Oman Medical Specialty Board Research Forum 2024/2025: Abstracts

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ANATOMICAL PATHOLOGY

Immunohistochemical Study of PD-L1 Expression in Molar P0regnancies

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ABSTRACT

Objectives: Hydatidiform moles (HMs) are classified as part of the gestational trophoblastic disease and can be categorized as either complete HM (CHM) or partial HM (PHM). The distinction between these types is made only after histopathological examination. The interaction between programmed cell death-1 (PD-1) and its ligand (PD-L1) is one of the most important immune checkpoints, which can be used by the trophoblast cells. We use the tissue microarray technique to investigate the expression of PD-L1 using immunohistochemistry in HMs and in normal trophoblastic tissues, including products of conception and placentas. ***Methods***: Tissue microarrays were constructed using the archival material of HMs (PHM and CHM) and control samples of normal trophoblastic tissues, such as products of conception and unremarkable placentas. All cases were collected from Sultan Qaboos University Hospital and Khoula Hospital between 2007 to 2018. Sections were immunohistochemically stained using antibodies against PD-L1. The staining was assessed semi-quantitatively based on the intensity and percentage of the positive cells in different cellular components (trophoblasts and stromal cells). ***Results:*** A total of 240 HMs (130 PHM and 110 CHM) and 240 control samples were included in the study. PD-L1 was highly expressed in the syncytiotrophoblast of PHM compared to CHM with a PD-L1 score of 4 (p = 0.003). The cytotrophoblast cells show less expression of PD-L1 compared to syncytiotrophoblast of the same cases with a PD-L1 score of 3 (p = 0.002). Control cases show less expression of PD-L1 in both syncytiotrophoblast and cytotrophoblast cells. Cases of HMs with progressed human chorionic gonadotropin (HCG) levels show high expression of PD-L1 compared to the regressed cases of HCG levels. ***Conclusions:*** Increased expression of PD-L1 in the syncytiotrophoblast cells, particularly in the progressed cases, indicates its vital role in the malignant behavior of these types of neoplasms. Our findings shed light on the usefulness of immune checkpoint inhibitors in treating gestational trophoblastic neoplasms.

ANESTHESIA

Association of Leuko-glycemic Index with Immediate Postoperative Events After Repair of Complete Atrioventricular Septal Defect in Infants with Down Syndrome

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ABSTRACT

Objectives: The primary objective of this study was to evaluate the association between postoperative leuko-glycemic index (LGI) and the duration of prolonged mechanical ventilation. Additionally, we aimed to determine the cutoff value of LGI if such an association is found. ***Methods***: This ambidirectional cohort study was conducted at the National Heart Center, a single tertiary cardiac care center, from January 2021 to December 2023. Pediatric patients with Down syndrome who underwent complete atrioventricular canal correction over 36 months were included. The demographic and cardiopulmonary bypass data, preoperative LGI, postoperative LGI measured at the time of admission to the intensive care unit (ICU), vasoactive inotropic score upon admission to the ICU, postoperative lactate values, duration of mechanical ventilation, ICU stay, total hospital stay, need for non-invasive ventilation, duration of vasopressor administration, and the incidence of renal failure postoperatively were obtained. The incidence of mortality after the surgery was also recorded. ***Results:*** A total of 112 patients were included; however, only 104 patients completed the study. Postoperative LGI was significantly elevated compared to the preoperative values (p = 0.001). A multivariate analysis showed that an elevated postoperative LGI was an independent predictor of a mechanical ventilation duration > 24 hours and renal failure. The area under the curve showed a postoperative LGI value of > 1640.16 was a predictor of a mechanical ventilation duration of > 24 hours, while a

value of > 2657.88 was a predictor of stage 1 renal failure. ***Conclusions:*** The LGI is a simple index available in any ICU, easy to calculate, and inexpensive. It may serve as a valuable prognostic tool for stratifying children in the immediate postoperative period following complete atrioventricular canal defect correction. Patients with elevated LGI values may benefit from closer monitoring and early therapeutic strategies to reduce the risk of prolonged mechanical ventilation duration and acute kidney injury.

Diaphragm Thickness Fraction as a Predictor of Weaning Mechanically Ventilated Patients: A Prospective Observational Study

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ABSTRACT

Objectives: Most patients can discontinue mechanical ventilation once the underlying illness is resolved. However, deciding the optimal time for extubation is important, as premature extubation can increase mortality and morbidity. The predictors of successful weaning are still a topic of debate. Ultrasound assessment of the diaphragm is used to predict weaning outcomes in mechanically ventilated patients. This study aims to evaluate the effectiveness and diagnostic accuracy of diaphragm thickness fraction (DTF) in predicting weaning outcomes in mechanically ventilated patients. ***Methods***: This prospective study was conducted at Khoula Hospital and Royal Hospital between July 2023 and August 2024. It involved adult patients on mechanical ventilation for ≥ 24 hours. After meeting the clinical criteria for weaning, a spontaneous breathing trial was performed. The rapid shallow breathing index (RSBI) was recorded, and a bedside ultrasound of the diaphragm was performed to measure the DTF before extubation. The predictability of the weaning success of DTF and RSBI was assessed by calculating the area under the receiver operating characteristic (AUROC) curve. Noninvasive ventilation or reintubation within 48 hours was considered a weaning failure. ***Results:*** Among the 42 patients studied, 30 (71.4%) patients were successfully weaned from mechanical ventilation. The AUROC values of the right DTF and the RSBI in predicting successful weaning were 0.882 and 0.675, respectively. The best cutoff value for predicting weaning success was identified as a right DTF of > 25%, which demonstrated a sensitivity of 100% and specificity of 83.33 %. ***Conclusions:*** A right DTF assessed by ultrasound with a cut-off value of > 25% is a predictor of weaning outcomes and can be a useful guide for extubation.

BIOCHEMISTRY

Evaluation of Icteric Interference in Clinical Biochemistry Assays

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ABSTRACT

Objectives: This study aims to investigate the interference of elevated bilirubin (icterus) on clinical biochemistry tests and establish a validated dilution protocol to mitigate this interference. We also assess the extent of bilirubin interference across various assays on two platforms (Roche and Siemens) and determine whether a standardized dilution method can minimize this effect. ***Methods***: A laboratory experiment was conducted at the clinical biochemistry laboratory of Royal Hospital and Sultan Qaboos University Hospital. Six serum sample pools were created, each representing a different range of creatinine concentration. Bilirubin solutions were prepared and added to these samples to simulate varying degrees of icterus (ranging from 0 to 1026 µmol/L). Spectrophotometric measurements were taken using two different automated clinical chemistry instruments: Cobas 6000 C501 from Roche and Atellica CH 930 analyzer from Siemens. Statistical analyses calculated the percentage bias (i.e. interference) for each dilution to quantify bilirubin interference. We are currently conducting statistical analyses to design a dilution protocol that effectively mitigates interference for each instrument. Ethical approval was obtained for the research proposal. ***Results:*** Among the 20 analytes tested, bilirubin interference affected four analytes on the Siemens machine: creatinine, sodium, triglycerides, and total cholesterol. On the Roche machine, six analytes were impacted, including creatinine, total cholesterol, triglycerides, sodium, total protein, and gamma-glutamyl transferase. The onset of interference was observed at a bilirubin concentration of 470 µmol/L (spike 4). A dilution protocol is currently being designed based on the statistical analysis, and its validation is ongoing. ***Conclusions:*** Bilirubin caused significant interference in specific spectrophotometric assays, with different analytes affected across the Siemens and Roche instruments. The interference became noticeable at bilirubin concentrations of 470 µmol/L. Ongoing efforts are focused on developing and validating a dilution protocol to reduce interference and to ensure readings remain within the total allowable error. Once validated, this protocol

could help reduce the rejection of icteric samples and improve the accuracy of biochemical measurements in clinical laboratories.

Novel Histopathological Markers of Steroid Resistance in Focal Segmental Glomerulosclerosis

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ABSTRACT

Objectives: Focal segmental glomerulosclerosis (FSGS) is a progressive disease that leads to end-stage chronic kidney disease. This condition results from damage and loss of podocytes. The therapeutic approach requires the administration of steroids to prevent further damage and proteinuria; however, some patients develop steroid resistance, leading to persistent proteinuria. Previous proteomic analyses of urine from steroid-resistant FSGS patients identified potential protein biomarkers. This study aims to assess the prognostic power of novel protein markers for steroid resistance in biopsy samples of FSGS patients. ***Methods***: We collected biopsy tissues from our previous study on steroid resistance, for which data was collected from hospital information systems of Royal Hospital and Sultan Qaboos University Hospital from 2006 to 2020. Patients presented with proteinuria and had biopsy-proven FSGS were included in the study. Patients were identified as steroid-resistant based on persistent proteinuria or double plasma creatinine for > 8 weeks post-therapy. The inclusion criteria for marker selection were previous proteomic evidence, evidence of expression in renal tissue, and availability of commercial providers. Stained slides were quantified for staining intensity using the Fiji tool. A statistical comparison of staining intensity between steroid-resistant and sensitive patients was performed and prognostic odds ratios were reported. A positive control tissue was used to assess the performance of the commercial antibody. ***Results:*** Our cohort consisted of 13 sensitive and 19 steroid-resistance patient samples. We identified eight potential biomarkers for our study. Analysis of neurotrophic receptor tyrosine kinase 1 (NTRK1) was performed, and the antibody showed good performance in stomach tissue as a control. NTRK1 was mainly expressed in tubules with minimum expression in glomeruli. Patients with lower expression of NTRK1 at diagnosis were 92% more likely to develop steroid resistance (OR = 0.08, 95% CI: 0.01–0.89). ***Conclusions:*** We identified NTRK1 as a potential histopathological marker to predict steroid resistance in patients with FSGS.

