

Oman Medical Specialty Board Research Forum 2019/2020: Abstracts

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ORAL

Assessment of Stress Response Attenuation with Caudal Morphine Using a Surrogate Marker during Pediatric Cardiac Surgery

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ABSTRACT

Objectives: The primary aim of this study was to compare the increase in chromogranin A levels from baseline levels following on pump pediatric cardiac surgery between patients that received bolus caudal morphine and patients who had surgery under a conventional intravenous narcotic based anesthetic protocol. The secondary objectives were to compare hemodynamic responses to skin incision and magnitude of rise in blood sugar values between the groups. **Methods:** This was a prospective observational study conducted on pediatric cardiac surgery patients at National Heart Center, a tertiary care cardiac surgery center in Oman from September 2017 to September 2018. Sixty patients undergoing elective open heart surgery after administration of general anesthesia were randomized. Group 1 (control group, n = 30) received an intravenous narcotic-based anesthesia for analgesia and group 2 (study group, n = 30) received a bolus of preservative free morphine (50 µgm/kg in 1 mL/kg normal saline) deposited in the caudal space as the primary analgesic technique. Demographic data including age, weight, duration of cardiopulmonary bypass, and duration of mechanical ventilation were collected. Comparison of difference in median values of chromogranin A levels between baseline and following completion of surgery was done. **Results:** The demographic data, Aristotle scores (both basic and composite), duration of cardiopulmonary bypass, and duration of postoperative mechanical ventilation were comparable between the groups. Caudal morphine group had significantly reduced rise in systolic pressure compared to the control group ($p = 0.006$). Increase in blood sugar reflected by the difference in the baseline and highest blood sugar levels that were detected were similar in both groups. The difference in the median value of the chromogranin A levels were comparable in both groups. **Conclusions:** The rise in chromogranin

A levels in response to surgical stress was found to be similar in pediatric cardiac surgical patients that received caudal morphine as compared to an intravenous narcotic based anesthesia technique. Caudal morphine attenuated stress response was comparable to narcotic based anesthesia techniques. This study suggests an objective method of assessing the stress attenuation in pediatric cardiac surgical patients by using a surrogate marker.

Workplace Violence against Healthcare Workers in the Emergency Department in Oman

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ABSTRACT

Objectives: The primary objective of this study were to estimate the prevalence and identify the types of workplace violence (WPV) experienced by Emergency Department (ED) staff in Oman using the same definition of WPV established by World Health Organization (WHO). The secondary objectives were to examine the relationship between WPV and demographic variables, describe the ED staff perception of safety and WPV reporting behaviors, identify ED staff knowledge and perception of existing Ministry of Health (MOH) policy and Oman bylaw against WPV, and identify consequence of WPV as reported by ED staff. **Methods:** This is a cross-section survey including staff, both doctors and nurses, working in EDs from various governorates of Oman. We used the Workplace Violence Questionnaire (WPVQ), which was developed by the International Labor Organization and WHO. Survey included questions about the three types of abuse (physical, verbal, and sexual) that might be encountered at any workplace. Questions on perception of safety, reporting of violence, and consequence of violence were also included. To explore the staff knowledge and perception on institutional and local civil laws in Oman, we added questions about awareness of Oman bylaws, policies, and procedures established by MOH. Demographic data were also collected. A Pearson chi-square test was used to determine the association between exposure to WPV and age and years of experience with

odds ratio and 95% confidence interval. Frequencies and percentages were used for categorical variables with $p < 0.050$ considered as statistically significant. **Results:** A total of 211 participants were included in the study with response rate of 70.0%; 141 (66.8%) were nurses and 70 (33.2%) were physicians. The majority of staffs ($n = 177$, 84.0%) experienced at least one type of WPV in the last 12 months. Non-physical violence accounted for 68.7% (verbal = 66.3% and sexual = 2.4%). Majority of the attackers were patient's relative (44.1%) followed by both patients and relatives (27.5%), and the least were by patients alone (12.8%). The staff response to the attack range from 'took no action or pretend it never happen' (30.0%) to 'reporting the incident to a senior or complete an incident report' (56.6%). Of those who reported the incident, actions were taken to investigate the cause of the incident in 49 (23.2%) reports, which mainly by department head (53.0%). Sixty-one percent of those who had an attack, had at least one or more kind of support; 90.0% of the participants have worries about their safety. Seventy-one percent of the participants were aware of procedure for reporting WPV, and 78.2% of them were aware on how to use them. In comparison, 69.0% did not have any idea about the Oman civil bylaw for WPV and 75.8% did not receive any training on how to respond to WPV in their institution. Fifty percent of those who were attacked think the incident could have been prevented. **Conclusions:** WPV is common in the EDs, and the commonest type is verbal abuse. Many ED staff are still concerned about their safety in the workplace. Increase awareness on the co-existing WPV reporting policy and the local Omani bylaws against WPV, and encouraging the staff to take the WPV prevention workshops are core steps in preventing such incident.

Canal Wall Reconstruction Surgery in Retraction Pathology, Experience at Al Nahdha Hospital, Oman

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ABSTRACT

Objectives: Tympanic membrane retraction pathology is a frequently encountered middle ear problem that itself can be a sac of a hidden cholesteatoma or a potential reservoir for its future formation. In selected cases sometimes, a defect in attic and posterior superior canal wall can result after surgical removal of the disease epithelium and or cholesteatoma then reconstruction is usually attempted. We sought to study the reconstructive outcomes of the attic and/or posterior superior canal wall defects for

selected cases of retraction pathology without a need for open mastoid cavity. Does it get resorbed with time, displaced or lead for recurrence of cholesteatoma during short or long term periods of follow-up. **Methods:** This is a retrospective study conducted at Al Nahdha Hospital in Oman between 2008 and 2014. A total of 301 patients who underwent inside-out atticotomy with attic defect repair or cortical mastoidectomy with atticotomy and attic defect repair were included in the study. Staging and classification criteria for middle ear cholesteatoma proposed by the Japan Otological Society (JOS) was applied based on surgical and follow-up notes in cases with recurrent cholesteatoma. The status of the reconstructed part of outer attic wall with respect to survival and stability of cartilage was assessed carefully at less than six months and at more than two years periods after surgery. **Results:** Out of 301 patients who underwent mastoid surgeries during this study period, 72 patients met the inclusion criteria. Results of both surgical methods were then assessed and it was noted that the longer the duration after post-operative period (> 2 years) the more chance to have recurrence of disease, displacement/desorption of reconstructed part, or retraction/perforation of tympanic membrane ($p < 0.026$). Moreover, the reconstruction part of the attic and posterior superior canal wall may get resorbed with time in some cases as shown in this study (9.4%). **Conclusions:** Resorption and displacement of the reconstructive part of the attic and/or posterior superior canal wall was observed during the follow-up period of this study. This probably contributing to retraction pocket formation followed by recurrence of cholesteatoma and was noted to be more obvious during long duration of follow-up. Hence, we recommended a longer follow-up of these cases for at least ≥ 2 years post-operatively even if findings are showing good results during the initial visits. Although recurrence rate of disease with the used surgical methods in this study was 16.9 %; to compare the results of this surgical methods with either canal wall up or canal wall down or surgical methods requires a randomized trial.

Perception and Opinion on Child Abuse Young People: A Qualitative Study Involving First Year Students at Sultan Qaboos University

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ABSTRACT

Objectives: Approximately five children die every day because of child abuse. According to a qualitative study

by UNICEF, young people have good insight about child abuse. The aims of this study were to determine perceptions and opinions of child abuse among young adults; to determine definition, types, and risk factors of child abuse, its causes and consequences; and to explore characteristics of abusers from the perspective of the participants. **Methods:** A qualitative study was conducted at Sultan Qaboos University using semi-structured interviews including 20 first-year students who were 18 years old. The study was conducted from August 2017 to August 2018. Interpretative phenomenological approach was used to understand an individual's perception of a particular experience using a purposeful sampling. Students were selected randomly from the waiting area of the students' clinic. All interviews were audio recorded and transcribed. Transcripts were analyzed using a thematic analysis. **Results:** Most of the participants classified the types of child abuse into physical, emotional, sexual, neglect, and financial. Risk factors identified were life stressors, addiction, personality of the abuser, child appearance and educational level, family instability, and lack of society safety. Signs of abuse were divided into physical and psychological. Physical abuse include body injuries, illness, and death, while psychological abuse were changes in child's behavior and mental disorders. Participants highlighted several consequences of child abuse such as becoming abuser in the future, decline in school performance, or formulation of antisocial and criminal behavior. **Conclusions:** In general, most participants had good perception about child abuse yet it was incomplete. In contrast to quantitative studies, this study shed the light on the depth of the problem and its hidden dimensions using interviews to know the opinions of young adults. Further qualitative and quantitative researches are strongly needed.

