

Oman Medical Specialty Board Research Forum 2022/2023: Abstracts

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ANESTHESIA

Factors and Patient Characteristics Specific to the Timing of Tracheal Extubation Following Pediatric Cardiac Surgery

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ABSTRACT

Objectives: The primary objective was to identify factors and patient's characteristics that were specifically found in pediatric cardiac surgical patients who received a similar anesthetic management and who had tracheal extubation within 6 hours (fast-track) vs. those who were extubated after 6 hours postoperatively in the intensive care unit (ICU). Secondary objectives assessed the incidence of failed extubation, duration of ICU stay and incidence of trisomy 21. **Methods:** After ethical committee approval (SRC#88/2022), 467 pediatric cardiac surgical patients that were operated under a similar anesthetic regimen at the Royal Hospital between 1 January 2020 and 30 June 2022 were included in this ambi-directional cohort study. The children were grouped into two: group I (n = 244) where a fast-track extubation was done and group II (n = 223) where the children were extubated after 6 hours. The factors and patient's characteristics that were recorded includes patients age, weight, gender, RACHS-1 score, the STAT Mortality Categories, cardiopulmonary bypass time, aortic cross clamp time, vasoactive-inotropic score (VIS) and arterial blood gas analysis values at the time of extubation, incidence of failed extubation, presence of genetic abnormalities, and duration of ICU stay. Non-normal continuous data are presented as median with quartiles. The categorical variables are presented as frequency and percentages. Continuous variables were compared using Chi-square test and Mann-Whitney U test. Multivariate logistic regression was adopted for adjusted analysis. **Results:** Bivariate analysis showed a significant correlation between age, weight, RACHS-1 score, STAT category, cardiopulmonary and aortic cross-clamp time, and VIS with the timing of tracheal extubation. Younger age, low weight, high RACHS-1 score and STAT category, high VIS, and long cardiopulmonary bypass and aortic cross-clamp time have an increased chance of delayed extubation. Multivariate

model showed weight (odds ratio [OR] = 1.296, 95% CI: 1.09–1.54, $p = 0.003$), STAT category (OR = 5.71, 95% CI: 2.33–14.0, $p < 0.001$), cardiopulmonary bypass time (OR = 0.983, 95% CI: 0.97–0.99, $p = 0.003$), and VIS (OR = 0.918; 95% CI: 0.85–0.99, $p = 0.023$) were independent predictors for fast-track extubation. Age, RACHS-1 score, and aortic cross-clamp duration were not independent predictors for the time of extubation. The ICU stay was shorter in the fast-track group. The reintubation rates and chromosomal disorders (such as trisomy 21) incidence were similar. **Conclusions:** The weight of the child, STAT category, cardiopulmonary bypass duration, and VIS played an important role in decision-making for fast-track extubation.

The Use of Ultrasonography Guided Real-time Imaging to Determine an Appropriate Size of Endotracheal Tube While Intubating Patients Aged Between Zero and Sixty Month-old: A Single Centre Experience

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ABSTRACT

Objectives: To find a correlation between ultrasound-guided measurement of tracheal anteroposterior diameter at the cricoid level and the size of the best fit endotracheal tube in patients less than 60 months of age. **Methods:** This prospective observational study was done in Royal Hospital operation theaters and Intensive care units from June to July, 2022. All patients whose age is less than 60 months, hemodynamically stable, and electively scheduled for general anesthesia with endotracheal intubation were included. Measurement of anteroposterior internal tracheal diameter at the cephalic border of the cricoid was done by real-time ultrasound imaging after induction of general anesthesia with muscle relaxation. Data related to patient anthropometric measurement, previous diseases, anesthesia induction, ultrasonography trachea measurement, anesthesia maintenance, and emergence were recorded. **Results:** Data from 38 patients were analyzed. Anterior

posterior tracheal diameter measures by ultrasound at the cephalic border showed a strong correlation in predicting the size of the best fit endotracheal tube in comparison to age-based formula, weight-based formula, and Broselow chart ($r^2 = 0.918, p = < 0.001$). Among all anthropometric measurements, patients' total body weight correlates with the best fit endotracheal tube size. Using ultrasound-based method, 33 out of 38 patients underwent successful endotracheal intubation from the first attempt while five patients from the second attempt. **Conclusions:** The ultrasound-measured anterior posterior tracheal diameter measured at the cricoid level correlates with best fit endotracheal tube size and may guide the selection of endotracheal tube size. Further studies are required to prove the superiority of ultrasound over other classic methods.

BIOCHEMISTRY

Accuracy of Conventional Troponin Cut-off Value in Elderly Patients with Suspected Acute Coronary Syndrome

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ABSTRACT

Objectives: To increase the accuracy of cardiac troponin use in elderly patients suspected of acute coronary syndrome (ACS). Specifically, to assess the sensitivity and specificity of troponin's current cut-off value of 14 ng/L in elderly patients, to identify the best cut-off value of troponin for diagnosis of ACS in elderly patients, and to illustrate other factors that increase troponin in the elderly. **Methods:** This is a retrospective cross-sectional study conducted from July 2017 to August 2022. Patient data was recruited from two tertiary care hospitals in Oman: the Royal Hospital and Sultan Qaboos University Hospital. All study participants were selected from an electronic system using the following criteria: age group of ≥ 65 years old, presented at an emergency department, and cardiac troponin measurements were recorded. **Results:** A total of 631 patients were included, 325 with ACS and 306 without ACS. By using a cut-off value of 14 ng/L in elderly patients, 33.0% of the control group have high troponin without ACS with a low specificity of 67%. Receiver operating characteristic curve analysis was used to identify a best cut-off value of troponin in elderly patients with maximum specificity and sensitivity. A cut-off value of 24.5 has maximum specificity in control

patients compared with all ACS, the area under the curve was 94% with 95% CI: 92-965, the specificity was 91.1%, and the sensitivity was 88.3%. The likelihood ratio (LR) 10 is better in performance compared with specificity of 67.2% and LR 2.8 in troponin cut-off value of 14 ng/L. **Conclusions:** This study highlighted the best cut-off value of troponin in elderly patients with suspected ACS. Maximum specificity and sensitivity with a high LR have been found with a cut-off of 24.5 ng/L compared with a low specificity and LR with a cut-off value of 14 ng/L.

DERMATOLOGY

A Cross-sectional Study of the Awareness, Knowledge, and Behavior of Hair Dye Use in Omani Population Attending Sultan Qaboos University Hospital in Oman

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ABSTRACT

Objectives: To assess the knowledge, level of awareness of the Omani population about the different types of hair dyes (HDs), the relative safety of using them, and possible side effects of HDs use. **Methods:** This is a cross-sectional study. A self-administered questionnaire about the use of HDs was distributed randomly among females and males attending the outpatient clinics at Sultan Qaboos University Hospital. The information was collected and entered using Epi-data Info program and then analyzed using SPSS program. **Results:** HDs are used frequently by both genders with a prevalence of 56.3%. Among the users of HDs, the minimum age was 10 years and the maximum age was 55. Our study showed that there is no association between educational level and awareness of HD use in Oman which needs more elaboration and attention to educate the society about HDs. Unexpected results, using chi-square test we found that the lower the income, the more use of HD, statistically significant with a likelihood ratio of 0.004. Our study showed that males tend to use natural HDs while females like to use permanent types. Only 13 HD users applied for allergy test before using HDs and the rest of the participants are not aware of allergy test. About 57.1% of HDs users have no idea about the potential risk of cancer with HDs use. **Conclusions:** Hair coloring is widely used among both genders at a wide range of age groups. Society should be educated about types of hair color and the risk of hair dye use.