Diagnostic Accuracy Study of Soluble Transferrin Receptor (Stfr) or Stfr/Log Ferritin Index for the Diagnosis of Iron Deficiency Anemia

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ABSTRACT

Objectives: This study aims to evaluate the diagnostic accuracy of serum soluble transferrin receptor (sTfR) for diagnosing iron deficiency anemia (IDA) in inflammatory conditions. Given the challenge of assessing iron status during inflammation using traditional markers affected by inflammatory processes, sTfR offers a promising alternative. The study focuses on determining sTfR's effectiveness in distinguishing between IDA and anemia of chronic disease (ACD), particularly in Oman, where its usage is not widespread. Additionally, the study assesses the cost-effectiveness of sTfR testing in clinical settings. ***Methods***: The study was conducted at the Medical City for Army and Security Services in Oman from 2021 to 2023. This retrospective study analyzed hospital records to evaluate sTfR's diagnostic utility. Data from patients with anemia and confirmed inflammatory conditions were compared to data from healthy controls. Key parameters included hemoglobin levels, mean corpuscular volume, ferritin, serum iron, transferrin saturation, and sTfR. Statistical analysis involved sensitivity, specificity, positive/negative predictive values, and receiver operating characteristic curve analysis to determine optimal sTfR cut-off values. Exclusion criteria included patients on iron therapy or with recent blood transfusions, with active bleeding, and pregnant ladies. We collected additional parameters, including age, gender, reticulocyte counts, and C-reactive protein levels to assess inflammation. Ethical approval was obtained, and data were securely managed. ***Results:*** The study included 373 subjects divided into four groups: control (n = 60, 16.1%), IDA (n = 93, 24.9%), ACD (n = 105, 28.2%), and IDA with ACD (n = 115, 30.8%). Significant differences were observed in hemoglobin, mean cell volume, ferritin, and sTfR levels across groups ($p < 0.001$). The sTfR cut-off value of 4.7 mg/L demonstrated a sensitivity of 83% and specificity of 82% for distinguishing IDA from controls, with an area under the curve (AUC) of 81.5%. For differentiating IDA from ACD, a cut-off sTfR index of 3.0 showed high sensitivity (91.4%) and specificity (86.8%), with an AUC of 92.3%. These results suggest that sTfR is a reliable marker for diagnosing IDA, even in the presence of inflammation. ***Conclusions:*** The study

supports sTfR as an effective diagnostic tool for IDA in patients with inflammatory conditions, offering superior performance compared to traditional markers affected by inflammation. These findings have significant implications for clinical practice in Oman, suggesting the potential for broader implementation of sTfR testing to improve the accuracy of anemia diagnosis. Per one sample sTfR testing costs 1.8 OMR, compared to the cost of 5.4 OMR for conventional parameters used to diagnose IDA, so having an sTfr test is sufficient and cost-effective.

DERMATOLOGY

The Impact of Dermatological Disease on Quality of Life among Omani Patients: A Cross-sectional Study

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ABSTRACT

Objectives: Research in dermatology has revealed that chronic dermatological conditions significantly reduce the patient's quality of life (QoL). Assessing the impact of chronic dermatological conditions is crucial to enhance overall healthcare and improve patient-reported outcomes in research, clinical practice, and care management. It is essential to measure the subjective effects of these diseases, as medical assessments often fail to fully capture the extensive impact of skin conditions across various domains, given their chronic nature and low mortality rates. This study aimed to assess the QoL and quantify the patient-reported impacts among Omanis visiting the outpatient clinics while identifying the various domains influencing their QoL, specifically the severity of symptoms, psychosocial functioning, and emotional well-being. ***Methods***: A cross-sectional study was conducted among Omani patients visiting the dermatology outpatient clinics at Sultan Qaboos University Hospital, utilizing the Skindex-16 questionnaire. The target sample size was 250 patients attending routine appointments, calculated based on a recent similar study in Saudi Arabia. Various statistical methods were employed to analyze the numerical data, including Student's *t*-test, analysis of variance, Mann-Whitney U-test, and Kruskal-Wallis test. ***Results:*** Out of 278 patients who participated in the study, only 250 completed the questionnaire and 49% of them reported poor QoL with an average score of 31.5. The emotional domain was the most severely affected, averaging 60.9%, followed by symptoms (53.5%) and functioning (38.5%). After adjusting for potential confounders, no significant differences in overall QoL were observed between males and females or across age groups, with a p-value > 0.05 (Pearson Chi-square 0.541). ***Conclusions:*** The study showed a significant impact on the overall QoL among all respondents, with the three tested predictor domains showing effects that were consistent across sex and age groups. Disease experiences are influenced by cultural factors and the severity of disability. In our clinical practice, it is clear that each disease presents a distinct experience, often with varying degrees of impairment. Therefore, we strongly recommend further research focused on specific diseases and developing targeted educational programs for patients at heightened risk of QoL decline.

Evaluation of Satisfaction Level Among Patients Attending Skin Clinics in Muscat Region: A Multi-Center Study

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ABSTRACTS

Objectives: Patient satisfaction holds significant importance and serve as a crucial element in assessing the quality of care. The primary aim was to assess the level of satisfaction among patients attending the dermatology outpatient department in Muscat governorate. Additionally, we sought to identify specific areas that could be enhanced to improve the quality of care provided. ***Methods***: A descriptive cross-sectional study was conducted among 350 Omani patients visiting the dermatology outpatient clinics in Sultan Qaboos University Hospital, Seeb Polyclinc, and Al Khuwair dermatology center in Muscat governorate. Data were collected after obtaining ethical clearance from the Sultan Qaboos University Hospital and Ministry of Health review committees. Patients were selected randomly who visited skin clinics in any of the three mentioned centers. We utilized the Patient Satisfaction Questionnaire-18 (PSQ-18) to assess patient satisfaction. Data were entered and analyzed in Statistical Package for the Social Sciences version 23. The mean score and the standard deviation were calculated. ***Results:*** A total of 350 patients responded to the survey. The overall average score for the 18 items on the perceived quality of care was 3.80 ± 0.49 points. Up to 76% were satisfied or very satisfied with the care they received. All items were statistically correlated with overall satisfaction (p < 0.001). Satisfaction was significantly higher in females (p < 0.05) and those with higher levels of education (university and above, p <

0.05). ***Conclusions:*** The final mean score in the degree of perceived satisfaction was high, showing that satisfaction is closely linked to the qualities and skills of the staff in their relationship with the patient.

Clinical Spectrum of Cutaneous Conditions among Pregnant Patients Attending Dermatology Clinics in Muscat, Oman

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ABSTRACT

Objectives: Pregnancy alters an individual's endocrine, metabolic, and immunological systems, resulting in multiple cutaneous changes, both physiological and pathological. We aimed to study the prevalence of cutaneous physiological changes and both pregnancy-specific and non-specific dermatoses among pregnant patients attending various dermatology clinics and to establish an association between different dermatoses with trimester and gravida. ***Methods***: This is a cross-sectional study of patients attending the dermatology outpatient departments at various dermatology clinics in Muscat, Oman from 2019 to 2023. The detailed history, clinical examination, and investigations were obtained from the patient's electronic records and reviewed. An ethical approval was taken from the Ministry of Health and Sultan Qaboos University, Oman. ***Results:*** Among 570 patients, 38 (6.7%) presented with physiological skin changes related to pregnancy, 66 (11.6%) had pregnancy-specific, and 475 (83.3%) had non-specific dermatoses. The most common physiological change was pigmentary changes (n = 29, 5.1%). Polymorphic eruption of pregnancy affected 34 (6.0%) individuals and was the most common pregnancy-specific dermatosis, followed by atopic eruption of pregnancy (n = 22, 3.9%). Concerning non-specific dermatoses, non-infectious diseases were the most common (n = 382, 67.0%). ***Conclusions:*** Non-specific dermatoses were more common than pregnancy-specific dermatoses and physiological changes. Most patients with pregnancy-specific dermatoses were multigravida and in their third trimester, with polymorphic eruption of pregnancy being the most common. Among the non-specific dermatoses, non-infectious causes were the most common. Further studies are needed to explore the impact of cutaneous changes on pregnant patients and their fetuses.

EMERGENCY MEDICINE

Impact of Timing of Coronary Computed Tomographic Angiography on Outcomes in Patients Presenting with Chest Pain to the Emergency Department. A Retrospective Analysis

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ABSTRACT

Objectives: This study aimed to evaluate the impact of delayed coronary computed tomographic angiography (CCTA) requested before discharge from the emergency department (ED) on the incidence of major adverse cardiovascular events (MACE) in adult patients presenting with presumed low-risk acute chest pain. The study also attempted to identify the clinical predictors of MACE in this population and to assess the incidence of coronary artery stenosis diagnosed by CCTA that required stenting. ***Methods***: This retrospective cohort study was conducted at Royal Hospital, a tertiary care facility in Oman, from January 2018 to September 2023. Inclusion criteria were adult patients (≥ 18 years) presenting with acute chest pain, negative high-sensitivity troponin, no ischemic electrocardiogram changes, and no history of cardiovascular disease. An outpatient CCTA was arranged prior to discharge from the ED. Patients with hemodynamic instability, impaired renal function, contrast allergies, or CCTA completed within 24 hours were excluded. Data were collected from the National Healthcare Information System and analyzed using SPSS software. Ethical approval was granted by the Royal Hospital Scientific Research Committee. ***Results:*** Among 414 consecutive patients, 27 (6.5%, 95% CI: 4.3–8.9%) experienced MACE prior to CCTA. The mean waiting time for CCTA was 94.7 days (SD = 94.91 days), with a median of 73.5 days. Multivariate analysis identified body mass index (BMI) and repeated ED visits as significant predictors of MACE. Each unit increase in BMI was associated with a 9.4% increase in MACE risk (OR = 1.094, 95% CI: 1.013–1.181; p = 0.022), while multiple ED visits for chest pain were linked to a 36-fold increase in MACE risk (OR = 35.807, 95% CI: 10.288–124.625; p < 0.001). Out of 296 patients who underwent CCTA, 40 (13.6%) had significant coronary artery stenosis (≥ 50% luminal narrowing), with 13 (4.4%) requiring revascularization, primarily through percutaneous coronary intervention. ***Conclusions:*** Delayed CCTA for presumed low-risk

acute chest pain patients in the ED was associated with a 6.5% cumulative MACE incidence before the procedure. Higher BMI and recurrent ED visits were independent predictors of MACE. Prioritizing earlier CCTA, particularly for individuals with the described high-risk features, could potentially reduce the incidence of MACE and improve patient outcomes.

The Factors Associated with Delay Presentation of Acute Ischemic Stroke to Emergency Department in Oman

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ABSTRACT

Objectives: Stroke is a leading cause of death and disability. Despite the effectiveness of tissue plasminogen activator (tPA) within 4.5 hours of acute ischemic stroke (IS) onset, many patients arrive at the emergency department (ED) too late for intravenous thrombolysis. This study aimed to identify the factors affecting the timely arrival of acute IS patients to EDs and assessed neurological function at 90 days using the Modified Rankin Scale. ***Methods***: We conducted a prospective observational cohort multi-center study at four hospitals in Oman from September 2022 to December 2023. Participants with acute IS arriving more than 4.5 hours after symptom onset were included. ***Results:*** A total of 512 participants were included with a mean age of 61.96±14.20 years. Among the participants, 65.2% were men, and 37.7% were illiterate. Most were transferred by relatives (62.3%), followed by ambulances (31.8%), and self-transportation (5.9%). The most common symptom was upper limb weakness (67.8%) with a median arrival time of 14.28 hours. Major delays were observed in memory loss (648.17 hours) and visual symptoms (23.52 hours). Shorter arrival times were seen in confusion (8.97 hours) and falls (9.00 hours). Common reasons for delay included lack of awareness of stroke symptoms (36.7%) and not knowing the importance of timely hospital arrival (31.9%). At 90 days, 36.3% had mild disability, 50.0% had moderate to severe disability, and 13.7% died. ***Conclusions:*** Various factors significantly contributed to late hospital arrival. Enhancing public awareness about stroke symptoms and the importance of timely intervention is crucial. Improving emergency response systems is also essential for facilitating early stroke intervention and achieving better outcomes.

