

Cardiovascular Club II
10:30 AM
Saturday, February 20, 2016

481 ASSESSING HEART RATE VARIABILITY AFTER ACUTE
ADDERALL ADMINISTRATION IN THE
SPRAGUE-DAWLEY RAT

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10.1136/jim-2015-000035.483

Purpose of Study The purpose of this study was to determine whether repeated administration of amphetamine would alter function of the autonomic nervous system (ANS) in the rat, and to thereby assess changes in heart rate variability (HRV). We hypothesized that the acute and chronic administration of amphetamine would not only increase heart rate (HR) and systolic blood pressure (BP), but would also decrease HRV which could in time lead to cardiovascular pathology.

Methods Used Telemetry blood pressure (BP) transducers were surgically implanted into male Sprague-Dawley rats (n=6). One week later (day 0), each rat received intraperitoneal (ip) injections of saline (0.1 ml) in the morning and afternoon. On days 1–17, amphetamine (2 mg/kg, ip) was administered in both the AM and PM. End-diastolic nadir points were taken from blood pressure waveforms sensed by the telemetry probes in order to generate R-R intervals. From this an in-house computer program was written (MATLAB R2014b) to calculate time domain measures of HR, SDNN, pNN5, and also frequency domain measures of LF, HF, and LF/HF. Average mean arterial pressure and heart rate were computed off-line.

Summary of Results BP and HR rose acutely for at least 6 hours after each AM injection throughout the study. Baseline (1 hr before AM injection) BP appears to remain unchanged over time, but baseline HR diminished as the study progressed. The time domain measure pNN5 acutely diminished after each injection, but baseline measures tended to increase over time. LF/HF acutely increased after each AM injection. Over the first 12 days baseline values diminished, but appeared to rise toward the end of the study.

Conclusions Acute ip injections of amphetamine increased HR and BP. pNN5 acutely decreased, suggesting a drop in parasympathetic nervous system (PNS) tone, and LF/HF acutely increased, suggesting a relative increase in SNS/PNS tone. These acute findings are suggestive of a sudden drop in PNS activity and a relative increase in SNS activity. Over time, baseline HR, but not BP diminished, and pNN5 increased suggesting an increase in basal PNS tone. Together these studies show that acute administration of amphetamine can alter HRV in the rats.

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ASSOCIATION BETWEEN BIRTH WEIGHT AND HEART RATE IN CHILDHOOD, ADOLESCENCE AND ADULTHOOD IN BLACKS AND WHITES: THE BOGALUSA HEART STUDY

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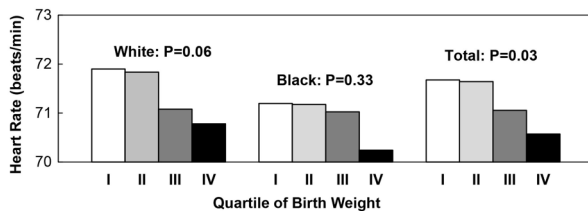
10.1136/jim-2015-000035.484

Purpose of Study Low birth weight is associated with cardiovascular risk and risk factors. However, information is limited regarding its impact on heart rate (HR), an important risk factor for cardiovascular disease. This study assessed the hypothesis that birth weight is associated with resting HR during different growth periods.

Methods Used The study cohort consisted of 6,282 black and white participants enrolled in the Bogalusa Heart Study (61.2% whites; 51% females), aged 3 to 52 years with a mean age of 19.4 years. Resting HR data were available in 2,344 children (3–11 years), 1,622 adolescents (12–19 years) and 2,316 adults (20–52 years). Birth certificate records, including information on birth weight and gestational age, were obtained from the Louisiana State Office of Public Health. Full-term (gestational age=37–42 weeks) birth weight data were considered for analysis.

Summary of Results Blacks had significantly lower birth weight than whites. HR showed a significant decreasing trend with increasing age, with blacks having a lower HR than whites. In multivariable linear regression analyses, adjusted for age, race, sex and gestational age, lower birth weight (kg) was significantly associated with increased HR (beats/min) in adults (regression coefficient, $\beta = -0.25$, $p = 0.552$ in children; $\beta = -0.76$, $p = 0.130$ in adolescents; $\beta = -1.16$, $p = 0.008$ in adults). The association did not differ significantly between races. The birth weight-HR association did not change markedly in the models with and without adjustment for BMI. The decreasing trend in covariate-adjusted means of HR in adults across birth weight quartiles is shown in the figure below.

Conclusions These results suggest that the association between prenatal growth retardation and increased cardiovascular disease risk in later life might be partly through its effect on resting HR.



Abstract 482 Figure 1 Covariate-adjusted means of HR in adults by birth weight quartiles

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EFFECT OF CATION DYSREGULATION ON CORRECTED QT INTERVAL

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Purpose of Study The electrical activity of the heart depends on transmembrane ionic gradients and time- and voltage-dependent alterations of their conductance. Electrolyte abnormalities may both generate and facilitate supra- and ventricular arrhythmias. Hypokalemia effects action potential duration and causes QT interval (QTc) prolongation. According to current laboratory standards normal potassium (K^+) is >3.6 meq; however, $K^+ <4$ meq/L is known to be arrhythmogenic. Likewise, hypomagnesemia has been defined as $Mg^{2+} <1.5$ meq/L; however, Mg^{2+} between 1.5 and 2.0 meq/L is known to prolong QTc. We have previously suggested the importance of maintaining serum K^+ and Mg^{2+} above 4 and 2, respectively, in preventing arrhythmogenicity. Herein, we reiterate the importance of this 4/2 rule.

Methods Used A retrospective chart analysis of 3200 patients who presented to Regional One Center Memphis between July 1, 2013 and June 30, 2015 was done. All patients who were on medications that could prolong QTc were excluded. Statistical analysis was performed using IBM SPSS v. 20.

Summary of Results A direct correlation was noted between K^+ concentration and QTc duration. Average serum K^+ in patients with QTc >450 msec was 3.9 ± 0.02 , and average serum K^+ in patients with QTc <450 msec was 4.1 ± 0.02 . Average QTc interval in patients with serum $K^+ >4.0$ was 463.7 ± 1.02 msec, and average QTc interval in patients with serum $K^+ <4.0$ was 471.7 ± 0.98 msec ($p < 0.01$). Interestingly, QTc was also increased with hyperkalemia >5 meq/L with average QTc 475.2 ± 0.8 msec. Average serum Mg^{2+} in patients with QTc >450 msec was 1.9 ± 0.01 ; and average serum Mg^{2+} in patients with QTc <450 msec was 2.1 ± 0.01 ($p < 0.001$). Average QTc in patients with serum $Mg^{2+} >2.0$ was 465.4 ± 1.1 msec. Average QTc interval in patients with serum $Mg^{2+} <2.0$ was 470.1 ± 0.99 msec ($p < 0.001$).

Conclusions Hypokalemia and hypomagnesemia prolong QT interval and therefore there would be an increase in arrhythmogenic potential for $K^+ <4.0$ and $Mg^{2+} <2.0$. Hence, K^+ and Mg^{2+} concentrations should be kept above 4.0 and 2.0 meq/L, respectively, further supporting the importance of the 4/2 rule.

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THE LIPID PROFILE OF A HISPANIC POPULATION

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Purpose of Study The purpose was to find a preliminary distribution of lipids in a community (Puerto Rico) a Commonwealth of the U.S.A. with a lower coronary artery disease (20–30%) than the U.S.A.

Methods Used A retrospective analysis of 500 patients (P) seen at the cardiology clinic of the University of Puerto Rico were analyzed. Emphasis was done to the first visit. All were receiving statins.

Summary of Results Sixty percent of the P was female and 30% males.

The cholesterol, HDL, LDL and triglycerides levels of the group were:

Cholesterol 190 ± 46 mg/dl

HDL 49 ± 16 mg/dl

LDL 111 ± 43 mg/dl

Triglycerides 142 ± 73 mg/dl

The female group showed higher values of cholesterol, HDL, LDL than the male group, but lower levels of triglycerides. The differences were not statistically significant. Probably the lower incidence of ischemic heart disease in this Hispanic group with a higher LDL is explained by genetics. In this community the DNA spectrum is a mixture of Africans-Black-Indians and Europeans. Probably this mixture from different DNA pools creates a population which is more resistant to the atherosclerotic factors producing atherosclerotic lesions.

Conclusions The atherosclerotic disease in the Hispanic communities (Puerto Rico-Hispanic) is less aggressive than the U.S.A. and other communities which are less DNA diverse (less infarct and ventricular tachycardia). Details of the genetics and clinical characteristics will be discussed.

Adolescent Medicine and Pediatrics Concurrent Session

1:00 PM

Saturday, February 20, 2016

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POTENTIAL ADVERSE CONSEQUENCES OF EARLY DISCHARGE FOR NEWBORNS WHO MEET AMERICAN ACADEMY OF PEDIATRICS (AAP) CRITERIA

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Purpose of Study To determine if there are adverse consequences of discharging newborns before 48 hours of age even when AAP criteria met

Methods Used After IRB approval was obtained, 1608 charts were reviewed from newborns admitted between July 2012 -December 2012 to the Florida State University resident teaching service where the standard is discharge at an average age of 48 hours for babies born via vaginal delivery and 72 hours for C-section. A ten-item checklist that contained American Academy of Pediatrics criteria for early discharge was applied for each record. If any criterion for early discharge was not met, then they were excluded. The research team reviewed the medical records to determine if there were any negative consequences/complications that occurred during the subsequent time spent in the nursery after 24 hours for those who met criteria for early discharge. Also, readmission rates in the first week of life were measured for the babies that met early discharge criteria.

Summary of Results Out of 940 babies admitted to the newborn service, 260 met early discharge criteria (27.7%).

From the 260 babies who met criteria, 21 developed problems after 24 hours of life (8%) while still admitted in the nursery. Problems included jaundice, poor feeding, rule out sepsis, abnormal bleeding, large PDA, neurologic problems including seizures and abnormal MRI, stridor, abdominal distension, weight loss, respiratory distress, hydronephrosis, cyanosis, bradycardia, arrhythmia, vesicular rash eruption, abdominal distention from small left colon. Out of the 260 babies who met criteria for early discharge, 36 babies were readmitted in the first week of life (15.55%).

Conclusions Only 28% of term newborns admitted to a residency service met criteria for early discharge; 8% of these babies developed problems after 24 hours of life. Newborns who meet criteria for early discharge may still require close monitoring after 24 hours

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FOOD INSECURITY AND MENTAL HEALTH: DIVERGENCE OF PARENT AND CHILD REPORTS

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10.1136/jim-2015-000035.488

Purpose of Study The major purpose of the reported study was to compare reports of household food insecurity and symptoms of food-related and generalized anxiety provided by parents with that of their children.

Methods Used Parents at least 18 years of age accompanying a child to his/her medical appointment at one of several pediatric clinics and their children between 8 and 17 years constituted the population. To be included, participants must have been able to speak and read English. We administered an anonymous coded 2-page survey to consenting parents and an anonymous coded 1-page survey to assenting children on issues related to food insecurity and mental health. Flesch-Kincaid Grade Level for the Adult Survey was 3.8 while that for the Child Survey was 2.1. The surveys included a 2-item screen for food insecurity that has been validated with adults. We modified the questions slightly for use with children. Questions about general anxiety and food-related anxiety were also included.

Summary of Results Of 25 parent-child pairs of respondents, 67.7% met criteria for food insecurity. Food insecurity was defined as the parent stating that at least once within the past 12 months they worried that food would run out before there was money to buy more or that purchased food didn't last and there was no money to get more. 23% of all surveyed parents reported that over the past year their child worried that food would run out, while 41.4% of the children reported this concern. Additionally, 29% of adults reported that their child had eaten less than they wanted in the past year to help save food; 52% of the children reported actually doing so. Among the children, we found a significant correlation ($r=.46$, $p < .01$) between generalized anxiety and food anxiety. We also found a significant difference between parent reports of their child's generalized anxiety symptoms and children's self-reported symptoms ($t=-5.20$, $p < .001$), suggesting that parents underestimate their

children's emotional distress.