Association between Body Mass Index and Clinicopathological Features and Recurrence of Breast Cancer in Pre and Postmenopausal Patients at Single Institute in Oman

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ABSTRACT:

Objectives: The aim of this study was to examine whether obesity is a risk predictor for breast cancer presentation and recurrence on menopausal status. **Methods:** This is a retrospective, cross sectional analysis including 511 breast cancer patients treated at Royal Hospital (RH) from January 2007 to December 2016. Twenty-two patients were excluded from the study; 13 patients were operated at regional hospitals then referred for systemic therapy with

not enough information and nine patients were operated at RH then lost to follow up. A total of 489 (female = 465, male = 24) patients were recorded after exclusion criteria, but only female patients were included in the study. Data were obtained from hospital information system (Al-Shifa) based on histopathology results. Patients were divided into three groups according to body mass index (BMI): normal weight (< 25.0 kg/m²), overweight (≥ 25.0 < 30 kg/m²), and obese (≥ 30 kg/m²). Association between BMI groups and clinicopathological characteristics were analyzed according to menopausal status, premenopausal (< 51 years), and postmenopausal (≥ 51 years). Statistical analysis was done using SPSS software. **Results:** Breast cancer patients less than 51 years were 287 (61.7%) and more than 51 years were 178 (38.3%). There was 248 (53.3%), 117 (25.2%), and 100 (21.5%) patients with normal weight, overweight, and obesity group, respectively. In obesity group, number of breast cancer cases were divided into two, 53 as postmenopausal and 47 as premenopausal that showed statistically significance ($p = 0.0001$). For premenopausal breast cancer cases, we found an inverse relationship between aggressive clinicopathological features and BMI groups. In each ultra-sonography breast imaging-reporting and data system score, more patients had normal weight as compared with overweight and obese ($p = 0.046$). Among patients with lymphovascular invasion, 49.2% had normal weight as compared with 25.8% and 25.0% in overweight and obesity groups, respectively ($p = 0.001$). For postmenopausal breast cancer cases, there was direct association between aggressive clinicopathological features and BMI groups, although statistically not significant. Overall, recurrence of breast cancer was more in overweight and obese postmenopausal patients as compared with normal weight group ($p = 0.001$). **Conclusions:** This single institute study found that obese postmenopausal patients have higher risk to develop breast cancer as compared with premenopausal group. It showed also overweight and obese patients at diagnosis were associated inversely with aggressive clinicopathological features than normal weight in premenopausal patients. It highlighted that high BMI is a risk factor to develop recurrence in postmenopausal patients. Our findings were similar to international findings. This study requires replication in large-scale analyses of pooled prospective data.

Agreement between One-stage Clot-based and Chromogenic Factor VIII Activity Assays

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ABSTRACT

Objectives: The primary objective of this study was to assess the agreement between two methods used for measuring factor VIII (FVIII) level, the one-stage clot-based, and chromogenic assays. The secondary aim was to evaluate the impact of baseline variables on the difference disagreement including baseline level, antinuclear antibody (ANA), and FVIII inhibitors. **Methods:** A retrospective study was conducted at Sultan Qaboos University Hospital from March 2009 to March 2018. During this period, FVIII level requests were assessed using both one-stage clotting-based and chromogenic assays. Data were obtained retrospectively from the electronic hospital health records. Bland-Altman plot and analysis were used to assess the mean-difference and limits of agreement between both assays. Linear regression was used to assess the impact of the predictor variables. All descriptive and analytical tests were performed using R program, Version 3.1.2. **Results:** A total of 2113 episodes were included with both test done after removal of duplicate and referral episodes. There was an excellent agreement between the one-stage assay and the chromogenic assays. The median was 0.005 with a range of -8% (underestimated) to 9% (overestimated). These two assays results showed poor agreement with higher level of FVIII activity. Positive ANA and inhibitor has no impact with $p = 0.249$ and $p = 0.701$, respectively. **Conclusions:** Our results confirms the excellent agreement between one-stage clotting-based and chromogenic assays for measuring FVIII activity level, especially with lower FVIII activity. Positive ANA, inhibitor status, and diagnosis has no impact on the difference between both assays. When expected level of FVIII is low (< 50%), either assay one-stage clotting-based or chromogenic can be used as they have good agreement. We recommend future studies to assess the effect of positive lupus anticoagulant, genetic mutations, type of FVIII concentrate, and anticoagulation medications in the discrepancy between both assays.

The Utility of Calretinin Immunohistochemistry in Suspected Cases of Hirschsprung's Disease: Diagnostic Accuracy, Staining Features, and Impact on Workload and Screening Time

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ABSTRACT

Objectives: The aim of this study was to assess the diagnostic value of calretinin immunochemistry as a simple and reliable method in the diagnosis of Hirschsprung's disease (HD) with emphasis on staining patterns and both workload and time reduction. **Methods:** Two pathologists evaluated 204 rectal suction biopsy specimens for suspicion of HD in children aged between two and nine years old. This study was conducted at Royal Hospital from 2015 to 2019. Specimen were evaluated using hematoxylin and eosin (H&E) and calretinin immunohistochemistry carried out on formalin fixed paraffin-embedded biopsies. H&E staining was performed on at least 50 levels for the suction biopsy or at least ganglion cells were reliably demonstrated on H&E. Number of H&E levels and slides were calculated. Calretinin immunohistochemical staining was performed in all cases, with adequate controls. Staining patterns were evaluated for both ganglion cells and normal nerve fibers in lamina propria, muscularis propria, and submucosa. One hundred sixty-six biopsies were accurately diagnosed on the basis of the positivity or negativity of calretinin staining. Patients' follow-up status and findings were noted and analyzed. **Results:** The presence of ganglion cells consistently correlated with calretinin-positive ganglion cells and thin nerve fibrils in the lamina propria, muscularis mucosa, and superficial submucosa. These nerve fibrils were not stained by calretinin in the aganglionic segments of bowel. Calretinin when compared to H&E showed a sensitivity and specificity of 95.24% and 78.18%, respectively, with 85.57% accuracy (95% confidence interval). However, additional comparisons with emphasis on nerve fibrils staining and patients' follow-up showed significant improvement. Also, using calretinin along with H&E showed better sensitivity and specificity compared to patient's clinical follow-up when compared to the individual sensitivity and specificity of each test. **Conclusions:** Calretinin provides a reliable marker and should be used in combination with H&E for the diagnosis of HD. The presence of positive nerve fibrils staining correlates well with the presence of ganglion cells. Calretinin provides a significant reduction in the time and number of sections that need to be examined.

Epidemiology and Survival of Omani Patients with Chronic Hepatitis C Infections at Sultan Qaboos University Hospital

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ABSTRACT

Objectives: Chronic hepatitis C (CHC), which is a curable disease, is a leading cause of liver cirrhosis and hepatocellular carcinoma (HCC) worldwide. However, there is lack of data regarding the epidemiology and survival of CHC in Oman. This study aimed to describe the demographics, estimate the prevalence of risk factors for transmission, and determine survival rates and the predictors of survival among CHC-infected Omani patients at Sultan Qaboos University Hospital (SQUH). **Methods:** This ambidirectional cohort study included all CHC-infected patients who presented to SQUH between January 2009 and December 2015. The baseline demographic, clinical, laboratory, and radiological data of the patients were analyzed. Patients were followed-up until the end of the study (1 September 2019). The survival rate was calculated and its association with other parameters were assessed by Cox regression. **Results:** A total of 615 CHC patients were included, with mean±standard deviation age of 44.8±16.5 years and male predominance (65.8%). The major risk factors for acquiring CHC infection in our cohort were intravenous drug addiction (22.6%) and history of blood transfusion (21.1%). The most prevalent genotypes were genotype 1 (44.0%) followed by genotype 3 (36.1%). Of 218 (35.4%) patients with liver cirrhosis, 104 (47.7%) had hepatic decompensation and 58 (26.6%) had HCC. Overall survival rate was 83% and 75.8% at 5 and 10 years, respectively. Older age, diabetes mellitus, HCC, receiving no antiviral treatment, and late diagnosis found to be independent predictors of poor survival. **Conclusions:** The implementation of national policies to prevent hepatitis C transmission and encourage the early screening, diagnosis, and treatment of at-risk patients is recommended to reduce the burden and consequences of this disease in Oman.

Bacillus Calmette-Guérin Vaccine related Diseases in Children

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ABSTRACT

Objectives: The aims of this study were to investigate the incidence, characteristics, and outcome of Bacillus Calmette-Guérin (BCG) related diseases in Omani children and address the question whether complications outweighs the benefits of giving vaccine at birth. **Methods:** This is a retrospective cross-sectional, descriptive study in multicenter including Central Public Health Laboratory (CPHL), Royal Hospital (RH), and Sultan Qaboos University Hospital (SQUH). All children age ≤ 13 years who had positive culture and/or polymerase

chain reaction (PCR) for Mycobacterium bovis from any clinical sample at CPHL (reference tuberculosis (TB) laboratory) from January 2006 to December 2018 were included in the study. Clinical details of the patient was reviewed from the electronic patient information system at CPHL, RH, and SQUH using data collection sheet after getting ethical approval. Data entered through Epidata then analyzed using SPSS version 16. **Results:** A total of 86 laboratory cases with BCG vaccine related diseases were included in the study, with nine cases cumulative incidence per 100 000 vaccinated newborns. Among them, 58 (67%) were males and 80 (93%) were Omanis. The most common complication was abscess (59%) followed by osteomyelitis (16%), lymphadenitis (9%), disseminated disease (9%), and lymphadenitis and abscess (5%). The median age of complication was four months (interquartile range (IQR): 2-9). The most common site of BCG abscess complication was axillary (44%) with 70% being in the left side. The diagnosis was made by positive culture in 98.8% of cases and by positive acid fast bacilli in 70%, although PCR started late in 2016, it came positive in 24.7%. Out of 86 cases, 10 (12%) were diagnosed with immunodeficiency including four (4.7%) with severe combined immunodeficiency, three (3.5%) with chronic granulomatous disease, two (2.3%) with interferon gamma deficiency, and one (1.2%) with PIK3R1 deficiency. The median age at diagnosis of this immunodeficiency was eight months (IQR: 5.5-12.25). Most (83%) of cases required both medical and surgical treatment and 43% received anti-TB medications. Most (64%) of cases recovered well, around 4% have deformity, and there was 5% death unrelated to BCG vaccine related diseases. **Conclusions:** Cumulative incidence of BCG vaccine related diseases was nine cases per 100 000 vaccinated newborns. For a period of 13 years of this retrospective study, 10 (12%) of affected children were proven to have primary immunodeficiency and suffered from severe and/or disseminated BCG related diseases. The risk and benefits of postponing BCG vaccination to age of one year should be considered along with our local epidemiological data of TB exposure in children, especially age less than two years is one of the high risk factors for TB infection and complications.