ENT

A Retrospective Analysis of Revision Septoplasty at Al Nahdha Hospital Over 10 Years Period

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ABSTRACT

Objectives: We aimed to identify the potential risk factors contributing to the need for revision septoplasty and the revision techniques in Oman. The secondary objective is to address the incidence of revision septoplasty at our institution. ***Methods***: A retrospective cohort study was conducted at Al Nahdah Hospital, the main ear, nose, and throat (ENT) secondary hospital covering patients from all over Oman. Data were collected from the Al Shifa system for patients aged 15–70 attending the ENT department either as inpatients or outpatients between 2010 and 2019. Ethical approval was obtained from the research section of the hospital. ***Results:*** A total of 907 patients were included in the study. Among them, 50 (5.5%) patients required revision surgery. Persistent sites of deviation in revision cases were caudal septum (68%), posterior (6%), mid septum (16%), and multiple sites (10%). Nasal valve collapse was noted in 52% of revision cases. Most revisions were performed using conventional septoplasty (66%), followed by open septorhinoplasty (26%) and closed septorhinoplasty (8%). Surgical techniques used varied, spreader graft was applied in 40% of cases, RFIT in 36%, and other techniques include septal batten graft, septal reinforcement graft, augmentation rhinoplasty, and quilting. Internal nasal valve collapse was found in 31 (62%) revised cases and was not initially examined in 89.5% of primary cases. Statically significant risk factors for revision were allergic rhinitis (OR = 3.167, 95% CI: 1.613–6.218), increased patient age at primary surgery (OR = 1.080, 95% CI: 1.045–1.116), the use of paraffin gauze as nasal pack after primary surgery (OR = 3.162, 95% CI: 1.609–6.216), and interestingly, if primary surgery was performed by a senior surgeon (OR = 1.743, 95% CI: 3.718–7.930). ***Conclusions:*** The incidence rate of revision septoplasty at our institute is similar to the reported rates globally. Careful management of caudal deviation during primary septoplasty is essential to avoid the recurrence of obstruction. A significant number of patients who underwent revision septoplasty had nasal valve collapse that was not investigated during the primary

surgery. Understanding the possible risk factors leading to the need for revision surgery is crucial for patient counseling and surgical planning.

Predictors of Intravenous Calcium Requirements Following Total Thyroidectomy

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ABSTRACT

Objectives: Hypocalcemia is a known morbidity following total thyroidectomy, leading to severe life-threatening complications. In view of the limited studies on the severity of hypocalcemia postoperatively, this study aimed to identify individual risk factors likely to predict the incidence of severe hypocalcemia post total thyroidectomy. ***Methods***: A retrospective cohort study approved by the Medical Research Ethics Committee at Sultan Qaboos University. Patients who underwent total thyroidectomy between 1 January 2016 and 31 January 2020 were included in the study. Risk factors studied include gender, preoperative thyroid status, and preoperative vitamin D or calcium supplementation. Subsequently, intraoperative parathyroid gland reimplantation and malignant pathology following histopathology examination were included. Corrected calcium levels were obtained before surgery, followed by 6 and 12 hours postoperatively. All aforementioned risk factors were compared between patients with mild and severe hypocalcemia following surgery. *P*-values of Chi-square and Fisher exact test were used to estimate the categorical data. The area under the curve was used to study the significance of parathyroid and calcium levels on the development of severe hypocalcemia. ***Results:*** A total of 323 patients underwent total thyroidectomy during the specified period. Hypocalcemia developed in 127 patients (male = 9, female = 118) with age range from 12–79 years. Among them, 14 (11%) patients required intravenous calcium administration. The risk factors were studied using univariate analysis. The majority (n = 81; 63.8%) of total thyroidectomies were performed to treat non-benign etiology. Although 11 females developed severe hypocalcemia, gender was found to be not statistically significant risk factor for developing severe hypocalcemia ($p = 0.061$). The presence of parathyroid tissue in histological specimens regardless of number or reimplantation (0.8%) did not correlate with a severe decline in serum calcium ($p = 0.999$). There was no significant difference between preoperative calcium or vitamin D supplements on postoperative intravenous calcium administration ($p = 0.999$). Hyperthyroidism (3.2%, $p = 0.736$), hypothyroidism (0.8%, $p = 0.999$), and grave diagnosis (11.1%, $p = 0.373$) had no statistically significant association with the development of severe hypocalcemia. ***Conclusions:*** The impact of the individually studied risk factors is not significant in determining the incidence of severe decline in calcium levels requiring intravenous supplements following total thyroidectomy.

FAMILY MEDICINE

The Pattern of Antibiotic Resistance in Cultured Uropathogens in Primary Health Care, Muscat Governorate

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ABSTRACT

Objectives: Urinary tract infections (UTIs) are prevalent conditions frequently encountered in primary health settings, often necessitating empirical antibiotic initiation. However, the escalating global concern of antibiotic resistance demands a prudent and evidence-based approach to prescription practices. This study addresses the imperative of understanding antibiotic resistance patterns in Oman, particularly within primary care. We aimed to investigate the prevalent antibiotic resistance among cultured uropathogens causing UTIs in patients attending primary care centers in Muscat and inform judicious antibiotic use in UTIs. ***Methods***: A cross-sectional retrospective study including adult patients with positive urine cultures from selected primary healthcare centers from 2018 to 2022. Local health centers included were Muscat, Ruwi, North Al Khuwair, Al Hail, Al Amerat, and Quraiyat Polyclinic. All positive urine cultures of the target population were addressed. The patient's data were collected from Al Shifa 3+ system. The data were analyzed using the SPSS program. Ethical approval was obtained from the Center of Study and Research, Ministry of Health, Oman. ***Results:*** A total of 3837 samples from different Wilayat, 528 were analyzed for uropathogen isolation. *Escherichia coli* (64.8%) was the most common pathogen isolated in the urine culture followed by *Klebsiella pneumonia* (10.7%) and *coliform bacteria* (5.5%). Nitrofurantoin was found to have the highest sensitivity to *E. coli* infection (92%) followed by Gentamycin (74%) and TMP-SMX and ciprofloxacin (70%). ***Conclusions:*** Overall *E. coli*

remains a prevalent uropathogen. While TMP-SMX and amoxicillin are not suitable for UTIs, opting for nitrofurantoin in uncomplicated cases can be a cost-effective choice.

Female Genital Mutilation or Cutting among Married Omani Women: Prevalence, Risk Factors, and Association with Sexual Dysfunction, A Cross-sectional Study

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ABSTRACT

Objectives: Female genital mutilation or cutting (FGM/C) is considered a public health issue with a huge concern affecting women of all ages. It is defined as all procedures that involve the partial or total removal of external genitalia or other injury to the female genital organs for non-medical reasons. This study aims to determine the prevalence, risk factors, and association of FGM with sexual dysfunction among married Omani women. ***Methods***: A cross-sectional study was conducted in five randomly selected health centers in Muscat governorate from July 2021 to July 2022. Omani females aged between 20 and 50 years, married, able to read and write, and attending health centers for any reason were included in the study. Those who are very ill, attending emergency services, and/or illiterate were excluded. A written informed consent was obtained from all participants. Statistical analysis was carried out using SPSS version 26. Numbers and percentages were used to estimate the prevalence rate of FGM/C. Categorical and continuous variables were analyzed using the Chi-square test and unpaired *t*-test, respectively. Logistic regression analysis was carried out to mitigate the effects of potential confounders on sexual dysfunction. A *p*-value of < 0.05 was considered statistically significant. ***Results:*** Out of 420 patients, 398 participated in this study with a response rate of 94.8%. Participants were aged 20–50 years old with a mean age of 33.67±6.68 years. The majority of the participants cannot recall the age at which circumcision was performed. Among the participants, 27.6% reported that their daughters had been circumcised, and the majority (53.2%) were circumcised at home by a traditional practitioner. Around 15.6% are planning for future circumcision for their daughters. We found that FGM is a risk factor for sexual dysfunction but statistically not significant (OR = 0.763, 95% CI: 0.485–1.199; p = 0.241). ***Conclusions:*** The current findings revealed a high prevalence of FGM among the Omanis. It has been observed that women who have undergone FGM are more likely to subject their daughters to the same practice. Our research did not establish a significant association between FGM and sexual dysfunction. The high prevalence of FGM highlights a critical gap in awareness and education about its harmful consequences.

Prevalence of Anemia among Omani Infants Attending Well-baby Visits in Muscat Governorate: A Retrospective, Observational, Cross-sectional Study

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ABSTRACT

Objectives: To estimate the prevalence of anemia among Omani infants aged 9–18 months old attending well-baby visits in Muscat, Oman. ***Methods***: A retrospective, observational, cross-sectional study was conducted in Muscat involving thirteen randomly selected local health centers. The target population consisted of infants aged 9 to 18 months who had attended well-baby visits at the selected local health centers between January 2018 and December 2019. Data related to complete blood count, sickling, hemoglobin electrophoresis, and glucose-6-phosphate dehydrogenase levels were retrieved from the infants' medical records. Anemia was diagnosed according to the World Health Organization criteria. Prevalence rates of anemia and related hemoglobinopathies were calculated using frequency tables. ***Results:*** A total of 768 infants were included in the study, of which the majority (61.3%) were male and aged 18 months (86.3%). The overall prevalence of anemia in the population was 50.5% (95% CI: 46.9–54.1%). Overall, 388 (50.5%) infants were anemic, with 289 (74.5%) having mild anemia and 99 (25.5%) having moderate anemia. Furthermore, glucose-6-phosphate dehydrogenase deficiency and sickle cell disease were identified in 27.3% and 5.7 % of the infants, respectively. ***Conclusions:*** The overall prevalence of anemia in the study population was high, underscoring the significance of this condition as a notable health issue among Omani infants in this age group. To improve early identification and timely management of anemia and hemoglobinopathies, integration of screening laboratory test results with well-baby check-up data is recommended. In addition, parents should be made aware of the importance of maintaining sufficient iron in children to prevent the development of iron deficiency anemia.