Conclusions Parents underestimate both their children's awareness of household food insecurity and their levels of general anxiety symptoms.

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THE CLINICAL IMPACT OF A WEB-BASED IMAGE REPOSITORY ON REPEAT IMAGING AND QUALITY OF CARE IN INJURED CHILDREN

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Purpose of Study To determine if a statewide web-based image repository (WBIR) results in a lower proportion of repeat imaging among transferred pediatric trauma patients.

Methods Used All injured children who underwent CT imaging and were transferred to a rural state's sole Level I pediatric trauma center during first 6 months of 2010 (pre-WBIR) and corresponding period of 2013 (post-WBIR) were reviewed. Patient demographics, mode of transportation and emergency department length of stay (EDLOS) at receiving hospital were analyzed. The proportion of repeat imaging was compared between the pre- and post-WBIR periods using a logistic generalized estimating equations (GEE) model, accounting for clustering of scans on the same patient and stratifying hospitals as those who had imaging transfer capability prior to WBIR and those that did not. We compared EDLOS among patients between pre and post periods using a Wilcoxon rank-sum test.

Summary of Results Two hundred thirty seven children under 18 years were identified for the study period with an average age of 7.9 (SD=5.5 years). Head CTs accounted for 185 (46%) of all imaging. The proportion of repeat imaging among hospitals without prior imaging transfer ability fell from 38% prior to WBIR to 24% after WBIR ($p=0.005$), with odds of repeat imaging cut in half (OR 0.51, 95%CI 0.32, 0.81). The pre-post reduction in repeat imaging was more pronounced among hospitals with imaging transfer capability prior to WBIR, with repeat imaging falling from 50% to 16% (OR 0.19, 95%CI 0.04, 0.87). Median EDLOS was significantly longer post WBIR compared to pre WBIR among all transferred children (pre: 2.7 hours vs post: 4.1 hours, $p<0.0001$).

Conclusions Injured children managed at facilities using the WBIR have lower likelihood of getting repeat imaging, with potential reduction in radiation exposure and health-care expenditures.

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EVALUATING DISTRACTED DRIVING BEHAVIORS IN PARENTS OF CHILDREN IN URBAN, RURAL, AND SUBURBAN AREAS OF ALABAMA

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10.1136/jim-2015-000035.490

Purpose of Study Using the model of a previously published study from New Haven Connecticut, we sought to investigate the talking and texting behaviors of parents/caregivers with children less than 18 years of age, while transporting their children in a southern state.

Methods Used A survey was conducted of 258 participants from suburban (N=86), rural (N=90), and urban (N=84) clinics in Alabama. Participants were recruited to complete a survey and brief intervention regarding their cell phone usage while driving with children. The inclusion criteria were having children less than the age of 18; a valid driver's license; cell phone and english speaking. The Z test of proportions was used to compare the responses among the areas. 95% Confidence Intervals were calculated for the differences in responses.

Summary of Results A significant difference was found between SPs and UPs for use of Bluetooth ($z=3.34$, $p<0.001$, 95% CI 12, 42). A significant difference was found between UPs and RPs for use of Bluetooth ($z=4.5$, $p<0.001$: 95%CI 20, 49). A significant difference was found between the UPs and SPs in texting while driving ($z=4.3$, $p<0.001$: 95% CI -49,-19); reading and sending texts while driving ($z=4.1$, $p<0.001$, 95% CI -44, -16); and surfing the internet ($z=3.9$, $p<0.001$, 95% CI: -42,-12). A significant difference was found between the RPs and SPs in texting while driving ($z=4.11$, $p<0.001$, 95% CI 17, 47); reading at a red light ($z=3.53$, $p<0.001$, 95% CI 12, 38); and surfing internet ($z=4.9$, $p<0.001$, 95% CI 23, 51). There was no statistical significance noted between the RPs and UPs in regards to texting while driving, at red light or parked, or surfing the internet.

Conclusions Parents living in suburban areas use cell phones in the speaker mode, read and send text messages, and surf the web more often as compared to parents in rural and urban areas while children are in the car. Parents living in urban areas use Bluetooth device more often compared to parents in rural and suburban areas. Considering the high prevalence of cell phone use while driving, an educational and awareness campaign must be directed toward parents.

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VIOLENCE AND DEPRESSION SCREENING IN NEWLY IMMIGRATED HISPANIC ADOLESCENTS: WHERE ARE THE GAPS?

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Purpose of Study Tulane Pediatrics is committed to serving newly immigrated, uninsured, Hispanic adolescents at two clinics, Covenant House, a free clinic for those ineligible for federally qualified health centers, and Jefferson Community Health Care Centers. The majority immigrated as unaccompanied minors, escaping violent conditions in Central America. To assess their complex psychosocial stressors including family reunification, trauma and violence exposure, an evidence-based screening questionnaire based on the Guidelines for Adolescent Preventive Services (GAPS) was selected (AMA, 1998) to address four objectives 1) to obtain descriptors of these youth 2) to identify

the primary medical and psychosocial factors reported by these youth 3) assess the prevalence of self-reported exposure to violence and 4) assess the depressive symptoms.

Methods Used The GAPS questionnaires are available in two forms; one for adolescents 11–14 years old and one for adolescents 15–21 years old (AMA, 1998). Adolescents completed these questionnaires privately at clinic visits and responses were discussed confidentially with the clinician as an established routine aspect of these clinics. Data was entered blind to all identifiers and analyses was performed in SAS 9.3.

Summary of Results 74 GAPS questionnaires were analyzed (39 younger adolescents, 35 older adolescents). The mean age was 13.6 years old, and 47% were male. 21% of youth reported violence exposure, 25% reported worry about safety and 25% reported significant symptoms of sadness.

Conclusions Our results demonstrate the feasibility and clinical utility of a brief screener. A significant number of our youth report exposure to violence and feelings of sadness. Our initial screen selection only asked about violence exposure in younger subjects. Recognizing the high prevalence of self-reported violence exposure in these youth it is now apparent that similar questions need to be asked of our older population. Although a significant proportion of youth endorsed symptoms of sadness, additional screening questions are likely needed to disentangle whether this sadness is appropriate to the substantial change in their living environment or whether it represents a clear indicator or risk factor for psychopathology.

490 GENDER DIFFERENCES IN HUMAN PAPILLOMAVIRUS VACCINE SERIES COMPLETION RATE AMONG CHILDREN AND ADOLESCENTS IN ACADEMIC PEDIATRIC OUTPATIENT CLINICS IN WEST TEXAS

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10.1136/jim-2015-000035.492

Purpose of Study The purpose of this study is to explore gender differences in HPV vaccine completion rates among children and adolescents in academic outpatient pediatric clinics in West Texas.

Methods Used After obtaining IRB approval, children and adolescents ages 9 to 18 years who initiated HPV vaccination series in any of the outpatient pediatric clinics associated with Texas Tech University Health Sciences Center in Lubbock, Texas were included. Patients were identified by the CPT code (90649) related with HPV vaccination between January 1st 2010 and October 31, 2014. Gender, age, race/ethnicity, and number of HPV vaccines each patient received was collected. Vaccination was considered complete if the three HPV doses were given within 12 months, and optimal if given within 6 months of the initial dose. Statistical analysis was performed with SPSS software version 22. Demographic data was expressed as mean+SD, and frequencies (%). The differences between males and females were analyzed using the Student's t-test for continuous data and with Chi Square for categorical data. A p value of <0.05 was considered statistically significant.

Summary of Results A total of 1147 (51.2%) females, and 1092 (48.8%) males initiated HPV vaccination during the study period ($p=0.24$). There was a statistically significant difference in the age of initiation of the HPV vaccine in years between females and males ($12.3+1.93$ vs. $12.8+1.99$; $p<0.001$). Of those who started the vaccination series, 559 received 3 or more doses (25%), 274 (12.2%) completed the series within 12 months, and only 26 (1.2%) had optimal series completion. More females than males received 3 or more doses of the HPV vaccine (304 vs. 255 ; $X^2=4.29$, $p<0.05$) and received 3 doses within 12 months (157 vs. 117 ; $X^2=5.84$, $p<0.05$).

Conclusions HPV vaccine series completion rate among adolescents in academic pediatric outpatient clinics in West Texas is low as reported in many parts of the country. There was no gender difference in HPV vaccine series initiation, but more females completed the vaccine series. Prospective studies are needed to evaluate different approaches to improve HPV vaccine completion rates among adolescents in a variety of clinical settings.

491 OFFICE VISITS FOR OBESE CHILDREN - DOES WHERE A CHILD LIVE MAKE A DIFFERENCE?

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10.1136/jim-2015-000035.493

Purpose of Study Guidelines recommend that obese children have Body Mass Index plotted once a year and regular weight management visits. The objective of this study was to test the hypothesis that obese Medicaid children in rural South Carolina receive fewer well visits that address obesity and fewer total office visits than obese children in urban South Carolina.

Methods Used All medical encounters for Medicaid children in 2012 were collected for 3 counties in South Carolina, with counties categorized as urban, rural high-resource, and rural low-resource. Children were included if they had any encounter with an obesity ICD-9 diagnosis code in 2012. The number of well visits among children was compared using chi square analysis and mean total office visits for children in each county was compared using an unpaired t-test.

Summary of Results There were 1,233 Medicaid children with an obesity diagnosis in any encounter. Forty-five percent of children were male, with a mean age of 11.5 years (range: 5–17 years). The children were 63% African American, 19% Hispanic, 11% Caucasian, 6% unknown, and less than 1% Native American, Asian, or more than 1 race. The frequency of well visits was 60.9%, 52%, and 31.5% for urban, rural high-resource and rural low-resource children respectively, and the differences among the counties were statistically significant (all $p<0.01$). Urban children (70%) had obesity as a diagnosis during well visits significantly more often than rural high-resource children (53.8%) and rural low-resource children (34.8%) ($p<0.01$). The comparison between rural high-resource and rural low-resource children was also statistically significant ($p<0.01$). The mean number of total office visits for obese urban children (8 visits) versus obese rural low-

resource children (5.2 visits) was statistically significant ($p < 0.01$).

Conclusions Obese Medicaid children in a rural low-resource county of South Carolina had significantly fewer well visits with obesity as a diagnosis and fewer total office visits than urban children. Further studies should assess the relative impact of likely contributing factors such as poor patient access to medical care, lack of provider recognition of obesity, or inadequate resources available to providers for childhood obesity.

492 **CHARACTERISTICS OF HOSPITALIZATIONS FOR INFANTS WITH HYPERBILIRUBINEMIA BEFORE AND AFTER THE 2004 GUIDELINES; DATA FROM A NATIONAL SAMPLE OF PEDIATRIC HOSPITALIZATIONS**

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10.1136/jim-2015-000035.494

Purpose of Study Hyperbilirubinemia is a leading cause of hospitalization for neonates. Guidelines for management have changed over time and are revised approximately every ten years by the American Academy of Pediatrics. We investigated national hospitalization patterns for infants with hyperbilirubinemia and explored the impact of the AAP hyperbilirubinemia management guidelines published in 2004.

Methods Used The Kids' Inpatient Database from the Healthcare Utilization Project at the Agency for Healthcare Research and Quality is the largest publically available all-payer pediatric inpatient care database. Using data from 2003 and 2006, patients discharged from the hospital with hyperbilirubinemia as the primary diagnosis were identified using ICD-9 codes (774-). Discharges for birth hospitalizations were excluded. We identified key characteristics of the hospitalization including length of stay, age at admission, secondary diagnoses and demographic factors. We also compared patterns before and after the 2004 American Academy of Pediatrics guidelines. All analyses were conducted using SAS 9.3 and SUDAAN 11.0.