Do Large Uterine Fibroids Impact Pregnancy Outcomes?

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ABSTRACT

Objectives: This study aimed to assess the prevalence of fibroids complicating pregnancy in Omani women followed-up and delivered at Sultan Qaboos University Hospital (SQUH); and to correlate the presence of large fibroids with maternal and neonatal outcomes.

Methods: This retrospective cohort study was conducted at Obstetrics and Gynecology Department, SQUH from January 1, 2011 to December 31, 2016. Demographic data such as maternal age, gravidity and parity, body mass index (BMI), and past medical history were recorded. Ultrasonographic data included total number of fibroids, number of fibroids > 5 cm in diameter, and location were also noted. Main outcome measured were preterm delivery, preterm premature rupture of membranes (PPROM), malpresentation, intrauterine growth restriction (IUGR), mode of delivery, postpartum hemorrhage, retained placenta, and cesarean myomectomy. Fetal outcomes included birth weight and APGAR score. Data were analyzed using SPSS version 21. Chi-square test and *t* test were used to calculate significant outcomes, $p < 0.050$ was considered statistically significant.

Results: Total number of deliveries over the study period were 24 800. Among these, 62 women had fibroids complicating pregnancy giving an overall prevalence of 0.25%. The study group was comprised of 44 (out of 62) women with documented uterine fibroids > 5 cm in diameter, while the control group was comprised of 90 women with normal singleton pregnancies. The mean age, parity, BMI, and past medical history were comparable. Mean age of study group was 33.43 years. There was no statistically difference in obstetric outcomes in the study and control group in terms of preterm labor ($p = 0.394$), PPROM ($p = 0.551$), malpresentations ($p = 0.251$), IUGR ($p = 0.064$), and retained placenta ($p = 0.308$). Postpartum hemorrhage was significantly higher in the study group ($p = 0.010$), the commonest cause was uterine atony ($p = 0.004$). Women with large fibroids had significantly increased cesarean section rate ($p = 0.004$). Five out of 44 (12.2%) women in the study group underwent cesarean myomectomy. The main indications for cesarean section were obstructed labor and failure to progress (52.9%). Regarding neonatal outcomes, a statistically significant difference was noted in the APGAR scores. **Conclusions:** Fibroids measuring > 5 cm in diameter are more likely to cause obstetric complications and a higher cesarean rate. Pre-conceptional myomectomy is recommended for women with large fibroids.

Analysis of Complications Related to Secondary Bone Grafting in Patients with Alveolar Clefts: A Retrospective Study

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ABSTRACT

Objectives: The aim of this study was to analyze and identify the predictors of complication of failure in secondary bone grafting in the alveolar cleft. **Methods:** We conducted a retrospective study of 102 patients, aged 9-29 years old, who received alveolar bone grafting at Oral and Maxillofacial Unit, Al Nahdha Hospital from 2013 to 2017. Data was collected concerning the site of cleft, status of dentition prior to surgery, complication encountered, and postoperative follow-up examination. **Results:** Out of 102 patients received alveolar bone grafting, 29 (28.4%) had postoperative complications and 73 (71.6%) patients with no complication, with a mean age of 16.83 and 13.9 years, respectively. There was a positive association on type of cleft and technique applied with complication rates and the need of re-grafting. **Conclusions:** The results demonstrates higher percentage of patients undergoing the procedure without reporting complications in the younger patient group (78.7%) compared to their counterparts in the older patient group (65.5%).

Epidemiology of Surgically Treated Pelvi-acetabular Fractures in Oman

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ABSTRACT

Objectives: The study aimed to review the epidemiological aspects of pelvi-acetabular fractures operated at Khoula Hospital, Oman. This is the first orthopedic trauma epidemiological study of such type of fractures in Oman and will provide a platform to advance the level of clinical research in this field. **Methods:** We obtained data of 209 patients with a diagnosis of pelvis and/or acetabular fracture who were operated at Khoula Hospital from 2010 to 2016. Age, sex, mechanism of injury, associated injuries, fracture classification, surgical approach, and associated complications were analyzed. Postoperative and follow-up radiographs were evaluated as per Matta's scoring system. **Results:** Males (70.0%) were three times more involved than females. The mean age at injury time was 35 years, and the most common cause of injury was motor vehicle collisions (96.0%). There were a total of 162 (72.0%) acetabular fractures in comparison to pelvis fractures, which were less than one third of the number ($n = 30$, 13.5%). Seventeen patients had combined fractures involving both pelvis and acetabulum. Posterior

wall fractures (43.0%) were the most common pattern in acetabulum fractures whereas anteroposterior compression (APC) type was the most common type of pelvis fractures (40.0%). Transverse fracture (52.9%) of acetabulum with APC type II was the most frequent type of combined fracture. Associated posterior hip dislocation occurred in 35.0% of cases. Sixty patients with acetabulum fractures had excellent results of surgical fixation as per Matta's criteria compared to 12 patients with pelvis fractures and six patients with combined fractures. Six patients had post-operative sciatic nerve palsy, five patients had venous thromboembolism, and 10 patients had wound infection. There were no cases of heterotopic ossification or reported mortality. **Conclusions:** Acetabular fractures are uncommon injuries, with motor vehicle collision being the most common cause of injury. Posterior wall fracture was the most frequent pattern of acetabulum fractures and APC type II was most common type of pelvis fractures, and most of the patients were males. The incidence of post-traumatic sciatic nerve palsy and the proportion of injured women were comparable to those reported in literature.

Neuroblastoma in Oman: A 6 years Retrospective Analysis of Clinical Characteristics and Outcome

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ABSTRACT

Objectives: Neuroblastoma (NB) is commonly defined as the most common extracranial solid tumor in children. The survival rate has improved during the last few decades of pediatric oncology. There were very limited number of publications regarding the incidence of neuroblastoma in the Middle East. This study aimed to assess the overall survival and the event free survival of neuroblastoma among the pediatric age group population in Oman. This is the first publication that describes the clinical characteristics and outcome of Omani children with neuroblastoma. **Methods:** This is a retrospective descriptive cohort study including all Omani patients, aged ≤ 13 years with neuroblastoma from January 2010 to December 2016. A total of 58 patients were followed during the period of the study. Data analysis was done using SPSS version 22 for descriptive analysis. The survival rate is illustrated using Kaplan Mayer survival analysis, and mean survival was presented with 95% confidence interval. **Results:** The majority of patients (35.7%) were

from Muscat region and only 1.8% from Al-Wusta region. Abdominal masses and constitutional symptoms were the most presentations. The female to male ratio was 1:1. Age distribution revealed 33.9% were < 1 year old at diagnosis, 33.9% of them were aged between 1 and 3 years, while the remaining 32.1% were > 3 years. Suprarenal masses were primary in 62.5% of patients. Based on the International Neuroblastoma Staging System, tumors within the high risk category were most common (54.0%), followed by intermediate risk tumors (36.4%), and low risk tumors (9.1%). Unfavorable histology was detected in 46.4% of patients. Although most of patients presented in advanced stages, the mortality rate was 23.2% over six years of the study. The 10 years overall survival and event free survival for all groups combined was 75.0% and 65.0%, respectively. **Conclusions:** Majority of Omani children with neuroblastoma had an advanced disease on presentation. The distribution among different age groups was the same. Omani children with neuroblastoma had comparable survival outcomes to other studies published in literature.

The Prevalence and Risk Factors of Depression and Anxiety in Patients with Rheumatic Diseases Attending a Tertiary Care Hospital in Muscat, Oman

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ABSTRACT

Objectives: There is ample evidence to suggest that physical illness tend to impact on mental disorder and conversely mental disorder affect physical illness. There is a dearth of studies examining such a link in societies in transition such as Oman. This study aimed to determine the prevalence of depression and anxiety among patients attending rheumatology clinic in a tertiary care hospital in Oman. Secondary objectives were to find out the contribution of demographic and clinical characteristics to the development of depression and anxiety. **Methods:** A cross-sectional study was conducted among attendees ($n = 318$) seeking consultation from a rheumatology unit at Sultan Qaboos University Hospital (SQUH) in Muscat, Oman from June 1, 2018 to December 31, 2018. Depressive symptom and anxiety were assessed using Patient Health Questionnaire-9 (PHQ-9) and Generalized Anxiety Disorder (GAD-7), respectively. Data regarding demographic and clinical characteristics of respondents were collected. **Results:** The prevalence of depressive symptoms was 61.7%, while 46.8% of patients endorsed the presence of anxiety. Thirty one percent of respondents with

depressive symptoms fulfil the criteria for moderately to severe depression. Approximately, 21.8% of respondents with anxiety symptoms found to have moderate to severe anxiety. Only 4.4% of patients with depressive symptoms and 2.8% of patients with anxiety symptoms were receiving relevant psychiatric treatment. **Conclusions:** This study collaborates with studies from other populations to support that the rate of psychiatric disorder is high among people with rheumatic diseases and it appears to exceed the rate found in the general population. Further study is needed. Mechanisms are needed in Oman to increase the awareness among physicians dealing with rheumatology patients. Such an undertaking could include providing ways for early detection and prompt interventions.