HEMATOPATHOLOGY

Incidence, Recurrence, and Risk Factors of Venous Thromboembolic Events in Patients with Pancreatic Cancer in Oman: A Retrospective Study

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ABSTRACT

Objectives: Venous thromboembolism (VTE) is a leading cause of morbidity and mortality in cancer patients, with pancreatic cancer being among the most prothrombotic malignancies. Pancreatic cancer patients are classified as having intermediate or high Khorana scores, reflecting a substantial risk of VTE. Despite clinical guidelines advocating prophylaxis for high-risk patients, in Oman, prophylaxis is primarily limited to inpatient settings, using parenteral anticoagulants during hospital admissions. This study aims to evaluate the incidence and recurrence of VTE in pancreatic cancer patients and the risk factors of VTE, assesses the impact of prophylaxis on VTE prevention, and emphasizes the potential benefits of integrating direct oral anticoagulants into routine care. ***Methods***: A retrospective cohort study was conducted at Royal Hospital, analyzing pancreatic cancer cases from 2017 to 2019. Data were analyzed using IBM SPSS version 22, employing descriptive statistics, chi-square tests, and Cox regression analysis to identify predictors of VTE. Ethical approval was obtained from the Royal Hospital Ethical Review Committee, with data anonymized and access restricted to the primary investigator and co-investigators ***Results:*** In this study, 55 pancreatic cancer patients were analyzed to evaluate the incidence, recurrence, risk factors for VTE, and the impact of prophylaxis. The overall incidence of VTE was 29.1%, with a high recurrence rate of 37.5% among affected patients. Patients who received chemotherapy and those with metastases demonstrated a higher incidence of VTE compared to others. Prophylaxis was administered to 40 patients during their inpatient admission, significantly reducing the occurrence of VTE to 17.5% in this group, compared to higher rates observed in patients who did not receive prophylaxis. However, prophylaxis was not extended to outpatient care, leaving a gap in comprehensive VTE prevention. Bleeding complications associated with anticoagulant use were rare, occurring in only two patients. Mortality was notably higher in patients with VTE (81%) compared to those without VTE (17%). ***Conclusions:*** These findings highlight the importance of VTE prevention in pancreatic cancer patients. Extending prophylaxis to include outpatient care and introducing direct oral anticoagulants, could reduce the risk of VTE.

Demographic Characteristics of Ovarian Vein Thrombosis Including Risk Factors and Outcome in Omani Patients: A Retrospective Study

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ABSTRACT

Objectives: This study aims to describe the demographic data and clinical characteristics of Omani patients diagnosed with ovarian vein thrombosis (OVT), identify the risk factors and symptoms at presentation, and determine the diagnostic methods used for OVT. Secondary objectives include assessing the use of anticoagulants, particularly direct oral anticoagulants (DOACs), for OVT and evaluating the patient's outcome. ***Methods***: A retrospective descriptive study was conducted at Royal Hospital (January 2010 to December 2019). A convenient non-random sampling method was used. The inclusion criteria were Omani females of all ages with diagnoses confirmed by radiological imaging. Categorical variables were presented as frequencies and percentages, continuous variables were presented as means and data were analyzed using SPSS version 29.0. ***Results:*** We included 39 female patients with a median age of 39 years (IQR: 19–85). Among them, 53.8% were incidentally diagnosed while 46.2% presented with symptoms. The majority had right-sided OVT (53.8%) followed by left-sided OVT (33.3%) and bilateral OVT (12.8%). Presenting symptoms included abdominal pain (38.5%), fever (5.1%), and gastrointestinal symptoms (2.6%). The primary risk factor was malignancy within six months of diagnosis (38.5%) and recent surgery (25.6%). Other factors included idiopathic (17.9%), pregnancy-related (5.1%), using oral contraceptives (5.1%), and miscarriages (5.1%). Only one patient had a pelvic infection. The diagnosis was primarily via CT scan (87.2%). Four patients had elevated D-dimer (> 0.5 mg/L). Two patients were tested for inherited thrombophilia, two for antiphospholipid, and eight for lupus anticoagulant test. Results were negative, except for one patient with positive lupus anticoagulant. Treatment varied: 35.9% did not receive treatment while others were treated with warfarin, low molecular weight heparin, and unfractionated heparin. None of the patients were treated with DOACs. Anticoagulation duration ranged from less than three months to more than six months, three patients experienced non-significant bleeding. Follow-up was inconsistent; 28.2% of patients had no follow-up and the rest had follow-up with different intervals (less than six months to one year). CT scans were the most commonly used imaging modality during follow-up (48.7%). Only two patients developed pulmonary embolism and one

patient had thrombosis progression, the rest had no complications. ***Conclusions:*** OVT is a rare clinical entity with nonspecific symptoms and is often diagnosed incidentally. Using anticoagulation for the treatment of OVT has been suggested, but no clear guidelines exist. Further prospective, multicenter studies with long-term follow-up are needed to define treatment indications and the role of thrombophilia testing.

INTERNAL MEDICINE

Prevalence of Feeding Difficulties, Survival, and Clinical Outcomes of Enteral Feeding in Advanced Dementia Patients with Feeding Difficulties: A Multicenter Retrospective Cohort Analysis

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ABSTRACT

Objectives: This study aimed to determine the prevalence of feeding difficulties in patients with advanced dementia, assess the frequency of feeding tube insertion, and evaluate the outcomes of feeding tube placement concerning the prevention of aspiration pneumonia, pressure ulcers, tube-related complications, survival, and mortality rates. ***Methods***: A retrospective multicenter study was conducted at two tertiary care centers in Oman. Data were collected from 2010 to 2024 from electronic patient records. The study included 202 patients diagnosed with advanced dementia, defined by the Global Deterioration Scale. Baseline characteristics and comorbidities were recorded, and patients were followed up for one year after either the diagnosis of feeding problems or feeding tube insertion. ***Results:*** The cohort had a median age of 78.5 years (IQR: 72.0–83.0), with 58.9% male. Feeding difficulties were identified in 71.8% of patients. Feeding tubes were placed in 75.9% of these patients, with percutaneous endoscopic gastrostomy being the most common type. The study found that feeding tube placement was associated with a four-fold increase in the risk of death (HR = 4.19; 95% CI: 1.75–10.04, p = 0.001). Conversely, a history of stroke was associated with a reduced mortality risk (HR = 0.356; 95% CI: 0.154–0.82, p = 0.015). Patients with feeding problems had a median survival of 27.6 months compared to 44.1 months for those without feeding problems. No significant differences were observed in aspiration pneumonia or pressure ulcers rates between patients with and without feeding tubes. However, electrolyte imbalances were significantly more common in the feeding tube group (43.40% vs. 11.43%, p = 0.002). ***Conclusions:*** The findings suggest that feeding tube placement in advanced dementia patients is associated with a significantly increased risk of mortality, nearly four times higher compared to those without feeding tubes. In contrast, a history of stroke appeared to confer a protective effect, reducing the likelihood of death. Despite their widespread use, feeding tubes did not confer a survival advantage and were linked to several complications. These results call for a critical re-evaluation of feeding tube use in this population, emphasizing palliative care approaches that prioritize patient comfort and quality of life.

Contrast-associated Acute Kidney Injury Post Coronary Angiography: Incidence, Risk Factors, and Clinical Outcomes

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ABSTRACT

Objectives: Coronary angiography (CAG) is an integral diagnostic and therapeutic strategy in the management of patients with coronary artery disease, especially those presenting with acute coronary syndromes. The procedure carries a risk of contrast-associated acute kidney injury (CA-AKI) defined as a rise in serum creatinine within 48 hours post-CAG, and has a variable incidence and can be associated with serious complications. This study investigates the incidence and predictors of CA-AKI in the Omani population. The study provides a unique opportunity to examine this entity in a population with a high incidence of diabetes and extensive coronary and non-coronary atherosclerosis. We aim to validate the previously described risk factors and explore potential additional risk factors specific to this group. ***Methods***: This is a retrospective, single-center, cohort study of patients > 18 years of age at Sultan Qaboos University Hospital undergoing CAG of various indications. Consecutive patients were enrolled in the catheterization laboratory registry between August 2020 and June 2022. ***Results:*** Out of 369 included patients, 48 (13%) developed CA-AKI and out of those, 8 (2.2%) patients required renal replacement therapy. In multivariate logistic regression analysis, pulmonary edema (OR = 10.9, 95% CI; p <

0.05), peri-procedural hypotension (OR = 1.316, 95% CI; $p < 0.05$), and pre-procedure serum albumin (OR = 1.316, 95% CI; $p = 0.05$) were the only independent risk factors. The results of a receiver-operating curve analysis indicated a serum albumin level of 40 g/L as the optimal cut-off value for prediction of CA-AKI. ***Conclusions:*** The incidence of CA-AKI post-CAG in the Omani population matches the numbers in published literature. Pulmonary edema and peri-procedural hypotension are recognized risk factors, but serum albumin level was only recently published. These independent risk factors align with the current trend of questioning the contrast as the causative agent alone, hence the recent terminology change. This is supported as well by an absent association between contrast volume and development of CA-AKI. Although advanced chronic kidney disease and diabetes mellitus are well-known risk factors, there was no association with the development of CA-AKI in our population.

Effect of Magnesium Supplements in Improving Glucose Control, Blood Pressure, and Lipid Profile in Patients with Type II Diabetes Mellitus: A Systematic Review and Meta-analysis

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ABSTRACT

Objectives: Magnesium is an essential mineral, which is hypothesized to enhance diabetes control by affecting insulin release and other biochemical reactions. Due to the lack of conclusive evidence, we aimed to evaluate the impact of magnesium supplements on glycemic control in patients with type II diabetes mellitus (T2DM). ***Methods***: This is a systematic review and meta-analysis of randomized controlled trials (RCTs) that administered magnesium supplements to T2DM patients. This study is registered in the International Prospective Register of Systematic Reviews [CRD42023454167] and follows the PRISMA 2020 guidelines. ***Results:*** Of the 7487 initially identified studies, 23 RCTs (n = 1345 participants) met the inclusion criteria. The studies showed a low to moderate risk of bias. Magnesium supplements significantly increased serum magnesium concentrations (weighted mean difference [WMD]: 0.69, 95% CI: 0.32–1.06, $p < 0.01$) and reduced fasting blood glucose levels (WMD: -0.58, 95% CI: -0.87 to -0.28, $p < 0.01$). However, the effect on glycated hemoglobin (HbA_{1c}) levels was not statistically significant (WMD: -0.16, 95% CI: -0.32 to 0.00, $p = 0.05$). Subgroup analyses indicated higher efficacy of magnesium in reducing HbA_{1c} levels among participants aged ≥ 65 years and with longer magnesium supplementation duration. Additionally, magnesium supplements were associated with reduced diastolic blood pressure and a potentially positive effect on lipid profile. ***Conclusions:*** Magnesium supplements positively affected serum magnesium concentrations and fasting blood glucose in patients with T2DM. While the reduction in HbA_{1c} was not statistically significant, subgroup analyses suggest potential benefits in specific demographic groups and with prolonged supplementation. The study highlights the importance of considering patient characteristics, magnesium dosage, magnesium salt level, and the duration of intervention in future research on magnesium supplementation for glycemic control in diabetes.

