Oral Presentations:

QUALITY IMPROVEMENT INITIATIVE TO REDUCE SEPSIS EVALUATION AND ANTIBIOTIC UTILIZATION RATES IN ASYMPTOMATIC NEWBORN INFANTS ADMITTED TO A LEVEL-ONE NEWBORN NURSERY

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Background: Over the past decade, the incidence of early onset sepsis (EOS) has been declining, but the sepsis evaluation rate (SER) and the antibiotic initiation rates (AIR) for suspected EOS are still high. The use of Kaiser sepsis score (KSS), calculated based on Kaiser neonatal sepsis calculator, has been proven to limit the unwarranted sepsis evaluations and to safely reduce the empirical use of antibiotics in healthy newborn infants.

Objective: To reduce both SER and AIR by 25% from the baseline values, in well appearing newborn infants who are born at ≥ 34 weeks of gestational age, and admitted to newborn nursery (NBN) at our institution, over a 12 month period.

Method: During the pre-QI baseline phase (June 2016 to August 2016), we prospectively collected data on all the newborn infants admitted to NBN to determine our baseline AIR and SER. During this period, we calculated but did not clinically apply KSS on all infants who underwent a sepsis evaluation to determine our center specific cut-off scores. To achieve our objective, starting from September 2016, we formulated and implemented the routine use of EOS sepsis evaluation algorithm, incorporating the center specific KSS cut-off values to determine the need for sepsis evaluation and immediate empirical antibiotic treatment initiation (QI-phase). The QI measures were implemented through multiple PDSA cycles. During the QI phase, the prospectively collected data on outcome, balancing and process measures were analyzed by the creation of run charts (trend analysis) and the comparison of SER and AIR rates between pre-QI and post QI phases.

Result: The baseline SER and AIR were 23% and 6%, respectively. Totally, 907 and 795 newborn infants were admitted to NBN during PDSA cycle 1 (September 2016 to January 2017) and PDSA cycle 2 (February 2017 to June 2017), respectively. The SER dropped to 21% during the PDSA cycle 1 and to 14% during PDSA cycle 2 (p < 0.05) (Figure 1). Similarly, AIR decreased to 4% and 2% during PDSA cycles 1 and 2, respectively (p < 0.05) (Figure 2). During the QI phase, both process and balancing measures were at target goal.

Conclusion: The routine use of a center KSS cut-off values to determine the need for evaluation and immediate antibiotic initiation for EOS in well-appearing neonates was able to safely reduce both SER and AIR at our institution.

HYPOGLYCEMIC EVENTS IN PUMP VERSUS INJECTION USERS IN INSULIN-DEPENDENT DIABETICS AT DIABETES CAMP

Melissa Perez, MD, Anne-Marie Kaulfers, MD

Purpose of the study: Insulin pump therapy was introduced with the purpose of obtaining more stable BG levels in insulin-dependent diabetics. Clinical observation suggests higher predominance of hypoglycemia in patients on pump compared to injection therapy. Our objective was to identify and compare the frequency of hypoglycemic events in insulin-dependent diabetics, as users of pump vs injections, at diabetes camp in the Gulf Coast area, and analyze the statistical significance of the differences encountered.

Methods used: We collected BG diaries from participants of diabetes camp in the Gulf Coast during 2015 and 2016. Prior approval from the diabetes camp board was obtained. During camp, participants were maintained at a controlled environment with standardized carbohydrate intake, activity level, BG check times and glucometers. Each participant had a diary with demographic information and BG levels. We combined data from the three summer camp events in the area (senior, junior and coastal). We included only complete camper diaries, and collected age, self-reported race, gender and most recent Hba1c. Total sample was 504 diaries. We defined hypoglycemia as BG ≤ 60mg/dl. Hypoglycemic events were counted and classified in day and nighttime. Stata performed statistical analysis. Per Shapiro-Wilk test, the variables did not show a normal distribution, so the Wilcoxon rank-sum test was applied.

Summary of results: 57% of the sample was female and 43% was male. Calculated mean age was 12.6 years. 70% were Caucasian, 15% AA, 15% Hispanic and other. Calculated mean baseline Hba1c was 8.72. 54% of campers were on pump and 45% on injection therapy. 1093 hypoglycemic events were identified, 63% at daytime and 37% at nighttime. 56% of the hypoglycemic events occurred in pump users, compared to 43% in the injection users. 29% of the campers did not have any hypoglycemic events (53,69% on pump, 46,30% on injections). Applying Wilcoxon rank-sum test, no significant statistical difference was found in the mean of hypoglycemic events in pump vs. injection users.