Summary of Results There were a total of 24,005 hospitalizations in 2003 and 25,620 in 2006 with a primary diagnosis of neonatal jaundice, providing national estimates of 39,061 and 40,747 hospitalizations respectively. The mean age of admission (5 days) was similar in each cohort. Phototherapy was the most common procedure performed. The most common secondary diagnoses were dehydration and feeding problems. Patterns were similar before and after the guidelines. Median length of stay was 2.00 in both 2003 and 2006. Approximately 21% of admissions occurred on the weekend in both time periods.

Conclusions Although the 2004 AAP guidelines regarding hyperbilirubinemia changed the phototherapy initiation criteria and recommended close follow up for neonates discharged home, patterns of hospitalizations were similar from 2003 to 2006. Fewer admissions occurred on the weekends than would be expected with an even distribution suggesting that hospitalization rates for jaundice are tied to availability of ambulatory care.

493 **THE TRANSGENERATION EFFECT OF PARENTAL ALCOHOLISM ON GRANDCHILDREN'S TELOMERE LENGTH AT BIRTH**

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10.1136/jim-2015-000035.495

Purpose of Study Children of alcoholic parents exhibit higher rates of substance use disorders, anxiety and depression. Increasing evidence suggests these adverse consequences of childhood exposure to parental alcoholism may extend transgenerationally via epigenetic factors including telomere length (TL). This study aimed 1) to determine if newborn TL is associated with grandparent alcoholism, and 2) whether maternal race moderates the effects of grandparent alcoholism on newborn TL.

Methods Used Women age 18–41 were recruited prenatally and interviewed about their exposure to parental alcoholism before the age of 12. At birth, newborn blood spot DNA was used to measure newborn TL. Data on pregnancy and birth outcomes were extracted from medical records and maternal self-report. The final sample included 196 women (64.8% black, 35.2% white). Linear regression was used to estimate the association between newborn TL and grandparent alcoholism controlling for maternal race, education, infant sex and gestational age at birth, and including a test for interaction by maternal race.

Summary of Results There was no difference in newborn TL between women who reported living with an alcoholic parent during childhood and those who did not in the full sample ($p = 0.39$); however there was significant interaction by race. Black newborn TL was positively correlated with maternal exposure to parental alcoholism in childhood ($p = .04$) yet the exposure and other covariates only explained 5% of the variance in TL. Conversely, white newborn TL was inversely correlated with maternal exposure to parental alcoholism in childhood ($p < 0.01$) and explained, along with other covariates, 26% of the variance in TL.

Conclusions White newborns whose mothers reported living with an alcoholic parent in childhood had significantly shorter TL at birth than infants whose mothers did not report living with an alcoholic parent. The inverse was true in infants of Black mothers. These findings suggest a transgenerational impact of parental substance use on newborn cellular markers of stress and aging, and that the effect may differ by race.

494 **EFFICACY OF TELE-HEALTH TO DELIVER PEDIATRIC ASTHMA EDUCATION IN A RURAL GROUP SETTING**

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10.1136/jim-2015-000035.496

Purpose of Study Asthma affects 12.3% of children in Alabama, more than the 9.0% national prevalence rate.

Alabama is a doctor deficient state, especially in rural areas. Lack of access to care is a barrier to asthma education. Telemedicine is an effective mechanism to address some medical problems when access to care is limited, though more research is needed. University of Alabama received private gift funding to provide pediatric asthma education for rural communities delivered by telemedicine. More is known about use of telemedicine for individual management of pediatric asthmatic patients rather than its use in pediatric asthma education in a group setting. This study assesses the efficacy of this instructional modality by surveying participants' asthma knowledge before and after completing curriculum.

Methods Used Asthmatic students in grades four through eight and their parents, selected from a rural school in Deklab County, AL, were asked to participate in a 4 week educational curriculum involving 30 minutes of instruction weekly. Instruction was delivered remotely via telemedicine. A 20 question multiple choice asthma knowledge survey was administered to participants before and after curriculum.

Summary of Results 9 students and 5 parents completed asthma pre-test. 16 students and 4 parents completed asthma post-test. Combined student pre-test average score was 59% and that for parents was 78%. Combined student post-test average was 72% and that for parents was 91%

Conclusions Tele-health is a useful and effective tool to provide asthma group education. This modality can improve access to health education opportunities for those in rural areas. Though not measured objectively, patients and parents were more interactive using this modality than is typically experienced during typical physician office visits. More investigation is needed to determine the best knowledge assessment tool and to determine why patients/families are more interactive using this method.

495 TEEN DRIVING BEHAVIORS IN RURAL WEST ALABAMA

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10.1136/jim-2015-000035.497

Purpose of Study Alabama is ranked 2nd in the nation for its teen driver death rate. There are extensive educational interventions in the state to educate teens on distracted driving. Last year, through the "Put it to an End—Don't Hit Send" campaign, three hundred students in Pickens County, AL pledged to no longer text and drive. This study evaluates the current driving behaviors of students who participated in the program and assesses the long-term efficacy of the campaign.

Methods Used 195 11th and 12th grade students of Gordo and Pickens County High schools participated in a 56 question survey administered by an audience response system. Students with limitations preventing them from indicating responses were excluded.

Summary of Results There were 120 participants from Gordo High and 75 from Pickens County High. Average age was 17 years old, with 50% African Americans and

45% Caucasians. 70% report texting/driving in the last month. 65% state they would not "give up their phone while driving" for laws prohibiting the activity, however, 70% would do so for automotive insurance discounts. 52% report having a friend/relative severely injured or die from a distracted driving accident. Of the 64% who pledged to no longer text/drive last year, 48% did so <1 week after pledging, 15% within 3–6 months, and 9% within 7–12 months. 28% no longer text/drive.

Conclusions The campaign had success with 28% of surveyed pledge participants; however, it appears that the overall rate of texting/driving (70%) increased from 55% last year. In the group studied, automotive insurance discounts appear most promising to achieve the necessary behavioral changes. These discounts may be more influential than loss or suffering of friends/family due to distracted driving.

Allergy, Immunology, and Rheumatology II Concurrent Session

1:00 PM

Saturday, February 20, 2016

496 BRIEF BEHAVIORAL ACTIVATION INTERVENTION FOR DEPRESSED URTICARIA PATIENTS

S Brabec, E Ciarloni, M Tull, G Marshall. UMMC, Jackson, MS

10.1136/jim-2015-000035.498

Purpose of Study A strong association between depression and control of allergic diseases, including chronic urticaria (CU), has been reported. CU patients experiencing depression tend have poor control of their disease, worsened quality of life, and higher exacerbation risk. We sought to determine if a one-session behavioral activation intervention (BAI) aimed at decreasing depression could improve CU control. We hypothesized that participants who received BAI would have less depression and improved CU control.

Methods Used This was a 2 visit study with 12 female patients, 66.7% black, age 18–64, who had CU and symptoms of depression. Participants were screened for depression with the Patient Health Questionnaire (PHQ) and disease control by the Urticaria Control Test (UCT). Exclusion criteria included pregnancy, antibiotics, systemic corticosteroid use and/or bacterial or viral infections within 30 days of enrollment. Participants completed 3 questionnaires at each visit – Behavioral Activation for Depression Scale (BADs), Depression Anxiety Stress Scales (DASS), and Urticaria Activity Score Questionnaire (UASQ). On visit 1, behavioral activation was performed, which was a 1 hour session of targeting behavior changes, engaging in positive activities associated with life goals, to improve depression followed with weekly motivational text messages until a 4 week follow-up. Data were analyzed using paired t-test.

Summary of Results Of the 9 participants that completed the study, there was a significant increase in UCT scores, (av. v1: 5.0; v2: 9.0, p=0.016), a significant decrease on the depression subscale of DASS, (av. v1: 13.0; v2: 9.0, p=0.027) and a significant decrease in avoidance and

rumination subscale of BADS (av. v1: 21.0; v2: 15.0, $p=0.019$). There were trends toward significance with a decrease in UASQ (av. v1: 5.0; v2: 2.0, $p=0.051$) and an increase in the total BADS score (av. v1: 86.0; v2: 97.0, $p=0.051$).

Conclusions This pilot trial suggests that a brief behavioral activation training with standard therapy can improve CU control while decreasing symptoms of depression. Further studies are needed in a larger, more diverse population to determine whether the improvement can be sustained past 1 month and if there are subgroups more or less likely to respond to this intervention.

497 A NEW FORMULATION OPTION FOR PATIENTS WITH ADVERSE DRUG REACTION TO INTRAVENOUS IRON

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10.1136/jim-2015-000035.499

Purpose of Study Patients with chronic renal failure often require iron supplementation. Adverse drug reactions (ADRs) can occur with administration of intravenous (IV) iron. Most ADRs are likely non-IgE-mediated. Although IgE-mediated reactions may be possible, there is no validated test for IgE-mediated reaction to iron. Systemic reactions are more likely to occur with IV vs. oral iron preparations. Options for ADR-inducing medication administration include pretreatment regimens, slowed IV infusion rates, and graded challenge vs desensitization for possible IgE-mediated reactions. A new formulation of oral iron, ferric citrate (Auryxia), was approved in 2014 for phosphate binding but may also provide effective iron supplementation.

Methods Used A 55 yo female with end stage renal disease on hemodialysis and iron deficiency anemia was evaluated in our allergy clinic due to three adverse reactions to IV ferric gluconate and persistent need for iron supplementation. Initial reactions included immediate post infusion nausea, vomiting, and diarrhea. Despite slowing infusion to three hours from one hour, next reaction progressed to include immediate post infusion hypotension, itching and swelling of hands and feet. Patients who are unable to tolerate a specific formulation of iron are often able to tolerate another. Given her need for iron supplementation, a 4-dose oral graded challenge with ferric citrate, to which we suspected low potential for drug allergy, was performed.

Summary of Results The doses administered were 4 mg, 52 mg, 157.7 mg, and 210 mg given at 15–20 minutes intervals. The patient completed her graded challenge without adverse reaction. She was discharged with instructions that she was not allergic to ferric citrate and continued to tolerate the drug well.

Conclusions Demonstrated by oral drug challenge, ferric citrate (Auryxia) was tolerated in a patient with prior ADR to IV ferric gluconate. If available, oral is preferred over parenteral administration for challenge or desensitization. Some patients have not been able to tolerate other available oral iron preparations. Ferric citrate may provide an

additional oral option for patients unable to receive IV iron due to adverse drug reaction.

498 DRESS PRESENTING AS ACALCULOUS CHOLECYSTITIS AND ASSOCIATED WITH HHV-6 REACTIVATION

R Darcey Weems, C Burkenstock, LS Engel, S Sanne. *LSU Health Sciences Center, New Orleans, LA*

10.1136/jim-2015-000035.500

Case Report: Introduction Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS) is potentially life-threatening and classically presents with fever, skin eruption, lymphadenopathy, eosinophilia, and systemic organ involvement. This drug reaction is delayed onset, typically occurring six to eight weeks after initiation of the offending agent. Reactivation of human herpes viruses, particularly HHV-6, is frequently seen in association with DRESS.

