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ANESTHESIA

Preoperative Predictors of Laryngoscope View in Pediatric Population Undergoing Cardiac Catheterization

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ABSTRACT

Objectives: The primary objective of this study is to identify the pre-anesthetic determinants of difficult tracheal intubation in pediatric patients undergoing cardiac catheterization procedures. The secondary objective is to identify factors that would contribute to difficult tracheal intubation in this subset of patients. *Methods*: After obtaining the institutional review board approval [MESRC#11/2014] as well as an informed consent from the parents, 199 children [newborns to 5 years of age] undergoing elective cardiac catheterization at the National Heart Center, Royal Hospital, Muscat, were prospectively included in this observational study. Children with Down syndrome and those with dysmorphic features were excluded. Pre-anesthetic airway assessment was done using modified Mallampati grading, lower lip to chin distance (LCD), tragus to mouth angle (TMA), thyromental distance (TMD), neck circumference (NC) and the ratio of height to thyromental distance (RHTMD). Demographic data (i.e. age, height, weight, sex, American Society of Anesthesiologists [ASA] physical status and body mass index (BMI)) were recorded for each child. Cormack and Lehane grade III and IV laryngoscope views under general anesthesia were considered to represent difficult airway access. The data collected was analyzed using MedCalc software version 17.8. The descriptive analysis of the categorized variables is presented as proportions, and continuous variables are presented as mean and standard deviation. Chi-square test was used to study association between pre-anesthetic airway assessment tools and Grade III and Grave IV laryngoscope views. The receiver operating characteristic (ROC) curves were plotted and the best cut-off values for each of the airway evaluation method that would predict Cormack and Lehane grade III and IV laryngoscope views were computed. The sensitivity and the specificity were also computed along with positive and negative predictive values for each assessment technique. *Results:* One hundred ninety-nine children undergoing elective cardiac catheterization aged < 5 years were included in the study. Pre-anesthetic airway assessment was done using modified Mallampati grading, lower lip to chin distance (LCD), tragus to mouth angle (TMA), thyromental distance (TMD), neck circumference (NC), and the ratio of height to thyromental distance (RHTMD). Demographic data (i.e., age, height, weight, sex, and body mass index (BMI)) were recorded for each child. Cormack and Lehane grade III and IV laryngoscopy views under general anesthesia were considered to represent difficult airway access. The receiver operating characteristic (ROC) curves were plotted and the best cut-off values for each of the airway evaluation method that would predict Cormack and Lehane grade III and IV laryngoscopy views were computed. Values of LCD, TMA, and TMD were ≤ 2.2 cm, ≤ 7.3 cm, and ≤ 3.9 cm, respectively were found to predict Grade III and IV laryngoscope views. NC and RHTMD values ≥ 21.4 cm and ≥ 15.77 cm, respectively, were found to predict Grade III and IV laryngoscope views. Low BMI (≤ 12.17) and those patients in American Society of Anesthesiologists physical status grade III and above had a significantly higher incidence of difficult laryngoscopy visualization of the airway. *Conclusions:* LCD, TMA, TMD, NC, and RHTMD could be used as screening tools during pre-anesthetic airway evaluation for predicting difficult laryngeal views in children undergoing cardiac catheterization procedures. However, LCD and TMD had both good sensitivity and specificity in predicting poor laryngoscopy views. Patient factors like low BMI and American Society of Anesthesiologists physical status grade III and above were also associated with a significantly higher incidence of difficult laryngoscopy views.

Identification of Optimal Anesthetic Depth with Sevoflurane Using Multiple Stimuli for a Pain Free Intravenous Cannulation in Children

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ABSTRACT

Objectives: It has been recommended that to achieve optimal depth of sevoflurane anesthesia for response free

intravenous (IV) cannulation, either 3.5 minutes should elapse after the loss of eyelash reflex or the eyeballs have centralized. However, neither of these optimization methods takes into consideration the painful stimulus evoked during IV cannulation. Trapezius squeeze test (TST) is a non-invasive, simple test in which 1-2 inches of full thickness trapezius muscle is squeezed for 1-2 seconds and toe/body movement is recorded if the patient feels pain. We tested the hypothesis that the loss of response to TST under sevoflurane anesthesia would give a more accurate optimization time for pain-free IV cannulation as compared to the other two test methods stated above. *Methods*: A prospective, randomized controlled pilot study conducted on 37 patients aged between one to eight years of either gender, weighing 8-20 kg with American Society of Anesthesiologists (ASA) grade I/II, undergoing minor day care surgery. Children with delayed development or any neurological pathology, and/or recent upper respiratory tract infection (URTI), were excluded from the study. Patients were randomly assigned to group I (eyeball centralization), group II (loss of eye lash reflex + 3.5 minutes), and group III (unresponsive to TST). All children were induced with a gradually increasing concentration of sevoflurane from 0.5 to 6% in 100% oxygen over 60 seconds and thereafter maintained at 6% until IV cannulation had been achieved. After one minute of induction, the study indicators were checked every 15 seconds until the end point of the indicator had been reached. After reaching the end point of indicator, IV cannulation was performed and presence or absence of response was recorded if any. *Results:* Patient distribution among the age spectrum from one to eight years, was appropriate among the three groups ($p = 0.111$). Likewise for the weight with p-value = 0.925. One patient from group I and two patients from group II responded to IV cannulation after the clinical indicator recorded negative, which counted for 7.1% and 16.6%, respectively. However, it was not statistically significant (p =0.246). *Conclusions:* None of the TST group patients showed any motor response to cannulation suggesting its superiority. However, the small sample showed no statistical difference between the groups.

Clinical Efficacy of Protocol-Based Management of Post-Dural Puncture Headache in Patients Undergoing Cesarean Section under Spinal Anesthesia

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ABSTRACT

Objectives: Despite advances in needle size and design, postdural puncture headache (PDPH) still remains a significant cause of morbidity in patients receiving spinal anesthesia. At Khoula Hospital, we adhere to a strict protocol for managing PDPH wherein adrenocorticotrophic hormone (ACTH) is one of the treatment steps in cases of unrelieved PDPH. This study aims to observe whether parenteral ACTH attenuate or relieve PDPH. *Methods*: We carried out a retrospective analysis to note the efficacy of ACTH in managing PDPH in patients undergoing spinal anesthesia for cesarean section between October 2015 and October 2016. All patients with PDPH were followed-up for at least two months after discharged from the hospital to note recurrence, if any. As per protocol, if PDPH did not resolve or lessen in intensity with bedrest and simple analgesics (paracetamol, diclofenac, or tramadol alone, or in combination) over the first 24 hours, two injections of ACTH (1.5 mg/kg in 500 ml saline intravenous over 30 minutes) were administered 12 hours apart. No further injections of ACTH were administered. If any treatment modality demonstrated relief or attenuation in PDPH, the patient was observed for the next two days. If there was no further improvement, next step of the protocol using epidural blood patch was adopted. *Results:* A total of 614 patients received spinal anesthesia. Of these 614 patients, 31 developed PDPH (5.0%). The first line of conservative treatment with bedrests and simple analgesics was successful in relieving or alleviating PDPH in 20 patients (64.5%) within 24 hours. About 11 patients (35.5%) went on to receive ACTH as the second conservative line of management. In 10 (90.9%) of these 11 patients, PDPH either resolved or showed significant relief between 12 and 48 hours after the last ACTH injection. One patient (9.1%) out of the 11 who received ACTH, PDPH remained unresolved and the patient went on to receive epidural blood patch for alleviation of her symptoms. Epidural blood patch resulted in 90.0% relief of PDPH. *Conclusions:* Initial conservative line of treatment using analgesic combination resolved PDPH in over half of the patients while ACTH had a high rate of efficacy when administered 24 to 48 hours after the onset of PDPH.

BIOCHEMISTRY

Reference Range of Serum Anti-Müllerian Hormone (AMH) in Omani Healthy Women at the Reproductive Age

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ABSTRACT

Objectives: We aimed to determine the age-specific reference range for serum anti-müllerian hormone (AMH) in healthy Omani women throughout the reproductive

ages 20–50 years in five age groups. *Methods*: This prospective study was conducted in healthy fertile Omani women aged between 20–45 years. Subjects were divided into five age groups; total sample size was 319 and each interval had a number that was calculated by using statistical analysis. The inclusion criteria were regular period, no history of any chronic illness, not using any type of hormonal contraceptive, no history of polycystic ovary syndrome, no history of any gynecological operation, and body mass index of < 30. The participants answered a questionnaire containing their personal data, height, weight, medical history, reproductive history, and any hormonal history including use of contraceptive pills and tobacco smoking. We measured AMH level using Elecsys cobas assay. Serum concentration of follicle-stimulating hormone, luteinizing hormone, progesterone, and HbA1c were measured. *Results:* Serum AMH concentration decreased progressively with age. An exponential model which is defined as ($\sqrt{AMH}=15.02\times\ 0.96\ ^\wedge Age$) showed the best-fit model that can explain the decline of AMH with age ($R2 = 0.288$). The median AMH levels were 25.83 pmol\L for 20–25 years, 20.89 pmol\L for 26–30 years, 19.92 pmol\L for 31–35 years, 13.71 pmol\L for 36–40 years, 9.24 pmol\L 41–45 years, and 0.68 pmol\L for 46–50 years. We recommended 2.5th to 97.5th percentile of the AMH levels, as a reference range, and they were as following for each age groups 10.36–56.46, 3.74–61.88, 5.49–47.56, 2.15–48.92, 0.92–41.26, and 0.14–5.10 pmol\L, respectively. *Conclusions:* Age dependent reference range of AMH is determined. The level of AMH is decreased with age and this support the physiology of this hormone and previous studies done in this field.

Reference Ranges of Fecal Calprotectin in Healthy Omani Pediatric Population

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ABSTRACT

Objectives: To establish the reference ranges of fecal calprotectin (FC) in apparently healthy Omani pediatric population aged from one to 16 years. *Methods*: Fecal samples were collected from volunteered children from the community with the parents' consent and were given a questionnaire to include the children. Inclusion criteria were no acute or chronic illness and between the age of 1–16 years old. The subjects were divided to four subgroups (1 to < 3 years old, 3 to < 6 years old, 6 to < 9 years old, 9 to <17 years old). The samples were analyzed using enzyme-linked immunosorbent assay immunodiagnostic kit, which is a verified assay in The Royal Hospital, Muscat. *Results:* The reference range of FC is not normally distributed, hence, we calculated the median and range for each subgroup as follows: group 1 (1 to < 3 years) consisting of 39 subjects (20 females, 19 males) with median of 79.62 (range 9–425.5); group 2 (3 to < 6 years) 20 subjects (7 females, 13 males) with median of 53.79 (range 5.62–241.5); group 3 (6 to < 9 years) consisting of 32 subjects (16 females, 16 males) with median of 50.12 (range 5.52–442.5); and group 4 (9 to < 17 years) consisting of 53 subjects (29 females, 24 males) with median of 36.12 (range 3.85–317.5). FC concentrations showed reduction in levels with increasing age. *Conclusions:* The reference range we established is not normally distributed, which is consistent with what was established in the literature. Hence, we calculated the median and range and developed a reference range.