MICROBIOLOGY

The Epidemiology of Brucellosis in Oman: A Seven-year Retrospective Analysis (2017–2023)

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ABSTRACTS

Objectives: Brucellosis is a worldwide zoonotic disease that significantly impacts countries in the Middle East, including Oman. Diagnosing brucellosis is challenging due to the non-specific symptoms and difficulty in interpreting serological test results. This study aims to understand the epidemiology and clinical presentation of human brucellosis in Oman and to assess the reliability of screening tests for the disease. ***Methods***: A retrospective cross-sectional study was conducted among patients diagnosed with brucellosis in Oman over seven years. Two primary datasets were utilized: the first included all notified cases reported to the Ministry of Health from 2017 to 2023, providing a comprehensive epidemiological profile; the second focused on laboratory-confirmed cases from Central Public Health Laboratories and Sultan Qaboos Hospital in Salalah, comparing the cases between the northern and southern governorates of Oman. Data were analyzed for trends and demographic relationships,

with comparative analyses of symptoms and diagnostic performance between the two governorates. Data were analyzed using R Project statistical software. ***Results:*** A total of 3383 brucellosis cases were reported, with 77.2% from Dhofar and 22.8% from the northern governorate. Males were predominantly affected in both governorates. In the north, the 30–39 age group accounted for the highest cases. In the south, the most significant proportions were found in the 0–9 and 30–39 age groups. Fever and body aches were the most common symptoms in both areas, with fever reported in 82.3% of cases in the south and 64% in the north. Body aches were also more frequent in the south (64%) than in the north (52.1%). However, complications such as spondylodiscitis were more prevalent in the north, affecting 14.8% of cases compared to 5.4% in the south. Diagnostic accuracy for brucellosis varied significantly across the tests used, indicating both strengths and limitations in identifying true cases. ***Conclusions:*** The findings showed notable regional and demographic differences in brucellosis cases, with a higher prevalence in Dhofar compared to the northern governorates. The results support the importance of ongoing surveillance and targeted public health strategies to improve the diagnosis and management of brucellosis in both endemic and non endemic areas.

OBSTETRICS AND GYNECOLOGY

Incidence, Risk Factors, and Neonatal Outcomes Associated with Early Preterm Birth Compared to Late Preterm: Retrospective Cohort Study at Tertiary Hospital, Sultan Qaboos University Hospital

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ABSTRACT

Objectives: The World Health Organization defines preterm birth as any birth that takes place before 37 completed weeks of gestation. It is a global epidemic and a major contributor to neonatal morbidity and mortality. This study assesses the incidence, risk factors, and neonatal outcomes associated with early preterm births compared to late preterm births among Omani females. ***Methods***: A retrospective comparative cohort study was conducted at Sultan Qaboos University Hospital in Oman from January to December 2022, with ethical approval from the Sultan Qaboos University ethics committee. Data were gathered from the TrakCare system and delivery registry books. The study compared early and late preterm births with various risk factors. Women with incomplete data, multiple pregnancies, chromosomal or congenital anomalies, and those who delivered outside the hospital were excluded from the study. The analysis was conducted using the SPSS version 29, and statistical significance was assessed using Chi-square tests and *t*-tests, with $p < 0.05$ considered significant. ***Results:*** In our study group, the incidence of early preterm births was 2.7%. We identified various risk factors for early preterm birth, including extremes of body mass index ($p = 0.001$), placenta abruption (10.7% vs 2.2% for control; $p = 0.003$), short cervical length (17.9% vs 4.8% for control; $p = 0.001$), oligohydramnios (17.9% vs 4.8% for control; $p = 0.001$), severe preeclampsia (15.7% vs 6.2% for control; $p = 0.012$), and maternal infection (38.1% vs 24.7%; $p = 0.023$). Moreover, we found that early preterm birth was associated with neonatal mortality and morbidity with $p < 0.001$. ***Conclusions:*** The current study indicated that various socio-demographic, nutritional, and obstetric risk factors are linked to early preterm birth. Modifying these risk factors and implementing timely interventions could help reduce preterm births rates and related morbidity and mortality.

OMFS

Long-term Correlation Between Anatomical and Functional Outcomes Following Non-surgical Management of Unilateral Mandibular Condyle Fracture

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ABSTRACT

Objectives: This study aims to assess the correlation between anatomical and functional outcomes in the close and conservative management of unilateral mandibular condyle fracture. ***Methods***: Using an ambi-directional cohort study, the trauma census of patients treated in Al Nahdha Hospital from 2014 to 2021 was reviewed. Patients who met the inclusion criteria were identified and their hospital records including orthopantomograms were collected and analyzed. Functional outcomes were assessed using the Helkimo index for the clinical dysfunction scoring system. We developed a scoring system for radiographic assessment that compared the shape, height, and location of the fractured condyle against the healthy condyle in relation to the glenoid fossa. Both functional and radiographic outcomes were assessed one-year post operatively. A Chi-square test was used to assess the correlation between the functional outcome and radiographic changes. ***Results:*** Out of

41 patients who met the inclusion criteria, 32 patients consented to be included in the study. Thirty-one (76%) were treated conservatively while 10 (24%) underwent intermaxillary fixation (IMF). According to the Helkimo Anamnestic index assessment, among 32 patients, 20(62%) patients reported no symptoms, eight (25%) had mild symptoms and four (13 %) had severe symptoms. On the dysfunction index assessment, 16 (50%) patients had no dysfunction, eight (25%) had mild dysfunction, five (16%) had moderate dysfunction, and three (9%) had severe dysfunction. The radiographic assessment showed that 15 (46%) patients had no radiographic changes between healed fractured condyle and healthy condyle, 12 (38%) had mild changes and five (16%) had severe changes. A Chi-square test concluded that there was a statistically significant difference between radiographic and functional outcomes. ***Conclusions:*** This study shows that there is no correlation between radiographic changes and functional outcomes in close and conservative management of unilateral mandibular condyle fractures.

Effectiveness of Advanced Platelet-rich Fibrin Plus After Extraction of Impacted Mandibular Third Molar: A Randomized Single-blind Clinical Study

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ABSTRACT

Objectives: To evaluate the efficacy of Advanced Platelet-rich Fibrin Plus (A-PRF+) in reducing post-operative pain and improving recovery outcomes following impacted mandibular third molar extraction. ***Methods***: A randomized, single-blind clinical study was conducted at the Armed Forces Hospital in 2023. Patients requiring impacted mandibular third molar extraction were randomly assigned to either the A-PRF+ or control group. Post-operative pain was assessed using a numerical rating scale from day 1 to day 7. Secondary outcomes included total ibuprofen consumption, swelling, and mouth-opening limitation. Statistical analysis used the comparison of means with 95% confidence intervals ($p < 0.05$). ***Results:*** The A-PRF+ group showed significantly lower pain scores throughout the follow-up period. Peak pain scores were lower in the A-PRF+ group (4.39; 95% CI: 3.95–4.83) versus control (6.39; 95% CI: 5.81–6.96) on day 1 ($p < 0.001$), with day 7 levels reaching 0.08 (95% CI: -0.04–0.20) versus 1.58 (95% CI: 0.96-2.21), respectively ($p < 0.001$). Total ibuprofen consumption was significantly reduced in the A-PRF+ group (7.81 tablets; 95% CI: 6.60-9.01) compared to control (13.33 tablets; 95% CI: 11.66–15.01; $p < 0.001$), representing a 41.4% reduction. Post-operative swelling measurements showed initial comparable values at day 2 (A-PRF+: 2574.08, control: 3508.20 square units; $p = 0.204$), but significantly lower values in the A-PRF+ group by day 7 (760.69 vs. 1507.01 square units; $p = 0.001$), representing a 49.52% reduction. Mouth opening showed no significant differences between groups. ***Conclusions:*** This randomized clinical trial demonstrates that A-PRF+ significantly reduced post-operative pain, analgesic consumption, and late-phase swelling following impacted mandibular third molar extraction. The significant reduction in facial swelling at day 7, combined with consistent pain control and decreased analgesic use, suggests that A-PRF+ effectively improves post-extraction recovery outcomes. Multi-center trials would be valuable in establishing optimal clinical protocols.

Plaque Removal to Disclose or Not to Disclose: A Single-blinded Randomized Controlled Clinical Trial

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ABSTRACT

Objectives: This study aims to assess the effectiveness of plaque disclosing agent (PDA) in professional plaque removal and to evaluate the total procedure time with and without the use of PDA. ***Methods***: The study was conducted at the Military Dental Center between February 2023 and November 2024. Patients were selected and randomized into two groups. The intervention group received a professional plaque removal session with the PDA, while the control group did not use the PDA as a visual aid. The residual plaque was evaluated by re-applying the PDA and recording the plaque score. The total procedure time was recorded for the procedure conducted with or without the PDA. ***Results:*** Sixty-eight patients were divided into intervention and control groups. A statistically significant difference was observed between the two groups. The intervention group achieved a mean residual plaque surface of 5.1% (3.2–6.9) compared to 8.0% (6.2–9.8) in the control group ($p = 0.026$). The treatment duration also showed a statistically significant difference with 43.6±4.3 min and 51.2±7.3 min in the intervention and control groups, respectively ($p < 0.001$). ***Conclusions:*** The PDA is an effective and efficient tool for improving plaque removal procedures.

Analysis of the Oral and Maxillofacial Histopathology Services at a Tertiary Centre in Oman

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ABSTRACT

Objectives: To study the proportion of different types of histopathological examination diagnoses in oral and maxillofacial total biopsies for patients who attend relevant clinical departments, and where biopsies were taken as part of their treatment plan. ***Methods***: The cross-sectional study involves a review of the patient records that underwent histopathological examinations performed at the Dental and Maxillofacial Surgery Department of Al Nahdha Hospital, a tertiary center in Oman. The study was conducted from January 2010 to December 2022. The sample size was calculated with a margin of error set at 5% with a 95% confidence interval. Patient demographics, anatomical locations of the conducted specimens, and histological diagnosis were analyzed, along with a functional period of the histopathological specimen outcomes. Urgency marking was also taken into consideration for all included biopsies. Statistical data analysis was performed using SPSS version 22. Ethical approval was granted by the research subcommittee.
Results: A total of 512 cases were investigated. Reactive or adaptive lesions accounted for the largest percentage (n = 103; 20.1%), followed by odontogenic cystic lesions (n = 84; 16.4%), salivary gland diseases (n = 70; 13.7%), inflammatory lesions (n = 152; 29.7%), and immune dysfunction lesions (n = 48; 9.4%). ***Conclusions:*** Current study findings offer an important insight into the frequency of oral and maxillofacial lesions in Oman. The most commonly diagnosed disorders were reactive lesions. Most soft tissue lesions in oral and maxillofacial biopsies were benign and had an inflammatory origin. Further research is required to improve future oral health policy.