Case A 20-year old woman with history of childhood asthma, cannabis use, and schizoaffective disorder presented to the Emergency Department with a complaint of fever and left-sided, abdominal pain that worsened with eating. She was febrile to 102.7°F and tachycardic on presentation. Labs revealed a normal leukocyte count and elevated transaminases (AST 162, ALT 301) with a normal bilirubin. An abdominal CT with contrast revealed mild intrahepatic biliary dilation, a partially contracted gallbladder with an abundance of pericholecystic fluid, and mild pancreatic ductal dilation. Findings on abdominal ultrasound suggested acalculous cholecystitis. She was started on intravenous antibiotics and underwent laparoscopic cholecystectomy. Her post-operative course was complicated by persistent fever and worsening transaminitis (AST 347 U/L, ALT 413 U/L). On exam, she was noted to have diffuse lymphadenopathy as well as interval development of a diffuse, erythematous, morbilliform rash. Given her constellation of symptoms and history of recent initiation of oxcarbazepine for schizoaffective disorder, DRESS was suspected. HHV-6 titers were elevated at 9.08 (positive >0.99). She was started on prednisone and improved clinically.

Discussion DRESS is a potentially life-threatening syndrome and early recognition is important. Initially, our patient's clinical picture was unclear due to recent cholecystectomy as a confounding cause of fever and transaminitis. However identification of elevated HHV-6 titers in the setting of drug hypersensitivity is considered specific for DRESS. Treatment of DRESS includes removal of the offending agent and steroids. Patients with DRESS are at increased risk of developing auto-immune illness and should be monitored closely for manifestations even after resolution of the acute syndrome.

499 A CASE OF UNRESOLVING ANGIOEDEMA

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10.1136/jim-2015-000035.501



Abstract 499 Figure 1

Purpose of Study When angioedema does not resolve in the time expected, it is important to consider the pathophysiology of the development and resolution of angioedema. We describe a case of a woman who developed ACE-inhibitor induced angioedema that did not resolve in the expected 24–48 hours of time, but rather persisted for many weeks.

Methods Used Lab testing, CT scan, ultrasound

Summary of Results This is a 51-year-old African-American woman who presented with rapidly progressive swelling of the face and lips, shortness of breath and stridor. Lisinopril had been started 3 months prior. She had no urticaria or pruritus. Angioedema secondary to ace-inhibitor was diagnosed. After 48 hours there was no improvement in the patient's swelling. A CT scan of her neck demonstrated edema of the soft tissues around the airway consistent with angioedema, and also showed a massive thyroid goiter unchanged in size from one year prior. An ultrasound exam was negative for thrombosis or external obstruction of vasculature. After 3 weeks of persistent swelling, she was taken for a subtotal thyroidectomy after which there was rapid resolution of her swelling.

Conclusions We believe this was a case of angioedema that developed secondary to ace-inhibitors but led to prolonged swelling secondary to obstruction of flow by a thyroid goiter. All alternate diagnoses including malignancy, infection, other inflammatory causes as well as rare causes of facial swelling were considered and investigated and ruled out via laboratory testing and imaging studies.

500 **ALMOST DRESSED TO IMPRESS: AN ATYPICAL CASE**

H Wang, J Tarbox, K Nugent. *Texas Tech Health Sciences Center, Lubbock, TX*

10.1136/jim-2015-000035.502

Background Drug reaction with eosinophilia and systemic symptoms (DRESS) is most often associated with the use of

carbamazepine or phenytoin and usually presents with fever, skin rash, hematological abnormalities and internal organ involvement. We report an atypical presentation of this syndrome.

Case report A 46-year-old African American male presented with a fever of 105.6F and decreased level of consciousness for one day. Past medical history was significant for a seizure disorder controlled only with phenytoin 100 mg twice a day for the last 8 months. Physical examination did not show a skin rash. Laboratory findings showed a normal phenytoin level and leukocytosis without eosinophilia. Broad-spectrum antibiotics were started and the patient was continued on phenytoin. On the fourth day of admission he continued to have high-grade fevers and labs showed AST 1,198 IU/L, ALT 244 IU/L, and CK 116,325 IU/L without improvements in his fever. CT scan showed subclavicular lymphadenopathy. Although he had no eosinophilia or clear development of a rash, the patient was diagnosed DRESS as there was no other explanation for his fever and lab abnormalities. After replacement of phenytoin with levetiracetam, his liver enzymes and CK levels began to decrease and his fever resolved over the next 2 weeks.

Conclusion DRESS can be potentially fatal due to multi-organ failure, although when diagnosed early there is usually good prognosis with recovery in weeks to months after stopping the drug. Our patient presented atypically without eosinophilia or cutaneous manifestations. Due to the variability in which DRESS presents, a scoring system has been developed to guide physicians in making the diagnosis. The system uses clinical symptoms and classifies the likelihood of DRESS as definite, probably, or possible. In our case, our patient met criteria for possible DRESS. Our case reminds physicians of the often atypical presentations of drug reactions.

501 **CANCELLED**

502 **PERCEPTIONS OF MINDFULNESS TRAINING (MT) IN SARCOIDOSIS**

J Ryan Adell,¹ AC Karpinski,² M Walker,¹ L Saketkoo². ¹LSU HSC, New Orleans, LA; ²Tulane University Lung Center, New Orleans, LA

10.1136/jim-2015-000035.504

Purpose of Study Mindfulness techniques (MT) demonstrate beneficial impact in cancer symptoms and treatment effects: pain, nausea, fatigue, stress, anxiety and depression. Standard MT requires 8 3-hour sessions and often infeasible for ill patients. Sarcoidosis is a multiorgan disease involving virtually any organ and commonly the lung, eyes, heart and nervous system; with symptoms of pain, dyspnea, fatigue, depression and anxiety.

Methods Used 26 participants (23 with sarcoidosis and 3 family members) as part of a sarcoidosis education day engaged in a 45 minute modified MT and completed pre/post evaluations. Questions were on a 0–10 Likert scale with 6 Pre/Post questions pertaining to symptoms, 4 to psychological burden (higher scores=more severe symptoms) and 3 to degree of focus, well-being and motivation (higher scores=higher ability). Questions time-referenced

'now'. Dependent t-Tests compared pre/post items. Items were also included on the post- evaluation assessing the workshop content itself (higher score=more positive).

Summary of Results Statistically significant pre/post decreases occurred in: physical symptoms (i.e., dyspnea: $p=.002$, headaches: $p=.009$, fatigue: $p<.001$, and nausea: $p=.041$), psychological symptoms (Stress: $p=.012$, Anxiety: $p=.002$, Worry: $p=.001$, Depression: $p=.003$), total psychological items score ($p=.001$) and total for ten symptom items ($p<.001$). Statistically significant improvement occurred in pre/post well-being: $p=.003$ and motivation: $p=.005$. Mean values indicated high:perceived benefit: 7.54 ± 1.88 , ease of daily incorporation: 7.84 ± 1.72 , likelihood to seek similar experiences: 7.24 ± 1.99 , recommend MT to others with sarcoidosis: 7.81 ± 2.19 and incorporate MT into daily routines: 7.76 ± 1.92 . Internal Consistency Reliabilities (Cronbach's α) for all scores at pre (.839) and post (.843) and the Test-Retest Reliability ($r=.761$, $p<.001$) were high. The pre/post reliabilities of the scores on the psychological items were high (.944/.95; Test-Retest: $r=.701$, $p<.001$).

Conclusions A modified 45 minute MT workshop had measurable benefit as evaluated by people living with sarcoidosis and their carers. The workshop was perceived as a feasible and beneficial introduction to routine daily life. Future studies will test durability of impact, perceived benefit and utility.

503 A CASE OF HEADACHE AND VISUAL LOSS - GRANULOMATOSIS WITH POLYANGIITIS MIMICKING GIANT CELL ARTERITIS

D Ragesh Panikkath, AG Adiga, K Nugent. *TTUHSC, Lubbock, TX*

10.1136/jim-2015-000035.505

Case Report Granulomatosis with polyangiitis (GPA) is an autoimmune vasculitis affecting small and medium sized vessels. Central nervous system (CNS) involvement is an uncommon manifestation of GPA, reported in about 7%-11% of patients. In this case report, we describe a female who presented with headaches and visual loss as the initial manifestation of the disease. She achieved substantial improvement in her symptoms with timely immunosuppressive therapy. A 54 year-old caucasian female with diabetes, hypertension and recurrent sinusitis presented with worsening right sided headache and facial pain of 2 months duration. She then developed abrupt loss of vision in her right eye. On admission, she had only light perception in her right eye, afferent pupillary defect and right lateral rectus muscle palsy. Lab results showed elevated ESR (85 mm/hr) and CRP (7.3 mg/dl). CT head showed pansinusitis. Right temporal artery biopsy showed no evidence of giant cell arteritis. MRI of the orbit showed evidence of optic neuritis. MRI of the brain showed pansinusitis. Interestingly, there was an area of meningeal thickening and enhancement in the right frontal region that represented pachymeningeal fibrosis. Based on the findings of optic neuritis and pachymeningeal fibrosis, inflammatory diseases were looked for. ANA was negative. She had elevated rheumatoid factor at 32 IU/ml and significantly elevated antiproteinase 3 antibody (PR-3 ANCA) at >8 AI with negative MPO - ANCA, highly suggestive of

granulomatosis with polyangiitis. She was started on 1 gm methylprednisone for 5 days followed by oral steroids which resulted in dramatic improvement in her headaches and visual symptoms. **Discussion:** GPA is now recognized as a multisystemic disorder affecting any tissue or organ. CNS involvement is rare and can mimic giant cell arteritis. Three major mechanisms cause CNS disease: invasion of granuloma from extracranial sites, remote intracranial granuloma, and CNS vasculitis. Our patient had optic neuritis and pachymeningitis which led to intractable headaches, visual loss and cranial nerve palsy. She demonstrated dramatic response to steroid therapy. Early diagnosis and treatment of GPA is warranted to prevent or reduce permanent damage associated with neurologic involvement.

504 GADOLINIUM BASED CONTRAST AGENTS RARELY CAUSE ANAPHYLAXIS

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10.1136/jim-2015-000035.506

Purpose of Study Gadolinium based contrast agents are used in diagnostic procedures to enhance the quality of magnetic resonance imaging (MRI) and angiograms. There is a risk of gadolinium hypersensitivity.

Methods Used We reviewed a case of a 67 year old male with hypertension and a recent diagnosis of multiple myeloma, who started experiencing dyspnea, substernal chest pain and tightness, as well as generalized pruritus within minutes of an injection of intravenous gadolinium for a MRI of the brain. He was noted to have a blood pressure of 90/50 mm Hg, pulse rate of 110 beats/min, and a respiratory rate of 24/minute. Physical exam revealed an alert and oriented, diaphoretic man, who was sitting up with labored breathing. Oropharynx was without erythema or edema. On auscultation there was no wheezing or stridor. Skin was cool, clammy, and pale without erythema or urticaria. Epinephrine 0.5 mL (1:1000 w/v) was administered intramuscularly in the right lateral thigh with subsequent improvement in symptoms.

Summary of Results Given the temporal relationship of the onset of symptoms after intravenous gadolinium based contrast, it was determined that the patient likely had an anaphylactic reaction.

Conclusions Gadolinium based contrast agents can cause anaphylactic reactions. In 2011, Jung, et al. conducted a study and reviewed 141,623 MRI examinations with gadolinium based contrast agents performed in 84,367 patients during a 6 year period. The incidence of anaphylaxis was 0.008%, similar to previously reported rates of 0.004%-0.01%. In conclusion, although the safety profile for gadolinium based contrasts is excellent, caution should be taken with increased use due to greater likelihood of reaction.