DERMATOLOGY

Acute Cutaneous Graft versus Host Disease after Bone Marrow Transplantation, Its Pattern and Outcome

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ABSTRACT

Objectives: Acute graft versus host disease (aGVHD) is a major complication of bone marrow transplantation (BMT). Despite the tremendous efforts in prevention and treatment, it is still associated with significant morbidity and mortality. The skin is the largest organ to be affected among other organs. This study was conducted to determine the prevalence, and to evaluate clinical manifestations and outcome of aGVHD developed after BMT in addition of evaluating the impact of conditioning regimen on severity of GVHD. *Methods*: Our study was retrospective cross-sectional descriptive study over a period of 10 years from 2006 to 2016, included all patients who developed aGVHD, post BMT and proven by skin biopsy. Those who are not biopsied were excluded from the study. Data were collected from Sultan Qaboos University Hospital through hospital information system. Data collection sheet was developed, which included patient's demographic, primary disease, GVHD grade, conditioning, and prophylaxis regimen. Epidata (version 3.1) was used for data entry and SPSS (version 20) was used for data analysis. *Results:* Twenty patients were found to have aGVHD. Forty-five percent developed grade I, 45% developed grade II, and remaining 10% developed grade III GVHD. Conditioning regimen that included anti-thymoglobulin (ATG) showed reduced risk of severity of GVHD as it was received by eight

patients who developed grade I–II as compared to other regimen that did not contain ATG and developed grade III GVHD. The 80% of the cases (16 patients) developed acral erythema in a form of maculopapular lesions and erythematous scaly patches. *Conclusions:* Acknowledging the limitation of our study including its retrospective nature and small sample size, which could be secondary to cases that have been clinically diagnosed without taking biopsy, it appears that the eruptions observed in our patients resemble the descriptions of cutaneous GVHD occurring after allogeneic BMT as described in literature. Certainly, the question of drug eruption cannot be excluded; however, we believe that the time course, the associated clinical findings, the morphology of the lesions, and the histological features fulfill the criteria for aGVHD. Also, conditioning with ATG provides durable disease control, with low rates of disease relapse and reduced mortality. Clinically significant aGVHD, however remains frequent and problematic, underscoring the need for continued investigations to prevent morbidity and mortality.

Sclerodermatous Chronic Graft versus Host Disease at Sultan Qaboos University Hospital

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ABSTRACT

Objective: To describe the clinical features and risk factors of patients with sclerodermatous chronic graft versus host disease (cGVHD) at sultan Qaboos university Hospital (SQUH).

Methods: Retrospective record review was conducted for all patients with clinical or histopathological diagnosis of sclerodermoid cGVHD at SQUH from January 2006 to January 2017. *Results:* A total number of 10 patients (nine males and one female) with confirmed diagnosis were included in this study. The mean age at transplant was 15.35 years old. All patient were human leukocyte antigen (HLA) matched, however, five patients had sex mismatch between donor and recipient. Stem cells source was peripheral blood for all patients. The most common conditioning regimen among all patients was cyclophosphamide with total body irradiation. In addition to sclerotic skin changes, 40% of patients had hyperpigmentation. Systemic steroids in combination with mycophenolate mofetil (MMF) (40%) was the commonest treatment regimen used. Four out of the 10 patients did not response to the systemic treatment and required extracorporeal photopheresis, two of them showed moderate to excellent response. *Conclusions:* cGVHD is a serious complication after bone marrow transplant. Many factors like source of stem cells, sex mismatch between recipient and donor, conditioning regimen may contribute as risks factors to develop sclerodermoid cGVHD.

Prospective Study of the Use of the 308-nm Excimer Laser for the Treatment of Vitiligo: The Experience in Sultanate of Oman

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ABSTRACT

Objectives: The 308-nm excimer laser represents the latest advance in the concept of selective phototherapy. In this study, we evaluated the use of 308-nm excimer laser for the treatment of vitiligo. The main objectives were to estimate the success rate for the treatment with excimer laser in different body sites and determine the factors favoring good response. *Methods*: This prospective study was conducted on 68 patients attending dermatology department at Al-Nahdha Hospital from February 2016 to May 2017. Written consent was obtained from the patients for enrollment in the study. Selected lesions were administered monochromatic 308-nm excimer laser as a mono or combined therapy. The repigmentation was assessed from photographs taken at the start and at the end of the study using 1–3 scales (1 = 0–25%, 2 = 26–75%, 3 = 76–100% repigmentation). The treatment was considered successful if > 75% repigmentation was achieved after a minimum of 15 sessions or a maximum of 30 sessions of laser treatment in a monotherapy or in combination therapy. *Results:* Out of the 68 patients enrolled in the study, only 40 patients that completed a minimum of 15 treatment sessions were used for the analysis. Twenty patients (50%) entered the study with more than one sites involved with total of 353 patches. The mean age of the patients was 34.65 years with a male predominance. Lesions located on the face, perioral, neck/scalp and trunk, (i.e. high responder location group) showed a better response to excimer laser treatment than lesions located on the upper extremities, hand, periungual, and feet (i.e., low responder location group). At the end of the 15 treatments, score 3 repigmentation was achieved in four patients (26.7%) with lesion on face, one patient (16.7%) with lesions over the neck/scalp, and two patients lesion on trunk. In 20 patients that received 30 treatments, the success rate of achieving grade 3 repigmentation was 77.8% over face, 75% over neck/scalp, and 100% over perioral area. However, despite increasing treatment sessions, most of the patients with lesions located on the upper extremities, hand, periungual, and feet (i.e.,

low responder group) had poor response. *Conclusions:* Adding 308-nm excimer laser to the treatment regimen of vitiligo patients give a better, faster, and safer response in those who failed to response to the conventional treatment. Lesion location and number of treatments may be the key factors affecting the clinical outcome.

EMERGENCY MEDICINE

Epidemiology of Sport-Related Injuries Presenting to a Tertiary Emergency Department in the Sultanate of Oman

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ABSTRACT

Objectives: This study aims to provide a scientific perspective on the epidemiology and burden of sports and recreation related injuries in the Sultanate of Oman. *Methods*: A retrospective cross-sectional study of all sports and recreation related injuries presented to the emergency department of the National Trauma Center in the Sultanate of Oman between 1 January 2016 and 31 December 2016. Data was extracted from the electronic medical system used at the National Trauma Center. Demographics, clinical, and management details were extracted. Data was recorded in excel software and analyzed using SPSS software version 22. *Results:* A total of 1015 patients were identified to have presented to the National Trauma Center during the study period with sport- and recreation-related injuries. Young men in the second and third decade of their life were the most prevalent population affected by sport injuries (mean age 24 SD±8-ears). The rate of emergency department visits due to sport-related injuries was higher in November 14.9% (151) and June 10.5% (107). Football related injuries are the most common among different sports (59%), followed by weight lifting related injuries (2%). Knee, ankle, and foot are the most commonly injured, which constitute 18.8%, 17.6%, and 17.3%, respectively. The 95.5% of cases were treated non-operatively. *Conclusions:* Sports and recreation related injuries are common in our community. Although most of these injuries are not of a serious nature, most of the injured individuals seek medical care at the emergency department leading to unnecessary crowding and inappropriate utilization of the health system. Increasing public awareness about sport related injuries and the preventive methods when practicing sports and recreational activities is necessary.

Characteristics and Patterns of Pediatric Injuries in Oman

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ABSTRACT

Objectives: Childhood injury is common in Oman; however, it has not been studied sufficiently. The aim of the study is to assess the characteristics, causes, and pattern of childhood injuries presented to a tertiary hospital (Khoula Hospital) in Oman. *Methods*: This is a descriptive retrospective study of all patients aged 12 years or less who presented to Khoula Hospital with 'injury' as a chief complaint over the year of 2014. A data collection sheet was developed that included details about the patient's demographics, time of the visit, place, cause, pattern, and outcome of injuries. The search was performed through Al-Shifa health electronic system. The charts of all visits of patients who are 12 years of age or younger where manually reviewed, trauma related visits then just got included. Those who presented with non-trauma related complaints, delayed complications of injuries as well as those who attended the emergency department for follow-up were excluded from the study. SPSS (version 20) was used for data analysis. *Results:* A total of 13 115 visits for children who are 12 years of age or younger were recorded. A total of 6 539 visits satisfied the inclusion criteria. About two-thirds of the patients were males and 93% were Omanis. Half of the injuries were secondary to fall. In addition, motor vehicle collisions and burns caused 4% and 3% of the childhood injuries, respectively. In contrast, poisoning, electrical injuries, and drowning collectively contributed to less than 0.5% of injuries. Around one third of cases were due to other causes like sharp and blunt objects, door trapping, and pulled elbow. Almost two-third of the injured children had open wounds and/or contusions, while over one-fifth had fracture or dislocation. Moreover, upper limbs followed by lower limbs then face were the most commonly injured parts of the body at 35%, 23%, and 21%, respectively. Less than 5% of the patients was admitted to the hospital, of which half was operated. *Conclusions:* Childhood injuries are common in Oman, and most of these injuries are minor and can be prevented. Fall is the most common cause of the reported injuries, while open wounds and

contusion are the most common pattern of injuries followed by fracture or dislocation. Due to the poor documentation, we were unable to describe the places of injuries. Prevention strategies need to be implemented to prevent childhood injuries. Public awareness campaigns can have a great impact in reducing the high numbers of childhood injuries.