Characterizing Colonic Anatomy Normal Values based on Air Contrast Enemas in Children

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ABSTRACT

Objectives: Constipation is very common in children. It is a clinical, not a radiological diagnosis. In cases of diagnostic uncertainty, contrast enemas sometimes are useful. However, there are no clear definition for colonic dilatation or redundancy in children. The aim of this study was to provide normal values for colon size ratios in children less than six years based on air contrast enemas. The secondary objective was to explore the correlation between colon size and age. **Methods:** This retrospective chart review was conducted on patients aged 0–5 years who were diagnosed with an intussusception and had an air contrast enema at Royal Hospital. This study was conducted between April 1, 2005 and February 29, 2016. The primary outcome measures were the ratios of the diameters and lengths of predetermined colonic segments (lengths of rectosigmoid and descending colon, and diameters of rectum, sigmoid, descending colon, transverse colon, and ascending colon) in relation to the L2 vertebral body width. **Results:** A total of 190 patients with median age of 8 months and age range 0–5 years were included in the study. Fifty-six percent of patients were male. There was no significant change in the colonic segment length ratios among age group. The ratios that involved the rectal, sigmoid, and descending colon diameters significantly changed with age, while diameter ratios involving the other colonic segments was normal. Results also reflected the ratios comparing different colonic segment diameters with one another. Differences by gender was not significant. **Conclusions:** Data provided on colonic size ratio on this study could be used as reference in young children undergoing contrast studies of the colon.

POSTER

Ultrasound-guided Out-of-plane versus In-plane for Radial Arterial Line Cannulation

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ABSTRACT

Objectives: Currently, short-axis out-of-plane and long-axis in-plane ultrasound techniques are used to guide radial artery cannulation. This study aimed to compare the success rate and the safety of the two techniques. **Methods:** This prospective observational study was conducted in Cardiac Centre, Royal Hospital a tertiary health centre. Eighty-four adult patients age 18-65 years old who underwent cardiac surgery were enrolled in the study. A pilot study was used to determine the sample size. The patients were randomly divided into two groups: the out-of-plane and the in-plane ultrasound guidance approaches with 42 patients in each group. The primary endpoint to compare the groups was the rate of cannula insertion successes on the first attempt. The secondary endpoints were recorded and compared such as the number of skin puncture, the number of cannula redirection, cannulation time, and vascular complications including hematoma. Continuous demographic variables were compared using independent *t*-test and time of cannulations were compared using Mann-Whitney U test due to the abnormal distribution. Categorical clinical outcomes were compared using chi-square test. Ethical approval was obtained from the Royal Hospital [MESRC#79/2015]. **Results:** All patients completed the study and have been analyzed. The cannula insertion success rate on the first attempt was significantly higher in the in-plane group compared to the out-of-plane group ($p = 0.007$). The number of cannula redirection and the number of skin puncture were significantly higher in out-of-plane approach with $p = 0.004$ and $p = 0.016$, respectively. However, cannulation time and the number of hematoma were not significantly different between the two group ($p = 0.792$ and $p = 0.241$, respectively). **Conclusions:** We think that the in-plane USG approach is cost effective and may be safer for arterial line cannulation. The future studies may be conducted on difficult subgroup of patients like obese or hemodynamically unstable patients.

Analytical Study of Reported Cases in Al Nahdha Hospital of Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis

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ABSTRACT

Objectives: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are rare and serious dermatological emergencies mostly caused by drug reactions. Limited studies were done because of the rarity of these conditions. The aim of this study was to evaluate and compare demographic, etiology, clinical manifestations, complications, and survival rate of SJS/TEN cases admitted in dermatology department at Al Nahdha Hospital. **Methods:** A retrospective study of 30 cases diagnosed with SJS, SJS/TEN overlap, or TEN who were admitted as inpatient in dermatology department at Al Nahdha Hospital from 2003 to 2017. **Results:** Twenty-two (73.3%) cases of SJS, two (6.7%) cases of SJS/TEN overlap, and six (26.7%) cases of TEN were reviewed. Male were predominant with a male to female ratio of 1.7:1. The most frequent offending drugs were antibiotics (36.7%) followed by allopurinol (23.3%), anticonvulsants (10.0%), and nonsteroidal anti-inflammatory drugs (3.3%). The most frequent antibiotic identified was Co-amoxiclav. Seventy percent of cases were treated with intravenous hydrocortisone, while 26.7% case treated with the combination of intravenous hydrocortisone and intravenous immunoglobulin. Mortality rate in this study was 6.7%. **Conclusions:** Antibiotics followed by allopurinol were the most frequent offending drug identified in this study.

The Validity to Test the Salicylate Level for All Cases of Paracetamol Overdose

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ABSTRACT

Objectives: The objectives of this study were to determine whether testing the salicylate level of paracetamol overdose cases is necessary, and to assess the risk factors that may contribute in salicylate toxicity with paracetamol overdose patient. **Methods:** We performed a retrospective study of all patients with paracetamol overdose presented to Royal Hospital emergency department from January 2007 to January 2017. Data were taken from Al Shifa health care system. Data was collected and analyzed using Epidata and SPSS 22.0 software. **Results:** A total of 338 patients (female = 288, male = 50) had paracetamol overdose. Of these, 145 patients admit to have other

type of ingestion (Actifed, mefenamic acid, antibiotic, antihistamine, aspirin, cough syrup, benzodiazepine, Buscopan, loperamide, alcohol, nonsteroidal anti-inflammatory drugs, household cleaning fluids, and psychiatric medication), 190 denied any ingestion, and three patients had no documentation whether there was any ingestion or not. Aspirin level test was done for 189 patients, six patients were ASA positive. Among the six cases, two had history of ASA ingestion, two had history of other medicine ingestion, one had history of abdominal pain, and one denied any ingestion or any clinical feature suggestive of ASA overdose. All ASA levels were nontoxic level. **Conclusions:** In view of those results, the absence of positive ASA ingestion history and clinical feature ASA toxicity level proves that testing of ASA level is not necessary among paracetamol overdose cases. There was one patient missing out of 189 (0.5%), which was from toxicologist and statistician point of view were insignificant.

The Application of E-point Septal Separation by Emergency Doctors to Estimate Ejection Fraction: A Meta-Analysis and Systematic Review

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ABSTRACT

Objectives: An easy and accurate method for determining patient's ejection fraction is needed in the emergency department. Our aim is to determine whether E-point septal separation (EPSS) can be used reliably by emergency doctors. This will be done by determining the strength of the correlation of EPSS to ejection fraction. The secondary objective is to pool results of sensitivity and specificity for the cut-off value of EPSS for preserved ejection fraction. **Methods:** We conducted a meta-analysis and systematic review. Keyword search in multiple database libraries including PubMed, the Cochrane Central Register of Clinical Trials, Google scholar, and clinicaltrials.gov were used in this study. We searched articles with sampling from adult patients over 18 years old who had an EPSS measurement done by emergency doctors. QUADAS-2 score was used to assess the quality of the studies. Data were gathered and inserted into the computer program Jamovi 1.0.7.0 to obtain a random-effects meta-analysis of correlations. The sensitivities and specificities of each study were computed in MetaDTA to obtain the pooled value of each. **Results:** Three hundred

and sixty-seven articles turned-out from the search, out of which three articles were included in the study, with a total of 256 patients. QUADAS-2 score showed low risk of applicability of each study. The baseline characteristics of the samples were similar. A forest plot was generated, which resulted in a correlation value of -0.82, -0.89 ($p = -0.850$). The heterogeneity value of the meta-analysis was $I^2 = 0\%$, which indicates that heterogeneity of the samples may be negligible. Pooled sensitivity and specificity at EPSS ≤ 8.0 -8.4 mm for preserved ejection fraction was 80.4% (95% confidence interval (CI): 65.7%-89.8%) and 89.4% (95% CI: 35.1%-99.2%), respectively. **Conclusions:** The meta-analysis shows a strong relationship between ejection fraction and EPSS when done by emergency doctors. However, there is a lack of studies in which this method has been used in the emergency department. The performance of the test at EPSS ≤ 8.0 -8.4mm shows a modest sensitivity. An EPSS ≤ 7.0 mm may perform better. More studies are required.

Effects of Otitis Media with Effusion on Surgical Outcomes in Pediatric Patients Underwent Cochlear Implantation: A Retrospective Observational Study

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ABSTRACT

Objectives: This study was conducted to determine whether cochlear implantation in patients with otitis media with effusion (OME) at the time of surgery has effect on the procedure, post-operative surgical complications, and outcomes. **Methods:** This study is a retrospective descriptive analysis of data collected from records of patients who underwent cochlear implantation at Al Nahdha Hospital in Oman from 2000 to 2018. The age of the patients ranged from six months to 14 years old. We excluded patients who received re-implantation, those who had their operations outside our institution, and patients with incomplete data. **Results:** Out of 369 children, 175 had OME prior to surgery compared to 194 non-OME children. Intra operative edematous hypertrophied middle mucosa was observed only among patients with OME, which was statically significant ($n = 18$, $p < 0.050$). Moreover, six cases from patients with OME developed mild intra operative bleeding compared to only one case from non-OME group ($p < 0.050$). Overall, there was no significant difference in post-operative surgical complications between the two groups ($p > 0.050$). A ventilation tube inserted in 26 out of 175 of patients before cochlear implantation, which did not affect the outcomes of implantation significantly.

Conclusions: Although operating on patients with OME can be associated with few intra operative technical difficulties such as impaired visualization and bleeding, cochlear implant (CI) should not be delayed in children with OME, and subsequent episodes of OME can be managed conservatively. We also recommend that there is no longer need for surgical treatment for OME prior CI since OME does not affect the surgical outcomes of CI.

Social Media Use among Oman Medical Specialty Board Residents

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ABSTRACT

Objectives: The objectives of this study were to estimate the prevalence of social media usage among Oman Medical Specialty Board residents, to find out whether the frequent use of social media leads to addiction, and to determine the association between internet addiction, sociodemographic characteristics, and depression. **Methods:** A cross-sectional survey was conducted from January to March 2019 by distributing a self-administered questionnaire to all the residents from different specialties in Oman Medical Specialty Board. Sociodemographic characteristics information was obtained. The Internet Addiction Test (IAT) was used to screen for addiction and Patient Health Questionnaire-9 (PHQ-9) to screen for depression. **Results:** A total of 399 residents (158 male and 241 female) out of 499 residents who participated in the study had completed the questionnaires, giving a response rate of 79.96%. Overall, 37.3% of the participants ($n = 149$; 64 male and 85 female) were found to be addicted to social media based on the IAT. Out of those who were addicted to social media, 88.6% ($n = 132$) had mild addiction, 10.7% ($n = 16$) had moderate addiction, and only 0.7% ($n = 1$) had severe addiction. Among all participants, 28.8% ($n = 115$) had various degrees of depression based on the PHQ-9. Moreover, the study showed that those who were addicted to social media, 36.2% ($n = 54$) were depressed. There was no significant association between social media addiction and participants' demographic characteristics such as age, gender, place of origin, specialty, and level of residency. **Conclusion:** Social media addiction is common among medical residents. Advantages and disadvantages of social media use needs to be addressed by higher authority of health education. Further research on the consequences of social media addiction and its effect on the overall quality of life and academic achievement is needed.