Etiology and Prognosis of Erythroderma in Oman: A Retrospective Multi-center Study

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ABSTRACT

Objectives: Our primary objective is to assess the epidemiological, clinical, and laboratory profile of patients diagnosed with erythroderma between 2010 and 2020 in six dermatology centers in Oman. The second objective is to describe the most common etiologies and the mortality rate related to erythroderma. **Methods:** The data for this cross-sectional study was collected retrospectively from electronic medical records at Sultan Qaboos University Hospital (SQUH) and Ministry of Health (MOH) hospitals. There was a standardized format spreadsheet for data entry distributed at focal points at the six different centers. The data was entered in Epi-data and the static analysis was performed using SPSS. Ethical approval was obtained for the multi-center study from both SQUH and MOH research sections. **Results:** Ninety-one patients with erythroderma were included. The median age at the diagnosis was 47 years (Q1 = 12, Q3 = 67), and the male to female ratio was 2:1. Children constituted 25.0% of the cohort. Most of the cases (45.0%) were retrieved from SQUH. Pruritus was the most commonly reported symptom in adults 93.9%, while scales were seen more frequently in the pediatrics group (91.0%). In both age groups, the most common causative factor was pre-existing dermatoses in 74.0% of pediatrics and 57.0% of adults. In the adult group, Other etiologies in descending order were drug reactions (12.1%), malignancies (9.9%), and idiopathic (6.6%). Among the pre-existing dermatosis in the adult group, psoriasis was the most common cause (40.4%), followed by atopic dermatitis (25.5%). Erythroderma in the pediatrics group was caused by inherited genetic diseases in 47.0% of cases, followed by psoriasis, atopic dermatitis, and miscellaneous, 27.0%, 20.0%, and 6.7%, respectively. The significant clinical and laboratory clues for the diagnosis were acute onset of erythroderma with a mean of 7.6 days (CI: 0.95-16.10), and eosinophilia noted in 73.0% in the drug-induced group. During the follow-up, erythroderma-related death was seen in 6.2%, where the majority of death was due to underlying malignancy. **Conclusions:** Most of the clinical features and laboratory abnormalities in erythroderma are non-specific and inconclusive. Acute onset symptoms and eosinophilia were associated with drug-induced erythroderma. Our

study demonstrated a high percentage of erythroderma related to new onset or pre-existing dermatoses in both age groups. A close follow-up is recommended especially in patients with underlying malignancy. A multinational study is required to better understand the disease entity.

EMERGENCY MEDICINE

External Validation of the Ottawa Subarachnoid Hemorrhage Rule in Patients with Acute Headache

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ABSTRACT

Objectives: To externally validate and evaluate the performance of Ottawa subarachnoid hemorrhage (SAH) rule in emergency department (ED) patients with acute headaches. **Methods:** We conducted a retrospective study in a tertiary care hospital in Oman from January 2014 to December 2019. Patients who were alert and neurologically intact with acute onset headaches were included. Patients with head trauma that occurred in the previous seven days, new onset of abnormal neurologic findings, or consciousness disturbance were excluded. The rule was applied following the SAH criteria. Data were collected from the electronic medical record and manually abstracted from individual patient charts using a standardized data abstraction form. We calculated the sensitivity, specificity, and likelihood ratios with 95% confidence intervals (CIs) of the SAH. **Results:** A total of 1424 ED visits with acute headaches were reviewed for eligibility. Five hundred-one patients met the inclusion criteria. Of them, 88 cases were SAH yielding an incidence of 17.5%. The SAH rule had a sensitivity of 100% (95% CI: 95.8-100), 19.13% specificity (95% CI: 15.68-22.57), a PPV of 20.85% (95% CI: 17.30-24.41), and an NPV of 100% (95% CI: 94.79-100). **Conclusion:** The Ottawa SAH rule was sensitive for identifying patients with SAH in otherwise alert and neurologically intact patients. We believe that the Ottawa SAH rule can be used to rule out this serious diagnosis.

The Optimal Intraosseous Needle Depth Required for Successful Resuscitation in Pediatric Population

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ABSTRACT

Objectives: Intraosseous (IO) access is a lifesaving technique to administer medications and fluid when intravenous access fails. Difficulty in establishing IO access is frequently reported and it is mostly related to the penetration depth of the needle. We aimed to provide an age-based and/or weight-based formula on the optimal depth required in establishing a successful IO access in the pediatric population. **Methods:** This cross-sectional study was conducted in a single trauma center in Oman. It included pediatric patients who underwent plain knee radiographs between January 2017 and February 2021. A two-view knee x-ray was used to measure the cortex thickness dimension and the medullary cavity diameter in two anatomical positions for interosseous needle (ION) insertion, proximal tibia, and distal femur. The depth was then obtained and evaluated against the age and the weight of the patients, to generate a formula using a regression model analysis. Data was collected and analyzed using the SPSS. Ethical approval was obtained, no consent was required. **Results:** A total of 372 Omani patients aged 0-13 years were enrolled in the study. Both age and weight were found to have a statistically significant impact on the depth ($p < 0.001$). The formula for predicting the optimal proximal tibia ION depth (mm) = $6.692 + 0.065 \times \text{age (months)} + 0.115 \times \text{weight (kg)}$ and the optimal distal femur ION depth (mm) = $5.978 + 0.042 \times \text{age (months)} + 0.094 \times \text{weight (kg)}$. **Conclusion:** The obtained formulas should provide a good estimate of the required depth of ION in pediatric population. Larger studies are required to standardize the formulas.

Atomized Intranasal Ketorolac versus Intravenous Ketorolac for Treatment of Severe Renal Colic in the Emergency Department: A Double-blind, Non-inferiority, Randomized Controlled Trial