Surviving Sepsis Campaign: Association between Bundle Compliance and Outcomes

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ABSTRACT

Objectives: The main objective was to determine the rate of compliance of emergency physicians at Royal Hospital, Muscat, Oman with the surviving sepsis campaign (SSC) care bundles and its impact on mortality. *Methods*: This cross-sectional, quality-improvement, observational study was carried out at Royal Hospital, Muscat, Oman. Participants were adult patients presenting to the emergency department over an 11-month period (1 January 2016 to 30 November 2016), with either severe sepsis or septic shock. The sample size required for a 95% confidence interval was calculated to be 322. Data was analyzed using SPSS (version 22.0). Categorical data was presented as numbers and percentages, while continuous data was presented as median figures. Association between compliance and outcome was tested using Chi-square with p-value < 0.050 deemed statistically significant. *Results:* During the study period, a total of 2232 patients presented to the emergency department. Of those, 554 met the inclusion criteria (males 54%, females 46%; age range 16−86 years; median±standard deviation 68±17 years). Patients aged > 75 years accounted for almost a third of the participants (29.3%), 39% of which passed away (p < 0.050). The 8.6% of patients were labeled with a diagnosis of septic shock, 57% of which passed away (p < 0.050). The compliance varied between the four components, being 54% for measuring lactate, 37% for collecting cultures prior to antibiotics, 15% for administering antibiotics within the first hour, and 15% for administering IV fluids. Overall rate of compliance was only 5%, mostly attributed to the latter two components. Compliance was also associated with an overall decrease in mortality (21% vs. 30%). Among patients who passed away, 67% had lactate measured within three hours (p < 0.050). In terms of collecting cultures, a total of 82% had them collected within the required time frame (p > 0.050). Fisher's exact test was not performed on the other two components. The figures were not comparable with mortality due to the low number of compliance and presence of missing data. Most patients were admitted to the hospital (90.3%), with the length of stay ranging from 1−51 days (median of 5 days). *Conclusions:* The overall compliance rate with the bundles was low. This could be attributed to the poor documentation practiced. An exploratory analysis has been initiated in that regard. Initiatives have been put into practice to raise awareness and improve adherence with these evidence-based bundles. Further educational and research programs are required to address this issue.

ENT

The Effect of Adenotonsillectomy in Immune System of Children at Sultan Qaboos University Hospital: A Prospective Cohort Study

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ABSTRACT

Objectives: To assess and determine the effect of adenotonsillectomy in immune system of children undergoing the adenotonsillectomy at Sultan Qaboos University Hospital. *Methods*: Ten patients from Sultan Qaboos University Hospital aged 1−10 years, who underwent adenotonsillectomy with no other medical issues were enrolled in this prospective cohort study conducted from February to December 2017. The control group included five healthy children matching age and sex. Blood samples were collected before the surgery and six months postoperatively. For control at recruitment and six months later, details and comprehensive assessment of immune system were done. At first stage, T-cell and B-cell lymphocytes subsets were done. Save serum was kept for immunoglobulins and specific antibodies response for the second stage (waiting test reagents). *Results:* Five male and five female underwent the adenotonsillectomy with a mean age of 6.6 years, while for the control group included three male and two female with mean age of 5.0 years were included. Comparative analysis of T-cell lymphocytes subsets (CD45, CD4, CD3, CD8, and CD57) and B-cell lymphocytes subsets (CD19, CD24, CD27, and CD38) are still under the statistical assessment. *Conclusions:* To be formulated after statistical analysis released, more children should be included in both groups in order to get more representative results. The most obvious limitation of our study was the highly expensive tests.

Influence of Recurrent Laryngeal

Nerve Injury on the Occurrence of Laryngopharyngeal Reflux: A Preliminary Study

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ABSTRACT

Objectives: To find out whether the recurrent laryngeal nerve injury after thyroid surgeries has an influence on laryngopharyngeal reflex (LPR). *Methods*: A retrospective study was conducted from January 2014 to January 2017. The case records and fiber-optic laryngoscopy (FOL) findings of patients presenting in the swallowing clinic with iatrogenic recurrent laryngeal nerve injury over a period of three years were studied. LPR was diagnosed based on the reflex finding score (RFS) that considered to be normal if the score is ≤ 7. *Results:* Nineteen patients enrolled in the study, 13 of them were having unilateral recurrent laryngeal nerve (RLN) injury while six of them were having bilateral RLN injury. The RFS ranged from six to 25 with an average score of 12.47. Eighty-nine percent (n = 17) of the patients were diagnosed to have LPR. Hence, there is a statistically proven association between recurrent laryngeal nerve injury and LPR. The most common FOL findings were diffuse erythema of the larynx (53.0%, n = 10) followed by moderate posterior commissure hypertrophy (47.0%, n = 9). These findings were comparable with the reported rate in the literature. There was no statistical significant association between the severity of LPR and the type of recurrent laryngeal nerve injury (unilateral or bilateral; p = 1.000) or the histopathological diagnosis of the thyroid swelling (p = 0.485). *Conclusions:* The role of recurrent laryngeal nerve on the control of upper esophageal sphincter (UES) has been proven anatomically and physiologically. Our study found an association between RLN injury and LPR. A prospective study with a larger sample size with preoperative FOL findings will be more statistically significant.

Outcome of Head and Neck Cancer National Screening Campaign

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ABSTRACT

Objectives: This study was conducted to determine whether head and neck cancer screening help in early detection of disease and promote awareness about head and neck cancer among Omani population. *Methods*: The study was performed using the head and neck cancer alliance screening form. The screening campaign was conducted twice on 28 April 2015 and 26 April 2016 at Al-Nahdha Hospital by the ear, nose, and throat and otolaryngology, head, and neck surgery doctors. The study involved 216 participants. *Results:* Of the 216 screened participants, 6.9% (15/216) had positive head and neck cancer screening examination and 6.9% were smokers. Ten (66.6%) of those with positive finding came for follow-up in clinic for further evaluation. No malignant case detected after further evaluation. A total of 31 participants (14.3%) were knew the earliest sign of head and neck cancer and six participants (2.7%) knew how to do an oral self-examination. Sixty percent (129/216) of the participants were interested in volunteering to promote awareness of this cancer. *Conclusions:* Head and neck cancer screening is a good tool that can help for early detection of cancer and promote the community awareness about this disease and it is risk factors.

FAMILY MEDICINE

Unintentional Childhood Injuries Presented to the Primary Health Care in Muscat, Sultanate of Oman: A Prospective Observational Study

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ABSTRACT

Objectives: Injuries in children are among the most common preventable health problems. Despite significant number of registered childhood injury cases in the Ministry of Health in Oman, there are limited studies about this issue in the country. This study aimed to describe the childhood injuries among patients attending primary care settings in Muscat governorate. *Methods*: This is a cross-sectional study conducted between 1 February 2015 and 30 April 2015 at 11 primary care centers in Muscat governorate targeting all children below the age of 12 years, presenting to the health center with injury during the study period. Studied data included site, nature, type, and time of injuries, in addition to demographic factors. *Results:* A total number of 509 children, under the age of 12 years, participated in the study from the 11 health

centers during the study period. The rate of injury visits was more than two times higher in males than in females and slightly high in children 0−6 years than 7−12 years by 54% and 45%, respectively. The majority of injuries (68%) were reported to have occurred at home, followed by school (13%), at road (8%), and at playground (6%). The most common causes of injury in children were fall (36.3%), sharp object (17.5%), burn (8.6%), and motor vehicle collision (5.5%). *Conclusions:* Childhood injuries represent a significant burden in Oman and more researches are needed on trauma care across all heath centers in the region.

Awareness of Stomach and Colorectal Cancer Symptoms and Barriers of Seeking Medical Help Among Adult Public Attending Primary Care Settings in Muscat City, Oman.

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ABSTRACT

Objectives: Stomach and colorectal cancer are among the common types of cancer in Gulf Cooperation Council including Oman. Most of the patients were diagnosed at advanced disease stages. This study aims to explore public awareness, knowledge on stomach and colorectal cancer, and barriers to seek medical help among Omani adults attending primary care settings in Muscat. *Methods*: The validated Cancer Awareness Measure questionnaire (translated to Arabic) was used to assess awareness of cancer risk factors, warning signs, symptoms, and barriers of seeking medical help among the general population. All 28 local health centers (LHCs) in Muscat were involved in the study. Omani adults 18 years and above attending LHCs were invited to participate in the study. *Results:* A total of 405 participants completed the questionnaire from 581 invitations (response rate = 69.7%). There were 169 male and 236 female. The most recognized risk factor for stomach and colorectal cancer were drinking alcohol (73%), smoking (71%), eating preservative products (62%), and family history of stomach and colorectal cancers (33%). The most recognized signs and symptoms of stomach and colorectal cancer were pallor and fatigability (55%), blood in the stool (53%), and blood in the vomit (50%). The younger age group recognized more risk factors than the other groups. Most of the risk factors were well recognized by the higher educated group. The most common barrier to seek medical help for possible early signs and symptoms of cancer were 'busy and no time to go to doctor' (57%), 'worried what doctor might find something' (56%), and 'have too many other things to worry about' (51%). Women have more barriers than men in 'scared' (odds ratio (OR) = 0.40; 95% confidence incidence (CI): 0.26−0.63), 'difficult arranging transport' (OR = 0.36; 95% CI: 0.20−0.64), and 'worried what doctor might find' (OR = 0.53; 95% CI: 0.34−0.83). *Conclusions:* Levels of awareness of stomach and colorectal cancer symptoms among public attending primary care were low in Oman. School curriculums could include sessions on cancer education and the information be reiterated to students periodically.

Family Medicine Resident's Attitudes and Perceived Barriers Toward Research Activity During Residency

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ABSTRACT

Objectives: Scholarly activity during residency is very important; however, it is faced by multiple barriers. This study was conducted to study family medicine resident's/graduates attitudes and perceived barriers toward research activity during residency at Oman Medical Specialty Board. *Methods*: A cross-sectional survey was conducted by self-administered questionnaire on all residents of all years (four years) and graduated residents of the last three years. *Results:* In general, the residents and graduates had positive attitude toward scholar activity. Lack of time (87%), lack of research curriculum (77%), lack of research skills (76%), and lack of mentor support (60%) are the most common barriers perceived by the residents and graduates. On the other hand, when asked about the factors that might influence the scholarly activity, the majority of residents and graduates agreed that providing time for research (86%), conducting journal club (85%), and mentor encouragement (86%) are the commonest factors. *Conclusions:* Family medicine residents have positive attitudes toward scholarly activity. But their scholarly work is faced by multiple barriers like lack of time and supervision. However, suggested facilitators might help to overcome these barriers and improve scholarly activity and research outcome among family medicine residents.