Common Presentation Patterns of Vitamin D Deficiency among Omani Population Presented to Primary Health Care System in Muscat

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ABSTRACT

Objectives: Vitamin D deficiency is defined as a 25-hydroxyvitamin D level < 50 nmol/L. Humans typically obtain 90.0% of vitamin D from sunlight. Oman is known to be one of the sunniest countries in the world; however, the prevalence of vitamin D deficiency in Omani population was estimated to be 87.5%. The commonest symptoms of vitamin D deficiency are bone pain, fatigue, muscle pain, muscle weakness, joint pain, low mood, and symmetrical lower back pain. The study aimed to assess the presentation patterns of vitamin D deficiency among Omani population presented to primary health care system in Muscat. **Methods:** This is a descriptive retrospective cross-sectional study including patients aged 18 years and above, who were tested for vitamin D level from January to December 2015. Data were collected from eight different local health centres in Muscat, Oman. A study questionnaire was created to investigate the risk factors of vitamin D deficiency. **Results:** A total of 250 patients were included in this study, 95.2 % (n = 238) were female and 4.8% (n = 12) were male. Two hundred and twenty seven (90.8%) were vitamin D deficient, 21 (8.4%) patients were insufficient, and only two (0.8%) patients were normal. The most common reasons for testing vitamin D level were muscle pain (n = 71, 28.4%), screening (n = 67, 26.8%), bone pain (n = 53, 21.2%), and joint pain (n = 35, 14.0%). One hundred and nineteen (47.6 %) patients believe that sun exposure is the main source of vitamin D, and 131 (52.4%) patients believe that diet is the main source. **Conclusions:** The most common presentations of vitamin D deficiency are bone pain and muscle pain. Low vitamin D level is prevalent in apparently healthy Omani population living in Muscat, Oman. Public awareness, supplementations, and fortifications of food with vitamin D should be considered in Oman. We recommend further research to investigate other areas in Oman and compare it with our findings, as well as to investigate the details of dietary intake of vitamin D among Omani patients.

Short and Long Term Outcomes of Laparoscopic Surgery versus Open Surgery

for Colorectal Cancer Resection in Royal Hospital from 2006 to 2017: A Retrospective Study

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ABSTRACT

Objectives: This study aimed to compare the perioperative and oncologic outcomes between laparoscopic surgery and open surgery for colorectal cancer. **Methods:** We conducted a retrospective cohort review of patients who underwent surgery for colorectal cancer resection at Royal Hospital from January 2006 to December 2017. The perioperative and oncologic outcomes were compared between laparoscopic and open surgery. **Results:** Out of 185 patients with colorectal cancer, 125 (67.5%) underwent laparoscopic surgery and 60 (32.4 %) underwent open surgery. There were no difference in patients' characteristics between the two groups. Regarding perioperative outcomes, the operation time was not significantly longer in the laparoscopic group than in the open group (217.3 vs. 205 minutes, $p = 0.360$), but the time to food intake were 3 days versus 5 days with $p = 0.040$. There were 29 (22.7%) conversions from laparoscopic surgery to open surgery. Complications were more frequent in the open surgery group than in the laparoscopic group, although the difference was not statistically significant (43.0% vs. 20.0%, respectively; $p = 0.080$). The number of harvested lymph nodes was lower in the laparoscopic group than in the open surgery group (20.3 vs. 13.7, $p = 0.060$). Overall survival was longer in laparoscopic group compare to open surgery (78.0% vs. 38.0%, $p = 0.540$). **Conclusions:** The present study showed that laparoscopic surgery is associated with several perioperative benefits and has similar oncologic outcomes to open surgery for the resection of colorectal cancer. Therefore, laparoscopic surgery offers a safe alternative to open surgery in patients with colorectal cancer.

Effectiveness of Enhanced Recovery after Surgery Protocol in Bariatric Surgery

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ABSTRACT

Objectives: The aim of this study was to determine if the application of enhanced recovery after surgery (ERAS) principles can reduce hospital stay and postoperative

complications. **Methods:** We performed a single-institution retrospective analysis in patients who underwent laparoscopic sleeve gastrectomy from February 2012 to December 2018. Patients were stratified into traditional care and ERAS protocol groups. The ERAS protocol consisted of goal-directed patient education, specific pre- and post-op multi-modal medication regimen, early ambulation, and early oral intake. The primary outcome was length of hospital stay. Secondary outcomes were mortality, 30-day readmission, and complication rates including bleeding, leak, thrombosis, and surgical site infection. **Results:** Three hundred thirty consecutive patients underwent laparoscopic sleeve gastrectomy, of which 119 (40%) were enrolled in ERAS. Median hospital stay was significantly shorter in the ERAS group by two days compared to the traditional care group (3.2 vs. 5.3 days, $p < 0.050$). One hundred eighty two patients (87.1%) from traditional group were admitted in high dependency (HD) postoperatively. Whereas HD bed requirement decreased significantly to 49% after applying ERAS ($p = 0.0001$). One patient had leak and was from ERAS group. On the other hand, two patients developed portal vein thrombosis from ERAS group ($p = 0.153$). Six patients had postoperative bleeding, five of them were from ERAS group. Eleven patients (3.3%) developed surgical site infection, two of them were in ERAS group. **Conclusions:** Length of stay and HD bed requirement decreased after ERAS. Overall, 14 patients were readmitted within 30 days. There is no increase in the postoperative complications after applying ERAS protocol.

'Evaluation of Reflex' High-performance Liquid Chromatography as Screening Modality for Hemoglobinopathy in Sultan Qaboos University Hospital: A Quality Project

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ABSTRACT

Objectives: High-performance liquid chromatography (HPLC) has been evaluated as a useful technique for detection of hemoglobinopathy in patients with abnormal red cell indices. This study aimed to evaluate the effectiveness of reflex HPLC test for the criteria which has been set by hematology laboratory in Sultan Qaboos University Hospital (SQUH). **Methods:** All reflex HPLC tests conducted between September 2018

and October 2018 in SQUH that met the inclusion criteria were included in this study. Inclusion criteria were patients' age < 35 years old with mean corpuscular hemoglobin (MCH) of < 24. Reflex HPLC tests were compared to different red cell indices. Analyses were done using IBM SPSS statistics version 23.0. **Results:** A total of 297 reflex HPLC results were included in this study, 66% of these were normal. There was no correlation between MCH and abnormal HPLC result. **Conclusions:** No correlation between low red cell indices and abnormal HPLC results, mainly due to the high prevalence of alpha thalassemia trait in our population. Reflex HPLC tests with the defined inclusion criteria have a limited utility for detecting hemoglobinopathy.

Elastosis in Breast Cancer as a Surrogate Marker for Estrogen Receptor Positivity

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ABSTRACT

Objectives: To investigate the occurrence and the amount of stromal elastosis in invasive breast carcinoma among Omani female patients using semi-quantitative methods (i.e., hematoxylin and eosin (H&E) stain and elastic van gieson (EVG) stain) and to calculate the interobserver variation if present. We also investigated the relationship between stromal elastosis and ER, PR, HER2/neu receptors, tumor grade, and Ki-67 index. Furthermore, to evaluate if elastosis can be used as surrogate marker for estrogen or any of the above mentioned hormone receptors and prognostic markers. **Methods:** The content of elastic tissue in primary infiltrating carcinomas of breast was assessed using semi-quantitative methods (H&E and EVG stains) in 80 female Omani patients. Data of primary breast cancer patients who were not treated with neoadjuvant therapy from 2009 to 2019 at Armed Forces Hospital were collected. Medical records were reviewed. Demographic data including age, menstrual status, tumor type and grade, ER, PR, HER2/neu status, and Ki-67 index were obtained. Data entry was done using Epidata followed by statistical analysis using SPSS program. Ethical approval was obtained from Histopathology Department, Armed Forces Hospital. **Results:** Female breast cancer was found to be more common among postmenopausal women in the age group 50-60 years, accounting for 32.5% of the total cases, which is higher compared to younger women under 30 years (3.8%). Among 80 cases studied, 80.0% were diagnosed with invasive ductal carcinoma, not otherwise specified; while 12.6% of the cases were diagnosed with infiltrating lobular carcinoma. Cases graded as Nottingham grade 2 were 51.2% of the total cases, while grade 1 and grade 3 were 23.8% and 25.0%, respectively. Interobserver

agreement of grading elastosis on H&E and EVG was strong (Kappa coefficient = 0.858). Sensitivity and specificity of detecting elastosis on H&E stained sections as compared to EVG stain (the gold standard) were 68.75% and 96.88%, respectively. A statistically significant relation between high elastosis and estrogen receptor positivity ($p = 0.015$) and negative HER2/neu receptor ($p = 0.045$) was observed. No statistically significant relation between elastosis and other factors including menopausal status, tumor type and grade, PR, Ki67, and prognosis. **Conclusions:** The strong relation between high elastosis and estrogen positivity and negative HER2/neu receptor in breast cancer in our study were similar to the relation found from previous studies, presence of elastosis can be considered as a surrogate marker for estrogen positivity in breast cancer in the initial screening procedure. Interobserver correlation in detecting elastosis on H&E and EVG is good. In addition, detection of elastosis in H&E stain is sensitive and specific. No significant relation between elastosis and other factors were seen.