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ABSTRACT

Objectives: Timely analgesia administration is crucial in treating patients with severe renal colic. Atomized intranasal (IN) administration offers rapid painless analgesia compared to the intravenous (IV) route. This study aims to evaluate the efficacy of IN Ketorolac versus IV Ketorolac in relieving acute renal colic among emergency department patients. **Methods:** This is a non-inferiority, randomized controlled trial study. Patients with clinical diagnosis of severe renal colic as assessed using visual analogue scale (VAS) were enrolled at an academic university hospital. Adult patients aged 18–64 years with severe pain (VAS ≥ 7.0) were included. Patients were excluded if had contraindications to nonsteroidal anti-inflammatory drugs (NSAIDs) or had recent NSAIDs use (within 8 hours of presentation). A computer-generated randomization sequence was used to allocate patients randomly in a 1:1 ratio to receive a single dose of either IN Ketorolac 30 mg + IV normal saline or IV Ketorolac 30 mg + IN normal saline. The primary endpoint was the reduction in pain score at 60 minutes. Pain scores were recorded at baseline (VAS 0), 30 (VAS 30), and 60 (VAS 60) minutes. Possible treatment side effects were also recorded. Non-inferiority was shown if the upper limit of the two-sided 95% confidence interval (CI) for the difference in VAS was lower than 2 points. Results were analyzed using intention-to-treat analyses. The study was registered under clinicaltrials.gov identifier: NCT04441762. **Results:** Of 171 subjects randomized, 86 were allocated to receive IV Ketorolac and 85 to receive IN Ketorolac. Patients in the two groups were similar in their baseline characteristics, stone sizes and locations, the presence of obstructive stones, and initial pain scores. The mean difference between VAS 0 and VAS 60 was 5.71 ± 2.99 for IV Ketorolac and 5.61 ± 3.274 in the IN Ketorolac group ($p = 0.839$), respectively. The difference in mean pain reduction at 60 min between groups was 0.22 (95% CI: -0.75, 1.20) and the upper limit of the 95% CI was less than the non-inferiority margin. Response to treatment was defined as VAS of ≤ 3 at 60 minutes. This was achieved in 60 (69.8%) patients receiving IV Ketorolac compared to 57 (67.1%) patients receiving IN Ketorolac ($p = 0.414$). Rescue analgesia were required in 10 (11.6%) patients in the IV group and nine (10.6%) patients in the IN group ($p = 0.511$). No major side effects were observed in this study. **Conclusions:** Ketorolac is effective acute pain management for patients with severe renal colic. Atomized IN administration of Ketorolac is non-inferior to the IV route providing an effective, fast, and non-invasive option, and can be effective alternative analgesia.

FAMILY MEDICINE

External Validation of a Cardiovascular Risk Model for Omani Patients with Type 2 Diabetes Mellitus: A Retrospective Cohort Study

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ABSTRACT

Objectives: Primary prevention of cardiovascular disease (CVD) in patients with type 2 diabetes mellitus (T2DM) is an important public health strategy. This study aimed to externally validate the recently developed CVD risk model for Omanis with T2DM. **Methods:** This retrospective cohort study was conducted between August 2020 and May 2021 in Muscat Governorate, Oman. A total of 809 adult Omani patients with T2DM free of CVD at baseline (the year 2015) were selected using a systematic random sampling strategy. Data regarding CVD risk factors and outcomes were collected from the patient's electronic medical records. The ability of the model to discriminate CVD risk was assessed by calculating the area under the curve (AUC) of the receiver-operating characteristic curve. Calibration of the model was evaluated by Brier score, as well as by comparing the predicted and observed risks in different risk groups. **Results:** The incidence of CVD events over the 5-year follow-up period was 4.6%, with myocardial infarction (48.6%) being most frequent, followed by peripheral arterial disease (27%), and non-fatal stroke (21.6%). A cut-off risk value of 11.8% demonstrated good sensitivity (67.6%) and specificity (66.5%). The AUC was 0.7 (95% CI: 0.60–0.78) and the Brier score was 0.01. However, the overall mean predicted risk was greater than the overall observed risk (11.8% versus 4.6%), and the calibration graph showed a significant difference between predicted and observed risk levels in different subgroups. **Conclusions:** Although the Omani CVD risk model slightly overestimated the CVD risk, it demonstrated good discrimination. However, it seems that the model needs to be re-calibrated, after which the model has the potential to be applied to patients with T2DM presenting to diabetic care centers in Oman.

Prevalence of Internet Gaming Disorder among Grade 10 and 11 Students in Muscat Governorate, Oman

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ABSTRACT

Objectives: Internet gaming disorder (IGD) is an emerging diagnosis characterized by a persistent interest in video games resulting in significant impairment. This study aimed to assess the prevalence and risk factors associated with IGD among grade 10 and 11 students in Muscat, Oman. **Methods:** This cross-sectional study was carried out from March to August 2021. Two governmental schools were randomly selected from each wilayat in Muscat. An Arabic-language survey was used to collect sociodemographic and gaming-related information from Omani students in grades 10 and 11. The IGD-20 Test was used to categorize students into diagnostic groups: IGD, at risk of IGD (R-IGD), and casual gamers (CGs). **Results:** A total of 414 students participated in the study with a response rate of 72.7%. The prevalence of IGD, R-IGD, and CGs was 4.3%, 32.4%, and 63.3%, respectively. Gender and amount of time spent gaming were independent predictors of IGD, with female students having four times greater risk (odds ratio [OR] = 0.229, 95% confidence interval [CI] = 0.056–0.928; $p = 0.039$). Similarly, students who spent 13–18 hours or > 18 hours gaming per day had five times (OR = 5.706, 95% CI = 1.076–30.272; $p = 0.041$) and 46 times (OR = 46.132, 95% CI = 7.190–296.009; $p \leq 0.001$) greater risk of developing IGD, respectively. **Conclusion:** Female high school students and those who spend ≥ 13 hours gaming every day are at risk of developing IGD. These findings may help raise awareness of this novel diagnosis and its consequences.

Frequency of Asthma Exacerbations and Upper Respiratory Tract Infections among Adult Asthmatics According to Vaccination Status: Does the Annual Influenza Vaccine have a Protective Effect?

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ABSTRACT

Objectives: Annual influenza vaccinations are recommended for patients with asthma to prevent seasonal influenza and influenza-triggered asthma exacerbations. However, there are conflicting data as to the benefit of the influenza vaccine on the frequency of asthma exacerbations. Therefore, this study aimed to assess the effectiveness of the influenza vaccine in terms

of reducing the frequency of asthma-related exacerbations and upper respiratory tract infections among adult patients with asthma. **Methods:** This retrospective cohort study was performed from January to December 2018 in Muscat Governorate, Oman. A total of 466 patients attending in nine randomly selected primary health centers in Muscat Governorate were enrolled in the study. Patients were followed up for one-year post-vaccination. **Results:** Most patients were female (70.6%) and most of them had moderate-persistent asthma (42.9%). Overall, there were 203 (43.6%) patients in the vaccinated group and 263 (56.4%) in the non-vaccinated group. A proportion of patients in each group had allergic rhinitis (28.6% and 25.5%, respectively). The frequency of upper respiratory tract infections over the one-year follow-up period was significantly lower in the vaccinated group compared to the non-vaccinated group (37% versus 73%; relative risk [RR]: 2.299, 95% confidence interval [CI]: 1.834–2.882; $p < 0.001$); however, there was no significant difference in terms of the frequency of asthma exacerbations (41.9% versus 45.2%; RR: 0.925, 95% CI: 0.750–1.141; $p > 0.050$). **Conclusions:** The influenza vaccine significantly reduces the frequency of upper respiratory tract infections over the following year. However, it did not significantly reduce the frequency of asthma exacerbations among adult Omanis with asthma. We recommended further studies to support the protective effect of the vaccine in this regard.