HEMATOLOGY

Molecular Characterization of Glucose-6-Phosphate Dehydrogenase Deficiency in Oman

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ABSTRACT

Objectives: Glucose-6-phosphate dehydrogenase (G6PD) deficiency is the most encountered abnormality of red blood cell metabolism worldwide and has high prevalence in Oman. We studied the G6PD enzyme deficiency mutations in the Omani population with partial and complete enzyme deficiency. *Methods*: Partial and complete deficient newborn and children less than one-year-old in Sultan Qaboos University Hospital from March 2017 to September 2017 were identified during routine screening test for G6PD deficiency using a fluorescent spot test. Then, the 146 identified samples were analyzed for the presence of C563T (Mediterranean mutation), G1003A (Chatham mutation), and other mutations using the direct DNA sequencing of the polymerase chain reaction. *Results:* A total of 146 participants were screened, 133 (91.1%) were completely deficient and 13 (8.9%) were partially deficient. The Mediterranean mutation (C563T) were identified in 123 (88.3%) of the participants. The remaining 23 samples showed three (2.1%) Chatham mutation (G1003A), eight (5.5%) other mutations, and six samples were not analyzed yet. *Conclusions:* The most common mutation in the Omani population is the Mediterranean mutation (C563T). However, some participants showed other mutations that need more analysis.

The Optimal Cutoff Level of Hemoglobin A2 to Differentiate Between Sickle Cell Disease Variants

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ABSTRACT

Objectives: The hemoglobin A2 (HbA2) is elevated in the presence of beta thalassemia trait and it is used as an indicator of its presence. It is overestimated in patients with sickle cell disease (SCD). The optimal cutoff to indicate the presence of beta thalassemia trait has been well established; however, it remains debatable with the coexistence of hemoglobin S (HbS). The aim of this study was to define the optimal cutoff level of HbA2 to differentiate between hemoglobin sickle/sickle and S/Beta SCD genotype variants. *Methods*: In this cross-sectional study, we enrolled 108 patients with SCD who have SS or S/Beta genotype based on high performance liquid chromatography (HPLC). The diagnoses were confirmed genetically by DNA sequencing of beta globin gene. Clinical and laboratory data were exported from track care system into an excel sheet. These include age, gender, genotype, HbA, HbA2, HbF, HbS, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, red cell count, and hemoglobin. We used the receiver operating curve analysis to obtain the optimal cutoff level of HbA2 using the maximum sensitivity and specificity. *Results:* Among 108 patients included in the analysis, SS and S/Bthal patients were 82.4% and 17.5%, respectively. The median HbA2 level was 4.45 (0.5–6.5) in SS group and 6.25(4.7–7.7) in S/Bthal group. Hemoglobin A median level was 2.1 (1.2–60) in SS patients and 4.85 (1.6–41) in S/Bthal patients. The hemoglobin S median level in SS patients was 84.1 (27.7–93.3) whereas it was 78.55 (46–86) in S/Bthal patients. Hydroxycarbamide therapy was used in 38 patients and 9 patients of SS and S/Bthal patients, respectively. The optimal cutoff level of HbA2 was determined to be 5.5% assessed by area under the curve (0.936, 95% confidence interval; 0.878–0.994). Using this cutoff gives 87% sensitivity and 89% specificity. *Conclusions:* The optimal cutoff HbA2 level to diagnose compound heterozygous Beta- thalassemia with sickle cell state is 5.5%. The limitation of the study is difficulty to classify some patients to specific group (SS versus S/B), because neither confirmed genetically, nor have parental HPLC done. We are looking forward to increase sample size through genetic confirmation and including other Hb variables.

Stable Mixed Chimerism after Hematopoietic Stem Cell Transplantation in Patients with Sickle Cell Disease

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ABSTRACT

Objectives: Hematopoietic stem cell transplantation (HSCT) is a curative therapy for patients with sickle cell disease (SCD). Hemoglobin A in SCD ameliorates the manifestations of the disease and this could be achieved with stable mixed chimerism after a reduced intensity HSCT. This study aims to estimate the proportion of patients who develop mixed chimerism after HSCT for SCD and to characterize its progression in patients who develop it. *Methods*: This is a retrospective cohort study conducted at Sultan Qaboos University Hospital (SQUH), Oman, bone marrow transplant unit. We included all patients with SCD who received HSCT from May 2007 to May 2016. Patients who received second HSCT were excluded. Short tandem repeat polymerase chain reaction was used for chimerism assessment. Mixed chimerism was defined as 5–95% chimerism at six months from HSCT. The data was analyzed by IBM SPSS statistics version 22. Univariable analysis was used to assess the predictors of mixed chimerism. *Results:* We included 56 eligible patients. The median follow-up time after HSCT was 37.50 months (interquartile range: 28.25–63.50 months). The mean age at transplant was 19.9 ± 8.44 years. Fifty-nine percent of patients were male. Most patients had S/S genotype (77%), followed by S/beta-thalassemia mutation (20%). The indications for HSCT were stroke in 7%, acute chest syndrome (ACS) in 9%, recurrent vaso-occlusive crisis (VOC) in 38%, stroke and ACS in 7%, ACS and VOC in 31%, orbital compression syndrome in 2%, stroke and Moyamoya disease in 4%, and Moyamoya disease in 2%. The two most frequently used preparative regimens were Busulfan/Fludarabine/ATG in 49% and Thiotepa/Treosulfan/Fludarabine in 42%. Twenty-five percent of patients developed mixed chimerism at six months after HSCT. On follow-up of patients with mixed chimerism, 8% rejected the graft, 31% developed complete chimerism, and 61% continued to be in mixed chimerism. Preparative regimen and the development of acute graft versus host disease (GvHD) were statistically significant predictors of mixed chimerism at six months (p-values: 0.001 and 0.018, respectively). Age at transplant, gender, red blood cell antigen alloimmunization, and ferritin were not statistically significant predictors of the mixed chimerism (p > 0.050). *Conclusions:* The study confirmed that mixed chimerism can commonly be achieved in patients with SCD after HSCT and in majority, it remains stable on long-term follow-up. Reduced intensity preparative regimen and lack of acute graft versus host disease predicts the development of mixed chimerism. Larger prospective studies are needed to confirm these results.

HISTOPATHOLOGY

Peripheral T-cell Lymphoma in Oman: Prevalence and Clinico pathological Findings

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ABSTRACT

Objectives: To estimate the prevalence and the annual rate of diagnosis of peripheral T-cell lymphoma (PTLCs) in Oman and to describe the associated clinical features and World Health Organization (WHO) pathological classification. *Methods*: The data of patients diagnosed with lymphoma from 2006 to 2015 was collected through review of medical records at Royal Hospital and Sultan Qaboos University Hospital. Out of 1130 lymphoma cases reviewed, 90 cases were PTLCs. Data entry was done using epidata and followed by statistical analysis by SPSS program. The classification of PTLCs was done according to WHO (2008) classification. *Results:* The prevalence of PTLCs in Oman among all lymphoma is estimated to be 7.9% and the annual rate of diagnosis has shown moderate increase from 6.0% in 2006 to 10.0% in 2015. Among all PTLCs, anaplastic lymphoma kinase-negative anaplastic cell lymphoma was the most commonly diagnosed comprising 35.0% of all PTLCs. The median age of patient diagnosed with PTLCs was measured to be 45.5 years, which is very young compared to the internationally estimated age (60-22 years). However, like the international data, male comprised the majority of patients diagnosed with PTLCs (71.9%). In this study, 73.0% of patients presented in later stage (III/IV) and 39.1% of all patients survived less than six months post diagnosis. *Conclusions:* The prevalence of PTLCs among all lymphoma, and among non Hodgkin lymphoma is similar to the prevalence described in previous studies in Asia (China and Hong Kong), while it is slightly higher than the prevalence described in the west (Canada). The annual rate of diagnosis is steadily increasing throughout the years. All these findings along the clinical features should be added to the international pool of data to reach better understanding of this rare entity. In addition, the diagnostic accuracy of PTCLs in Oman, and the reasons of patients' late presentation and poor survival should be considered in future studies.

INTERNAL MEDICINE

Depression in Patients with Sickle Cell Disease in Oman

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ABSTRACT

Objectives: Depression associated with sickle cell disease (SCD) has been thought to result from chronic pain and other illness-related symptoms. Studies suggested a relationship between medical complications and psychopathology in patients with SCD. This study was conducted to assess the prevalence of depression and depressive symptoms in patients with SCD in Oman, and to assess predictors of depression severity. *Methods*: This was a cross-sectional study conducted in the outpatient hematology clinic at Sultan Qaboos University Hospital from the period of 11 May 2016 to 6 August 2017. The study included adult patients > 17 years, diagnosed with SCD. We excluded patients who cannot read or did not consent to be enrolled for the study. The study assessed depressive symptoms using the Beck Depression Inventory (BDI), which is a previously validated 21-item self-report multiple-choice inventory and widely used indicator of the severity of depression. We used Cronbach's Alpha to assess the reliability of Statistics. *Results:* A total of 39 participant's scores were analysed. Among those, 33% were males. Our results have shown that a total of 56% patients had at least mild depressive symptoms (38% with mild to moderate depression and 18% are in the moderate and severe range). The remaining 44% were labelled as minimal depression (BDI score of 0-9). Our small sample size failed to prove a significant relation of the depression severity when linked to the following variables: use of hydroxyurea, gender, state of bone marrow transplant, and presence of complications. *Conclusions:* A high proportion of patients with SCD in Oman suffer from depression or depressive symptoms. This is likely related to SCD or its complications. Further research is suggested to point out the contributing factors to the severity. It is suggested to have a low threshold to assess depressive symptoms in patients with SCD to offer proper psychiatric management.

Lifestyle-Related Risk Factors of Colorectal Cancers in Oman

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ABSTRACT

Objectives: Colon cancer is the third most common cancer globally and the second in Oman. Diet, body mass index (BMI), physical activity, education level, and family history may affect the risk of developing colon cancer, however, no epidemiological studies in Oman assess these factors simultaneously. This study aimed to examined the relationship between the mentioned factors and colon cancer. *Methods*: This is a case-control study, based on a validated semi-quantitative questionnaire on potential risk factors. The colorectal cancer (CRC) patients who were diagnosed between 2003 and 2016 (excluding hereditary cases) were interviewed in the oncology clinic in Sultan Qaboos University Hospital. Gender and age matched controls, who did not have cancer, were interviewed in non-medical clinics. Cases and controls were identified from hospital information system. We used SPSS version 25 for analysis. Descriptive statistics, chi-square tests, univariate, and multivariate analysis were used where appropriate. Odds ratio (OR) with 95% confidence interval was calculated to assess the magnitude of association between risk factors and CRC. $p = 0.050$ or below regarded as statistically significant. *Results:* A total of 232 participants were interviewed (102 cases and 133 controls). Seventy two percent of the cases were diagnosed having stage 3 and 4. Having a BMI 30 reduces the risk of CRC by 89% (OR: 0.104; 95% CI: 0.021–0.5, $p = 0.006$). Walking at least twice weekly reduces the risk of CRC by 94% (OR: 0.051; 95% CI: 0.009–0.278, $p = 0.001$). Consumption of cooked vegetables reduces the risk of CRC by 79% (OR: 0.21; 95% CI: 0.004–0.109, $p = 0.000$). The risk of CRC by 69% is reduced by eating rice (OR: 0.31; 95% CI: 0.003–0.349, $p = 0.005$). The risk of CRC is increased 22 times when there is family history of colon cancer (OR: 22.8; 95% CI: 1.11–467.7, $p = 0.043$). No associations seen with smoking, alcohol consumption, educational level, processed meat consumption nor with fruit consumption. *Conclusions:* These findings support the information of influences of obesity, physical activity, vegetables consumption, and family history with CRC incidence.