Conclusions: Noted higher frequency of hypoglycemic events in pump users when compared to injection users at the studied population, with no significant statistical value. Study design limitations, including broad list of confounding factors, were identified.
INCIDENCE OF HERPES SIMPLEX VIRUS INFECTION COMPARED TO SERIOUS BACTERIAL INFECTIONS IN INFANTS 3 MONTHS AND YOUNGER

Mauricio Rendon Bernot, MD, Haidee Custodio, MD

Purpose of the Study: Herpes simplex virus (HSV) and serious bacterial infections (SBI) in very young infants are devastating illnesses. However, unlike in SBI, initiation of empiric evaluation and therapy for HSV infection is unclear resulting in variation in clinical practices. This ambiguity partly stems from scarcity of incidence data applicable to local settings. The purpose of this study is to determine the incidence of HSV infections relative to SBI's in infants 3 months and younger.

Methods Used: Medical records of infants < 3 months evaluated at the ER and/or admitted to USA Children’s and Women’s Hospital (CWH) from January 1, 2014 through December 31, 2016 were reviewed. Infants with microbiologically-proven HSV infection and SBI, AND who were born at CWH and/or admitted to USA Children’s and Women’s Hospital from January 1, 2014 through December 31, 2016 were reviewed. Infants with microbiologically-proven HSV infection and SBI, AND who were born at CWH were included in the study. Infected infants in the NICU and nursery, or those born outside of CWH were excluded. Laboratory results (bacterial cerebrospinal fluid [CSF], blood and urine cultures as well as HSV surface cultures, serum PCR and CSF PCR) were obtained from the hospital’s laboratory database (Medmined™).

Summary of Results: Twenty (0.24%) of the infants born at CWH (n=8272) during the study period were found to have either HSV infection (n=2, meningitis) or SBI (meningitis n=0, bacteremia n=5, urinary tract infection [UTI], n=13). UTI was the most common SBI in this group of patients. The relative distribution of infections is similar when only < 28 day old neonates were included in the review (Table 1).

Conclusions: HSV meningitis is more frequent than bacterial meningitis in our study population. Further study looking at cost-effectiveness of empiric evaluation and therapy for HSV infection is warranted.

<table>
<thead>
<tr>
<th>Infection</th>
<th>Incidence of infection, %</th>
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<tbody>
<tr>
<td></td>
<td>≤ 90 day old infants (r, age in days)</td>
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<tr>
<td>HSV infection</td>
<td>0.024 (n=2, r 19-84)</td>
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<tr>
<td>Bacterial meningitis</td>
<td>0</td>
</tr>
<tr>
<td>Bacteremia</td>
<td>0.060 (n=5, r 11-35)</td>
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<tr>
<td>Urinary tract infection</td>
<td>0.157 (n=13, r 16-80)</td>
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<tr>
<td>TOTAL</td>
<td>0.242 (n=20)</td>
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Table1. Incidence of HSV and serious bacterial infections from 2014-2016 among children born at CWH

CHARACTERISTICS OF PATIENTS WITH ESTABLISHED TYPE 1 DIABETES MELLITUS ADMITTED TO THE PEDIATRIC INTENSIVE CARE UNIT FOR DIABETIC KETOACIDOSIS FROM 2012 TO 2016

Sandra Vazquez Diaz, MD, Nordie Bilbao, MD

Purpose of the Study: Diabetic Ketoacidosis (DKA) in established Type 1 Diabetes (T1D) patients is an extremely common cause of hospital admission, despite being highly preventable. In the past decade, there were remarkable improvements in insulin therapy and glucose monitoring, but the risk of recurrent DKA admission remains high. We aim to describe the characteristics of patients who had multiple hospital admissions for DKA in the last five years, in order to identify high risk groups. We hope to use the findings for future development of targeted intervention for prevention of recurrent hospitalizations for DKA.

Methods Used: After obtaining IRB approval, a retrospective chart review was performed using electronic health records of USA Children’s and Women’s patients ages 1 to 20 years old with established T1D, who were admitted with a diagnosis of DKA in the Pediatric Intensive Care Unit, from January 2012 to December 2016. Age, sex, race/ethnicity, type of insulin treatment (pump, basal/bolus, conventional, mixed) and HbA1c at time of admission were collected and analyzed for frequency distribution.

