternal hypothyroidism was well-controlled. At 45 days, he presented with bilateral inguinal hernias, pigmented scrotum, a palpable left testis, and an empty right scrotum. Penis size was 1. 5–2cm, weight 2. 68kg (-2. 02 SD), and height 46 cm (-3. 6 SD). Endocrine evaluation showed normal 17-hydroxyprogesterone levels (16–39 nmol/L), a testosterone-to-dihydrotestosterone ratio of 1: 2. 9, and normal luteinizing hormone and follicle-stimulating hormone levels (3. 1 and 1. 7 IU/L). Elevated aldosterone (4655 pmol/L) was noted, but the ACTH stimulation test showed normal cortisol levels (452 to 1059nmol/L). HCG stimulation doubled testosterone from 3. 5 to 6. 8 nmol/L. Imaging revealed bilateral inguinal hernias and testicular sizes of 1. 05×0. 58cm (right) and 0. 83×0. 54cm (left), with no female genitalia. Normal karyotype excluded chromosomal abnormalities. Diagnosed with isolated under-virilization, he began intramuscular testosterone therapy. At 9 years, he presented with short stature and precocious puberty. Weight was 33kg (0. 502 SD), height 30. 4cm (-1. 039 SD), BMI 19. 4 (+1. 396 SD), and Tanner stage 2 puberty was noted, with left testicular volume of 6mL and no palpable right testis. Brain MRI excluded pituitary abnormalities. Treatment included growth hormone for short stature and GnRH agonist (Leuprolide) for pubertal progression.

Conclusions:
This case illustrates the challenges of diagnosing and managing isolated under-virilization with a normal karyotype. It underscores the importance of early intervention, personalized endocrinological care, and routine monitoring. Tailored surveillance may benefit patients at increased risk of similar presentations.

Key Words: Isolated under virilization; Precocious Puberty; Small for gestational age (SGA);

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CRYOABLATION FOR PEDIATRIC ATRIAL FLUTTER WITH SINUS NODE DYSFUNCTION IN A 2-YEAR OLD PATIENT

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CASE REPORT

Background:
A 16-month old female toddler, product of non-consanguineous marriage, with no past medical history, was referred to our center for bradycardia. She was clinically asymptomatic except for poor growth consistent with weight and height below the third percentiles. Echo revealed small atrial septal defect but is otherwise normal. Holter showed atrial flutter with variable degrees of block with heart rate between 53-150 bpm. Over a year, the patient was on sotalol the dose of which was frequently adjusted for SAN and AVN nodal dysfunction, and she was electrically cardioverted 4 times for recurrent AFL. The F-wave morphology was variable over time. Her ECGs also exhibited, when she was not in flutter, junctional and ventricular escape rhythms with retrograde conduction. Ultimately, cryoablation of the CTI was performed and followed by resolution of AFL.

Case Summary:
SND often coexists with atrial tachydysrhythmias, as one can worsen the other through atrial electroanatomic remodeling. There may also be underlying genetic factors, including SCN5A or HCN mutations. Bradycardia can enhance atrial ectopy, while prolonged tachycardia can cause fibrosis and prolong flutter cycles. Restoring NSR is preferred over rate control in AFL, as it improves symptoms and reduces thromboembolic risk. For patients with both SND and AFL, pharmacologic treatment may cause asymptomatic bradycardia, making pacemaker placement or ablation more effective. RFA is associated with higher complication rate in children under 4 years or weighing less than 15 kg. Cryoablation provides safer lesion formation with reduced risk of local complications and is effective for complete block in AFL despite slightly higher likelihood of requiring repeat ablation.

Conclusions:
Medical management for concomitant conduction disease with AFL is challenging with concerns for asymptomatic bradycardia. Catheter is the ideal option, with cryoablation being favored in patients younger than 4 years or weigh less than 15 kg.

Key Words: Pediatric atrial flutter; Cryoablation ; Tachycardia-Bradycardia Syndrome ;

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A case study of persistent cloaca with endocrinological manifestations of rare variants of Salt-Losing Congenital Adrenal Hyperplasia Versus Transient Pseudohypoaldosteronism

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CASE REPORT

Background:
Persistent cloaca is a complex congenital anomaly of the urogenital system where there is one opening to the outside that leaves the child severely impaired in the urological, gastrointestinal and reproductive system thus, its coincidence with CAH a disorder of cortisol biosynthesis that requires lifelong hormonal support . The aim of this case report to report on a patient that is suspecting to have a rare variant CAH or transient pseudohypoaldosteronism based on the clinical findings, hormonal profiles and endocrine studies.