Characteristics of Colorectal Cancer among Omani Patients: A Single Center Study

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ABSTRACT

Objectives: Colorectal cancer (CRC) is the second most common cancer among Omani male and third most common among female. There was an increase in the age-standardized incidence rates of CRC over the last few decades. Our aim was to identify the clinical characteristics of CRC among Omani at Royal Hospital. *Methods*: This was a single centered retrospective chart review. It involved all histologically confirmed CRC patients who presented to Royal Hospital between January 2006 and December 2015. A total of 341 patients' information were collected. Data analysis was performed using descriptive statistics. *Results:* Among the 341

Omani patients with confirmed diagnosis of CRC, the majority were males (57.1%), with a mean age of 55 years and 20% present at age 40. The most frequent symptom leading to investigation was abdominal pain (84.7%), followed by constipation (61%), rectal bleeding (51.4%), altered bowel habit (39.9%), weight loss (36%), and melena (18.5%). A proportion of patients had comorbidities including hypertension (38.6%), diabetes (31.3%), heart disease (10.6%), and dyslipidemia (16%). CRC was found to affect mostly distal colon (42%) and rectum (41%). Histopathologically, 79.7% of CRC were moderately differentiated, 11.4% were well differentiated, and only 8.9% were poorly differentiated. Majority of patients were diagnosed at stage II (43%) and stage III (36%), while only 8% had an early diagnosis at stage I. *Conclusions:* CRC is more common in males and it frequently presents with abdominal pain. Most frequent disease location is distal colon and rectum and majority of the patients are in stage II and stage III.

MICROBIOLOGY

Evaluation of rt-PCR as a Diagnostic Test for Bordetella pertussis Isolated from Patients in Oman

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ABSTRACT

Objectives: Pertussis (whooping cough) is a highly infectious respiratory illness caused by Bordetella pertussis. Although vaccination has been available for pertussis, resurgence of cases was noticed since the 1990s in all countries, which highlights the importance of timely accurate diagnosis of pertussis. Culture is considered the gold standard for diagnosis of pertussis because of its high specificity, yet several previous studies showed suboptimal sensitivity compared to real-time polymerase chain reaction (rt-PCR). This study was designed as a diagnostic test accuracy study to evaluate rt-PCR for diagnosis of pertussis. *Methods*: A total of 590 nasopharyngeal samples sent from all over Oman to Central Public Health Laboratories from January 2014 to December 2016 were tested using both culture and rt-PCR. *Results:* Out of 590 samples, 73 were positive by rt-PCR compared to 26 samples positive by culture. All of the 26 samples positive by culture were also positive by rt-PCR. The sensitivity and specificity of rt-PCR compared to culture was 100% (confidence interval (CI): 86.77%−100%) and 91.67% (CI: 89.07−93.81%), respectively. In order to rule out false positive results by rt-PCR, clinical correlation was done. Out of the 47 cases, which were pertussis positive by rt-PCR but negative by culture, 44 cases were clinically evaluated by access to clinical details and classification of cases using different case definitions for pertussis. Clinical evaluation was not possible for three cases due to unavailability of clinical data. Out of these 44, cases that met clinical criteria as probable pertussis cases were 21 (48%) according to CDC2014 case definition, 41 (93%) according to European 2008 case definition, and 44 (100%) according to Canada 2009 and Australia 2004 case definitions. With positive rt-PCR, these cases were classified as confirmed according to case definitions. Hence, this increases the specificity of rt-PCR. The mean turn-around-time was 3.46 days for rt-PCR compared to 6.26 days for culture. *Conclusions:* rt-PCR is highly sensitive and specific test for diagnosis of B. pertussis. Based on these results, it should be considered to set up PCR diagnostic facility in regional hospitals in Oman, as this will lead to timely accurate diagnosis of pertussis. In addition, we postulate that rt-PCR may replace culture as the gold standard for diagnosis of B. pertussis.

HIV Drug Resistance among HIV Patients Failing Therapy at Tertiary HIV Center in Oman: A Case Record Review

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ABSTRACT

Objectives: This study aimed to estimate the prevalence of human immunodeficiency virus (HIV) drug resistance and describe the common genetic mutations in patients failing antiretroviral therapy (ART) at a tertiary HIV center in Oman (Al Nahdha Hospital). The impact of HIV resistance tests results on patients' management was also investigated. *Methods*: A retrospective cross sectional record review was conducted for all HIV drug resistance tests requested from Al Nahdha Hospital from January 2003 to May 2017. Ninety-eight tests for 84 patients failing ART were analyzed. *Results:* Eighty-two percent of patients had a resistance to at least one drug. M184V, G190 and K103 are the most common mutations among those patients. Among the tests showed resistant virus (n=82), 78% were followed by ART switch based on the resistance test results. After ART switch 67% of the cases achieved good virological response. *Conclusion:* HIV drug resistance is very common among HIV patients failing ART, and HIV drug resistance should be considered in those patients. ART switch based on the resistance test result leads to a good virological response in compliant patients.

Staphylococcus aureus Bacteremia: Trend of Risk Factors, Microbiological

Characteristics, Treatment and Outcome in a Tertiary Hospital, Muscat, Oman

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ABSTRACT

Objectives: Staphylococcus aureus bacteremia (SAB), one of the most prevalent and difficult to treat bacteremia, is considered a major cause of morbidity and mortality worldwide. However, no local epidemiological data available for SAB. This study aims to study the episodes of SAB diagnosed at a tertiary hospital, to determine the source of infection, trends of risk factors, and the microbiological and clinical outcome of treatment. *Methods*: A descriptive cross-sectional study in which the episodes of SAB diagnosed at Royal Hospital, from January 2015 to December 2016 were analyzed. *Results:* A total of 118 episodes of SAB were diagnosed with a median age of 52 years (the interquartile range 36 years) and a male: female ratio of 1.4:1. Hospital-acquired infection was detected in 59.3% of the episodes versus 40.7% community acquired. Methicillin resistant S. aureus was found in 30% of the episodes. Skin and soft tissue infection and catheter related blood stream infection were the main sources of bacteremia episodes (35.6% and 28%, respectively). The 30 days overall mortality was 17.8%. Empirical vancomycin was given to 73.2% of patients in which isolates turned to be methicillin sensitive S. aureus, whereas it was not given to 8.6% of isolates that turn to be methicillin resistant S. aureus. Fifty-one of the patients were discharged before completing 14 days of intravenous antibiotic. *Conclusions:* This study highlights the importance of following the infection prevention and control measures to reduce the rate of hospital acquired infection. It is crucial to increase awareness of the standard of care for SAB in accordance with the international guidelines. Moreover, the study emphasizes the need of introducing a rapid molecular test for early accurate diagnosis; thus, aiding proper management.

OBSTETRICS AND GYNECOLOGY

Obstetric Outcome in Adolescence: A Single Centre Experience over 10 Years

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ABSTRACT

Objectives: Multiple studies demonstrated that childbearing is associated with greater health consequences for teens than for adult women. The aim of this study was to determine whether young adolescents aged 11−19 years have an increased risk of cesarean or operative delivery, as well as maternal or neonatal delivery-related morbidity, compared to young adults aged 20−24 years. *Methods*: Retrospective longitudinal cohort study. All pregnant women aged < 25 years with cephalic presentation and singleton pregnancy delivered in Royal Hospital over the period of 10 years (January 2006 to December 2015) were followed-up retrospectively for pregnancy outcomes. Exclusion criteria included all pregnancies at 24 weeks and less, breech presentation at time of delivery, and multiple pregnancy. *Results:* Total deliveries of adolescent age were 180 out of 3000. The ratio of adult age deliveries to adolescent age deliveries were considered as 2:1 in data analysis, which is randomly selected over the period of 10 year. Overall obstetric outcomes, the significant complications for adolescent age group are intrauterine growth restriction (IUGR) ($p = 0.023$) and neonatal intensive care unit (NICU) admission ($p = 0.009$). The rest were not significant. *Conclusions:* There is no significant outcome complication among adolescent age group pregnancy compared to adult group except IUGR and NICU admissions.

Pregnancy Outcome in Elderly Primigrvida above 35 Years Old in Oman

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ABSTRACT

Objectives: Worldwide, it is becoming common to conceive at or beyond 35 years. The age of marriage in Oman is increasing and more women are postponing childbearing. Up-to-date, there are no published reports of pregnancy outcome in elderly primigravida in Oman. Hence, the purpose of this study is to review the pregnancy outcome in elderly primigravida women. *Methods*: This is a retrospective cohort study in which primgravida women at the age of 35 years or older at the time of delivery were classified as elderly primigravida and those who are aged between 20 to 34 year were considered the control group. Pregnancy and birth outcomes in elderly primigravida compared to the control group at Sultan Qaboos

University Hospital from the year 2010 to December 2016 were reviewed. Maternal complications in pregnancy like gestational diabetes, hypertension, mode of delivery, and neonatal outcome of all these women were collected from the hospital information records and delivery ward registry. The inclusion criteria were Omanis, not known to have any medical disease, spontaneous conception, and singleton pregnancy. Pregnancies with history of previous miscarriage/s, and ovulations induction pregnancy were all excluded. *Results:* The study started with 230 women, out of which 83 cases were excluded, 146 remained. Subjects were divided equally to 73 cases for each group, the study and the control group. Results had shown significant increase in the rate of pre-eclampsia, gestational diabetes mellitus, instrumental delivery, post-partum hemorrhage, and neonatal intensive care unit admission for the neonates, all in comparison to the younger age group including the cesarean section up to 63.6% and perineal trauma with rate of 60%. *Conclusions:* Maternal age at the first pregnancy carries influences on the mother, pregnancy and neonatal outcome. Hence, elderly primigravida are considered as high-risk pregnancy.