505 A CASE OF PRIMARY LOCALIZED CONJUNCTIVAL AMYLOIDOSIS

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10.1136/jim-2015-000035.507

Case Report Amyloidosis is the abnormal, extracellular deposition of protein fibrils. Systemically, primary (AL) amyloidosis is the most common form in developed countries and secondary (AA) is the most common in developing countries.¹ Systemic amyloidosis often manifests with renal, cardiac, gastrointestinal, neurologic, musculoskeletal, hematologic, pulmonary, and skin disease. Amyloidosis may also be localized to a specific organ either primarily or secondarily. Primary localized conjunctival amyloidosis is a rare disease that may present with eye discomfort, lid swelling, ptosis, recurrent hemorrhage², or epiphora³. The lesions are most often found in the palpebral-conjunctival or fornix-conjunctival region⁴. We describe a rare presentation of the disease as giant papillary conjunctivitis. A Caucasian 37-year-old female was referred to our clinic for chronic conjunctivitis. Symptoms began three years ago with eye irritation and a red spot on her RLL. She subsequently developed swelling of the lid that initially responded to steroid drops but later became refractory. She had no eye pain or foreign body sensation. The left eye was asymptomatic. Review of systems was negative. Visual acuity was 20/20 in each eye. Slit lamp examination revealed large, 4+ confluent papillae in the lower palpebral conjunctiva with thickening of the eyelid. The superior eyelid appeared unaffected. A shave biopsy was confirmed the diagnosis of conjunctival amyloidosis. Histopathology showed abundant nodular, amorphous, eosinophilic, hyaline material in the lamina propria. Staining with Congo red was strongly positive and exhibited green birefringence after application of polarized light. It showed a diffuse and vaguely nodular pattern throughout the lamina propria and did not appear localized to vessel walls. The patient was evaluated thoroughly for systemic disease. Systemic disease should be ruled out with CBC, CMP, serum electrophoresis, ESR, and LFT.⁵ Urine protein electrophoresis can help exclude multiple myeloma. Subcutaneous abdominal fat pad biopsy is a valuable tool in diagnosing some forms of systemic amyloidosis.⁶ If the eyelid skin is involved the condition is referred to as primary localized cutaneous amyloidosis which has a higher association with systemic amyloidosis.⁷

506 A HELPFUL HAND IN DIAGNOSIS OF ANTISYTHETASE SYNDROME: A RARE CASE REPORT

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10.1136/jim-2015-000035.508

Case Report Antisynthetase Antibody syndrome (ASS) is a rare idiopathic inflammatory myopathy with myositis, ASS antibodies, fever, arthritis, Raynaud's phenomenon, mechanic's hands and interstitial lung disease (ILD). Although anti-jo1 autoimmune antibodies are most commonly identified, anti-PL12 antibody is noted in less than 2% of patients with ASS. We report a case of ASS diagnosed only with help of this rare antibody and refractory to all standard therapy. 49-year-old male presented with complaints of joint pains, intermittent fevers and exertional dyspnea of few months duration. Review of systems was positive for raynaud's, hyperkeratotic skin lesion on the hands, heartburn and recurrent fevers. Past medical history was significant for splenic vein

thrombosis, undifferentiated connective tissue disease and hypoxia secondary to ILD. Physical exam revealed decreased bilateral breath sounds with no clinical evidence of synovitis and normal muscle strength. Laboratory work-up showed negative autoimmune work-up except only positive anti-PL12 antibodies. Pulmonary function tests revealed mild restriction with severe reduction in diffusion. Chest radiography revealed presence of bilateral diffuse ground glass opacities and nodular infiltrates with intra-lobular septal thickening. He was unsuccessfully treated for his ILD with systemic corticosteroids, Cyclophosphamide, Intravenous IgG, Mycophenolate mofetil and cyclosporine. Anti-PL12 ASS is characterized by less frequent although severe/refractory myositis, occasional mechanic hands, calcinosis cutis and frequent but severe ILD and usually effects women in their fifties. Joint manifestations are noted in higher prevalence but like our patient none usually have positive rheumatoid factor or other autoantibodies. In one review of 77 patients with Anti-PL12 ASS, 97% exhibited ILD with non-specific interstitial pneumonia as the most frequent pattern. The presence of ILD is a major prognostic factor and is an indication for intensive treatment with systemic corticosteroids and immunosuppressive drugs. Rituximab has been successfully utilized in patients refractory to standard therapy. Anti-PL2 antibody should be tested in all ASS patients, and if noted ILD screening should be performed as this impacts prognosis and intensive therapeutic management is clinically indicated.

Endocrinology and Metabolism

Concurrent Session

1:00 PM

Saturday, February 20, 2016

507 METFORMIN HAS A POSITIVE EFFECT ON COLON CANCER PATIENTS WITH TYPE 2 DIABETES MELLITUS

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10.1136/jim-2015-000035.509

Purpose of Study Metformin (MET), a diabetic drug, has anti-neoplastic activity when used as adjuvant therapy in the treatment of breast and prostate cancer. MET works via signaling pathways, i.e. inhibition of mTOR, activation of tumor suppressor genes p53 and LKB1 via AMPK. Colorectal and Lung cancer and type 2 diabetes mellitus (DM2) are common diseases found in the US. We investigated survival, recurrences, and the prevalence of metastases in DM2 patients with either colorectal or lung cancer taking MET using the electronic medical record (CPRS) in VAMC Memphis (N=202, Colon; N= 180, Lung).

Methods Used Colorectal and lung cancer patients with DM2 on MET were compared to controls taking any diabetic medication except for MET. These patients were observed in CPRS for the recurrences, metastases, secondary cancers, survival and CEA (colon only) values. Hemoglobin A1C and creatinine values were also compared between groups. Inclusion criteria was based on the use or lack of use of MET and the presence of colorectal or lung cancer and DM2. Statistical analysis was performed

using unpaired t-test and chi square tests.

Summary of Results For colon cancer, in the MET group, there were significantly fewer deaths (48% vs 76%, $p < 0.001$), less recurrence (4% vs 19%, $p < 0.003$), less metastases (23% vs 46%, $p < 0.001$), better 5 year survival rates (56% vs 34%, $p < 0.001$), lower CEA blood levels (47% vs 72%, $p < 0.02$), and improvement in overall cancer related issues (47% vs 66%, $p < 0.006$). The primary treatments were comparable for colon cancer in both groups (surgery, chemotherapy, and radiation therapy). MET significantly improved overall survival in lung cancer patients ($p < 0.001$), but was not significant for other parameters.

Conclusions This retrospective study shows that the adjuvant use of MET leads to a significantly better prognosis in patients with colorectal cancer, but only increased survival in lung cancer. There are fewer recurrences of colon cancer and less metastases present in patients who took MET. Based on HbA1C, control of DM in all patient groups was not different. Differences in metabolic pathways between colon and lung likely account for the differences in effect of MET on these 2 cancers.

508 ESTABLISHING A NOVEL ENZYME ASSAY IN WHOLE BLOOD AND FIBROBLASTS IN PATIENTS WITH PHOSPHOGLUCOMUTASE 1 DEFICIENCY

SJ Perez, E Morava. *Tulane University School of Medicine, New Orleans, LA*

10.1136/jim-2015-000035.510

Purpose of Study Phosphoglucomutase 1 (PGM1) is an important enzyme needed for protein N-glycosylation since glucose-1-phosphate (its substrate) is a precursor for the biosynthesis of nucleic sugars used in glycan biosynthesis. Inborn defects in PGM1 leads to PGM1-CDG, a novel subtype of congenital disorders of glycosylation. Patients with PGM1-CDG encounter multisystem diseases including endocrine abnormalities, malignant hyperthermia, hepatopathy, and hypoglycemia among others. We developed a technique to screen and confirm PGM1 enzyme deficiency in six patients with different levels of severity (mild, moderate, and severe) in order to establish a reliable method to diagnose a novel disorder in different tissues.

Methods Used Phosphoglucomutase 1 enzyme activity was assayed on whole blood and skin fibroblasts from six PGM1-CDG patients and two healthy controls. Fluorometric equipment was used to measure enzyme activity in whole blood. Similarly, spectrophotometry was utilized to confirm enzyme deficiency in fibroblast.

Summary of Results All patients with PGM1 deficiency showed abnormal enzyme activity (37%) compared to healthy controls in whole blood. The test was validated by additional measurements of blood samples from 40 healthy controls and 10 affected patients. Interestingly, patients' fibroblasts presented a significant decrease in PGM1 activity (2%-5% residual activity), compared to the wild type controls.

Conclusions We established a new biochemical assay for PGM1 deficiency. Our assay serves as a diagnostic tool for confirming PGM1 deficiency in patients suspected with PGM1-CDG. The technique used to determine PGM1 enzyme activity in fibroblasts is more reliable since no compensatory enzyme (PGM2) is present. Each patient's clinical

condition (severity) was congruent to the observed biochemical results.

509 LEVELS OF PLASMA SOLUBLE PRORENIN RECEPTOR (SPRR) IN OBESE PATIENTS ARE ASSOCIATED WITH TYPE 2 DIABETES MELLITUS (T2DM) IN WOMEN BUT NOT IN MEN.

MA Feroz, CB Rosales, D Arita, T Thethi, V Fonseca, M Prieto. *Tulane University, New Orleans, LA*

10.1136/jim-2015-000035.511

Purpose of Study The levels of the soluble PRR, a new member of the renin-angiotensin system (RAS), are increased in the circulation of cardiovascular patients. To test the hypothesis that plasma sPRR levels are associated T2DM in obese patients.

Methods Used We examined plasma samples from 201 patients (mean age, 41 ± 13 years; 39% men), including 107 controls (Ct; BMI < 30), 66 obese (Ob; BMI ≥ 30) and 28 obese with T2D (Ob+T2D) patients. We used waist to hip ratio (WHR) as a measure of abdominal adiposity.

Summary of Results Plasma sPRR levels measured by ELISA were significantly higher in Ob+T2D patients ($21,481.7 \pm 1,600.5$ pg/mL) compared to Ct ($16,488.4 \pm 417.9$ pg/mL) and Ob ($16,598.5 \pm 538.7$ pg/mL; $P < .0001$). Urine Albumin/Cr ratio showed a similar trend (Ob: 31.0 ± 4 , Ob+T2D: 53.1 ± 8 vs. Ct: 24.9 ± 2 mg/g uCr; $P < 0.0001$). Simple regression analysis indicated plasma sPRR levels negatively correlated with WHR in the Ob+T2D ($r = -0.62$, $P = 0.0395$) but not with Ct or Ob patients. Control lean men patients exhibited significantly higher plasma sPRR levels compared to women ($18,066.6 \pm 795.5$ vs. $15,391.7 \pm 389.1$ pg/mL; $P < 0.01$). Interestingly, the plasma sPRR differences among groups of same sex were greater in Ob+T2D women compared to Ct ($20,972.3 \pm 1,659.8$ pg/mL vs. $15,391.7 \pm 389.1$ pg/mL; $P < 0.0001$) and Ob ($15,794.4 \pm 649.5$ pg/mL; $P < 0.0001$) patients, but did not differ among men groups. The interaction between sex and group was significant ($p = 0.036$) suggesting that the increase of plasma sPRR levels in T2D patients is greater in women than men. Multiple regression analysis, adjusted by age, WHR, and groups indicated a significant association between plasma sPRR levels and T2D status in women ($P < .0001$) but not men.

Conclusions Our data indicate that plasma sPRR levels are associated with T2D in women but not in men, and that this effect is independent of obesity. The identification of potential biomarkers of RAS activation will allow us to better understand the association between obesity, T2D, and its complications and find novel therapeutic treatments for these highly prevalent diseases.

510 DETERMINANTS OF GLYCEMIC RECOVERY AFTER HYPERINSULINEMIC EUGLYCEMIC CLAMP

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10.1136/jim-2015-000035.512

Purpose of Study Hyperinsulinemic euglycemic clamp, the gold standard method for assessing insulin sensitivity, involves constant infusion of supraphysiological insulin with variable infusion of dextrose (D20) to maintain euglycemia. Once insulin infusion is stopped, subjects continue to receive D20 infusion and are discharged after endogenous glycemic recovery off D20 support. The determinants of individual variability in glycemic recovery time (GRT) have not been fully investigated. We tested the hypothesis that post-clamp glycemic recovery is dependent on insulin clearance and insulin sensitivity.