GENERAL SURGERY

Clinical and Pathological Predictors of Recurrent Breast Cancer

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ABSTRACT

Objectives: Recurrence of breast cancer is not common. There are reported risk factors for recurrence which are patient age, tumor size, tumor grade, (lymph vascular invasion (LVI), extensive intraductal component (EIC), and margin status. Nodal involvement also contributes to the recurrence rate as well as hormonal status, and if the patient receives neoadjuvant/adjuvant therapy or not. The aim of this study is to look for the clinical and pathological predictors of patients who have recurrent breast cancer after surgical treatment. **Methods:** We conducted a retrospective cohort study at one center (Royal hospital) between 2010 to 2020 for patients who were treated surgically for non-metastatic breast cancer. We collected the clinical which was mainly the age at the diagnosis and pathological predictors (final histopathology report of the surgical specimen) from the medical records system

of the hospital after obtaining the ethical approval. Total sample size was 270 Omani patients. The primary endpoint was the time to locoregional recurrence or systemic recurrence as the first event. A multivariate analysis of the predictors was carried and a p -value of < 0.05 was considered statistically significant with 95% CI. **Results:** Out of 270 patients with breast cancer who were surgically treated, 113 had recurrence and 157 had no recurrence. There were 104 patients with recurrence have invasive ductal carcinoma (IDC) and nine patients with high-grade ductal carcinoma in situ (DCIS). The Mean age of patients with recurrence was 44.0 while in patients without recurrence was 48.3. The difference in age between the two groups is not statistically significant in predicting the recurrence ($p = 0.816$). ER, LVI, EIC, nodal involvement, grade, margin, and type of tumor were the significant predictors of recurrence by bivariate analysis. However, High grade (Hazard ratio (HR) = 3.823, 95% CI: 1.104-13.240; $p = 0.034$), EIC (HR = 17.407, 95% CI: 1.538-196.999; $p = 0.021$), and nodal involvement (HR = 2.314, 95% CI: 1.123-4.767; $p = 0.023$) remain the significant predictors for recurrent breast cancer in the multivariate Cox regression analysis. By using Kaplan-Meier, the median survival time was 132 months and the recurrence-free survival at two years was 88.0% (The recurrence rate = 12.0%). **Conclusions:** High grade, extensive intraductal component, and nodal involvement are significant predictors for breast cancer (IDC and DCIS) recurrence. The recurrence-free survival at 2 years is 88.0%. Our recommendation is a close follow-up for patients with these predictors.

HEMATOLOGY

Role of Plasma Exchange in COVID-19 Infection

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ABSTRACT

Objective: To evaluate the role of plasma exchange in improving mortality in patients admitted with COVID-19 infection. **Methods:** We conducted a systemic review and meta-analysis. We searched PubMed, Cochrane library, and Trip Database for all studies evaluating plasma exchange in COVID-19 infection. We excluded studies of convalescent plasma, studies focusing on the safety of the plasma exchange process, and studies of plasma exchange in specific patient populations (e.g.

patients with autoimmune disease). The quality of the studies was calculated using the New-Castle Ottawa scale for retrospective studies and modified Jadad score for randomized controlled trials. For two-arms studies, the odds ratio of mortality was calculated and a random effect model was used to pool the results. For single-arm studies, we reported the pooled proportion of mortality. **Results:** A total of 550 citations were retrieved from the search strategy, of which 17 studies were identified for systematic review and meta-analysis. All studies were of fair to good quality. One randomized controlled trial showed a statistically insignificant improvement in mortality in patients receiving plasma exchange compared to the control group. Three retrospective two-arms studies were identified. The pooled odd ratio of mortality was 0.15 (95% CI: 0.06–0.40) with low heterogeneity ($I^2 = 0\%$). The number of studies was too small to evaluate for publication bias. For single-arm studies, a pooled proportion of mortality was 0.34 (95% CI: 0.22–0.48) with low heterogeneity ($I^2 = 11\%$). However, the funnel plot showed a possible publication bias. **Conclusions:** Results suggest that plasma exchange improves mortality in patients with COVID-19 infection, albeit with a high likelihood of publication bias.

Venous Thromboembolism Risk and Prophylaxis in the Acute Hospital Care Setting: A National Multicenter Cross-sectional Study

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ABSTRACT

Objectives: To evaluate the prevalence of patients at venous thromboembolism (VTE) risk in acute hospital care settings along with the proportion of at-risk patients who receive appropriate thromboprophylaxis. Furthermore, we aim to evaluate the type and time of initiation of VTE prophylaxis as secondary outcome. **Methods:** This is a multicenter, cross-sectional study conducted in three hospitals in Oman including Sultan Qaboos University Hospital, Royal Hospital, and Sohar Hospital. The study included acutely ill medical and surgical inpatients admitted from August to September 2022. VTE risk assessment and prophylaxis recommendation were assessed based on the American College of Chest Physicians- 2012 recommendations. **Results:** A total of 384 patients were enrolled, 240 were medical patients and 144 were surgical patients. Based on the American College of Chest Physicians criteria, 179 (74.6%) and 92 (63.9%) of medical and surgical patients respectively are at risk of VTE and required prophylaxis. However, 142 (79.3%) and 70 (76.1%) of at-risk medical and surgical

patients received appropriate prophylaxis respectively. In patients where pharmacological prophylaxis was contraindicated, mechanical prophylaxis was markedly underused. The median day of initiating VTE prophylaxis was day 1 of admission. In patients who underwent surgery, the median day of initiating VTE prophylaxis was day 1 postoperatively. **Conclusions:** A large proportion of hospitalized patients in Oman are at risk of VTE. However, many patients do not receive appropriate prophylaxis. A national VTE risk assessment and guiding tool that also allows for monitoring of compliance is required. Alternative mechanical prophylaxis should be well- utilized when indicated.

HISTOPATHOLGY

The Role of CK7 in the Evaluation of HPV-induced Cervical Epithelial Lesions

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ABSTRACT

Objectives: This study aimed to assess the role of CK7 as diagnostic markers and prognostic predictors of human papillomavirus (HPV) induced cervical epithelial lesions in female patients treated at Sultan Qaboos University Hospital and Royal Hospital. **Methods:** A retrospective cohort study included 200 females diagnosed with a cervical low-grade intraepithelial lesion (LSIL), high-grade intraepithelial lesion (HSIL), or cervical squamous cell carcinoma (SCC) in Sultan Qaboos University Hospital and Royal hospital from January 2010 to December 2018. The hematoxylin and eosin (H&E) slide and the paraffin blocks were retrieved and reviewed. Tissue microarray blocks were constructed for 270 cases, and 233 normal cervical tissue as control. H&E, p16, and CK7 immunohistochemical stains were done and reposted by two pathologists. Interpretation of CK7 was interpreted as negative, patchy, gradation, and full thickness positivity. Follow-up information on the prognosis were gathered from the electronic medical records. **Results:** Among the 270 cases, 42 (15.5%) were diagnosed as normal cervical tissue, 87 (32.2%) showed cervical intraepithelial neoplasia (CIN) I, 52 (19.2%) CIN II, 46 (17%) CIN III, and 43 (15.9%) SCC. Among the 233 control cases, 139 (59.6%) showed ectocervix, 43 (18.4) endocervix, and 51 (21.8%) metaplastic epithelium. The diagnosis was confirmed by p16. The most common staining pattern in normal ectocervix and CIN I was negative staining.