Outcome of Labor Induced with Prostaglandin E2 in Patients with Previous One Lower Segment Cesarean Section

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ABSTRACT

Objectives: To evaluate the incidence of scar complications and mode of delivery in patients with previous one lower segment cesarean section induced with prostaglandin E2 at Khoula Hospital by assessing fetal and maternal morbidity. *Methods*: A retrospective cohort study on women at Khoula Hospital with previous history of one lower segment cesarean section from January 2013 to December 2016. One-hundred and eighty-eight patients were included (n=188) in this study who were Omanis, had history of one previous lower segment cesarean section, and had no contraindications for vaginal delivery. The study group included ninety-four patients who were induced with low dose of prostaglandin E2. Patients who came with spontaneous labor were included in the control group. *Results:* The repeat cesarean section in patients who were induced were 39.4% compared to 23.4% in patients who came with spontaneous labor ($p = 0.027$). Patients with history of previous vaginal delivery in the study group, had 80% successful rate in vaginal delivery after cesarean section compared to 51.6% who did not have previous history of vaginal birth after cesarean ($p = 0.012$). There was no maternal or fetal mortality case recorded and there was no significant increase in the maternal or fetal morbidities. *Conclusions:* Induction of labor in previous one lower segment cesarean section was associated with significantly increased rate of repeat cesarean section; however, there were no scar complications. Low-dose prostaglandin E2 is a safe option for induction of labor in women undergoing trial labor after cesarean section.

OMFS

Operative Time and Length of Hospital Stay Following Orthognathic Surgery: A Five-year Retrospective Study at Al-Nahda Hospital, Oman

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ABSTRACT

Objectives: The aim of this study was to find a possible link between the operative time of orthognathic surgery and the postoperative length of hospital stay (LHS). Other factors that may influence LHS were also assessed including age, gender, indication for the surgery, type of procedure, and the need for blood transfusion. *Methods*: This is a retrospective cohort study of patients' records in Al-Shifa 3 plus at Al-Nahda Hospital, Muscat, Oman. Records of patients who underwent orthognathic surgery between January 2009 and December 2013 were included. Data were collected by the principal author (HI) and calibrated with two other authors (SA & MN). The following variables were recorded for each patient: age, gender, indication for surgery, type of procedure, operative time, LHS, and need for blood transfusion. Data analysis were carried out using IBM SPSS (Version 22). *Results:* Two hundred fifteen patients were operated during the study period. Eleven patients have been excluded due to treatment as day care cases (eight patients), incomplete records (two patients), and concomitant non-maxillofacial procedure (one patient). Two hundred four patients were therefore eligible for inclusion. We found that there was a statistically significant correlation between the operative time of orthognathic surgery and length of hospital stay ($p > 0.001$). Other factors that have a statistically significant influence in LHS include female ($p = 0.021$), if the indication for the surgery is facial asymmetry, malocclusion, or vertical maxillary excess ($p = 0.033$), type of procedure (LeFort I, bimax and trimax) ($p = 0.002$) and if the patient needed blood transfusion postoperatively ($p = 0.005$). The age of the patient did not influence the LHS ($p = 0.358$). *Conclusions:* LHS after orthognathic surgery is influenced by the operative time, gender of the

patient, indication for the surgery, procedure type, and if blood transfusion is needed.

OPHTHALMOLOGY

Phenotypic and Genotypic Characterization of Leber Congenital Amaurosis in Omani Families: A Sultan Qaboos University Hospital Experience

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ABSTRACT

Objectives: To describe the phenotypic and genotypic characteristics of Omani leber congenital amaurosis (LCA) patients attending the ocular genetic (OG) clinic at Sultan Qaboos University Hospital (SQUH). *Methods*: In this retrospective descriptive case series study, the electronic health records of all Omani patients attending the OG clinic at SQUH between 2014–2017, with a clinical diagnosis of LCA, were retrospectively reviewed. The reviewed data include demographic data, clinical history, findings of ophthalmic examination and electroretinography, the major phenotypes for each gene, and results of molecular genetic testing (MGT). *Results:* Thirty-three patients from 24 Omani families with clinical features of LCA were identified, 61% were female. Onset of symptoms in 61% of patients was less than six months old. Consanguinity was present in 21 families. ninety percent of patients had severe rod-cone dysfunction in electroretinography. Disease causing mutaione were identified in 27 patients. MGT were performed on 179 retinal dystrophy known genes by next generation sequencing (NGS) all found mutations were homozygous except one heterozygous. The GUCY2D mutation was identified in five families (9/27 patients). Of these patients eight had hypermetropia and attenuated retinal blood vessels, 5/9 had salt and pepper appearance. The CEP290 mutation was found in three families (5/27). Hypermetropia was found in 3/5, dull macula reflex and white flecks. Joubert syndrome was found in 2/5. The RPGRIPI mutation was found in 4/27 from four families. Three-fourth have hypermetropia, dull macula reflex and attenuated retinal blood vessels. The RDH12 mutation was found in two unrelated patients who both have pale optic disc and attenuated retinal vessels. The RPE65 mutation was found in two siblings both of whom had squint, sluggish pupil reaction, white flecks, leopard retina, dull macula reflex, pale optic disc, and attenuated retinal vessels. The WDR19 mutation was found in two siblings who were diagnosed with non-syndromic LCA but then both developed renal impairment (nephronophthisis). They were diagnosed eventually with (SLSN8) Senior–Loken syndrome. *Conclusions:* LCA has a striking variability in its phenotypic and genotypic characteristics. This study, being the first in Oman, gives us an overview of the clinical and genetic characteristics of LCA in the studied patients. Gene mutation identification will serve these patients with informed genetic counseling, family planning, and future gene therapy selection.

Symmetrical versus Asymmetrical Inferior Oblique Muscle Weakening for Asymmetrical Inferior Oblique Over-action

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ABSTRACT

Objectives: Inferior oblique over-action (IOOA), a common disorder of ocular motility, is often bilateral and asymmetrical. This study was conducted to compare the effect of two inferior oblique (IO) weakening procedures (symmetrical vs. asymmetrical) in normalizing IO action when employed in the treatment of asymmetrical IOOA. *Methods*: In this retrospective cohort study, the electronic records of all patients with asymmetrical IOOA who had undergone IO weakening procedures in both eyes in Sultan Qaboos University Hopsital between January 2010 and May 2016 were retrospectively reviewed. Patients with comitant esotropia or exotropia with bilateral, asymmetrical IOOA, vertical deviation in primary position < 15 prism diopters (PD), and a minimum of three months follow-up were included. Patients with horizontal incomitance, restrictive strabismus, dissociated vertical deviation, and history of previous IO surgery were excluded. Findings of orthoptic evaluation were recorded and analyzed using the Mann-Whitney U test. *Results:* A total of 11 patients (22 eyes) were included in the study with mean age of 5.5 years (3-13 years). The male to female ratio was 2:1. The primary diagnosis of the 11 patients was infantile esotropia (four), congenital exotropia (four), intermittent exotropia (two), and isolated IOOA (one). Symmetrical IO surgery had been performed in seven patients and asymmetrical IO surgery in four patients. Seventy-one percent of patients in the symmetrical group had vertical alignment within five PD compared to 75% in the asymmetrical group. The mean reduction in IO overaction was similar in symmetrical (2.5;1.5-3.0) and asymmetrical (2.5;1.125-3.5) groups (p-value = 1.000).

The lower limit of the mean confidence interval was within +5 PD. V-pattern correction in symmetrical and asymmetrical groups was 40%, and 17%, respectively (p-value = 0.140). *Conclusions:* Both symmetrical and asymmetrical IO weakening procedures are effective in reducing IOOA, the vertical deviation and V pattern in patients with asymmetrical IOOA. Symmetrical surgery may have a 'balancing effect' in normalizing the IO action.

Effect of Accelerated Collagen Corneal Cross-Linking in Arresting the Progression of Keratoconus Among Young Omani Population: One Year Follow Up Results

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ABSTRACT

Objectives: The effect of accelerated collagen corneal cross-linking (ACXL) in arresting the progression of keratoconus (KC) among young Omani population one year follow up results. *Methods*: A retrospective cohort study conducted at Ophthalmology center, Armed Forces Hospital, Muscat, Oman. One hundred fifty eyes of 101 patients age 9−20 years with progressive KC were included in this study. The patients underwent corneal topography for K max and spectral domain ocular coherence tomography (SD-OCT) for pachymetry. Forme fruste KC, pellucid marginal degeneration, and other corneal ectatic condition were excluded. All patients underwent epithelium-off ACXL using 0.1% riboflavin for 10 minutes after debridement of 7−8 mm of corneal epithelium. Cornea was exposed to 365 nm ultraviolet A light for four minutes at an irradiance of 30mW/cm2. Patients were followed-up at three months and one year. The change in K max, best corrected visual acuity, and corneal thickness over the time period was analyzed using generalized estimating equation. *Results:* Over the time of 12 months the mean change of reduction in K max after is 0.135 (confidence interval (CI): -0.150,-0.120) per month, which is statistically significant (p < 0.001). Best corrected visual acuity statistically has no significant change (CI: -0.001, 0.001). Corneal thickness over period of time the mean change -0.465 (CI: -0.588, -0.342). *Conclusions:* ACXL has shown significant effect in arresting the progression of KC disease in our patients. It also showed improvement by mean change -0.135 diopters of K max per month over the study period. Corneal thickness reduction even if it is statistically significant, the mean reduction of -0.465 micrometer consider clinically stable cornea after ACXL

ORTHOPEDICS

Mapping Molecular Changes Associated with Avascular Necrosis Using Raman Spectrometry

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ABSTRACT

Objectives: Bone avascular necrosis is a pathological condition, which results from hypo-vascularity to the bone tissue. Although it is a poorly understood condition, it can be a consequence of either traumatic or non-traumatic factors, compromising the bone precarious blood flow. Bone hypo-vascularity causes the death of bone marrow, osteocytes, and ultimately failure of the necrotic part. Due to the lack of resolution and poor sensitivity of existing diagnostic modalities, the aim of this study was to examine avascular necrosed bones, and map the molecular changes using Raman spectrometry. *Methods*: Avascular necrotic femoral heads were obtained under institutional permission from sickle-cell-diseased patients who underwent total hip replacement due to avascular necrosis (n = 7), and stored at -20ºC until further processing. Samples were cut in half and scanned with a Raman spectrometer. Scanned areas were interrelated with preoperative magnetic resonance scans to identify avascular necrosed areas (samples) and healthy bone areas (control). The effect of avascular necrosis on bone mineralization, crystallinity of minerals, content of carbonate, collagen cross-linking, mineral and collagen fibril orientation were examined. *Results:* Results suggest a significant difference ($p < 0.050$) in bone quality when comparing diseased bone areas to controls. *Conclusions:* Our results showed the efficacy of Raman spectroscopy as a tool to analyze the overall biochemical signature of avascular necrosis. It can be a potential screening tool for bone avascular necrosis, and provide future predication of bone fragility while differentiating from other bone pathologies.