Summary of Results: A total of 567 admissions were reviewed, of which 383 met the inclusion criteria. These admissions were divided by year (2012-2016). 2014 was the year with most admissions (N=84). Most admissions fall under the ages 13-17 years. There were more females admitted in every year (54%), except in 2015 in which there were more African American patient admissions (55%). More patients admitted were Caucasian (49%), male admissions (55%). More patients admitted were receiving Multiple Daily Injections (basal-bolus) regimen in all years, except 2012 when patients admitted were mostly on conventional (twice daily) insulin regimen. The HbA1c range of these patients was mostly 10-16%.

Conclusions: Patients with established T1D who were admitted for DKA were mostly 13 to 17 years old, with a HbA1c of 10% and above. Most patients admitted were receiving Multiple Daily Injections (basal-bolus), except in the earliest study year (2012), in which conventional dosing was the most prevalent treatment modality. Development of targeted intervention for patients with these characteristics may help decrease their recurrent hospitalizations for DKA.
Poster Presentations:

VITAMIN D STATUS, RESPONSE TO VITAMIN D SUPPLEMENTATION AND FACTORS ASSOCIATED WITH INCREASED VITAMIN D REQUIREMENTS IN PRETERM INFANTS

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Introduction: The importance of vitamin D over the past decades have increased significantly both secondary to the fact that it is one of the key nutrients critical in the management of bone health in preterm infants and from the fact that there are currently more data that vitamin D is associated to nonskeletal health such as development of innate and adaptive immunity and lung development. However, data on level of vitamin D supplement and factors associated with increased vitamin D requirements in preterm infants especially very low birth weight infant is still limited. Our study is aimed to provide more data on vitamin D requirement in very low birth weight infants.

Methods: A retrospective study. Prospectively collected data pertaining to exposures, demographic variables, and cofounding covariates is retrieved from the data set maintained by the division of neonatology at USA called neonatal information system (NIS). The identified cohort will be followed to determine the primary and secondary outcome data variables, which will be retrieved from the NIS. Other data sources Crib notes and Sorian were searched as needed to obtain the data pertaining to the study variables.

Results: We collected data from infants born at gestational age less than 28 weeks from January 2014 to April 2016 with total subjects of 285 very low birth weight infants. The average birth weight of the populations was 786 grams (Max 1765 grams, Min 254 grams), No maternal vitamin D level was collected on all prenatal period but there was more than half received prenatal vitamin D supplementation with prenatal vitamin which contained 400 unit of vitamin D. 95.8% of infants received vitamin D supplementation postanatally with more than half received starting dose of 400 unit per day of vitamin D. Average first vitamin D level (25 OH-D) was 35 ng/mL with average Alkaline phosphatase of 514 IU/L, ionized calcium of 1.29 and phosphorus of 5.55. All of which was not suggestive of metabolic bone disease.

Discussion: Vitamin D which is critical to bone health among other recently suggested benefit of other organs function including immune system and pulmonary development, still currently have limited data in terms of strategies on how to fortify human milk which is low in vitamin D on preterm infants and standardize biochemical markers follow up is still limited. More evidence is needed to provide recommendations for vitamin D supplementation and follow up in these high risk populations.

INDIVIDUALIZED LEARNING ACTIVITY FOR MEDICAL STUDENTS TO LEARN PRESCRIPTION WRITING

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Purpose: Prescription writing is an important skill that is vital to the management of patients, and is something all Physicians must know how to do, and do well. Many medical students here at South Alabama felt that they were not comfortable writing prescriptions by the end of their clinical clerkships, and had asked for extra training. The purpose of our study is to find out if an individualized learning activity would be sufficient for improving prescribing skill of third year medical students.

Methods: An independent study PowerPoint was constructed and made accessible for all 3rd year medical students. The PowerPoint included a concise how to guide for writing prescriptions, as well as acceptable methods to writing prescriptions by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO). The students were given a pretest during orientation before starting their clerkship and instructed to review the PowerPoint. Following completion of their clerkship they were given a posttest, which was essentially the same as the pre test to document their progress. The test consisted of knowing appropriate identifiers, JCAHO approved abbreviations and medical terms as well being able to properly write 2 separate prescriptions.

Results: The mean scores obtained by the students were compared which showed a 3 point increase from the pretest (25.9) taken by 67 students and posttest which 53 of these students took (28.9). The 14 students that did not complete the posttest were either absent for testing, or had other obligations. These scores were compared using t-test (P 0.00000005), which showed that the score increase was statistically significant

Conclusion: The data was statistically significant in regards to the individualized learning activity improving prescription writing skills. Several students endorsed that they received training during their clerkship, which may have been a contributing factor toward the improvement seen. In conclusion individualized learning may serve as a sufficient means of learning prescription writing.
ARE WE MISSING CELIAC DISEASE?