While CIN II shows a negative and gradation pattern for CK7. CIN III has gradation and full-thickness staining while SCC has negative and full-thickness staining. The positivity of CK7 is significantly associated with higher-grade lesions. CK7 appeared to be a specific marker in predicting HSIL (specificity is 77.7%) but not sensitive. CK7 positivity shows no significant correlation with the prognosis of these lesions. **Conclusion:** The positivity of CK7 is significantly associated with higher-grade HPV-induced cervical lesions. CK7 is a specific marker in predicting HSIL (specificity is 77.7%) but not sensitive. The most common pattern of CK7 expression in the normal ectocervical tissue is negative, which is similar to the expression of the normal cervical tissue in patients with known HPV infection. There is no association between CK7 positivity and the prognosis of the HPV-induced cervical lesions.

An Analysis of Giant Cell-rich Lesions of Bone with Emphasis on the Role of p63 Expression as a Diagnostic Biomarker for Giant Cell Tumor of Bone

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ABSTRACT

Objectives: This study aimed to analyze giant cell-rich lesions of bone and determine whether p63 can be used as a biomarker to discriminate giant cell tumors of bone from other giant cell-rich lesions. **Methods:** A retrospective cross-sectional diagnostic accuracy test study of all patients at any age diagnosed with giant cell rich lesions on bone biopsy in Khoula Hospital from 2009 to 2021. The sample size was 128 cases. P63 expression was evaluated using immunohistochemistry. We use bone pathology specialist diagnosis after clinical and radiological correlation as the gold standard. Data were analyzed using MedCalc software 19.1.6 and IBM SPSS Statistics version 28.0. **Results:** Among the sample size, 45% male and 55% female with a mean age of 23 years have giant cell-rich lesions. Lesions were frequent in the femur, tibia, and small bones. Immunohistochemical analysis showed a p63 nuclear expression in 92.3% of giant cell tumors of bone, 42.3% of aneurysmal bone cysts, 100% of chondromyxoid fibromas, 13.6% of non-ossifying fibromas, 66.7% of brown tumor of hyperparathyroidism, 75% of chondroblastoma, 25% of giant cell reparative granuloma, and 0% of metaphyseal fibrous defect. The sensitivity and negative predictive value (NPV) of p63 immunohistochemistry of giant cell tumor of bone were 92.31% and 92.0%, respectively. The specificity and positive predictive value (PPV) were 60.53% and 61.54%, respectively. **Conclusions:** P63 is a helpful marker for diagnosing giant cell tumors of bone due to its high

sensitivity. However, it cannot be recommended as the single definitive test for making this diagnosis. The results need to be carefully interpreted in conjunction with other diagnostic methods such as imaging studies.

INTERNAL MEDICINE

Orthostatic Intolerance After Bariatric Surgery: A Systematic Review and Meta-analysis

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ABSTRACT

Objectives: To summarize evidence of orthostatic intolerance after bariatric surgery. **Method:** We conducted a systematic review using PubMed, Scopus, CINAHL, Cochrane Database of Systematic Reviews, and Cochrane Central Register of Controlled Trials to identify relevant articles from the date of inception to 1 April 2020. Study selection, data extraction, and quality assessment of the included studies were performed independently by two reviewers. The findings of the included studies were narratively reported. When feasible, a meta-analysis was done to summarize the relevant results. **Results:** Twenty studies were included (n = 19 843 participants) reporting findings of 12 prospective cohort studies, five retrospective cohort studies, two cross-sectional studies, and one randomized controlled trial. The 5-year cumulative incidence of orthostatic intolerance was 4.2% (one study). Common clinical presentations of orthostatic intolerance were lightheadedness, dizziness, Syncope, and palpitation. The pooled data suggested improvement in overall cardiac autonomic function (sympathetic and parasympathetic) post-bariatric surgery. In addition, a significant systolic blood pressure drop may reflect a reset of the balance between the sympathetic and parasympathetic nervous systems after weight loss in the pooled analysis. Existing literature on orthostatic intolerance post-bariatric surgeries was limited or of low quality, and larger studies are needed to know the true incidence of orthostatic intolerance post-bariatric surgeries and the pathophysiology. **Conclusions:** We found one study reporting the 5-year cumulative incidence of orthostatic intolerance post-bariatric surgeries as only 4.2%. This could challenge the idea of increased orthostatic intolerance prevalence post-bariatric surgeries.

Baseline Characteristics and Outcomes of Patients with COVID-19 Admitted to the Intensive Care Unit in Armed Force Hospital, Oman: A Single-center Cohort

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ABSTRACT

Objectives: To describe the demographic characteristics and outcomes among critically ill patients with COVID-19 admitted to the intensive care unit (ICU) in Armed Force Hospital (AFH) in Muscat, Oman. **Methods:** This single-center retrospective cross-sectional study was conducted among all adult patients admitted to the AFH ICU from February 2020 to November 2021 with laboratory-confirmed SARS-CoV-2 infection. AFH electronic system was used to extract demographics, clinical records, laboratory results, and radiological examinations for all patients. Depending on the variable, laboratory results were either presented at baseline value or at their peak value within the first three days of ICU stay. SPSS was used for data analysis. The t-test was used for continuous variables and chi-squared test was used for categorical variables. A *p*-value of < 0.050 was considered statistically significant. **Results:** We identified 216 critically ill patients with laboratory-confirmed SARS-CoV-2 infection. The median age of the patients was 61 years. Overall, 71 (32.9%) patients were females and 145 were males (67.1%). A total of 183 (84.7%) patients had at least one medical comorbidity. The most common comorbidities were hypertension (111 patients, 51.4%), diabetes mellitus (99 patients, 45.8%), and chronic kidney disease (26 patients, 12.0%). The overall mortality rate was approximately 56%. **Conclusions:** The high mortality rate in our study was comparable to other local and international studies. This signifies how tragedian was the burden of COVID-19 on the nation and necessitates future strategies to deal with such outbreaks to avoid similar outcomes.

OBSTETRICS AND GYNECOLOGY

Effect of COVID-19 severity on Maternal, Perinatal, and Neonatal Outcomes in Pregnant Women Infected with SARS-CoV-2 at Sultan Qaboos University Hospital

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ABSTRACT

Objectives: To evaluate the effect of COVID-19 severity on maternal, perinatal, and neonatal outcomes in pregnant women infected with SARS-CoV-2 and assess the effect of medical comorbidities on the severity of COVID-19 infection. **Methods:** A retrospective cohort study was conducted on pregnant women who were infected with SARS-CoV-2 and delivered at Sultan Qaboos University Hospital from 1 March 2020 to 31 December 2021. **Results:** A total of 118 pregnant women with COVID-19 infection were included in this study. The mean maternal age was 32.0 years, with 61.0% of women infected in the third trimester. The majority of those had mild symptoms. Eleven women had moderate infections needing inpatient care, and six women had severe infections needing intensive care unit to treat COVID-19 pneumonia. The chronic diseases among the infected women were hypothyroidism, obesity, sickle cell disease, epilepsy, and diabetes. The mean gestational age at delivery was 37.0 weeks with 20.6% of women delivering by a cesarean section which 37.5% of women had moderate to severe disease. The most common complications affected by COVID-19 severity were preterm labor (*p* = 0.002), preeclampsia (*p* = 0.002), and intrauterine fetal death (*p* = 0.089). Moreover, a total of 118 newborns were included, 111 singleton deliveries, three sets of twins, one had fetal death, and three had miscarriages. Placental histopathology was examined in 64 women over the study period, and most of them had no COVID-specific findings on histopathology. **Conclusions:** Most pregnant women with COVID-19 infection had mild symptoms. The majority of women with moderate to severe infection were admitted for COVID-19 pneumonia. There was no direct effect of COVID-19 severity on neonatal outcomes or placental histopathology changes.