Return to Full Military Activities after Anterior Cruciate Ligament Reconstruction

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ABSTRACT

Objectives: Armed forces represent a physically active population who engage in regular exercises, recreational sports, and physical training that place them at high risk for anterior cruciate ligament (ACL) injury. Considering the high occupational demand, uniformed military personnel encouraged to have surgical reconstruction of a ruptured ACL to resume their military activities. However, surgical reconstruction is not always successful and uniformed personnel may not tolerate the heavy military's physical demand. In this study, we reported the outcomes of full return to duties in the uniformed military personnel after primary ACL reconstruction. We also analysed the risk factors, which can lead to long-term disability. *Methods*: A single-institution, retrospective analysis of surgical records data and phone interviews of uniformed military personnel who underwent primary ACL reconstruction during a 5-year period identified. Measured end points were the rate of return to full military duties as well as knee function (measured by the Lysholm score). *Results:* Total number of uniformed military personnel who underwent ACL reconstruction included in the study was 137 with a minimum follow-up of one year. All were male, mean age was 30.2 (min 22, max 44), 30.7% had isolated ACL injury whereas 69.3% were associated with a meniscus injury. The majority of the surgeries done within five years of injury (92%). The mean Lysholm functional score was 90.22. Seventy-five percent of the service members returned to full military activity. Return to duties was not affected by age, military rank, associated meniscal injuries, or time from injury to surgery with p-value > 0.050. *Conclusions:* The overall majority of uniformed personnel returned to full military duties with excellent functional Lysholm score that shows the effectiveness of surgical intervention in this active population. This report may guide attending surgeon to counsel the ACL deficient military personnel who are considering surgical reconstruction about the likelihood of an eventual return to duties.

PEDIATRICS

Incidence and Outcome of Group B Streptococcal Sepsis in Omani Infants Admitted at Royal Hospital

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ABSTRACT

Objectives: Group B streptococcus (GBS) infection is a serious disease that continues to cause significant morbidity and mortality. It represents the leading cause of sepsis, particularly meningitis in infants and young children around the world. We aimed to identify the incidence of GBS sepsis in Omani infants aged less than three months. In addition, we aimed to describe the clinical presentation and complications noted on admission and then at follow-up. *Methods*: This is an observational retrospective chart review. It included all Omani infants aged 0-3 months who were diagnosed with GBS sepsis/meningitis from 1 January 2006 to 30 October 2016 at Royal Hospital. *Results:* Of a total 83 000 live births, only 38 babies had culture proven GBS infection with an overall incidence rate of neonatal GBS of 0.45 per 1000 live births. There were no significant variations in the annual rates of infection during the study period, ranging around one to seven cases per year. Additional five cases of GBS sepsis presented to Royal Hospital either through emergency department or referrals from other hospitals, giving us a total of 43 cases of proven GBS infections. *Conclusions:* Our GBS incidence is comparable to that of screened population internationally. At the time being and with the best available results, maternal screening might not seem cost effective in our current settings. A well-structured plan is needed first before a screening program and it can be implemented in our country. However, this study will definitely help in the process of any plans of implanting new guidelines, as it can be used as a leading point for future prospective studies.

Screening for Factor VIII Inhibitor Development and It's Risk Factors in Patients with Severe Hemophilia A in Oman

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ABSTRACT

Objectives: A major challenging complication of factor VIII replacement therapy is the development of neutralizing antibodies, rendering therapy ineffective. There are genetic and non-genetic risk factors for inhibitors development. This study aimed to screen for the prevalence of inhibitor development among Omani patients with severe hemophilia A and to assess its non-genetic risk factors. *Methods*: A retrospective cohort study that includes all patients with hemophilia A registered in main tertiary care hospitals in Oman. Data were collected using the hospital information system computerized data. Patient's demographic data included age, age at diagnosis, age at first treatment, date of the first documented inhibitor development and its titer, and date of its disappearance in case of a transient inhibitor. Data

on non-genetic risk factors such as, mode of treatment (on demand vs prophylaxis) type and dose of the concentrate, time interval of exposure to factor VIII till inhibitor development, previous surgeries or major bleeding events; were included. Missing data were collected through phone interviews whenever possible. *Results:* Out of the 156 patients registered, 78 patients had complete data. The age of inhibitor development ranged between 16 months and 21 years (109.4+79.9 months). The prevalence of inhibitor development among the included patients was 35% and mainly of low titer 87%. There was a significant correlation between the intensity of first treatment and inhibitor development (p < 0.050). Inhibitor development was not associated with type of the factor used, time interval of exposure to factor VIII, use of on-demand or prophylaxis regimen, and history of major bleeding or previous surgery. *Conclusions:* Inhibitors development is a major complication in patients with hemophilia A in Oman. The reported prevalence matches the international reported figures. A large-scale study that includes all the registered patients and their genetic mutation is needed.

Bacterial Infections and Antimicrobial Use in Pediatric Cardiac Intensive Care Unit at Royal Hospital

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ABSTRACT

Objectives: To describe the pattern of bacterial infections, use of antibiotics, and antibiotic sensitivity in patients with infections in pediatric cardiac intensive care unit (ICU) at Royal Hospital. *Methods*: This is a retrospective study of 100 patients admitted to pediatric cardiac ICU for more than 48 hours between August 2015 and July 2017. Data on antibiotic choices, reasons for upgrade, days of fever, culture results, and antimicrobial sensitivity were retrieved from patients electronic records. Number of possible risk factors predisposing to infections were analyzed as well. *Results:* Thirty eight percent of infections developed on the second day of admission. Among the study group, 56% did not have fever at time of infection onset. All patients had central venous catheter during their admission, however, only two patients confirmed to have central line associated infection. Eighty eight percent of patients were on prophylactic cefazolin with as a first line antibiotic Tazocin and vancomycin were most commonly used as second line antibiotics. Cultures were positive in 28% of cases with pseudomonas species being the most commonly isolated organism followed by extended spectrum beta-lactamases¬ Klebsiella and Stenotrophomonas. These organisms were sensitive to Tazocin in 45% of the cases and vancomycin in 25% of

the cases. *Conclusion:* Incidence of bacterial infections in pediatric cardiac ICU patient is not uncommon. Results of this study may serve as a reference for our unit regarding the choices of antimicrobial treatment.

PSYCHIATRY

Prescribing Practices in the Treatment of Depression in Oman: A Clinical Audit

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ABSTRACT:

Objectives: The number of antidepressants available to psychiatrists had increased in the recent years. Given the fact that most of these antidepressants are equally effective, psychiatrist tend to select antidepressants that are more tolerable and has decreased risk of harm in overdose. On the other hand, limited data is available in guiding psychiatrists on selecting an antidepressant. The aim of this study was to examine the prescribing patterns of antidepressants among a sample of psychiatrists working in Oman and to measure the extent of practices to the current evidence for prescribing specific antidepressant in particular clinical situation. *Methods*: This study was carried out on 75 psychiatrists working in the governmental health sectors in Oman. Data was obtained with a Massachusetts General Hospital Psychopharmacology Questionnaire (MGHPQ) over a period of nine months (April to December 2016). MGHPQ was used to explore the prescribing patterns of antidepressants. The response of psychiatrists were compared against the empirical evidence using Maudsley Prescribing Guidelines and American Psychiatric Association Guidelines. *Results:* Of the 75 questionnaires distributed to all psychiatrists, 55 psychiatrists returned filled with 73.3% response rate. Twenty-nine (52.7%) of the psychiatrist believed that one type of antidepressant is more efficacious than others. Of those 29 psychiatrist, 32.7% indicated selective serotonin reuptake inhibitors (SSRI) as being most efficacious, while 12.5% indicated that tricyclic antidepressant were more efficacious. A total of 52 psychiatrists (94.5%) indicated SSRI as their first-line treatment preference. Mirtazapine (85.5 %) was chosen as the most likely to be associated with weight gain, paroxetine (50.9%) with sexual dysfunction, and (80.0%) with discontinuation syndrome, whereas fluoxetine (45.5%) associated with agitation. For the treatment of anxious depression and depression with melancholic feature, SSRI was the first choice of treatment (61.8% and 41.8 %). For depression with atypical feature, 43.3% indicated monoamine oxidase inhibitor as their

first option whereas 0.9% indicated SSRI. Around 81.8% of psychiatrist indicated mirtazapine as the best treatment for depression with prominent insomnia. *Conclusions:* There is a discrepancy between prescribing practices of antidepressants in Oman and empirical evidence and this finding is consistent with previous studies.

Predictors of Burnout Syndrome and Depression among Medical Students at Sultan Qaboos University: A Cross-sectional Analytical Study from Oman

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ABSTRACT

Objectives: The aim of the study was to study the prevalence and predictors of burnout syndrome and depression among medical students at the College of Medicine and Health Science, Sultan Qaboos University (SQU). Moreover, we aimed to explore whether the three-dimensional aspects of burnout syndrome (high emotional exhaustion, high cynicism and low academic efficacy) would predict the presence of depressive symptoms in a logistic regression model. *Methods*: A cross-sectional analytical study was conducted among a random sample of pre-clinical and clinical medical students at SQU between October and December 2016. The Maslach Burnout Inventory/Student Survey (MBI-SS) and the patient healthcare questionnaire were employed to assess burnout syndrome, and depression. Statistical analysis was performed in SPSS software by utilizing parametric tests and backward stepwise logistic regression. *Results:* A total of 662 students (m=27.6%, f=72.4%) participated in the study with a response rate of 98%. The prevalence of burnout syndrome and depression were 7.4% and 24.5%, respectively. Pre-clinical students had higher level of burnout syndrome (odds ratio (OR) 2.83; 95% confidence interval (CI) 1.45– 5.54, p = 0.002) and depression (Adjusted OR 2.72; 95% CI 1.07–6.89, p = 0.035) compared to their colleagues at the clinical stage. In the logistic regression model, the three burnout syndrome subscales (high emotional exhaustion, high cynicism, and low academic efficacy) were statistically significant predictors of depression in the present study, OR 3.52 (95% CI 2.21-5.60), OR3.33 (95% CI:2.10-5.28), and OR 2.07(95%CI 1.32-3.24), respectively. *Conclusions:* The current study revealed that burnout syndrome and depression were prevalent among medical students

at SQU, especially students at pre-clinical stage. Furthermore, the presence of high occupational burnout elevates the risk of depression. Those two interrelated conditions are threats to medical students' mental and physical well-being and performance. Therefore, from stakeholders point of view, adopting programs focusing on promoting and maintaining students' wellness during medical school years are highly recommended.