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Background: US population based studies have shown that celiac disease is largely underdiagnosed among all ethnic groups. The prevalence of celiac disease ranges from 0.4-0.95%. We are unaware of the local prevalence of the disease within our local population in South Alabama and surrounding regions of the Gulf Coast.

Aim: We initially aim to calculate the prevalence of celiac disease among patients that present to the primary care setting with symptoms that are suggestive of celiac disease. We then aim to identify any demographic or clinical bias in screening of children that present with symptomatology that is characteristic of celiac disease. Furthermore, we assess the local clinicians’ knowledge of screening and diagnosis of celiac disease through a verified questionnaire.

Methods: We retrospectively reviewed medical records of children who met the following criteria: Children ages 1-18 who visited the primary care services at the University of South Alabama Children’s and Women’s Hospital from July 2015 – June 2017 with the ICD-10/9 diagnosis of constipation, diarrhea, Iron deficiency anemia, abdominal pain, weight loss and failure to thrive (symptoms seen with celiac). We recorded demographics and data using a clinical abstraction form. We identified the number of (tissue transglutaminase) TTG- IgA screening tests and the number of celiac diagnosis in that period. We tried to identify any trends or factors that raise the clinician’s suspicion for celiac disease within our local population. We then created a questionnaire to assess the clinical knowledge of the healthcare providers at our primary care centers.

Results: Out of 2570 patients seen at the outpatient primary care setting with symptoms suggestive of celiac disease, 83 TTG- IgA tests were ordered and no celiac diagnosis was made. 65% of these tests were ordered among Black/African American patients and 16% among whites. 46% of these tests were ordered on males and 54% among females. 46% of these tests were ordered in children over 13 years of age. A questionnaire sent to the primary care physicians showed that 70% of the health care providers did not feel comfortable in their ability to diagnose celiac disease. The majority were able to identify gastrointestinal symptoms as possible presentations of celiac disease; however, extra intestinal manifestations were not seen as symptoms that would require screening for celiac disease.

Conclusion: Despite the high national prevalence of celiac disease no cases were identified in our local population during the study period. A Questionnaire sent out to the healthcare providers identified a knowledge gap in celiac disease screening and diagnosis. This knowledge gap likely raises concern of missed celiac disease cases.

THE RELATIONSHIP BETWEEN SLEEP DISTURBANCES, QUALITY OF LIFE, AND SYMPTOM SEVERITY IN PEDIATRIC PATIENTS WITH INFLAMMATORY BOWEL DISEASE

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*USA Department of Mathematics and Statistics

Introduction: Pediatric inflammatory bowel disease (IBD) including Crohn's disease (CD) and ulcerative colitis (UC) is a waxing and waning disease with symptomatic alternating with remission periods. Sleep disturbances impose adverse effects on host defense mechanisms, and the inflammatory response. We hypothesize that sleep disturbances may occur in proportion to disease activity in children with IBD.

Objective: This aim of this prospective study was to assess the prevalence of sleep disturbances and quality of life in children with IBD. Sleep Habits were assessed by the Child Sleep Habits Questionnaire (CSHQ) for parents, the Pittsburgh Sleep Quality Index (PSQI), Pediatric Daytime Sleepiness Scale (PDSS), and Adolescent Sleep Wake Scale (ASWS) for adolescent. Quality of Life was evaluated using the KINDLR questionnaire. Disease activity for CD was determined by the Pediatric Crohn's Disease Activity Index (PCDAI). The Pediatric Ulcerative Colitis Activity Index (PUCAI) was used to define disease activity in UC/indeterminate colitis patients.

Results: Fifty-three children with IBD (38 CD, 12 UC, and 3 indeterminate colitis) were screened for participation in the study. There was a significant association between the CSHQ and PCDAI (p=0.002) and the PSQI and PUCAI (p=0.04). Children with UC and indeterminate colitis had more sleep disturbances than patients with CD significantly based on the PSQI, PDSS, and ASWS (p=0.03, 0.05, and 0.04, respectively). In addition to the above correlations with active disease, CSHQ scores correlated with pediatric CD patients in remission (p=0.002), while PSQI results best correlated with pediatric UC/indeterminate colitis patients in remission (p=0.033).

Conclusion: The results of this study showed that sleep disturbances occur in pediatric IBD patients whether they are in remission or have active disease. We speculate that adverse affects on sleep quality may affect quality of life and possibly disease activity. Based on the results of this study, we propose that pediatric IBD patients should be screened for sleep disturbances.