Placental Histopathological Abnormalities in Adverse Obstetric Outcomes: A Retrospective Cross-sectional Study at Sultan Qaboos University Hospital

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ABSTRACT

Objectives: Placenta is a vital organ with highly specialized functions. According to the Perinatal Section of the Pediatric

Pathology Society, placental histopathology abnormalities can be classified into maternal vascular underperfusion, fetal thrombotic vasculopathy disease, and inflammatory lesions. We sought to assess the placental histopathological abnormalities in adverse obstetric outcomes and determine if there is a relationship between a specific adverse obstetric outcome and a specific placental histopathological finding. **Methods:** A retrospective cross-sectional study was conducted from January 2017 to January 2020 including all women who were admitted to Sultan Qaboos University Hospital with the adverse obstetric outcome, where the placenta was sent to the histopathology department. Pregnancies with multiple gestations, congenital abnormalities, placenta ultrasonographic abnormalities, and previous history of molar pregnancy were excluded. Data analysis was performed using SPSS version 28. Fisher Exact test was used for measuring the statistically significant relationship between placental histopathological abnormalities and adverse obstetric outcomes. **Results:** After applying inclusion and exclusion criteria, 191 women were included in our study. The most common adverse obstetric outcomes reported in our study included preterm labor (25.1%), intrauterine fetal growth restriction (IUGR) (19.4%), preeclampsia and its complications (14.7%), placental abruption (14.1%), and chorioamnionitis (13.6%). Seventy-four percent of cases were reported with Placental abnormality. In preterm labor, inflammatory lesions were present in 50.0% ($p = 0.002$), while 10.0% had maternal vascular underperfusion lesions. In IUGR, maternal underperfusion lesions were present in 24.3% while fetal thrombotic vasculopathy lesions were present in 5.4% with a statistical significance ($p = 0.037$). In preeclampsia, half of the cases had maternal underperfusion lesions ($p = 0.001$) and 10.0% had Inflammatory lesions present. Maternal underperfusion lesions were present in 30.0% with placental abruption. However, the presence of fetal thrombotic vasculopathy lesions (7.4%) was statistically significant ($p = 0.019$). Chorioamnionitis suspected cases were confirmed by histopathology in 58.0% ($p = 0.001$). **Conclusions:** Histopathological examination of the placenta was abnormal in 74.0% of women with adverse obstetrical outcomes which was significant. Histopathology examination of the placenta is important in cases of adverse obstetric outcomes to identify the underlying pathology and to formulate an appropriate plan of care in the subsequent pregnancy. Establishing hospital protocols for indications of placental histopathological examination is necessary.

OPHTHALMOLOGY

Effect of Fingolimod Therapy on the Macula of Patients with Multiple Sclerosis: A Quantitative Four-year Cohort Study from Oman

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ABSTRACT

Objectives: Fingolimod (FTY-720) is an immunomodulatory oral agent approved for the treatment of relapsing-remitting multiple sclerosis (RRMS). Several clinical trials have shown that some recipients may develop macular edema (ME) as an adverse reaction. This study aimed to evaluate the quantitative effect of fingolimod therapy on central macular thickness (CMT) and total macular volume (TMV) over a four-year period. **Methods:** This retrospective longitudinal cohort study was performed between January 2014 and December 2018. A total of 21 patients with RRMS receiving fingolimod therapy were recruited and followed-up over four years to assess CMT and TMV changes measured using spectral domain optical coherence tomography. A paired sample t-test was used to compare mean CMT and TMV values calculated at baseline prior to the initiation of fingolimod therapy with those observed at three, six, 12, 24, 36, and 48 months of treatment. **Results:** None of the patients developed ME over the four-year study period. In addition, there was no significant difference in baseline mean CMT values and those observed at a four-year follow-up. Although mean TMV values remained constant initially, there was a significant decrease towards the end of the study period. **Conclusions:** Long-term fingolimod therapy did not result in significant CFT changes. While there was a reduction in TMV towards the end of the study, this is likely due to the disease's degenerative effect on the retinal nerve fibers.

ORTHOPEDIC

Quantification of Risk Factors Associated with Developmental Dysplasia of the Hip in Patients Presenting to Khoula Hospital: A Case-Control Study

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ABSTRACT

Objectives: Developmental dysplasia of the hip (DDH) is a disease with multifactorial etiology. Risk-based ultrasound screening for DDH is common. However,

risk factors can vary from one country to another based on diverse genetic, environmental, and cultural behaviors. In this study, we aimed to evaluate the risk factors for DDH among Omani newborns presenting to Khoula Hospital. **Methods:** In this retrospective case-control study, the medical record of all children who were born in Khoula Hospital and referred by the pediatric unit to the orthopedist for various reasons, between January 2009 and December 2019, were investigated for the diagnosis of DDH. Out of 567 children, 100 children were diagnosed with DDH and met the inclusion criteria. These constituted the case group. For control group, 200 healthy children were selected matching the gender and age of the case group. Mann-Whitney U-test, Fisher's exact test, and multivariate binary logistic regression analysis were performed to compare and identify the independent risk factors. Ethical approval was obtained from the Centre of Studies and Research of MOH. **Results:** Out of the 100 (17.6%) cases of DDH, 25 were males and 75 were females. The mean age of presentation was 7.4 months. The most common reason for referral to the orthopedic unit was hip click (88%). The left hip was affected in the majority of the cases. When the two groups were compared, family history had four times increased risk for DDH (OR = 4.376, 95% CI: 1.814-10.553; $p = 0.001$), while consanguinity had two times increased risk for DDH (OR = 2.024, 95% CI: 1.185-3.457; $p = 0.010$). Both were identified as independent risk factors and predictors of developing DDH. **Conclusions:** According to our findings, family history and consanguinity seemed to be risk factors for DDH in our population, while breech presentation, mode of delivery, and oligohydramnios were not statistically significant. Infants at risk should be screened using ultrasonography. Further multicenter studies are recommended to confirm the results.

Primary Knee Anterior Cruciate Ligament Repair

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ABSTRACT

Objectives: We aimed to study the success rate of arthroscopic anterior cruciate ligament (ACL) repair of acute proximal tears, to assess the functional outcomes using validated functional scoring systems, and knee stability using instrumented stability testing. **Methods:** This is a prospective cohort study. Patients diagnosed with acute ACL injuries (less than 3 months

and Sherman type 1 and 2 proximal tears) from January 2016 to June 2020, and who agreed to undergo the repair were included in the study. Repair was done arthroscopically using simple suturing technique. Post-operatively, patients were kept in knee brace for four weeks and ACL reconstruction rehabilitation protocol was initiated at six weeks. After two years, candidates were recruited for functional scoring and instrumented stability testing. **Results:** A total of 45 patients included in the final analysis, eight failed the repair and 37 were available for functional evaluation. A success rate of 95% was found among avulsion type ACL tears. Age, tear location, and injury to repair time interval were the most factors that affected the success rate. Failure was less likely to occur after the first two years of the repair. Repair of acute proximal tears yielded high functional scores using universal validated scoring systems and knee stability was good among repaired ligaments. **Conclusions:** ACL repair has a high success rate among acute avulsion-type tears with satisfactory stability and functional outcomes.