Prevalence and Predictors of Depressive Symptoms among Caregivers of Children with Attention Deficit and Hyperactivity Disorder Attending a Tertiary: A Cross-sectional Analytical Study from Muscat, Oman

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ABSTRACT

Objectives: This study aimed to measure the prevalence of depressive symptoms among caregivers of children with a diagnosis of attention deficit hyperactivity disorder (ADHD) attending a tertiary care child and adolescent mental health clinic in Oman. The related aims were to explore clinical and socio-demographic predictors of depressive symptoms. *Methods*: A cross-sectional analytical study was conducted among a systemic random sample of caregivers of children with ADHD seeking consultation from a dedicated unit for child and adolescent mental health services in Muscat. The presence of depressive symptom was quantified using the Patient Health Questionnaire-9 (PHQ-9). A binary logistic regression model was used to find the adjusted and unadjusted odds ratios (ORs). *Results:* A total of 117 caregivers participated in the study, with a response rate of 89%. The prevalence of depression symptoms was 65%. Logistic regression analysis indicated that low income, being the only caregiver in the family, and hyperactive-impulsive or combined types of ADHD were significant predictors of depression in multivariate analysis (OR = 24.98, 95% confidence interval (CI): 2.94 – 212.56, p = 0.003; OR = 14.26, 95% CI: 2.44 – 83.24, p = 0.003; OR = 6.60, 95% CI: 2.81 – 212.58, p = 0.003; and OR = 5.60; 95% CI:2.14–108.40, p = 0.007, respectively). *Conclusions:* This study showed that depressive symptoms are common among caregivers of children with ADHD in urban places in Oman, especially

in those with financial difficulties and being the only caregiver whom children are suffering from hyperactive-impulsive or combined types of ADHD. Therefore, detection and prompt treatment of depression among caregiver is recommended.

RADIOLOGY

Evaluation of the Currently Used Baseline Staging Test in Breast Cancer Patients at Sultan Qaboos University Hospital

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ABSTRACT

Objectives: Breast cancer is the most common cancer among females in Oman. In Sultan Qaboos University Hospital (SQUH), all breast cancer patients were scanned with computed tomography (CT) chest, abdomen, and pelvis, regardless of the clinical stage, grade, symptoms, and risk factors as part of baseline. The aim of this study was to assess if the current local SQUH baseline radiological staging for newly diagnosed breast cancer patient is justified or not. ***Methods***: This cross-sectional retrospective study was conducted at SQUH all Omani breast cancer patients who underwent CT as baseline investigation between January 2010 to October 2015 were included in the study. The reports of CT chest, abdomen, and pelvis were reviewed for metastatic components. SQUH TrakCare system was used to search for data related to: age, tumor size, axillary lymph nodes, immunochemistry status (ER, PR, HER2), histopathology types, and Ki 67. The sample size was 350 patients, but after exclusion criteria, we ended up with 317 patients. ***Results:*** Fifty-five percent of the cases were in premenopausal age group. The incidence of metastasis increases with T and N levels, but this is not true with the clinical stage, with no significant statistical difference ($p = 0.888$). Only 6.5% of patients presented in stage 1, while 58.7% presented in stage 3. HER2 was positive in 36.5% of patients, which was very high compared to western countries. ***Conclusions:*** Breast cancer is more common in premenopausal. Most of our patients presented in late stages. The risk of developing metastasis is not related to the stages of the disease. This justifies the current practice of radiologically staging all patients regardless of their clinical stage. This result can be attributed to the young age of the patients when compared to western countries. The behavior of the disease is also different from those of quaternary countries in term of having more HER2 positive and triple negative cases that is known to run worse course of disease.

Prevalence of Significant Coronary Artery Stenosis in Patients with Low to Intermediate Risk of Cardiovascular Disease and Zero Calcium Score

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ABSTRACT

Objectives: Previous studies had concluded that in patients with zero calcium score, from calcium score computed tomography (CT) done for stratifying patients with cardiovascular disease, the presence of significant coronary artery disease is very rare. However, there was an observation in our patients undergoing cardiac CT to having significant stenosis in the absence of calcified atherosclerotic disease. Therefore, this study was designed to determine the prevalence of significant coronary artery disease in patients with low to intermediate risk for coronary artery disease and zero calcium score CT. Another aim was to determine the association with the known risk factors for coronary artery disease. ***Methods***: Patients' data were surveyed from Royal Hospital information system from September 2012 to August 2017. Patients who underwent cardiac CT including coronary calcium score and coronary CT angiography (CTA) were searched. A total of 785 patients (male = 309, female = 476) were identified to have zero calcium score CT. The presence of significant coronary artery stenosis ($\geq 70\%$) was obtained from the results of the coronary CTA. Risk factors such as sex, smoking history, diabetes, dyslipidemia, and hypertension were obtained. Patients were divided into two groups; patients with significant coronary artery stenosis (stenosis $\geq 70\%$) and patients with no significant stenosis. Baseline demographic and clinical characteristics were compared between the two groups using Mann-Whitney U test for continuous variables and chi-square test for categorical variables. A multivariate binary logistic regression analysis was performed to identify the independent predictors of significant coronary artery stenosis in patients with zero calcium score. ***Results:*** Twenty patients (male = 8, female = 12) (2.5%) were found to have significant coronary artery stenosis of $\geq 70\%$, and 765 patients were found to have no or mild coronary artery stenosis based on the coronary CTA results. There was a statistically significant association between diabetes and significant coronary stenosis ($p = 0.004$). Significant stenosis was high (5.1%) among diabetic patients when compared to non-diabetic patients (1.2%). Diabetes mellitus was found to be an independent risk factor (odds ratio 4.2, 95% confidence interval: 1.49−11.87, $p = 0.007$). The other risk factors demonstrate no statistically significant association with coronary artery stenosis. ***Conclusions:*** The prevalence of coronary artery stenosis in patients

with zero calcium score is high. Patients who have zero calcium score and diabetes have four times higher risk for significant coronary stenosis when compared to non-diabetic patients with zero calcium score.

The Prevalence of Bone Metastasis Among Young Omani Female with Breast Cancer and the Role of Bone Scan in Early Stage

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ABSTRACT

Objectives: Breast cancer in women is a major health burden worldwide. Bone is the most common site to which breast cancer metastasis. Imaging by skeletal scintigraphy, plain radiography, computed tomography, or magnetic resonance imaging, is an essential part of evaluating bone metastases. We will assess the prevalence of bone metastasis among young Omani female with breast cancer and importance of bone scan as a primary tool for staging breast cancer among asymptomatic patients who are stage I and II. *Methods*: One hundred ninety-nine breast cancer patients were collected retrospectively from 2010 to 2013 from Sultan Qaboos University Hospital. Patients were divided to two groups according to their age (young = < 45 and old > 45). The prevalence of bone metastasis which was proven by bone scan between the two groups was analyzed using SSPS software. *Results:* Positive bone scan was found in five patients among young group compared to seven among the second group. The prevalence of bone metastasis among young Omani female is low. However, the percentage among the positive cases detected by bone scan is 42%. We found that bone scan could detect bone metastasis even in stage II cancer with a percentage of 40%. *Conclusions:* Bone metastasis is uncommon among young Omani female with breast cancer. However, among all positive cases, the young women are accounting almost around 42%. Bone scan can detect bone metastasis in stage II cancer patients.

SURGERY

Enhanced Recovery after Surgery (ERAS) Protocol in Sleeve Gastrectomy

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ABSTRACT

Objectives: Enhanced recovery after surgery (ERAS) is a multidisciplinary perioperative care algorithm that aims to accelerate recovery while preserving the quality of care. The aim of this study is to assess the rate of readmissions and re-operations within a 30-day period from the time of surgery in patients underwent sleeve gastrectomy and followed some aspects of ERAS protocol at the Royal Hospital. *Methods*: Data was collected between February 2017 and October 2017, which is the duration of the time where ERAS protocol was introduced in the hospital. All patients that have undergone sleeve gastrectomy between the age of 18 and 60 years in the specified period were included. Readmissions during the first month following surgery and other associated surgical complications were traced retrospectively. *Results:* Females constituted 60% of the sample. The mean age was 36 years. The 60% of all patients had comorbidities associated and broken down further into different categories with measurement of the percentage in each category compared to total number of patients with associated illnesses, only 2% of total number of patients deviated from some aspects of ERAS and required insertion of Foleys, narcotics, or intensive care unit or high dependency. Complications within the first month involved 4% of total patients, for which most were categorized as grade 2 and one only was categorized as grade 3b as per the Clavein Dindo classification. Readmissions were also noted in 9% of patients, none of them were critically ill. *Conclusions:* Applying ERAS protocol or components of ERAS to patients undergoing bariatrics surgery is safe and has not shown to increase risk of readmissions or major complications. However, a larger sample is required and comparison to other practice is required to definitely give a final conclusion.

Pattern and Rate of Disease Related Complications and Their Surgical Treatment among Inflammatory Bowel Disease Patients

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ABSTRACT

Objectives: Ulcerative colitis (UC) and Crohn's disease (CD) are the most prominent phenotypes of inflammatory bowel disease (IBD) and are associated with a wide variety of surgical complications. The aim of this study was to address the pattern and rate of complications in patients with IBD and their surgical options of treatment among Omani population in two major hospitals in Oman from 2010 to 2015. *Methods*: This is a cross-sectional

study involving record review, which was conducted in two tertiary centers, Royal Hospital and Armed Force Hospital. Data were collected from database/patient file electronic records of all Omani patients with confirmed diagnosis of IBD. Descriptive statistics, chi-square, and binary logistic regression were conducted using SPSS software. *Results:* Four hundred fifty-three patients with the diagnosis of IBD were recruited for the study. The majority of these patients were diagnosed with UC (80%, 344 patients). Out of the whole population, 12.4% were operated and among operated cases CD contributed to 71%. The most common procedure performed among CD patients was right hemicolectomy, and among UC was panproctocolectomy with ileal pouch-anal anastomosis. Diagnosis of CD ($p < 0.001$), steroid use ($p < 0.001$) or biological agent use ($p < 0.012$), and male gender ($p < 0.008$) were identifiable risk factors that predicted the need for surgical interventions. *Conclusions:* Despite the new and ever-expanding types of medications for the treatment, there are still clear indications for operative management of IBD and its complications.. Predictors of the need for surgical intervention are CD type, male gender, the history of using steroids, or biological agents during the treatment period.