OPHTHALMOLOGY

Transepithelial versus Conventional Photorefractive Keratectomy. Visual Recovery, Spherical Aberration and Densitometry: A Randomized Control Trial

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ABSTRACT

Objectives: This study aims to compare postoperative pain, photophobia, corneal epithelial healing, visual acuity, spherical aberration, and corneal haze (densitometry) between transepithelial photorefractive keratectomy (tPRK) and conventional manual PRK (mPRK). ***Methods***: A prospective, single-blinded randomized controlled trial was conducted at Armed Forces Hospital, Muscat. Participants were randomly assigned to undergo either tPRK or conventional mPRK. Postoperative pain and photophobia were evaluated using a 0 to 10 scale, while corneal healing was assessed through clinical examination. Distance visual acuity was measured, and Pentacam© was used to analyze spherical aberration and corneal densitometry. Baseline parameters were recorded preoperatively, with follow-up visits conducted on days one, four, and eight, and at first, third, and sixth months postoperatively. ***Results:*** A total of 79 patients (158 eyes) were included in the study, with each group comprising 79 eyes. Both groups showed similar pain levels over the eight-day postoperative period, except on the day of surgery, where the tPRK group reported significantly higher pain levels than the conventional mPRK group (median pain score 7.0 vs. 5.0; $p = 0.004$). There were no significant differences in photophobia between the two groups ($p > 0.05$). Epithelial healing was faster in the tPRK group, with 67.1% of eyes achieving complete healing by day four, compared to 36.7% in the mPRK group ($p < 0.001$). Visual acuity outcomes were similar in both groups over the six-month follow-up, except at the first-month visit, where the tPRK group demonstrated better-uncorrected distance visual acuity (1.0 vs. 0.9; $p = 0.029$). Spherical aberration increased significantly in the tPRK group at the sixth-month postoperative visit (0.469 vs. 0.322; $p < 0.001$). Densitometry values did not show significant changes over the six months in either group, though a slight increase was observed at the first-month visit, with a more pronounced rise in the mPRK group. However, this difference was statistically insignificant. ***Conclusions:*** The tPRK offers comparable visual outcomes with faster epithelial healing to mPRK, although it may result in higher initial postoperative pain and increased spherical aberration.

Efficacy and Safety of Micropulse Transscleral Cyclophotocoagulation on Glaucoma among Omani Patients at Tertiary Care

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ABSTRACT

Objectives: This study aimed to evaluate the effect of micropulse transscleral cyclophotocoagulation (MP-TSCPC) on intraocular pressure (IOP) among Omani patients with glaucoma. ***Methods***: A retrospective cohort study including all patients who underwent MP-TSCPC at Al Nahdha Hospital under local or general anesthesia from 2017 to 2023. Patients with major missing data related to the outcomes were excluded from the study. All patients had at least one year of follow-up after the procedure. ***Results:*** A total of 96 eyes of 96 patients, males and females with various types of glaucoma at different stages, were included in this study. The primary outcome revealed significant improvement in IOP among the patients over time. The most significant decrease in IOP occurred on day 1 post-treatment, with a baseline median IOP value of 27.0 dropped to 18.0 ($p < 0.001$). Subsequently, IOP significantly remained low from one-month post-treatment to one year of follow-up, with a median IOP between 17.0 and 18.0. The study also showed a significant reduction in the number of IOP-lowering medications over time, mainly in the first-week post-treatment. The median number of medications dropped significantly from 4.0 at baseline to 3.0 at one-week post-procedure ($p < 0.001$) and remained around 3.0 medications across time with some variations. The median baseline best corrected visual acuity was 0.10 and almost constant after 12 months post-procedure ($p > 0.05$ for all comparisons). We also studied the side effects profile of the treatment and the most common side effect observed was IOP spike, which occurred in 12.5% of the study sample, followed by hypotony (7.3%), persistent anterior chamber reaction (6.3%), and phthisis bulbi of (1%). However, no patient suffered scleral thinning or cystoid macular edema. ***Conclusions:*** Our study results demonstrated that MP-TSCPC is a safe and effective treatment option for lowering IOP and can stabilize the IOP until 12 months after treatment. MP-TSCPC is also effective in reducing the number of IOP-lowering medications.

Long Term Efficacy and Safety of Trabeculectomy with Mitomycin C in Adult Omani Patients with Open Angle Glaucoma

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ABSTRACT

Objectives: To study the efficacy of trabeculectomy with mitomycin C (MMC) in lowering intraocular pressure (IOP) and to determine and compare the efficacy in reducing the number of anti-glaucoma medications between preoperative and postoperative. We also aimed to study the incidence of complications after trabeculectomy procedures and the need for postoperative interventions. ***Methods***: This retrospective cohort study includes all Omani patients who underwent the procedure from 2015 to 2023 at Al Nahdha Hospital. The inclusion criteria were phakic, age ≥ 40 years, with open-angle glaucoma, and those who underwent trabeculectomy with MMC operated by the same surgeon. The exclusion criteria were pseudophakia, aphakic, angle-closure glaucoma, and age < 40 years. Informed consents were obtained from all patients. Patients' data was collected from the Al Shifa system and was statistically analyzed. ***Results:*** A total of 40 eyes underwent trabeculectomy with MMC. The mean IOP decreased from 23.50 ±6.9 preoperatively to 13.9±4.2, 14.58±4.8, 14.26±3.9, and 13.67±5.007 mmHg in 1st, 3rd, 5th, and 7th years, respectively, in postoperative visits. With a complete success rate defined as an IOP level of < 18 mmHg without medications, a success rate of 60 % was obtained in the 1st year following trabeculectomy. For the qualified success rate defined as < 18 mmHg IOP level with or without medications, an 89% rate was obtained in the first year following the trabeculectomy. In terms of the antiglaucoma medications, the mean number of medications was four preoperatively, which dropped to one for the postoperative. Around 73% of the patients were taking four antiglaucoma medications in the preoperative status, while 70% of the patients stopped the medications in year one postoperatively. Around 11 eyes had encapsulated bleb but there is no incidence of other potential complications. Thirty-three eyes required digital ocular massage and 20 eyes required removal of the releasable sutures. Bleb needling was done for 10 eyes, and only eight eyes underwent cataract surgeries. ***Conclusions:*** This study showed that trabeculectomy with MMC is a safe and effective surgical procedure for uncontrolled open-angle glaucoma, particularly in reducing IOP. There was a significant reduction in the number of antiglaucoma medications needed when comparing the preoperative versus postoperative status.

ORTHOPEDICS

Analysis and Outcomes of Medicolegal Claims in Orthopedics Surgery Specialty in Oman: Twelve Years National Experience

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ABSTRACT

Objectives: The medicolegal litigations have increased in the past few decades, particularly in the medical specialties with intervention. Orthopedics surgery is one of the major medical specialties that encounter such litigation. Analyzing these litigations and learning from them is one way to reduce medical errors. This study aims to analyze medicolegal litigation claims against trauma and orthopedic surgery in Oman. ***Methods***: This is a retrospective review of all litigations registered in the Higher Medical Committee, Oman between 2010 and 2022. All litigation data, including demographics, cause of litigation, and outcome were obtained and analyzed using SPSS software. ***Results:*** The Higher Medical Committee investigated 176 cases, involving 157 (89.2%) Omani patients and 19 (10.8%) expatriates. Among these cases, 118 (67%) were related to trauma, while 58 (33%) were elective procedures. In elective procedure cases, the sports subspecialty was most commonly involved (10.2%), while the least involved subspecialties were pediatrics and oncology (0.57%). The 45% of the cases showed evidence of deviation from the standard of care. However, only 25% of the cases investigated reached the level of medical malpractice in terms of deviation from the medical standard of care. ***Conclusions:*** The number of medicolegal litigations against orthopedic surgery in Oman is low over the study period, with 75% of the investigated cases resulting in the dismissal of medical malpractice claims.

The Utilization of 3D Pelvis Model to Improve the Ability to Understand Complex Anatomy among Orthopedic Surgical Trainees: An Experimental Educational Study

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ABSTRACT

Objectives: There is growing data and revolution for three-dimensional (3D) model use for multiple purposes including clinical and health professional education. While the 3D model of the human body is utilized frequently during surgical procedures with beneficial effects, however, its usefulness for the surgical trainees in their education has not been evaluated yet. This study aimed to evaluate if the 3D pelvis model is helpful for the trainees to improve their ability and understanding of complex pelvis anatomy. ***Methods***: The existing literature was reviewed using PRISMA guidelines and this quantitative design study was formulated. The participants were recruited through the local orthopedic residency program. Twenty-eight trainees were divided into two groups, an experimental group with a 3D pelvis model and a control group without the model, based on their year of training experiences and gender. Both groups were asked to solve a knowledge test created through the Delphi process method. All participants were requested to read pre-test educational materials. ***Results:*** There were 14 residents in each group. The experimental group had higher overall scores than the control group, and specifically better at the anatomy questions subgroup ($p = 0.019$ and $p = 0.006$, respectively). No statistically significant difference in the time required to complete the test between the two groups. In this study, we found that females scored higher than males. ***Conclusions:*** The 3D model showed a beneficial role among orthopedics trainees to enhance their ability to understand complex pelvis anatomy. We recommended further studies with well-designed and larger numbers among different surgical subspecialties and/or among different orthopedics sites.