Methods Used We enrolled 220 nondiabetic subjects (110 African Americans {AA} and 110 European Americans {EA}; 68.6% females) who were participants in the Pathobiology of Pre-diabetes in a Biracial Cohort (POP-ABC) study. At scheduled visits to the Clinical Research Center, each subject completed the food habits (FHQ) and modifiable activity (MAQ) questionnaires, underwent anthropometry, oral glucose tolerance test (OGTT), and measurement of plasma insulin and c-peptide levels. Insulin sensitivity was derived from hyperinsulinemic euglycemic clamp (ISI) and HOMA-IR. Insulin clearance was calculated using the molar ratio of fasting c-peptide and insulin. GRT was established from the time interval between stopping insulin infusion and stopping D20.

Summary of Results Our cohort had a mean (\pm SD) age of 46.3 ± 9.96 yr and BMI of 30.7 ± 8.43 kg/m². The final plasma glucose level (mg/dl) at discharge was 124.2 ± 26.9 for the entire cohort, 123.9 ± 25.8 in men, 124.3 ± 27.4 in women, 122.1 ± 26.2 in AA and 126.1 ± 27.4 in EA. There were no ethnic or gender differences in the final glucose level. The mean time to glucose recovery (min) was 72.2 ± 31.4 for the entire cohort, 77.7 ± 34.8 in men, 69.7 ± 29.6 in women, 73.3 ± 33.2 in AA and 71.1 ± 29.8 in EA. GRT did not differ significantly by race ($P=0.10$), gender ($P=0.18$) or age ($P=0.07$). Using linear regression models, predictors of post-clamp glycemic recovery were 2 hrPG ($p=0.0002$), insulin clearance ($p=0.02$), MAQ score ($p=0.05$), ISI ($p=0.03$) and HOMA-IR ($p=0.01$).

Conclusions In our biracial cohort of healthy subjects, recovery from hyperinsulinemic clamp was significantly delayed by lower glucose tolerance, insulin resistance, physical inactivity and decreased insulin clearance.

511 LEAN BODY MASS IS A DETERMINANT OF BONE MINERAL MEASUREMENTS IN UNITED STATES ADOLESCENTS

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10.1136/jim-2015-000035.513

Purpose of Study Multiple studies have shown independent relationships between birthweight and body composition on adult bone health. The purpose of this study is to evaluate the impact of if there is an birthweight, fat mass, and lean body mass on bone mineral content and density in US teenagers.

Methods Used Cross-sectional study of individuals between the ages of 13 to 15 years of age who participated in the National Health and Nutrition Examination Surveys

(NHANES) conducted from during 1999–2006. 2,165 participants included had recorded birthweights and dual energy x-ray absorptiometry (DEXA) scans.

Summary of Results The cohort consisted of 1,221 males and 944 females with an overall average age of 14 ± 0.8 years. Total BMC and lean body mass were higher in boys (BMC: 2085 ± 467 g, 1929 ± 327 g, $p < 0.001$; lean body mass: 46253 ± 10132 g, 37932 ± 6760 g, $p < 0.001$). Total BMD and fat mass were increased in girls (BMD: 1.05 ± 0.93 g/cm², 1.04 ± 0.11 g/cm², $p < 0.001$; fat mass: 20857 ± 9522 g, 16944 ± 10052 g, $p < 0.001$). Significant correlations were seen between lean body mass and BMC ($p < 0.001$, $r^2=0.7$) and BMD ($p < 0.001$, $r^2=0.3$). No correlation was observed between birthweight and BMC or BMD. Gender, age, height, waist circumference, and lean body mass were the main determinants of BMC ($r^2=0.81$). The association of lean body mass remained significant after adjusting for variables found to be statistically significant on univariate analysis ($p < 0.001$, 95% CI 0.040, 0.044).

Conclusions During early adolescence, higher lean body mass is greatly associated with improved BMC and BMD.

512 GENE EXPRESSION DIFFERENCES IN INDIVIDUAL HUMAN PANCREATIC ISLETS FROM CONTROL, NEWLY DIAGNOSED T1D, AND ESTABLISHED T1D DONORS

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Purpose of Study The purpose of our study was to define variability in gene expression of individual pancreatic islets from a newly diagnosed type 1 diabetes (T1D), an established T1D, and a non-diabetic control donor.

Methods Used Cryo-sections were obtained from pancreata of 3 organ donors. Laser-capture was used to isolate a number (n) of individual islets from each donor: control (n=24), newly diagnosed T1D (n=19), and established T1D (n=8). RNA was extracted and amplified. Transcriptome analysis was performed on Affymetrix HTA 2.0.

Summary of Results Hierarchical clustering was performed on the combined set of data from all 51 islets. This revealed 3 groups of islets with distinct gene expression patterns: all newly diagnosed islets clustered together, 18/24 of control islets clustered together. The final group of islets consisted of all 8 T1D islets as well as 6 control islets. Principal component analysis (PCA) classified 6/24 control islets and 5/19 newly diagnosed islets as outliers within their own group. Gene expression abnormalities in individual outlier islets were defined by genes whose expression was at least 1.5 fold changed from the mean expression of that gene in the non-outlier islets of that donor. Those genes were subjected to pathway analysis to define how they differed from the majority of islets in that donor. In the control donor 3/6 outlier islets had EIF2 signaling, 4/6 had agranulocyte adhesion and diapedesis, and 3/6 had granulocyte adhesion and diapedesis pathway affected. Among the newly diagnosed outliers EIF2 was differentially expressed in 3/5 islets, antigen presentation and oxidative phosphorylation in 2/5 islets.

Conclusions Thus 25% of islets in a control donor have gene expression profiles more similar to islets from a diabetic

patient than to the rest of the islets in that donor. These outlier control islets differentiated from the main group by genes in stress pathways (EIF2) rather than hormonal genes. The same stress pathway appears to define gene expression abnormalities in about 25% outlier genes found in the newly diagnosed T1D patient. Furthermore, those outlier genes also were involved in antigen presentation and oxidative phosphorylation, consistent with reports that only a smaller % of islets display active autoimmunity at the time of diagnosis.

513 EFFECT OF DIET COMPOSITION ON REMISSION OF PREDIABETES AND METABOLIC PARAMETERS

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10.1136/jim-2015-000035.515

Purpose of Study To compare the effects of high protein (HP) vs. high carbohydrate (HC) diet during energy restriction on remission from pre-diabetes to normal glucose tolerance (NGT), weight loss, body composition (lean and fat mass), and various metabolic parameters.

Methods Used This study was a randomized controlled clinical trial comparing a HP(30% protein, 40% carbohydrate, 30% fat) vs HC (15% protein, 55% carbohydrate, 30% fat) diet in pre-diabetic patients. Subjects (n=24) age 20- 50 years meeting study criteria were recruited and placed on the HP or HC diet for 6 months. Demographics: weight, blood pressure, RMR were determined. Laboratory:irisin, fibroblast growth factor 21 (FGF-21) and uncoupling protein-1 (UCP-1) were measured. DXA was used to evaluate % lean and fat body mass. *Statistical Analysis:* We described continuous data by mean±standard error of mean (SEM) and categorical data by counts, and percentages

Summary of Results 100% of the patients on the HP diet (n=12) converted to normal glucose tolerance (NGT) whereas only 33.3% converted that were on the HC diet (n=12). Weight and blood pressure both significantly

decreased in both groups. HP group had a 2.8 ±0.4% increase in lean body mass and 2.5± 0.4% decrease in fat mass while the HC group had a 2.1± 1.1% and 3.5±0.9 % decrease in lean and fat mass(Table1). Both diets resulted in improvement in glucose tolerance and insulin sensitivity but the HP diet was most effective.

Conclusions Our results suggest that lean body mass preservation may be more important than total weight loss in the conversion of IGT to NGT, possibly due to the high insulin sensitivity of muscle cells. Additionally, the HP had increased levels of Irisin, and UCP-1 possible major regulators of metabolic rate and weight loss.

514 REFRACTORY HYPOGLYCEMIA: A RARE INITIAL MANIFESTATION OF ADVANCED HEPATOCELLULAR CARCINOMA

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10.1136/jim-2015-000035.516

Case Report Hepatocellular carcinoma (HCC) with a paraneoplastic manifestation has a prevalence of 4–27%. Although hypoglycemia as a paraneoplastic syndrome is not an uncommon presentation with advanced HCC, hypoglycemia as initial presentation is rare. Here we report a case of refractory hypoglycemia as an initial manifestation of HCC. 33-year-old Hispanic male presented to the Emergency Department after being found confused by co-workers. He complained of weakness, fatigue and headaches for the last month, and a 20 lb weight loss in the last year. He had no previous medical problems. On physical examination he was lethargic and slow to respond to questions. Examination of his abdomen revealed hepatomegaly with a palpable mass in the left lobe. Glucose on admission was 29 mg/dL, further hypoglycemia evaluation revealed Insulin <1 uU/mL, C-Peptide 0.04 ng/mL, and sulfonylurea screen negative. Serum testing confirmed Chronic Hepatitis B,

Abstract 513 Table 1

Parameters	HP (n=12)			HC (n=12)			p* HP vs HC 6 months
	Baseline	6 months	p-value	Baseline	6 months	P-value	
Age (yr)	43.1±1.3			41.1±1.8			
Weight (lbs)	248.8±12.2	229.4 ±11.3	0.005	236.6±6.8	211±8.3	0.008	0.07
Blood Pressure	130/80±3/2	116/72±3/3	0.006	126/80±4/2	113/73±4/2	0.005	0.6
RMR	1571±19	1862±18	0.005	1569±17	1598±15	0.6	0.001
Irisin (ng/ml)	9.41±0.7	10.42±0.4	0.03	8.86±0.8	8.99±0.8	0.5	0.02
FGF-21 (pg/ml)	166.39 ±41.36	129.47±24	0.04	114.25 ±30.48	166.39±30	0.05	0.06
UCP-1 (ng/ml)	0.30±0.06	0.33±0.07	0.05	0.82±0.35	0.62±0.26	0.03	0.04

p is significance of change from Baseline to 6 mo; p* is significance between HP vs HC at 6 mo.

AFP-Tumor Marker was >50000 IU/mL, Insulin-Like Growth Factor 1 (IGF1) 22 ng/mL, and Insulin-Like Growth Factor II (IGF2) 506 ng/mL. Computed tomography confirmed a 21 cm mass concerning for HCC. Due to continued hypoglycemia on an intravenous dextrose infusion he was started on Prednisone, chewable dextrose tablets, and high protein-carbohydrate meals. He was weaned off intravenous dextrose with no further episodes of hypoglycemia. Two types of hypoglycemia have been described with HCC. Type A hypoglycemia occurs with advanced HCC as the liver is replaced by tumor it is no longer able to meet the glucose demands of the body. Type B hypoglycemia occurs due to defective processing of the precursor to IGF2 (pro-IGF2) by the hepatocytes and causes increased glucose uptake. Molar ratio of IGF2:IGF1 was 10:1 which supports our suspicion of a non-islet cell mediated hypoglycemia. Steroids and high carbohydrate meals have been described as options for management of hypoglycemia in HCC. Steroids aid with stimulating gluconeogenesis and prednisolone, the active metabolite in prednisone, has been described to decrease pro-IGF2 levels. It is important to consider the diagnosis of HCC in patients who present with chronic liver disease and hypoglycemia as paraneoplastic syndromes play a significant role in management, and are associated with a poor prognosis.