Effectiveness of Metformin in Management of Gestational Diabetes in Oman: A Retrospective Observational Study

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ABSTRACT

Objectives: This study aimed to determine the efficacy and safety of metformin in Omani women with gestational diabetes mellitus. The secondary objective was to determine the maternal and neonatal outcome in patient with gestational diabetes mellitus who was on diet and was on metformin, insulin, or both. **Methods:** We conducted a retrospective observational cohort study including all pregnant Omani women in second and third trimester who were diagnosed with gestational diabetes based on the one step 75 g OGTT and who attended the Endocrine Outpatient clinic at National Diabetic and Endocrine Center and Obstetric Outpatient clinic at Royal Hospital from June 2014 to June 2016. The data was obtained from clinical notes that were documented by endocrinologist and obstetrician in Al Shifa health care system. All data were analyzed using SPSS version 22. **Results:** A total of 361 patients were diagnosed with gestational diabetes mellitus and treated with metformin. Out of 361 patients, 305 (85%) achieved the glycemic control within 2-4 weeks from initiating the therapy. Twenty-eight patients could not tolerate metformin because of gastrointestinal symptoms, so only insulin was given. There was no difference in maternal (delivery mode, inductive of delivery, and hypertensive complications) and neonatal outcome

(preterm, hypoglycemia, small and large of gestational age, requirement of phototherapy, and neonatal intensive care unit admission) for those taking metformin, insulin, or both ($p > 0.050$). **Conclusions:** Metformin has an efficacy in controlling blood glucose among Omani pregnant women. Metformin is safe and comparable to insulin in maternal and neonatal outcome.

Assessment of Lung Function by Spirometry in Transfusion-dependent Thalassemia Patients in Tertiary Care Center in Sultanate of Oman

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ABSTRACT

Objectives: The primary aim of this study was to assess the spirometric patterns in asymptomatic Omani patients with transfusion-dependent thalassemia using spirometry studies. Secondary objectives were to identify the relationship between respiratory dysfunction pattern and serum ferritin levels and pre-transfusion hemoglobin level. **Methods:** This is a cross-sectional study which involved transfusion-dependent thalassemia (both major and intermedia) patients who registered at Sultan Qaboos University Hospital from July 2017 to July 2019. Patients' aged > 15 years old and able to perform spirometry test were selected for the study after they signed the inform consent. All the patients were free of any respiratory disease. Spirometry was performed in all patients in sitting position and FVC, FEV1, FEV1/FVC were obtained. **Results:** A total of 34 thalassemia patients (male = 20, female = 14) were enrolled in this study. Twenty-nine patients were suffering from thalassemia major and five were suffering from thalassemia intermedia. The mean age of our patients was 30 ± 6.7 years. We found that 38.2% of the patients showed normal spirometry and 61.8% had abnormal spirometry; 35.3% showed restrictive pattern, while 26.5% showed obstructive pattern. There was no significant association between ferritin level and the different spirometric patterns. Majority of patients were receiving transfusions every 3 weeks which accounts for 76.4% of the patients and 19.4% were receiving the transfusion every 4 weeks. **Conclusions:** The spirometry assessment of the lung function in thalassemia patients who were receiving regular transfusion showed that majority had abnormal spirometry results despite being asymptomatic from respiratory point of view.

Epidemiology of Carbapenem-resistant Enterobacteriaceae, Bloodstream Infection:

Risk Factors and Outcome in Khoula Hospital from 2011-2019

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ABSTRACT

Objectives: Emergence of Carbapenem-resistant Enterobacteriaceae (CRE) is a public health concern worldwide. It is associated with limitation of antibiotic option and increase in mortality. To our knowledge, there is no published study in Oman to assess the risk factors and the outcome of patient with bloodstream infection with this emerging organism. Our main objective was to study the epidemiology of CRE, and to compare risk factors and related mortality in each risk factor. The secondary objective was to study if combination therapy is superior than monotherapy. **Methods:** This is a retrospective cohort study, all CRE isolated in blood culture were identified from Al Shifa system in Khoula Hospital between December 2011 and October 2019. Incidence rate was estimated, and factors associated with CRE bacteremia were identified. Risk factors associated with 14- and 30-day mortality in patients with CRE infection were also determined. **Results:** A total of 55 cases of bloodstream infections were isolated during the study period. Median age of patients with CRE bacteremia was 55 years. Eighty-four of patients were receiving treatment in the intensive care unit at onset of illness. Other common comorbidities were presence of central venous catheter (78%) and postoperative status (17%). The most common bacteremia sources were central line related bloodstream infection (53%) followed by ventilator associated pneumonia (24%). Mortality at 14 days was 41% and at 30 days was 52%. Univariate analysis showed that 14 days mortality was higher in patients with central venous catheter with $p = 0.010$. Charlson comorbidity index was associated with increased risk of death at 30 days ($p = 0.040$). Other factors were not associated with increased death at 14 or 30 days of illness. There was no statistically increased survival in those treated with combination therapy at 30 days ($p = 0.500$). **Conclusions:** In this cohort of CRE bacteremia, hospital acquired infection seems to be the most common focuses. The mortality of this difficult to treat infections is high, and optimal therapy is not well defined yet. Further studies with larger number of patients is needed to assess the impact of different combination therapies.

Epidemiology of Central Line-associated Blood Stream Infections in Neonatal Intensive Care Unit

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ABSTRACT

Objectives: The main objectives of this study were to investigate the burden of central line-associated blood stream infections (CLABSIs) in neonatal intensive care unit (NICU) and to assess the outcome in terms of mortality and morbidity. This study also highlights the risk factors and microbiological etiology of CLABSI. **Methods:** This descriptive retrospective cohort study includes all neonates with CLABSI confirmed by National Healthcare Safety Network (NHSN) criteria and were admitted in NICU at Royal Hospital from January 2011 to December 2018. Demographic and clinical details of the patient were reviewed from the electronic patient information system (Al-Shifa system) using data collection sheet after getting ethical approval from Royal Hospital. Data were entered through Excel sheet and analyzed using SPSS. **Results:** A total of 436 bacteremia was reported, 59 of these were confirmed CLABSI cases identified based on NHSN criteria. The percentage of CLABSI from total bacteremia ranges from 7.9% to 20.0%. Annual CLABSI rate ranges from 1.9 to 5.9 per 1000 line days, and overall CLABSI rate was 3.5 per 1000 line days. The median length of stay after CLABSI was 23 days, gestation age was < 33 weeks for 47.5% of cases, and birth weight was < 2501 g for 72.9% of cases. RDS was found in 52.5% respiratory distress syndrome, 30.5% with gastrointestinal (GI) conditions, and 18.6% with congenital heart disease. Ten percent of CLABSI cases had more than one condition, five cases had RDS and GI, and one case had RDS with hypoglycemia. Cases underwent surgical procedure (49.1%) before CLABSI, abdominal surgery (55.5), and thoracotomy (44.5%). The median duration of total parenteral nutrition TPN use was 24 days. Most (78.0%) of CLABSI happened within one to two weeks. Regarding the type of catheter, 48.8% were related to umbilical line, followed by central venous catheter CVC (32.2%) and peripherally inserted central catheter PICC line (22%). The most common organism isolated were *staphylococcus epidermidis* (40.7%) and other coagulase negative staphylococcus (16.9%). In the overall outcome, 23.7% of CLABSI cases died within 30 days of the event, 50.8% were discharged, and 20.3% were transferred to other hospitals. **Conclusions:** The overall mortality rate was 23.0%. CLABSI rate was fluctuating over the year despite of the intervention, indicating the sustainability failure. The low birth weight, small gestational age, underlying condition, and TPN use were identified as risk factors among neonates with CLABSI. The most common organism isolated was coagulase negative staphylococcus.

Comparing Methods of Term Labor Induction for Women with Previous One Cesarean Section, Foley's Catheter versus Dinoprost

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ABSTRACT

Objectives: Women with a prior cesarean section (CS) delivery have an increased risk of uterine rupture in the subsequent delivery. For women subsequently requiring induction of labor (IOL), it is unclear which methods are preferable to avoid adverse outcome. Current clinical practice support trial of vaginal birth among women who have had a prior CS. IOL is common obstetric intervention. Between 20%-30% of births reported to occur following IOL. This study aimed to assess the benefits and harms associated with two different methods used to induce labor (Foley's catheter vs. Dinoprost) in women who had a previous CS and require IOL in a subsequent pregnancy. **Methods:** This retrospective chart review was conducted in all women with history of a previous CS either admitted in spontaneous labor or planned induction at Obstetrics and Gynecology Department, Royal Hospital, from January 2010 to December 2014. A total of 634 women met the selection criteria and were included in this study. Out of which, 549 came with spontaneous labor, and 85 planned for IOL. Out of 85 pregnant women, 73 women were induced with Foley's catheter and 12 were induced with 1 mg Dinoprost. **Results:** The rate of CS between induced (80.0%) and non-induced (79.8%) group was almost the same, with no significant difference. In the group induced with PGE2 (33.3%), the rate of successful vaginal birth was higher than the group induced with Foley's catheter (17.8%). Difference was not significant ($p = 0.247$). Two (0.4%) cases from the non-induced labour group were reported with uterine rupture, these two cases were augmented with oxytocin. No rupture uterus reported in the induced group. Neonatal outcome shows six (1.1%) babies from non-induced group admitted to special care baby unit. **Conclusions:** There was no significant difference in fetomaternal outcome and the adverse effect using two different methods of IOL. The two cases of scar dehiscence in non-induced group is a concern of safety. Foley's catheter and Dinoprost were equally safe and effective in inducing labor in patients with previous CS.