Compliance of Orthopedic Surgeons with Investigation and Treatment of Osteoporosis Following Fragility Fractures of the Hip: A Systematic Review and Meta-analysis

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ABSTRACT

Objectives: Osteoporotic fractures of the hip are associated with high morbidity, mortality, and secondary fracture. We aimed to investigate how frequent do the orthopedic surgeons who treat primary fragility fractures of the hip undertake appropriate investigations (blood parameters and DEXA) and treatment for the underlying cause of fragility fracture which is osteoporosis. **Methods:** All observational studies that mentioned hip fracture as an index fracture with any of the secondary fractures were extracted from databases. Databases used were PubMed, Google Scholar, and Cochrane Library. Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines was used. Analysis carried out with MedCalc. Five studies were excluded for duplication from 9937 studies. From those, 9746 were excluded and 191 articles were screened. Twenty-five articles matched eligibility criteria but 11 were excluded because of different study design. Fourteen articles were then assessed. **Results:** The highest value of pooled proportion of 95% CI showed that orthopedic surgeons of 34.8% of the patients do not know what happened to the patients. From 8.76% to as high as 36.5% of patients are not investigated nor treated for the cause of osteoporosis.

Only 5% and 2% patients were investigated with DEXA scan or with blood workup, respectively. Patients of those are treated somehow, either empirically or investigated and treated (3.7% and 10.4%, respectively). **Conclusions:** Osteoporosis and fragility fractures are undertreated. We recommend surgeon education sessions to increase awareness on how to investigate and treat osteoporosis after fragility fracture. Collaboration between orthopedic units, metabolic services, nuclear medicine, and fracture liaison units with a help of a coordinator can prove helpful.

PEDIATRICS

The Outcome of the Use of Acute Noninvasive Ventilation Outside of the Pediatric Intensive Care Unit in Two Tertiary Hospitals in Oman: A Retrospective Study

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ABSTRACT

Objectives: Noninvasive ventilation (NIV) is widely used in pediatric intensive care units (PICUs). However, there is limited experience regarding the utilization of NIV in non-PICU settings. This study aimed to evaluate the use of NIV for acute respiratory distress in two pediatric high-dependency units (HDUs), identify risk factors for PICU transfer, describe outcomes, and report the incidence of adverse events. **Methods:** This retrospective study included all pediatric patients (one month to 12 years old) admitted to the pediatric HDUs of two tertiary hospitals in Oman; Royal Hospital and Sultan Qaboos University Hospital for acute respiratory distress over a 19-month period. Relevant data were collected via chart review, including diagnosis, type and duration of NIV, adverse events, and the need for PICU transfer or invasive ventilation. **Results:** A total of 299 patients were included in the study, with a median age of 7 months (interquartile range [IQR]: 3–25 months) and a median weight of 6.1 kg (IQR: 4.3–10.5 kg). Bronchiolitis (37.5%), pneumonia (34.1%), and asthma (12.7%) were the most frequent diagnoses. The Median NIV duration in the HDU was two days (IQR: 1–3 days). At the time of NIV initiation,

median SpO₂ was 96% (IQR: 90–99%), median pH was 7.36 (IQR: 7.31–7.41), and median PCO₂ was 44 mmHg (IQR: 36–53 mmHg). Overall, 234 (78.3%) patients were successfully managed in the HDU, while the remainder (21.7%) required transfer to the PICU. Of those requiring transfer, 38 (58.5%) needed invasive ventilation. The median time to invasive ventilation was 43.5 hours (IQR: 13.5–108 hours). Ten subjects (3.3%) died in the PICU. According to the multivariate analysis, maximum FIO₂ of > 50% after two hours of treatment (odds ratio [OR] = 4.494, 95% confidence interval [CI]: 1.357–14.886; *p* = 0.014) and positive end-expiratory pressure (PEEP) of > 7 cm H₂O (OR= 3.368, 95% CI: 1.490–7.612; *p* = 0.004) were predictors for NIV failure in the HDU. Significant apnea, cardiopulmonary resuscitation, and air leak syndrome were reported in 0.4%, 0.9%, and 0.9% of subjects, respectively. **Conclusions:** Utilization of NIV in a non-PICU setting was found to be safe and effective; however, high FIO₂ and PEEP requirements were associated with NIV failure.

Culture-proven Bloodstream Infection in Children Managed at a Tertiary Hospital in Oman

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ABSTRACT

Objectives: Bloodstream infection (BSI) in children causes significant morbidity and mortality and is associated with longer hospital stays and higher healthcare costs. Our objective is to study the incidence and risk factors and identify causative organisms and outcomes of BSI among Omani children in a tertiary hospital. **Methods:** A retrospective study of laboratory-confirmed BSI was conducted among children managed at Sultan Qaboos University Hospital, Oman, between 2014 and 2018. Patients' demographic, clinical, and laboratory data were extracted from the hospital's electronic records. Univariate and multivariate logistic regression analysis was used to explore the relationship between death within 30 days in children with confirmed BSI and the other studied factors. **Results:** A total of 1253 positive blood cultures were identified during the study period. Among these, 592 were probable contaminants, representing 47.2% of positive blood cultures. Overall, 404 (32.2%) clinically significant episodes of BSI were identified in 272 patients. Two-thirds of the patients (346; 85.6%) were ≤ 5 years old. Overall, 5

years incidence of BSI was 13 per 1000 admission. Three-hundred thirty-three (82.4%) episodes were either hospital-onset or healthcare-associated. Comorbidities were present in 366 (90.6%) of these children including prematurity (106; 26.2%), hematological malignancies (90; 22.3%), gut-related pathologies (71; 17.6%), and metabolic/genetic syndromes (47; 11.6%). Of the significant isolates, 211 (52.2%) were gram-negative bacteria, 168 (41.6%) were gram-positive bacteria, and 25 (6.2%) were *Candida* species. Enterobacteriaceae (152; 37.6%) was the most common organism identified followed by Coagulase-negative staphylococci (63; 15.5%) and *Staphylococcus aureus* (47; 11.6%). Of the *Klebsiella* spp and *Escherichia coli* isolates, only 60% were susceptible to 3rd generation cephalosporins. Among the potential factors predisposing to BSI, the central venous catheter was the most frequent (182; 45%). The crude mortality at 30 days was 9.2%. Moreover, both Pediatric Intensive Care Units admission (COR = 2.24, 95% CI: 0.98-4.78) and the presence of Graft-Versus-Host Disease during bacteremia (COR = 7.99, 95% CI: 1.52-37.76) were associated with increasing death within 30 days. **Conclusions:** We reported a high percentage of contaminants among our positive blood culture isolates, which highlighted an urgent need to follow aseptic precautions during blood culture collection. Since a large proportion of BSI was hospital related, there was an urge to optimize infection control strategies and Central Vein Access Device care. Adding gentamicin to the BSI empiric antimicrobial cover is highly recommended given the high rates of gram-negative organisms to third-generation cephalosporins.