515 VITAMIN D STATUS IN CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

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10.1136/jim-2015-000035.517

Purpose of Study New studies have shown potential effects of vitamin D on developing type 1 diabetes mellitus (T1DM), glycemic control and its vascular complications. We aimed to assess vitamin D status in pediatric patients with T1DM.

Methods Used This was a retrospective study of patients diagnosed with T1DM who had 25-hydroxy vitamin D (25OHD) level on medical record. Baseline characteristics were collected and patients were stratified into 3 groups; vitamin D sufficient (25OHD >30 ng/mL), vitamin D insufficient (25OHD 20 - 30 ng/mL), and vitamin D deficient (25OHD <20 ng/mL).

Summary of Results 83 children and adolescents with T1DM were included in this study (age 3.33 - 18.33 years). Only 25% of patients were vitamin D sufficient while vitamin D insufficiency and vitamin D deficiency were found in 47% and 28% of participants respectively. Vitamin D deficiency was more prevalent in winter ($p<0.05$). However, there was no significant difference in age, sex, ethnicity, body mass index, duration of T1DM or glycemic control (HbA1c) among the 3 groups.

Conclusions Vitamin D insufficiency and deficiency are very common in pediatric patient with T1DM regardless of age, sex or ethnicity. Assessment of vitamin D in pediatric patient with T1DM seemed to be high yield especially in winter.

516 REPLACE POTASSIUM WITH CAUTION: A CASE OF THYROTOXIC PERIODIC PARALYSIS

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10.1136/jim-2015-000035.518

Case Report Thyrotoxic periodic paralysis (TPP) is a condition characterized by hypokalemic episodes associated with profound muscle weakness in the setting of hyperthyroidism. Despite extracellular potassium depletion, whole body stores remain replete, which could lead to physician over-correction of hypokalemia. We report a case of TPP presenting with hypokalemia and muscle weakness. A 33 year-old African American male is transferred from an outside hospital with a 1-day history of bilateral leg weakness and pain. He described muscle cramping that started after working outside in the heat. His pain was followed by diffuse muscle stiffness that progressed to muscle weakness starting in his distal extremities. He was eventually unable to lift his legs or arms off the bed. Prior to transfer, his labs were significant for potassium of <1.0 mEq/L. He received intravenous potassium with improvement in his weakness, and was transferred to our hospital emergency department. He noted a 1-day history of diarrhea, nausea, vomiting and hot flashes. He reports an unknown medication for his thyroid two years prior, but was unsure of specifics. He denies similar past episodes, but described his father having episodes of sudden paralysis associated with hypokalemia. Physical examination revealed a diffusely enlarged thyroid gland, and lower and upper extremity weakness. On admission to the hospital his potassium was 1.6 mEq/L. He was given 160 mEq total of intravenous potassium. Repeat potassium was 5.4 mEq/L. Thyroid stimulating hormone was 0.01 uU/ml, T4 3.480 ug/dl, T3 1651 ng/dl. Anti-thyroperoxidase antibody and thyroid receptor antibody results were consistent with a diagnosis of Grave's disease and was started on Methimazole for treatment. Our findings were consistent with a diagnosis of TPP. While the pathogenesis of hypokalemia is unclear, it is believed to be associated with increased sodium-potassium-adenosine triphosphatase pump activity, causing an intracellular shift of potassium. Whether this occurs by direct interaction with the thyroid hormones or indirectly through an adrenergic response is unknown. In a euthyroid state, the potassium returns to the extracellular space. The patient is susceptible to iatrogenic hyperkalemia and should be closely monitored for over correction of hypokalemia.

517 HYPERGLYCEMIA INDUCES AUGMENTATION OF THE PRORENIN RECEPTOR (PRR) AT THE CELL PLASMA MEMBRANE IN THE COLLECTING DUCT

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Purpose of Study During the type 1 diabetes mellitus (T1DM), the collecting duct is the main source of intrarenal prorenin, the natural agonist of the prorenin receptor.

Therefore, in the present study we tested the hypothesis that high glucose increases PRR abundance at the cell plasma membrane (PM) of collecting duct cells, which contributes to the stimulation of downstream fibrotic factors.

Methods Used Male Sprague-Dawley rats (14 w of age) were subjected to STZ-induced hyperglycemia for 7 d (ip, single injection; 60 ng/kg) and compared to controls. Cultured collecting duct M-1 cells treated for 0, 5 min, and 1, 6, 12 and 24 h with normal glucose (NG; 5 mM glucose +20 mM mannitol) and high glucose (HG; 25 mM).

Summary of Results After 7 d, STZ-induced rats (N=9) showed plasma levels of glucose as 428 ± 13 vs. 138 ± 9 gr/dL and insulin as 0.07 ± 0.02 vs. 2.4 ± 0.01 ng/mL; compared to controls (N=7). Although PRR mRNA levels did not differ between groups; PRR protein levels and its downstream target TGF- β mRNA levels were augmented in the renal medulla of STZ-induced rats (0.55 ± 0.03 vs. 0.44 ± 0.02 PRR/ β -actin protein ratio; $P < 0.01$; 1.22 ± 0.06 vs. 0.97 ± 0.03 TGF- β / β -actin mRNA ratio; $P < 0.01$). Interestingly, PRR protein levels were maximum elevated at 1 h in PM extracts from M-1 cells treated with HG (0.95 ± 0.04 vs. 0.33 ± 0.2 PRR/E-cadherin protein ratio) but not in NG-treated cells. HG also upregulated fibrotic proteins like fibronectin (0.47 ± 0.4 vs. 0.28 ± 0.1 fibronectin/ β -actin protein ratio) and collagen (4.473 ± 0.2 vs. 2.79 ± 0.1 collagen/ β -actin protein ratio) compared with NG-treated cells. Immunofluorescence studies of M-1 cells treated with NG for 1 h showed that PRR is mainly localized in the perinuclear areas, whereas in HG-treated cells it was predominantly localized toward the cell surface, and augmented fibronectin, collagen, TGF- β expression as it was more clearly observed in de-convoluted images.

Conclusions These data indicate that hyperglycemia leads to PRR trafficking alterations by inducing PRR translocation towards PM in the collecting duct cells and suggest that the activation of PRR during hyperglycemia conditions might be a novel mechanism underlying the development of DN, particularly tubulointerstitial fibrosis in DM. Grant support by the NIH-NIDDK (DK104375-01)

Health Care Research and Quality Improvement

Concurrent Session

1:00 PM

Saturday, February 20, 2016

518 PATIENT PORTAL ACCESS AND SERVICE UTILIZATION AMONG PATIENTS WITH HYPERTENSION AND DIABETES

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10.1136/jim-2015-000035.520

Purpose of Study The effect of patient portals on healthcare utilization and cost remain unclear. Our study objective was to compare utilization among patients who do vs. do not have access to MyOchsner patient portal.

Methods Used We conducted a retrospective observational study of patients with hypertension (HTN) and/or diabetes

(DM) who saw a primary care physician (PCP) within Ochsner Health System at least twice between July 2012 and December 2014. We used age, gender, race, diagnosis and PCP encounter rates to generate propensity scores. Inverse probability treatment weights (IPTW) were used to reduce case-mix differences between MyOchsner users and non-users. We used unadjusted utilization rates (PCP/Specialty/ Emergency Department (ED)/hospital visits and phone encounters) for difference-in-difference analyses. We used generalized estimating equations to compare adjusted utilization rates before and after index dates for accessing MyOchsner among users and the midpoint between first and last contact date for non-users.

Summary of Results The study cohort included 10,647 MyOchsner users and 92,065 non-users. Most patients had HTN and were age 50+, female, and white. Only 1/3 were black. After IPTW, the standardized difference between users and non-users was <10% for all patient characteristics. Comparing adjusted rates for use of clinical services before and after index dates between cohorts, there was a significant increase in rate ratios of PCP visits (users: 1.17; 95% CI, 1.13–1.21; non-users: 0.99 (0.98–0.99); $P < 0.001$) and phone encounters (1.17 (1.11–1.24) vs. 1.02 (1.0–1.03); $P < 0.001$) and a higher rate of specialty visits (0.94 (0.64–1.4) vs. 0.65 (0.61–0.68), $p = 0.03$). There were no significant differences in ED use (1.25 (1.07–1.46) vs. 1.21 (1.16–1.27); $P = 0.35$) or hospitalizations (0.96 (0.73–1.25) vs. 1.16 (1.07–1.25); $P = 0.09$). We found similar trends among demographic sub-groups; however, there were variations in utilization patterns among patients with only HTN or DM vs patients with both HTN and DM.

Conclusions Patient portal access was associated with increased use of some but not all clinical services. Further studies examining details of patient portal use patterns associated with utilization and which types of patients would benefit most are needed.

519 INFLUENCES OF OBESITY ON HEALTHCARE UTILIZATION: GENDER DIFFERENCES

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10.1136/jim-2015-000035.521

Purpose of Study It is known that obesity is associated with adverse health outcomes and increased healthcare utilization. However, limited information is available whether the impact of obesity on healthcare utilization is gender-specific, particularly in older adults. Such information is important for allocating healthcare resources and reducing healthcare burden.

Methods Used We examined healthcare utilization associated with obesity by gender in the Health and Retirement Study, a representative sample of the US population over the age of 50 years (n=22,185, mean age 65.2 years in men and 65.9 years in women at baseline), between 1991–2012. General linear models and logistic regression models were used to examine the associations between obesity and healthcare utilization (costs/visits) and the interaction

between gender and obesity, adjusted for physical activity, education, household income, and cigarette smoking.

Summary of Results Those who were non-obese at baseline had an average annual total reimbursement amount of \$1,359.84, compared to \$1,987.64 for the obese ($P < 0.0001$). Obesity was associated with \$127.27 increase in total reimbursement in men, compared to \$981.28 in women (P for interaction < 0.0001). Similarly, obesity was associated with increased odds of visiting hospitals ($P < 0.001$); this association was much stronger in women than in men. For example, odds ratio for in-patient visit associated with obesity was 1.69 (95% confidence interval: 1.52–1.88) in women, compared to 1.13 (95% confidence interval: 1.00–1.271; P for interaction < 0.001) in men.

Conclusions In conclusion, obesity is associated with increased healthcare utilization and such increase is more in women than in men. Obesity prevention and intervention in older US adults may reduce healthcare utilization, more so in women.

520 CHILD LIFE SPECIALISTS LESSEN THE EMOTIONAL RESPONSES OF CHILDREN DURING LACERATION REPAIR IN THE EMERGENCY DEPARTMENT

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Purpose of Study In the past few decades, the utilization of Child Life Specialists (CLS) has steadily increased in many arenas of pediatric medicine. By using age-appropriate education, preparation, and supportive activities, CLS help children cope with potentially stressful clinical situations. The goal of the study was to evaluate the impact of CLS on the emotional response of children undergoing laceration repair in the emergency department.

Methods Used Patients 4–12 years of age who required suture laceration repair were prospectively enrolled (via convenience sampling) in the Children's of Alabama Emergency Department. CLS availability is varied in our center, allowing for *a priori* categorization of subjects into 2 comparison groups - those with and those without CLS involvement during the procedure. The Children's Emotional Manifestation Scale (CEMS), a previously validated, Likert-like tool, was used to quantify the patients' emotional responses; a higher score reflects a more anxious child. Scales were completed (just prior to placement of the first suture) by trained, unblinded observers. Subjects were excluded if they required sedation or restraint with a board ("papoose"). Age, gender, ethnicity, type of anesthetic or pain control, and length and location of laceration were recorded. Data are presented as medians and interquartile ranges. CEMS scores were compared with a 2-tailed Mann-Whitney U test, with a $P < 0.05$ considered statistically significant.