Post Cesarean Section Surgical Site Infection at a University Hospital: Incidence, Risk Factors, and Outcomes

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ABSTRACT

Objectives: To identify the prevalence of surgical site infection (SSI) in patients who underwent cesarean section (CS) and to identify predisposing factors, outcomes, and microbial patterns. **Methods:** A retrospective cohort study of all patients who underwent elective or emergency CS at Sultan Qaboos University Hospital between July 1, 2017 and June 30, 2018. All patients with SSI diagnosed within 30 days from the time of surgery were included in the study. Demographic data such as age, parity, body mass index (BMI), antenatal complications, and previous obstetric history including previous CS, medical complications (e.g., gestational diabetes mellitus or overt), hypertensive disorders, and premature rupture of membranes were recorded. **Results:** A total of 457 CS patients were included in the study. Twenty-six patients developed SSI post CS with a prevalence of 5.7%. Mean age was 32.6 years and mean parity was 3.9. In the study cohort, 77.0% were overweight or obese, all class 2 and 3 obese patients developed SSI. Risk factors were pre-gestational and gestational diabetes (42.3%), hypertensive disorders of pregnancy (26.9%), and previous CS (50.0%). Emergency cesareans (category 1 and 2) were a major risk factor (73.1%). All category 1 cesarean patients developed SSI despite our protocol of prophylactic antibiotics intraoperatively. Longer operative time (> 1 hour) was found in 16 out of 26 (62.0%) patients. All patients with > 5 cm vaginal examinations and prolonged labor (> 12 hours) had SSI (100% correlation). Prolonged hospital stay and re-admission were 31.0% each. SSI occurred in superficial, deep and organ/space in 61.5%, 19.25%, and 19.25% patients, respectively. *Pseudomonas aeruginosa*, enterococcus, and mixed coliforms were the predominant microbes (8% each). **Conclusions:** The prevalence of SSI was 5.7% in our study. Maternal obesity, gestational diabetes, hypertension, and previous cesarean delivery are important contributory factors. Emergency cesareans, prolonged duration of surgery, and prolonged labor increases the risk. *Pseudomonas*, enterococcus, and mixed coliforms were the main causative organisms. Implications for practice include optimizing BMI and medical comorbidities, continued antibiotic cover in high-risk patients, and policies for post cesarean surveillance up to 30 days following surgery.

Prevalence of Silent Obstructive Sleep Apnea in Patients with Jaw Deformity

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ABSTRACT

Objectives: The aim of this study was to assess the prevalence of silent obstructive sleep apnea (OSA) among patients with jaw deformity in Omani population.

Methods: This prospective study cross-sectional design was conducted among patients with jaw deformity at Al Nahdha Hospital from 2018 to present, based on subjective questionnaires, objective sleep study, and nasopharyngeal assessment. Chi-square test was used for statistical analysis. **Results:** A total of 28 patients (male = 11, female = 17) with an average age of 28 years were included in this study. Patients were planned for jaw corrective surgery (advancement mainly). The types of deformities included in the study were mandibular retrognathia, hypoplastic maxilla, midface deficiency, and retrogenia. In this study, we found that silent OSA were present in 60.7% of patients. **Conclusions:** Despite the presence of various risk factors that could give rise to silent OSA, jaw deformity is considered a major factor. The results demonstrated a high percentage of patients who were found to have silent OSA associated with jaw deformity.

Success Rate of Dental Implants Placed in Autogenous Bone Graft at Al Nahdha Hospital

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ABSTRACT

Objectives: To evaluate the clinical outcome and assess the success rate of dental implant placed in autogenous bone graft in all patients reconstructed for alveolar ridge deformities and seeking oral rehabilitation with dental implant. This study also aimed to discuss the rate of success in different grafted areas of the oral cavity. **Methods:** This retrospective longitudinal study was conducted in patients who attended the Oral and Maxillofacial Department at Al Nahdha Hospital from 2010 to 2018. All patient underwent autogenous bone augmentation to reconstruct defective alveolar ridge and placement of dental implant. The implant success rate was clinically and radiographically evaluated over a follow-up period of six months after prosthesis loading, following Buser et al's criteria. Epidata entry software was used for

data collection. SPSS version 2.2 was used for analysis. All categorized variables were described as percentages. Success rate of dental implant was also presented as percentage with 95% confidence interval. **Results:** There were 64 patients involved in this study, 23 males and 41 females, who underwent autogenous bone graft procedure prior to dental implantation. Age range 17-60 years old with a mean age of 31 years during autogenous bone augmentation surgery. Dental caries or periodontal disease were major causes of teeth loss (n = 47, 73.4%), followed by trauma (n = 9, 14.1%) and pathology (n = 8, 12.5%). A total of 187 dental implants were placed in grafted regions (n = 78), mandible (n = 95), and maxilla (n = 92). Overall success rate of dental implants placed in autogenous bone graft was 96.7%. Six implants were removed as they showed signs of failures. All removed dental implants were never prosthetically resorted due to lack of osseointegration. The average length between date of bone augmentation and implant insertion was 112 days. The mean follow-up period between the implant insertion and the follow-up period was 243 days. **Conclusions:** According to the finding of this study, reconstruction of atrophic alveolar ridge with autogenous bone graft appears to be a reliable and predictable procedure with no markable complications seen at donor site and is associated with high bone survival rate and implant success in Al Nahdha Hospital, meeting the international standards of success.

Complications Associated with the Use of 1000 Centistokes and 5000 Centistokes Silicon Oil in Vitreoretinal Surgeries: Single Tertiary Center Experience in Oman

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ABSTRACT

Objectives: To describe complications associated with the use of 1000 centistokes (cs) and 5000 cs silicon oil in vitreoretinal surgery. **Methods:** This is a retrospective descriptive study including all patients who underwent vitreoretinal surgery in which silicon oil injection or removal was done. The study was conducted in Sultan Qaboos University Hospital between January 1, 2010 and December 31, 2017. Patients with less than six months follow-up were excluded. Demographic data, status of the eye at the time of oil injection (i.e., phakic, pseudophakic, or aphakic), type of oil used (1000 cs or 5000 cs), duration of oil in the eye prior to removal, and complications associated with silicon oil were extracted from the electronic records of the patient. Descriptive statistics and

chi-square test were used to analyze the data. The study was approved by the institutional research and ethics committee (MREC # 1816). **Results:** A total of 107 eyes of 103 patients were included in the study. The median age of the patients was 57 years (interquartile range = 43–63). Sixty five (63%) patients were males and 38 (37%) were females. Thirty four (32%) eyes were phakic, 61 (57%) were pseudophakic, and 12 (11%) were aphakic. Silicon oil 1000 cs was used in 66 eyes and silicon oil 5000 cs was used in 41 eyes. A total of 37 (34.6%) eyes developed silicon oil associated complications, which included silicon oil emulsification (n = 14, 13.1%), high intraocular pressure (IOP) (n = 19, 17.8%), and band corneal keratopathy (n = 4, 3.7%). Silicon oil emulsification was seen in eight (12.1%) eyes that received 1000 cs silicon oil and in five (12.2%) eyes that received 5000 cs silicon oil ($p = 1.000$). **Conclusions:** Silicon oil injection was found to be a safe adjunct in vitreoretinal surgery. Silicon oil related complications such as silicon oil emulsification, high IOP, and band corneal keratopathy were observed in one-third of study eyes. No difference was noted in both silicon oil emulsification rate with 1000 cs and 5000 cs silicon oil. A prospective, multicenter study with a larger sample size is being planned.

Prevalence and Outcome of Avascular Necrosis of the Hip among Young Omani Patients with Sickle Cell Disease

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ABSTRACT

Objectives: Sickle cell disease (SCD) is a common hemoglobinopathy worldwide and in Oman. Avascular necrosis (AVN) of the hip causes significant morbidity to patients with SCD and has a profound impact on their quality of life. This study aimed to identify the prevalence and outcome of AVN among young Omani patients with SCD. **Methods:** This is a cross-sectional study done in the main tertiary care and referral facility in Sultan Qaboos University Hospital between June 2017 and January 2019. Out of 3000 registered patients, 85 patients were found to have clinical and radiological proven AVN. Data

was obtained including demographics, the affected joint (uni or bilateral), radiological staging by Ficat magnetic resonance imaging (MRI), and hydroxyurea (HU) use, dose, and duration as well as laboratory data at the time of diagnosis. **Results:** The prevalence of AVN among SCD Omani children and young adults was 2.8%. Age ranges from 5 to 25 with mean age of 14.6 ± 3.4 . Male to female ratio was 1.6:1. Based on Ficat system score, most of the cases (70%) are AVN grade 3 and above at the time of diagnosis. Thirty-six (47.0%) patients were diagnosed with stage 4 AVN. Regarding the HU use, 43 patients (50.6%) started HU before the development of AVN. Mean duration of HU use was 5.3 years with an average dose of 15.7 mg/kg/day. Fifteen patients developed AVN and started HU as part of their management. Four of them showed AVN improvement (from stage 4 to 2) on follow-up MRI. Fifteen (17.6%) patients underwent joint replacement because of chronic pain and disability, and almost half (seven patients) of them were on HU. **Conclusions:** Prevalence of AVN in young patients with SCD in the main tertiary care referral facility in Oman is 2.8%, which is less than the internationally reported data. Patients were diagnosed at later stages (3 and above) indicating a possibility of under diagnosis of asymptomatic stage 1 and 2 patients. HU use has improved the severity of the AVN in few patients.