Case Summary:
This is a 5-month old girl infant who presented Jaber AL-Ahmad Hospital with persistent cloaca, now presenting with UTI, adrenal crisis and electrolyte disturbance. She was born at term by spontaneous vaginal delivery and weighed 3. 35 kg. She had colostomy and vesicostomy performed for persistent cloaca. Her clinical course has been complicated by recurrent UTI and bilateral hydronephrosis. She had an adrenal crisis during previous admission, where in she was treated with stress dose hydrocortisone and recent admission for fever and was confirmed to have UTI due to multi-drug-resistant pseudomonas. Laboratory findings revealed leukocytosis, increased inflammatory markers, metabolic acidosis and electrolyte disturbance. Hormonal analysis including 60 minutes ACTH stimulated cortisol 1483nmol/l,androstenedione13. 2nmol/L ,DHEA-S 21. 2µmol/L, testosterone 3nmol/l and17 hydroxyprogestrone 47. 2nmol/l raised the suspicion for a rare variant of CAH. Examinations showed ambiguous external genitalia with fused labia majora and a single opening for the anal orifice. Case management required a multidisciplinary team consisting of pediatric endocrinology, nephrology and urology. The hormone replacement treatment was personalized depending on the stabilization of the adrenal axis and prevention of recurring crisis.

Conclusions:
The present case represents the diagnostic dilemma and the therapeutic difficulties of rare variants of CAH or transient pseudohypoaldosteronism in association with persistent cloaca. The integration of hormonal regulation, infection control and surgical interventions underlines the need for a multidimensional approach in such cases.
Acknowledgments:
We would like to extend our appreciation to the pediatric endocrinology, nephrology, and surgical teams in Ibn Sina and Jaber AL-Ahmad Hospital for their cooperation in taking care of this case. Many thanks to the family for their compliance with treatment and follow-up.

Key Words: Ambiguous genitalia; |Hypoaldosteronism; Disorder of six differentiation;

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Post Covid-19 Dermatomyositis – A Case Report

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CASE REPORT

Background:
Dermatomyositis (DM) is an inflammatory myopathy, a relatively rare autoimmune disease that causes symmetrical and predominantly proximal muscle weakness in the limbs and skin lesions. Its prevalence increased during the coronavirus disease-2019 (COVID-19) pandemic. Viral infections are known to trigger autoimmune diseases, and COVID-19 has been known to exacerbate preexisting autoimmune diseases and trigger various autoantibodies and autoimmune disease occurrences.

Case Summary:
Here we report a case of a 40-year-old Kuwaiti female patient, without any previous history of illness, including autoimmune diseases, who developed Covid-19 infection in October 2022. This was followed by generalized body pain and extreme fatigue. These symptoms were attributed to "Long COVID". In May 2023 she developed skin rashes and laboratory investigations revealed elevated CK level (8281U/L) and positive Antinuclear antibodies (1: 2560). She was diagnosed with Dermatomyositis and was started on immunosuppressant medications (Azathioprine and Prednisolone). However, her condition deteriorated further, and she presented to the Emergency department with shortness of breath, difficulty in swallowing, and muscle weakness. She was admitted to the hospital and received intravenous methylprednisolone and intravenous immunoglobulin therapy. Her symptoms improved and she was referred to Physical Medicine and Rehabilitation Hospital for Rehabilitation in June 2023. On admission, she was found to have poor to fair voluntary control in the limbs, proximal muscles were weaker than distal with tenderness in the muscles. She needed mild assistance for bed mobility, moderate assistance for getting up from a low level, and could walk only indoors for short distances with an unsteady gait. She also needed help with grooming and showering. She received an intensive rehabilitation program after which her strength and endurance improved. She was able to walk outdoors, stopped using a wheelchair for long distances, and also became independent in Instrumental activities of daily living.

Conclusions:
The association between COVID-19 and the development of multi-system autoimmune disorders remains unclear. However, this case report demonstrates that doctors should be aware of the possibility of Covid sequelae and investigate any new or worsening symptoms in their patients.