PSYCHIATRY

Effectiveness of Adjunctive Repetitive Transcranial Magnetic Stimulation in Management of Treatment-resistant Depression: A Retrospective Analytic Study in Oman

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ABSTRACT

Objectives: To establish the efficacy of repetitive transcranial magnetic stimulation (rTMS) as an adjuvant treatment in patients suffering from treatment-resistant depression (TRD). **Methods:** This retrospective analytical study included all patients diagnosed with major depressive disorder and completed at least 20 sessions of rTMS, follow-up at Al Massarah Hospital between January 2015 and January 2021. Hamilton Rating Scale

for Depression was used to assess the response pre and post-treatment. The collected data were revised, coded, tabulated, and analyzed using SPSS. A *p*-value < 0.050 was considered significant. **Results:** A total of 49 patients fulfilled the inclusion criteria of the study. The mean age of the participants was 42.5±13.3. There was a significant reduction in the final assessment score after rTMS intervention as compared to baseline (*t* = 10.819, 95% CI: 8.574-12.488; *p* < 0.0001). **Conclusions:** This study shows the effectiveness of rTMS intervention in patients with TRD. Almost 37% of the patients with TRD responded to the intervention after completing 20 sessions.

The Effect of Preoperative Anxiety in Postoperative Clinical Outcome

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ABSTRACT

Objectives: To determine the relationship between the preoperative anxiety status and the clinical outcome postoperatively in a sample of Sultan Qaboos University Hospital patients. **Methods:** A prospective cohort study was conducted on elective and emergency surgical adult patients at Sultan Qaboos University Hospital, Oman. Patients' preoperative psychological status was assessed using the Hospital Anxiety and Depression Scale (HADS). Postoperatively, the length of hospital stay, observed pain scores, and complications at three days were recorded. Demographic data and clinical details including data regarding postoperative analgesia were collected. **Results:** A total of 138 patients were enrolled in the study. The overall prevalence of anxiety and depression was 42.4%, based on the HADS scores. There were no significant associations between the postoperative length of hospital stay and preoperative anxiety (HADS) scores and no significance was observed between preoperative anxiety and pain score as well. **Conclusions:** The presence of preoperative anxiety as indicated by the HADS score may significantly influence the postoperative length of hospital stay however this study failed to prove this hypothesis. Further studies needed to be more specific for a certain type of surgery.

The Differential Mediating Roles of Resilience in the Relationship Between Presence of and Search for Meaning in Life and Stress among College Students During the COVID-19 Pandemic: Mediation Analysis

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ABSTRACT

Objectives: The current literature, mostly Euro-American based, indicates that the presence of meaning in life (MIL) improves resilience and lowers stress. However, the differential mediating roles of resilience in the relationship between the search for and presence of MIL, and stress have not been explored. This study aimed to investigate the differential mediating roles of resilience in the relationship between the presence of and search for MIL, and stress among Omani college students amid the COVID-19 pandemic. **Methods:** This cross-sectional study consisted of the Brief Resilience Scale, Perceived Stress Scale 4, and Meaning in Life Questionnaire, as well as socio-demographic questions. A path analysis model was used to examine the hypothesis. **Results:** A total of 970 Omani college students responded to the questionnaire. Findings indicate that searching for MIL was significantly associated with a high level of stress directly ($\beta = 0.023$; $p < 0.001$) and indirectly, through a negative effect on resilience ($\beta = 0.006$; $p < 0.001$). Conversely, the presence of MIL was significantly associated with a decreased level of stress directly ($\beta = -0.045$; $p < 0.001$) and indirectly via a positive effect on resilience ($\beta = -0.151$; $p < 0.001$). **Conclusions:** In keeping with the proposed hypothesis, this study contributes to the current knowledge, by extrapolating the effect of searching for MIL on resilience and stress, and culturally re-contextualizing MIL research. University counseling centers could adopt meaning-based strategies to mitigate stress by promoting meaningful living and resilience.

RADIOLOGY

COVID-19 Related Pulmonary Embolism: Does it Correlate with the Computed Tomography Parenchymal Severity Score? A Retrospective Study

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ABSTRACT

Objectives: Since the isolation of the COVID-19 virus, there has been increasing evidence about its association with increased rates of pulmonary embolism. In this study, we aim to identify the possible association between the severity of COVID-19 pneumonia and the severity of pulmonary embolism. **Methods:** In this study, all Computerized Tomography Pulmonary Angiograms that were performed between 1 March and 31 June 2020 in patients with COVID-19 pneumonia at Royal and COVID-19 Field hospitals were collected. Scoring of the severity of lung parenchymal involvement and severity of pulmonary embolism if present was done. Several clinical, laboratory, and demographic data were obtained. A Computed tomography severity score and pulmonary embolism score were categorized according to the recent relevant published systems. The correlation between the severity of lung parenchymal involvement and the severity of pulmonary embolism was measured. Also, the Association between the presence of pulmonary embolism and multiple clinical and laboratory parameters was explored. **Results:** A cohort of 271 patients (mean age = 49.6 years; 35.8% females) with COVID-19 pneumonia were evaluated. 95.0% of the patients tested positive for SARS-CoV-2 and the rest were considered infected according to clinical manifestation. There was 20.4% of the patients suffered from pulmonary embolism. Twenty-eight percent of the patients were diabetic and 29.0% were hypertensive. Therapeutic anticoagulation was administered for 62.0% of the patients and 11.4% of the patients were admitted to the intensive care unit. The study demonstrated an extremely weak correlation between the severity of COVID-19 pneumonia and the severity of pulmonary embolism. From the various laboratory and clinical data, D-dimer is the only parameter that correlates significantly with the development of pulmonary embolism. **Conclusions:** There is a weak correlation between the severity of pulmonary embolism and the severity of parenchymal lung changes while the D-dimer correlates significantly with the development of pulmonary embolism.

The Utilization of FDG-PET/CT in the Management of Non-Hodgkin's Lymphoma

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ABSTRACT

Objectives: Non-Hodgkin's Lymphoma (NHL) is a collection of malignant neoplasms, originating from the lymphatic tissue, bone marrow, and extranodal sites. There are increasing numbers of studies, revisions, and recommendations of guidelines for the use of positron emission tomography/computed tomography (PET/CT) in the management of NHL. This study aims to assess and reviews the current practices regarding the use of PET in patients diagnosed with NHL at the Royal Hospital to the currently globally accepted best practice. **Method:** We conducted a retrospective analysis involving all patients from the Royal Hospital with NHL from January 2016 to December 2020, confirmed by histopathology after having their radiological history reviewed from the time of their diagnosis to the completion of treatment. Then, we compared it with the current globally accepted best standard of care. **Results:** There was a difference between the utilization of PET/CT and the international recommendations. In addition, there was inconsistency among the different treating teams managing NHL in when and how often PET/CT is indicated. **Conclusions:** There are rapidly developing advancements in the use of PET/CT, including the management in NHL. Characterization and staging of the initial disease radiological have a significant role in dictating its treatment and prognosis. It has been shown to be superior to the use of contrast-enhanced CT alone and has also been shown a potentially upstage disease severity. We recommend a revision of current established practices in the management of NHL at the Royal Hospital, as well as looking into other managed malignancies and their current protocols.