Specific Discrimination of Pathogenic Bacteria Causing Septic Arthritis Using Raman Spectroscopy: In vitro Study

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ABSTRACT

Objectives: Raman spectroscopy (RS) is an evolving biofluid and microbial characterization technology. This study aimed to evaluate the potential of RS for the rapid diagnosis of pathogenic bacteria in an in vitro synovial fluid infection. ***Methods***: The Sultan Qaboos University Medical Research Ethics Committee approved the study which was conducted in 2022. After obtaining informed written consent, synovial fluid samples were collected from patients undergoing knee surgery. These samples were confirmed to be sterile and then inoculated in vitro with *Staphylococcus aureus* (ATCC2943), *Escherichia coli* (ATCC25922), or

Pseudomonas aeruginosa (ATCC27853) at a concentration of 1×10^6 to 1×10^7 CFU/mL. Control samples remained bacteria-free. All samples were incubated at 37°C and analyzed using RS on days 3, 6, and 12. For each day and bacterial type, 20–30 spectra were collected per sample using a 1064 nm laser RS system with a spectral acquisition time of 30 seconds. Multivariate regression analysis was performed on spectra within the range 600–1800 cm^{-1}. ***Results:*** The study examined the Raman spectra collected from inoculated samples (n = 40) throughout the study, focusing on differentiating various bacterial species and understanding their biochemical compositions. The characteristic peaks serve as key indicators of bacterial presence and biochemical activity. Each bacterial species exhibited distinct marker peaks that enabled their differentiation. *S. aureus* exhibited characteristic peaks at 953, 1520, and 1526 cm^{-1}, related to DNA C-C stretching, with peak intensity increasing over time ($p < 0.01$). *P. aeruginosa* displayed a unique peak at 780 cm^{-1} associated with carotenoids, while *E. coli* showed prominent DNA peaks at 932 cm^{-1} and 1551 cm^{-1} ($p < 0.05$). Compared to control samples, the infected samples exhibited significant biochemical changes in synovial fluid, with an amide I band shift from 1541 cm^{-1} to 1660 cm^{-1}, indicating protein and collagen degradation ($p < 0.01$). Additionally, glycosaminoglycan levels decreased by 35% ($p < 0.05$), and hyaluronic acid content dropped by 28% ($p < 0.05$) during the study period, indicating degradation caused by bacterial enzymes. ***Conclusions:*** This study showed the effectiveness of RS in detecting and characterizing microbial infection in an induced in vitro septic arthritis model. From a clinical perspective, RS adds to the armament at the clinician's disposal as an adjunct to current diagnostic methods for quickly and accurately identifying bacteria as early diagnosis, prompt treatment, and improving disease prognosis.

PEDIATRICS

Prevalence, Risk Factors and Outcomes of Hospital Acquired Infections in Infants and Children After Congenital Heart Surgery in Oman

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ABSTRACT

Objectives: Hospital-acquired infections (HAIs) remained a major cause of morbidity and mortality in children after congenital cardiac surgery and there were multiple risk factors reported to be associated with it. We aimed to assess the prevalence, risk factors, and outcome of HAIs after cardiac surgeries. ***Methods***: A retrospective cross-sectional study included all children who underwent congenital cardiac surgery at the Royal Hospital between 2018 and 2022. Patients with infections and/or on antibiotics within two weeks before the surgery and patients who were transferred to other hospitals after the surgery were excluded from the study. Student *t*-test and Chi-square were used to compare groups with and without infection including the risk factors and the outcome. Multivariate analysis was done to assess the risk factors or predictors of infections. ***Results:*** Out of 653 patients, 102 (15.6%) developed an infection. Multivariate analysis showed that the risk factors for infection include delayed sternal closure (OR = 3.3, 95% CI: 1.3–8.0), pre-operative critical care admission (OR = 2.7, 95% CI: 1.01–7), peritoneal drain (OR: 9.5, 95% CI: 1.34–66), and heterotaxy syndrome (OR = 4.12, 95% CI: 1.12–15.2). In terms of outcomes, there was a significant difference in the pediatric intensive care stay and hospital length of stay between patients with and without infection [12.79 (12.15) vs. 4.07 (5.47) days, $p < 0.001$ and 25.53 (16.86) vs 10.21 (7.5) days, $p < 0.001$, respectively]. The mortality rate was higher in patients who had an infection [7 (6.9%) vs. 12 (2.2%); $p = 0.010$]. ***Conclusions:*** The prevalence of HAIs after cardiac surgeries remains high in our population. The major risk factors were pre-operative critical care admission, delayed sternal closure, heterotaxy syndrome, and peritoneal drain. Effective preventative strategies for HAIs need to be studied further to reduce morbidity and mortality.

Growth Trends and Factors Affecting Growth among Children with Cystic Fibrosis in Oman: A Multi-center Retrospective Study

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ABSTRACT

Objectives: Cystic fibrosis (CF) is a common multisystemic genetic disease caused by mutations in the CF transmembrane conductance regulator (CFTR) protein. Children with CF often experience growth impairment, leading to weights and heights far below the general population. There is limited data regarding CF-related growth impairment and its contributing factors in Oman and other Middle Eastern countries. This study aimed

to assess the growth pattern and identify the possible risk factors for poor growth among patients with CF in Oman. ***Methods***: This multi-center retrospective cohort study includes all patients with confirmed CF disease who were followed up in the pediatric pulmonology clinic at the two CF centers in Oman from January 2006 to January 2023. Data were obtained from the electronic health records in both hospitals. Patients were divided into three groups according to their growth trends: trending upwards, steady trend, or trending downwards based on World Health Organization body mass index (BMI) Z-scores. ***Results:*** A total of 175 children with CF were included in the study. The average height for all the patients was between -1 and -3 standard deviation (SD), which represents short to stunted growth. Weight-for-age ranges between -1 and -3 SD while BMI-for-age ranges between 0 and -3 SD. Based on the BMI, 88 (50.3%) children showed steady growth, 45 (25.7%) had poor growth patterns, and 42 (24.0%) children showed up-trending growth. Among the studied factors for impaired growth, there was a statistically significant relationship between CFTR modulator (ivacaftor) use and growth trend (p = 0.030). Low birth weight and dietitian follow-up showed clinically significant correlation with growth pattern; however, there was no statistical significance (p = 0.058 and p = 0.097, respectively). There was no significant relationship between growth pattern and gender, gestational age, age at diagnosis, inhaled corticosteroid use, pancreatic sufficiency status, chronic infection with *Pseudomonas aeruginosa* status, exacerbation rate, and number of family members with CF. ***Conclusions:*** Growth impairment in Omani CF children is comparable to the available international data. The use of ivacaftor showed a significant improvement in growth trends.

Childhood Hereditary Ataxia Spectrum in Oman: A single tertiary Centre Experience

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ABSTRACT

Objectives: Hereditary ataxias are disabling disorders with high mortality and morbidity. This aimed to describe the spectra of hereditary ataxias and to delineate phenotypic features that could aid in early diagnosis. ***Methods***: A retrospective cohort study was conducted on patients under 18 years old who presented with ataxia at Sultan Qaboos University Hospital between January 2012 and January 2022. Demographic, clinical, molecular genetics, and neuroimaging characteristics were reviewed and collected from the patient's medical records. Ataxia was classified as either hereditary or acquired. Hereditary ataxia was defined based on clinical characteristics and family history. Hereditary ataxia was further categorized into genetically confirmed ataxia and non-genetically confirmed ataxia. Data analysis was performed using SPSS version 29, with a significance level set at $p < 0.05$. ***Results:*** A total of 132 patients were identified with ataxia, 70 met the diagnostic criteria for hereditary ataxia. Among them, 46 (66%) patients had autosomal recessive ataxia, five (7%) had autosomal dominant, and one (1.4%) had mitochondrial diseases. Ataxia telangiectasia was the most common inherited ataxia in our cohort (n = 12, 17%) followed by Charlevoix-Saguenay spastic ataxia (n = 5, 7.1%). There was no significant difference in clinical characteristics and neuroimaging findings between genetically confirmed ataxia and non-genetically confirmed ataxia except for the presence of peripheral neuropathy. ***Conclusions:*** Ataxia telangiectasia is the most common form of hereditary ataxia in this cohort. The presence of peripheral neuropathy may serve as a predictor of specific types of inherited ataxias; however, further studies with a large sample size are needed to confirm this finding.

PSYCHIATRY

Accuracy of the Strengths and Difficulties Questionnaire in Identifying Common Mental Health Disorders in Children and Adolescents: A Cross-sectional Analytical Study

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ABSTRACT

Objectives: To investigate if the strengths and difficulties questionnaire (SDQ) is a valuable tool for identifying mental health disorders in children and adolescents in a clinical setting. ***Methods***: This study was conducted at Sultan Qaboos University Hospital from January to December 2022. The Arabic and English versions of SDQ were distributed to the parents of new referrals. A psychiatrist conducted a diagnostic interview in a child and adolescent outpatient clinic. Collected data were analyzed using IBM SPSS Statistics version 29.0. The computer-generated scores of 'probable' were considered as such. In contrast, scores of 'unlikely' and 'possible' were grouped as 'not probable' and compared to a clinical diagnosis (considered the gold standard) of either 'present' or 'absent' disorder. ***Results:*** A total of 161 caregivers completed the SDQ. The agreement

between clinical diagnosis and SDQ prediction was moderate for emotional problems (Kendall's tau b 0.278; $p < 0.001$), and between moderate and strong for hyperactivity problems (Kendall's tau b 0.324; $p < 0.001$). The sensitivity of SDQ was 80% for hyperactivity and 56% for emotional problems. However, the specificity was 72.9% for emotional problems and 53% for hyperactivity. ***Conclusions:*** This study shows that an algorithm using parent SDQs can accurately predict diagnoses in clinic samples. However, we recommend a follow-up study to compare SDQ predictions with independent psychiatric diagnoses in a larger community study.

Impact on Rate of Relapse and Duration of Admission when Converting Oral to Long-acting Injectable Antipsychotics in Schizophrenia Spectrum Disorders

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ABSTRACT

Objectives: There is an ongoing debate regarding the effectiveness of long-acting injectable (LAI) antipsychotics compared to oral medications in treating schizophrenia spectrum disorder. This study aims to assess the rate of relapse and duration of hospital admission in patients with schizophrenia spectrum disorder who were transitioned from oral antipsychotics to LAI antipsychotics. ***Methods***: The study was conducted at Sultan Qaboos University Hospital (SQUH) between 2010 and 2023. A descriptive study design was utilized to analyze data extracted from electronic hospital records of patients who initially used oral antipsychotics and later shifted to LAI antipsychotics. The inclusion criteria were adult patients of both genders aged between 18 and 59 years old, who have been diagnosed with schizophrenia or schizoaffective. Exclusion criteria included patients whose symptoms were due to organic disorders such as epilepsy or substance use disorders. The fifth edition of the Diagnostic and Statistical Manual of Mental Disorders was used for the diagnostic criteria. ***Results:*** The study included 59 patients, representing all available patients who met the inclusion criteria. The study involved a relatively young population with a mean age of 39.69 years, where schizophrenia was the primary diagnosis for 74.6% of participants. Olanzapine was the most commonly used oral antipsychotic, while long-acting injections such as Risperdal Consta were used by 27.1%, with better compliance (84.7%) and lower relapse rates (16.9%) compared to oral medications. Common side effects included extrapyramidal symptoms (8.5%) and weight gain (5.1%). Hospitalization rates were significantly lower for LAIs (11.9%) compared to oral medications (55.9%) ***Conclusions:*** The results indicated that LAI significantly reduced the number of relapses, admissions, and duration of hospital stay compared to oral antipsychotics. This highlights the importance of transitioning patients from oral to LAI antipsychotics.