Key Words: Dermatomyositis; Covid-19 ; Rehabilitation;

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Splenic Artery Aneurysm in A Primigravida

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CASE REPORT

Background:
Splenic artery aneurysm (SAA) is the third most common true aneurysm occurring in the abdomen after aortic and iliac artery aneurysms. SAA are more common in women, with a female to male ratio of 4: 1. It is most common in the sixth decade of life. Around one third of patients with SAA have other intraabdominal aneurysms [4]. Mortality in case of rupture is 25% and 75% among pregnant women, with fetal mortality of 95%.

Case Summary:
22-year-old female primigravida 26 weeks of gestation with insignificant past history presented to the emergency department with sudden severe right upper quadrant (RUQ) pain. Physical examination and baseline investigations were unremarkable. Abdominal ultrasound done and revealed SAA around 2 cm with no evidence of extravasation or leaking as shown in Figure 1 thus urgent vascular consultation was sent and advised for further imaging with contrast to rule out leak. The patient became vitally unstable she was given dexamethasone and a loading dose of magnesium sulphate as she was shifted to operating theater and exploratory laparotomy was done and ruptured splenic artery noted with hemoperitoneum approximately around 1. 5 litters and splenectomy done. During her hospital stay the patient was managed by a multidisciplinary team (MDT). The patient was discharge from the hospital and was followed up routinely in the antenatal clinic according to hospital protocol. The patient was admitted when she was 41 weeks, admitted for induction of labor (IOL). However, due to failure to progress, emergency cesarean section with good outcome.

Conclusions:
The prevalence of SAA in women in childbearing age is 0. 1% [4]. Parity, seems to influence the incidence of SAA in women, being four times more common in multiparous women [5]. In pregnancy, influence of hormones namely progesterone and relaxin on the arterial wall leading medial degeneration, increased elasticity and aneurysmal dilatation [6-7]. The incidence of rupture of the aneurysm during pregnancy increases with each trimester [9]. Prompt surgical intervention in pregnant patients with SAA is recommended to regardless of the presence of symptoms or size to minimize the risk of rupture and the associated morbidity and mortality [4]. Management options laparotomy or laparoscopy. In Conclusions SAA should also be a differential diagnosis in women presenting with sever preeclampsia due to the effects of high blood pressure on circulation of blood and vascular integrity.

Key Words: Splenic artery aneurysm; Splenic artery aneurysm in pregnant population; Splenic artery aneurysm in primigravida;

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LINX Reflux Management System: A Novel Solution for the Treatment of Gastroesophageal Reflux Disease

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CASE REPORT

Background:
The LINX Reflux Management System is a magnetic Sphincter augmentation device, which is implanted around the esophagogastric junction to mechanically augment the function of the lower esophageal sphincter for the treatment of gastroesophageal reflux disease. The LINX is an alternative to the fundoplication operation for gastroesophageal reflux disease (GERD) as well for post Sleeve gastrectomy Reflux, that was approved by the U. S. Food and Drug Administration (FDA) in 2012. The LINX device is a titanium-beaded bracelet with a magnetic clasp placed around the LES. Review of published studies for the last 10 years suggests that LINX is safe with no reported deaths and a 0. 1% rate of perioperative complications. Long-term efficacy of LINX appears good for typical GERD symptoms with improved GERD symptoms achieved in 85-88% at 3-5 years. Early dysphagia within the first few weeks is common at about 70% which resolves in most patients. Based on very limited literature, erosion can be successfully treated with explanation.

Case Summary:
We report our short-term experience with the LINX system. A 53-year-old female patient presented with history of GERD for 2 years duration, associated with persistent cough. BMI= 28 Los Angeles score C/D (sever reflux esophagitis in Endoscopy) Demeester score < 14. 7. The medical treatment has failed. The procedure was uneventful and patient was discharged next day in a stable general condition tolerating oral intake.

Conclusions:
Magnetic sphincter augmentation (MSA) is an alternative option to fundoplication when medical management fails. it is a safe and an effective treatment for GERD with short-term outcomes comparable to the more technically challenging and time-consuming fundoplication. Long-term comparative outcome data past 1 year are needed in order to further understand the efficacy of this novel technique.

Key Words: Magnetic Sphincter Augmentation; Reflux; Fundoplication;

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