Factors for Lumbar Puncture Refusal for Pediatric Patients Admitted in Royal Hospital: A Cross-sectional Descriptive Study

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ABSTRACT

Objectives: Many parents refuse lumbar puncture (LP), although it plays a major role in the diagnosis of suspected central nervous system infections, optimizes the clinical outcome with controlling antimicrobial agents use, and reduces the hospital cost and stay. This study aimed to assess the factors that contribute to LP refusal and to improve the public knowledge of the safety and benefits of LP. **Methods:** We conducted a cross-sectional, descriptive study at the Royal Hospital from January 2015 to December 2017. Parents of pediatric patients were interviewed by phone calls using a questionnaire that includes parents' sociodemographic factors, patients' characteristics, and reasons for LP refusal. Data were collected in Epidata and analyzed using SPSS version

16. **Results:** A total of 314 parents were included in the study, of which one-third (33.1%) refused LP. The most common reason for refusal was fear of paralysis (66.3%). On regards to counselling, among parents who refuse to give consent, 49% of the parents feel LP was not necessary, 32% were not aware of its indications, 14% did not want to take the responsibility to decide for LP and 14% had distrust on the motives behind requesting for consent. Regarding advantages of refusing LP when indicated, as part of counselling. The study showed, 78.1% of parents agreed for consent when advantages of LP were explained as compared to 59.8% refused when not explained. Additionally, 73.9% of parents agreed for consent when disadvantages of refusing LP were explained as compared to 66.7% refused when not explained. **Conclusions:** One third of parents refused LP due to lack of procedure awareness. The parents need to be aware of the procedure's indications, advantages and complications. They have to be informed about the consequences of LP refusal. As a result, LP parent's awareness leaflet was designed by the study author to make consistent counselling among physicians.

Symptom Perceptions and Help-seeking Behaviors Experiences of Omani Patients Diagnosed with Colorectal Cancer in Sultan Qaboos University Hospital: A Qualitative Study

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ABSTRACT

Objectives: Colorectal cancer (CRC) is the third most common cancer among Omanis. Early diagnosis is important in reducing CRC mortality, but the literature suggests many people wait for a considerable time before presenting symptoms. The aims of this study was to gain in-depth understanding of patients' interpretations of symptoms of CRC prior to diagnosis and to explore processes leading to help-seeking. **Methods:** This is a qualitative study. After ethical approval and taking consent, we conducted semi-structured in-depth interviews for 16 CRC patients diagnosed in the past one year at Sultan Qaboos University Hospital. Patients were asked about symptoms experienced in the period preceding diagnosis, their interpretations of symptoms, and decision making for help-seeking. Interviews were audiotaped and

transcribed. Andersen's Model of Total Patient Delay was used as the theoretical framework for the interview's topic guide and analysis. Data were analyzed using framework analysis. **Results:** Half of the participants diagnosed after nine and a half months from the onset of the symptoms. Patient and health-care system related factors both attributed to the delayed diagnosis. Patient's failure to perceive the seriousness of their condition because of lack of awareness on CRC symptoms and cancer risk played major factor. Many participants developed alternative, non-cancer explanations based on their knowledge and experience. Pain was the most common reason to seek medical help; however participants waited until pain become severe. They explained the waiting with their value of being patient in life. Discussions with important others had negative impacts as it reinforced alternative explanations. Inappropriate assessment mostly at primary level, misdiagnosis, and delayed referral to specialized clinic and colonoscopy were main health system related factors. **Conclusion:** Patients' reasoning, decision making, and interpersonal interactions prior to diagnosis were complex. The findings stimulate decision makers to increase efforts in raising public awareness about CRC and to develop interventions that encourage people to seek timely medical advice leading to early CRC diagnosis.

Duration of Untreated Psychosis among Adolescents with First-episode Psychosis admitted at Sultan Qaboos University Hospital in Oman

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ABSTRACT

Objectives: Sociodemographic and clinical profile and their relation with the duration of untreated psychosis among adolescents with first-episode psychosis has received scant attention in non-western societies. This study aimed to explore sociodemographic and clinical profile and their relation with the duration of untreated psychosis among adolescents with first-episode psychosis admitted in a tertiary care hospital in Oman. **Methods:** This is a retrospective cross-sectional analytical study conducted Sultan Qaboos University Hospital from January 2010 to December 2018. The study preform sought all adolescent age 10 to 19 years old, drug naive, with first-episode psychosis and fulfilling the criteria for the psychotic disorder based on the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR or DSM-V). The sociodemographic as well risk factors were recorded. **Results:** A total of 121 adolescents fulfilled the inclusion criteria. The overall mean duration of

unthread psychosis was 4 ± 4.5 (range = 1-24 months). Sociodemographic factor such as place of abode ($p = 0.006$), family history of psychosis ($p = 0.040$), presence of both positive and negative symptoms ($p = 0.001$), use of traditional healing system ($p = 0.001$), length of stay ($p = 0.027$), and discharge against medical advice ($p = 0.040$) were significant factors association with duration of untreated psychosis. **Conclusions:** Child and adolescent psychosis are increasingly recognized in non-western society and Oman is no exception. This study examined sociodemographic and clinical profile and their relation with the duration of untreated psychosis among adolescents with first-episode psychosis. Some of the factors that contribute to the duration of untreated psychosis could lay groundwork for prevention and contemplating services for such population within the background that this untreated psychosis recoups a longer inpatient stay with all the consequence this may entail.

First Experience with 18F-FDG PET/CT Compared to CT in Oncology Patients in Royal Hospital in Oman

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ABSTRACT

Objectives: To our knowledge, this is the first study conducted about the utilization of the positron emission tomography-computed tomography (PET/CT) in Oman. The aim of this study was to evaluate the accuracy of the PET/CT compared to CT scan in diagnosis staging, restaging, follow-up and treatment planning in oncology patients. **Methods:** This retrospective study traced the records of 1409 oncology patients who underwent both PET/CT and CT scan and had attended the Royal Hospital Molecular Center between February 2016 and November 2017. For analysis, 201 patients were included by calculating sample size using nMaster 2.0 calculator. Data were collected from Al Shifa, Syngovia, and PACS systems of Royal hospital. PET/CT and CT scan reports and images in every patients were reviewed. Then, findings of both studies were compared in term of detection of any extra lesion. The medical records of patients were reviewed for the following clinical outcome like alteration in clinical staging and change in the management after PET/CT scan. EpiData program was used for data collection and SPSS version 22 was used for analysis. MedCalc's diagnostic test evaluation calculator was used to assess the accuracy of PET/CT compared to CT alone by calculating the sensitivity, specificity, predictive values, and likelihood ratios. McNemar test was used to see if the improvement in the diagnostic accuracy is statistically significant. **Results:** Among 201 patients,

81 (40.4%) were males and 120 (59.7%) were females with age range from 6 years to 82 years. The diagnosis with highest frequency was lymphoma (n = 59, 29.0%) followed by breast cancer (n = 35, 17.0%). Eighteen patients were diabetic at the time of the test. Image quality of three PET/CTs studies were non-acceptable. One was due to fluorodeoxyglucose activity in the urinary bladder in case of urinary bladder cancer. The other two were due to brown fat uptake in cervical area in cases of Hodgkin lymphoma. PET/CT imaging was shown to have a sensitivity of 98.5% (95% confidence interval (CI): 91.96%-99.96%) and a specificity of 100% (95% CI: 97.28%-100.00%) compared to 11.94% (95% CI: 5.30%-22.18%) and 95.52% (95% CI: 90.51%-98.34%) for CT alone, respectively. Improvement in diagnostic accuracy was shown to be statistically significant ($p < 0.010$). PET/CT findings helped change the clinical staging in 57 (28.4%) patients and treatment plan in 72 (35.8%) patients. **Conclusions:** This is the first study conducted on utilization of the PET/CT in Oman. It showed that PET/CT study is more accurate in diagnosis, staging, and treatment planning of the Oncology patients. It explained some factors that affect the accuracy of the PET/CT scan. This study will help healthcare workers in managing patients, nuclear medicine, and oncologists to have a clear plan about the management of oncology patients and if there is any difference from what is practiced elsewhere.

Validating Ultrasound based Thyroid Nodule Stratification Scheme - TI-RADS and its Concordance with Bethesda Cytopathology Categories: A Single-center Retrospective Study

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ABSTRACT

Objectives: Thyroid nodules are extremely common. Prevalence of palpable thyroid nodules is approximately 5%, while nodules are detected on thyroid ultrasound (US) in 19-68%. Only a minority of them are malignant. US of thyroid plays a vital role in detecting and characterizing thyroid nodules. Fine needle aspiration and cytology (FNAC) of the thyroid nodule helps in characterization of the nodules. The Bethesda system classifies thyroid FNAC into six categories. Each category is linked to a malignancy risk and has a recommended clinical management. Thyroid FNAC is invasive and expensive. These limitations have motivated the research

for non-invasive methods for stratifying thyroid nodules. American College of Radiology TI-RADS is a reporting system for thyroid nodules on US. This uses a standardized scoring system for reports with recommendations. Our study aimed to validate TI-RADS scoring system in stratifying the thyroid nodules and to correlate TI-RADS with the Bethesda cytopathology categories. **Methods:** A retrospective, cross-sectional study conducted at Sultan Qaboos University Hospital between January 2009 and May 2019. All adult patients aged more than 12 years with thyroid nodules detected on US who underwent FNAC with Bethesda categories were included in the study. Statistical analysis was performed using SPSS version 23. **Results:** A total of 396 patients were enrolled in this study

after applying inclusion and exclusion criteria. Each of the patient was stratified using US based TI-RADS class and Bethesda based cytopathology category. The sensitivity and specificity of the TI-RADS scoring system for the detection of malignant thyroid nodule (TI-RADS 4-5 in correlation with Bethesda 5-6) was 77.63% and 62.28%, respectively. Positive predictive value was 57.84% and negative predictive value was 80.68%. **Conclusions:** The US-based TI-RADS system has a statistically significant fair concordance and alignment with the cytology Bethesda system in evaluating thyroid nodules. US-based TI-RADS system is a highly recommended tool for radiological assessment of thyroid nodule malignancy potential.