Evaluating the Psychometric Properties of Arabic Version of the Patient Health Questionnaire-9 (PHQ-9) among Omani Patients with End Stage Renal Disease on Dialysis

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ABSTRACT

Objectives: This study aimed to evaluate the sensitivity, specificity, positive predictive value, and negative predictive value of the Arabic version of the Patient Health Questionnaire-9 (PHQ-9) in identifying depression among Omani renal dialysis patients. Additionally, the study examined the optimal cut-off score and assessed the tool's internal consistency. ***Methods***: A cross-sectional analytical study was conducted using a convenient sampling method, involving patients from the Al Seeb and Bausher renal dialysis units. Depression was screened using the PHQ-9 and compared against the gold standard, the Structured Clinical Interview for DSM-5. ***Results:*** The study included 209 chronic kidney disease patients, 60.3% male, with a mean age of 48.43 years. The Arabic PHQ-9 demonstrated an area under the curve of 0.87, with 78% sensitivity, 85% specificity, and 83.25% overall accuracy in detecting depression. The Cronbach's Alpha was 0.85, and the optimal cutoff score was 9. ***Conclusions:*** This study confirms the validity and reliability of the Arabic PHQ-9 for detecting depression in Omani dialysis patients, with a lower cutoff score than the international standard, highlighting the need for cultural adaptations. Future research should explore whether similar adjustments are necessary in other clinical populations and investigate the impact of these adjustments on treatment outcomes and clinical decision-making.

RADIOLOGY

Pelvic Radiograph in Polytrauma: Diagnostic Accuracy and Interobserver Agreement: A Retrospective CT Correlation Study

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ABSTRACT

Objectives: Multiple studies have highlighted the limitations of radiographs in detecting pelvic fractures, and computed tomography (CT) is considered the gold standard for detecting and characterizing these fractures and the associated soft tissue and vascular injuries associated with it. This study aims to evaluate the diagnostic accuracy of radiographs in detecting pelvic fractures using CT as a reference standard and to analyze the level of interobserver agreement in diagnosing pelvic fractures based on AP pelvic radiographs. ***Methods***: This retrospective cross-sectional study was approved by the medical and ethics committee at Sultan Qaboos University Hospital. The study includes adult patients who presented to the emergency department with acute pelvic trauma between 2016 and 2022 and underwent both pelvic radiography and CT imaging. Two staff radiologists at the SQUH have independently reviewed the pelvic radiographs while blinded to the CT findings. The results were calculated to assess the interobserver variability and the level of agreement between the two. Fracture detection on radiographs was compared to CT findings, which served as the reference standard. Standard statistical methods were used to calculate the sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) of pelvic radiographs. For the interobserver variability, we used the Fleiss Multirater Kappa. The results were then compared with similar international studies. ***Results:*** A total of 99 patients with blunt pelvic trauma who underwent both conventional radiography and CT in the same setting were included in the study. The mean age of patients with pelvic fractures was 33.2±13.1 years, comprising 77.5% males and 22.5% females. Acetabular fractures were the most frequently missed injury on radiographs. And among the 90 cases without acetabular fractures on radiographs, 53% were false negatives, and 1.2% false positives were observed. The sensitivity of pelvic radiographs for detecting acetabular fractures was 47%, with a specificity of 98.7%. Sacral fractures were the second most commonly missed fractures, with 50% cases missed on radiographs. The overall agreement between the two radiologists was substantial (kappa = 0.788). The highest agreement was in fractures involving the iliac bone, pubic bone, and fractures of the proximal femur, while the lowest agreement was seen in fractures of the acetabulum and sacrum. ***Conclusions:*** Our findings highlight that anteroposterior pelvic radiographs frequently miss posterior ring and acetabular fractures. However, fractures of moderate to high severity mechanism are often detected. In our case, none of the unstable fractures detected on CT were missed on radiographs, hence AP radiographs will be utilized in screening patients with polytrauma to detect unstable fractures.

The Effect of Changing the Encoding Velocity on Aortic Flow Parameters in Cardiac Magnetic Resonance Imaging Flow Sequences

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ABSTRACT

Objectives: This study aims to evaluate the effect of changing the encoding velocity on aortic flow parameters in cardiac magnetic resonance imaging (MRI) flow sequences on patients undergoing cardiac MRI. ***Methods***: A prospective study including all patients scheduled for cardiac MRI at the Royal Hospital from October 2023 to February 2024. Patients with aortic valve disease were excluded from the study. Due to the practical experience of the potential applicable use of encoding velocities, five encoding velocities were examined for each patient with intervals set after the baseline encoding velocities of 20, 40, 40, 40, and 40. The baseline lowest possible value was determined when a slightly lower value produced an aliasing artifact. The aortic flow parameters (forward flow volume, backward flow volume, total volume, regurgitation fraction, volume per minute, maximum velocity, minimum velocity, maximum flow, and minimum flow) at different encoding velocities were collected in an Excel worksheet. Data was analyzed using SPSS. ***Results:*** A total of 136 patients were included in the study. A paired sample test of the baseline and maximum encoding velocities showed negligible differences in the means of the parameters when changing the encoding velocity, with the largest change in the minimum velocity of 8 units (p = 0.00). One-way repeated analysis of variance tests revealed similar negligible differences in the parameter changes, the largest of 8 units in the minimum velocity (p = 0.00). ***Conclusions:*** The study shows negligible differences in the aortic flow parameters when changing the encoding velocity. Therefore, it is not necessary to achieve the lowest encoding velocity to obtain the most accurate results.

Anatomical Variations of Koerner's Septum: A Computed Tomography–based: A Singlecentered Study

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ABSTRACT

Objectives: Koerner's septum (KS) is a bony plate located at the junction of the petrous and squamous parts of the temporal bone. The reported prevalence of KS varied between studies. KS variations are associated with various pathologies and pose difficulties during surgeries. The study aims to determine the KS frequency in Omani patients and analyze its association with sex and side. ***Methods***: The study investigated the KS topography scans of normal temporal bones of adult Omani patients at Sultan Qaboos University Hospital from January 2018 to December 2022. The presence of KS, its parts (complete or incomplete), and thickness at three anatomical landmarks were recorded. Additionally, sex and laterality differences in KS parameters were analyzed using a Chi-square test. ***Results:*** A total of 344 computed tomography were included in the study. The overall frequency of KS among Omani subjects was 39.5%. The complete KS was observed only in 14% of cases. The thickness of KS was 0.78 Å} 0.21 mm, 0.93 Å} 0.28 mm, and 0.78 Å} 0.21 mm at the head of the malleus (HM), the superior semicircular canal (SSC), and the tympanic sinus (TS), respectively ($p < 0.01$). KS was present most constantly at the level of HM (64.7%) followed by SSC (57.4%), and less constantly at the level of TS (49.3%). KS frequency was almost similar in males and females (41.9% vs. 37.3%), with a statistically insignificant difference ($p = 0.38$). No side differences were observed concerning KS frequency ($p = 0.955$). ***Conclusions:*** The KS frequency in Omani subjects is within the range of previously reported studies. It is incomplete in most of the cases and constantly present at the level of HM. Its thickness is more at the level of SSC.

SURGERY

Short versus Long Course of Antibiotics in Penetrating Abdominal Trauma: A Meta-analysis of Randomized Controlled Trials

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ABSTRACT

Objectives: Penetrating abdominal trauma (PAT) with hollow viscus injury carries a high risk for postoperative infection rate. After the introduction of antibiotics, the duration of treatment has been a subject of ongoing debate in the last few decades. Despite the evidence of the effectiveness of short-course antibiotics in preventing postoperative infection, some surgeons still recommend long-duration antibiotic administration for patients with PAT in association with hollow viscus injury. The study aimed to evaluate the effectiveness of a short course of antibiotics with a long course in preventing postoperative surgical site infection. ***Methods***: We conducted a comprehensive search of studies published in electronic databases, such as PubMed and Embase, until January 2024. The study compared a short course of antibiotics (administered within 24 hours) with a long course (5 days) in preventing postoperative surgical site infection. Inclusion criteria were English-only studies, and the type of studies was restricted to randomized controlled trials. ***Results:*** The study included four randomized control trials. There were 794 patients, with group 1 including 398 who received a short course of antibiotics compared to group 2, which included 396 who received a longer course of antibiotics. The two groups had no significant difference in postoperative superficial and deep surgical site infection. Further analysis showed no difference in mortality between the two groups. ***Conclusions:*** Based on the available literature on the duration of antibiotics for penetrating abdominal injury with or without associated hollow viscus injury, it can be concluded that a short-course antibiotic is as effective as a longer course in preventing postoperative surgical site infection in patients with PAT.

Effect of Neoadjuvant Chemotherapy on the Expression of Hormone Receptors in Breast cancer among a Cohort of Omani Patients Following at a Tertiary Care Hospital: A Retrospective Study

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ABSTRACT

Objectives: Our primary aim is to evaluate the variability of immunohistochemical biomarkers before and after neoadjuvant therapy in a cohort of Omani patients. The

secondary objectives were to determine which tumor subtype most frequently has a change in biomarker expression and to assess the change in the Ki67 expression. ***Methods***: This retrospective cohort study included patients with breast cancer who received neoadjuvant chemotherapy (NACT) at Sultan Qaboos University Hospital between 2014 and 2019. Data was collected from the electronic health records after getting approval from the hospital's ethical committee. An Excel sheet was used to collect the data, and analysis was conducted using SPSS program version 28.0. ***Results:*** A total of 135 Omani patients met the inclusion criteria. The mean age of the cohort at the time of breast cancer diagnosis was 43.9 years old. Demographic features showed 75% of the cohort were premenopausal, 22% postmenopausal, and 3% perimenopausal. Of the cohort, 96% were married, and 26% reported a family history of breast or ovarian cancer. Baseline biomarker expression before receiving NACT showed 54.8% of patients with positive hormone receptor expression, 40% with HER2 expression, and 23.7% were triple negative. After the NACT, there was a 16% change in biomarker expression. Subgroup analysis of each biomarker showed statistically insignificant changes, with $p > 0.05$ for each. Ki67 expression changed significantly with $p = 0.012$. The mortality rate for patients with changes in biomarker expression was 5.3%, while 16.5% in the group with no change in expression. ***Conclusions:*** Hormone receptors in breast cancer may change after receiving NACT. While this was found to be statistically significant in international research, it was not significant in our cohort. This could be due to a small sample size and the study being conducted at a single institution. Further study is required with larger populations. Retesting breast biomarkers in the resection specimen is recommended to ensure the appropriate use of targeted therapy.