Summary of Results To date there are 140 patients enrolled in the study. One patient was excluded for being outside the predefined age range. There were 75 children with CLS during laceration repair and 64 without CLS. These groups did not differ in regards to age, gender, or ethnicity. Median CEMS score for patients with CLS present was 7 (6–9) versus 10 (8–13.5) for those without CLS ($P < 0.0005$).

Conclusions CLS help lower a child's emotional response just prior to laceration repair in the emergency department.

521 DIURNAL SEDATION VARIATIONS IN THE PEDIATRIC INTENSIVE CARE UNIT

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Purpose of Study Severely ill pediatric patients frequently require sedation as part of their critical care. If such children are not appropriately sedated, adverse events resulting in negative patient outcomes can occur. The purpose of this study was to characterize the trends in the level of sedation in intubated and mechanically ventilated patients in the pediatric intensive care unit (PICU) with regard to diurnal variations. We predict that most patients are over sedated based on the State Behavioral Scale (SBS) with a higher percentage being over sedated at night.

Methods Used Patients meeting study inclusion criteria (e.g., endotracheal intubation and are mechanically ventilated between the ages of 6 weeks to 18 years of age) and none of the exclusion criteria (e.g., neuromuscular blockade, post-surgical, suffered traumatic brain injury, status epilepticus, burst suppression, within 12 hours of planned extubation, or receiving propofol) were assessed for sedation level during a 12 week period. Trained nurses used the SBS on intubated and mechanically ventilated patients to assess the level of sedation. SBS scores were collected every 4 hours. Scores were classified as "Under sedated" (+1 or +2), "Over sedated" (-2 or -3), or "Adequately sedated" (0 or -1).

Summary of Results Results stratified based on the time of day showed a peak in the level of appropriately sedated patients at approximately 1200 hours and a nadir at 2000 hours. Most patients were adequately sedated (Day shift: 70.3%, Night Shift: 61%). During the day, 22.7% were under sedated and 7% were over sedated. At night, 31.4% were under sedated and 7.6% were over sedated.

Conclusions Our study indicates that most patients were adequately sedated. Most inadequately sedated patients are under sedated. Patients were more likely to be under sedated on the night shift compared to day shift. Our next steps will focus on standardizing sedation based on the SBS and correlate appropriate sedation with adverse clinical events.

522 A COST ANALYSIS OF TUBERCULOSIS SCREENING AND TREATMENT IN A REFUGEE POPULATION

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Purpose of Study The US has a constant influx of refugees and they must be tested for illnesses endemic to their country of origin. Tuberculosis is one such infection which is typically screened for with a tuberculin skin test (TST) and read 48 h later. The TST is highly sensitive in non-immunocompromised individuals with latent TB infection. However, in people who have received the BCG vaccine or

who have had non-tuberculous mycobacterial (NTM) disease, the TST has a high false positive rate. Two interferon gamma release assay (IGRA) tests are available, including the T-SPOT, which has the advantage of not cross-reacting with the BCG or NTM. A drawback is the high cost of these tests which has limited their use. The aim of this study is to compare the cost of using the T-SPOT as confirmation of a positive TST in a refugee population vs treating all positive TST results.

Methods Used Data from January 2011 to August 2015 was reviewed from the refugee program at the Amarillo, TX Department of Health. During this time both the TST and the T-SPOT were used in order to identify who needed treatment for LTBI. Using the cost of tests, drugs, the office visits, medical personnel time and transportation, the total cost for treating positive TST patients was calculated. The cost difference of treating all positive TSTs vs only those with a positive confirmatory T-SPOT was calculated.

Summary of Results The false positive rate of the TST in this population, (T-SPOT=gold standard) was calculated to be 8.3%. The approach of treating only patients with positive TST confirmed by a T-SPOT resulted in a savings of \$3,836 to the program.

Conclusions Treating all patients with a positive TST in a refugee population, with its inherent high false positive rate due to BCG vaccine and/or exposure to NTM is costly. Despite the high cost of using an IGRA test at the outset for all patients, the ultimate result is cost savings to the public health system. We propose that when the rate of false positives to the TST is increased, either all patients should be tested initially with an IGRA or any positive TST can be followed up with an IGRA. In the refugee population, the initial screen with an IGRA test saves even more time, effort and money in that the newly arrived patients do not have to be located 48 h after placement of the TST for the reading.

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FACTORS ASSOCIATED WITH CLINICIAN PERCEPTION OF IMPROVED PATIENT SAFETY FOLLOWING TRANSITION TO A COMPREHENSIVE ELECTRONIC HEALTH RECORD

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Purpose of Study Electronic health records (EHR) have the potential to improve health care delivery and enhance patient safety. We sought to identify factors associated with clinician perception of improved patient safety following the transition from a basic, locally-developed EHR to a comprehensive, commercially-available EHR.

Methods Used We surveyed clinicians working in outpatient only or combined inpatient and outpatient settings in a large, academic healthcare system 12–24 months after implementation of a comprehensive EHR (EpicCare 2010). The survey was adapted from a published tool and included questions about satisfaction with the EHR and other factors related to EHR adoption, along with

demographics and practice characteristics, including gender, age, clinician type, years worked at the institution, practice type, practice setting, practice location, and length of time using the EHR. We started with a logistic regression using improved patient safety as the response variable and the remaining survey questions as predictive factors. We then used forward selection to identify factors that were significantly associated with improved patient safety.

Summary of Results We received completed surveys from 191 clinicians (45.9% of 416 eligible). Respondents were 62.3% male, 82.2% between the ages of 36 and 65, 78.0% physicians, 72.3% having worked at the study setting for more than five years, and 53.9% in a primary care or medical specialty. Among respondents, 58.1% agreed or strongly agreed that using the EHR improves the safety of patients. In the final model, factors associated with clinician perception of improved patient safety include perception of providing better care (OR=11.82, p<0.0001), avoiding drug errors (OR=11.94, p<0.0001), and coordination of care between departments (OR=9.63, p<0.0001).

Conclusions Several factors relevant to comprehensive EHRs were associated with clinical perception of improved patient safety following transition to a comprehensive EHR. These factors may inform future EHR transition initiatives and increase EHR adoption and integration into clinical practice.

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KEY DRIVERS INFLUENCING OVERALL PATIENT EXPERIENCE IN AMBULATORY PEDIATRICS

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Purpose of Study Improving the patient experience has become an imperative for health systems as a part of increasing quality care, gaining market share and meeting regulatory standards. Health systems are working to determine the key factors that drive patient experience, patient loyalty, and patient engagement. This study reviewed patient satisfaction survey data in order to determine which factors drive patient experience in a pediatric academic health care system. Our research examined three years of survey data in order to determine which factors show the most positive correlation with overall satisfaction.

Methods Used Patient satisfaction surveys from a children's health system were reviewed from January 2012 to February 2015. The survey tool used was from Press Ganey, Inc. The analysis focused on the ambulatory pediatric primary and subspecialty care surveys. The Pearson's Product-Moment Correlation (*r*) was used to examine the association between each patient satisfaction question and the overall loyalty indicator: the "Likelihood to Recommend" (LTR).

Summary of Results Responses from over 59,000 surveys were reviewed. The top four survey items that correlated with LTR were: "cheerfulness of practice", "staff worked together", "care provider (section)", and "care provider explanations of problem/condition". The Pearson's Product-Moment Correlation (*r*) for these top four responses were: 0.94, 0.92, 0.86, and 0.86; respectively.

Conclusions Our data demonstrates that families seeking care for their children value the overall mood of the practice and the demonstration that the medical team is working together. Patients seeking pediatric care expect personnel to be warm and child-friendly. Staff should engage the child directly and staff should provide care in a way that enhances teamwork. The interaction of the doctor, nurse practitioner, or physician assistant was another key driver to overall experience. This speaks to the ability of a highly engaging and compassionate caregiver to overcome any limitations that may impact the overall patient experience. The doctor's explanation of problems was found to be a key factor in overall pediatric patient experience. When designing a care experience for families in the pediatric ambulatory care setting, one should consider the key influencing factors that families value.

525 PROBLEMS BREASTFEEDING? LET ME SEND YOU TO LACTATION

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10.1136/jim-2015-000035.527

Purpose of Study The positive health benefits of breastfeeding for infants and mothers are well established. Although recent CDC data indicates that breastfeeding initiation rates are improving, only 49% are still breastfeeding at 6 months and 27% at 12 months; substantially lower than the national objective of 60.6%, and 34.1%, respectively(1). Despite AAP and ACOG recommendations for exclusive breastfeeding until 6 months of age and nonexclusive breastfeeding until 1 year of life, many physicians fail to convey to patients a breastfeeding preference(3). One hypothesis for this failure is physician uncertainty about breastfeeding education and inadequate training during residency. This study evaluated this hypothesis in a convenience sample of pediatric and OB residents.

Methods Used OB and pediatric residents completed a survey based on the AAP breastfeeding survey and additional questions derived from an extensive literature review related to potential etiologies of low breastfeeding rates. 40 residents completed the survey; 32% male; 22 pediatric residents, 10 OB residents and 8 combined residents(Med-Peds or Triple Board). We analyzed data within and between programs. We also analyzed male vs. female residents and residents with prior breastfeeding experience vs. no prior breastfeeding experience.

Summary of Results 35% of residents rated themselves as not confident or not confident at all, 45% neutral, and only 20% rated themselves as confident or very confident about their own ability to adequately address parental breastfeeding questions. Only 28% felt confident to manage common breastfeeding problems. Self-reported competency was significantly associated with correct responses on questions related to breastfeeding, such as guidelines about pumping and storing of breast milk. Only 12% of residents reported that physician recommendation was more influential on a mothers' choice to breastfeed

than friend, mother, spouse, sister, or internet; indicating that residents may underestimate their impact on breastfeeding practices.

Conclusions Poor resident competency and/or modest self-perception of importance, likely contribute to decreased encouragement of breastfeeding during residency and throughout their careers. The next phase expects to implement additional breastfeeding education into the curricula for OB and pediatric residents.

526 DECREASED MEDIAN TIME TO FIRST DOSE OF ANALGESIC FOR LONG BONE FRACTURE-ASSOCIATED PAIN IN THE PEDIATRIC EMERGENCY DEPARTMENT, A QUALITY IMPROVEMENT INITIATIVE

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10.1136/jim-2015-000035.528

Purpose of Study The aim of this quality improvement initiative was to decrease the median time to first dose of analgesic for long bone fracture-associated pain in the pediatric emergency department (PED), based on the Center for Medicare and Medicaid Services (CMS) OP-21 reporting measure, to 36 minutes or less by July 1st, 2015. The average monthly median time to first dose of analgesic in the PED during the nine-month period prior to the initiative was 66 minutes (range 45–89 min, national average 60 min).

Methods Used A nursing quality improvement team was formed among stakeholders in the PED. The aim was chosen based on the current 10th percentile among reporting institutions for the CMS OP-21 reporting measure at the beginning of the initiative (36 min). After a review of department processes, a series of four interventions were identified and implemented in successive "plan, do, study, act" (PDSA) rapid cycles. Initiatives one through four, in order, included an educational intervention to stakeholders regarding Emergency Severity Index (ESI) procedures for triaging pain, creation of a nursing pod leader assignment, introduction of a radio communication tool along with enhanced communication about quality goals, and ongoing staff educational sessions with particular attention to outlier cases as well as biases and barriers to quality.

Summary of Results Initiatives one through four were implemented consecutively in April, May, June and July of 2015. Median times to analgesic delivery for long bone fracture-associated pain in the PED decreased from 72 min in April to 37 min in May, 37.5 min in June and 33.5 min in July of 2015.

Conclusions A series of four rapid-cycle PDSA interventions resulted in a consistent decrease in the median time to first dose of analgesic for long bone fracture-associated pain in the PED using the CMS OP-21 reporting measure. As a result, the team believes that optimization of the triage process in particular may lead to improvements in other quality measures within the department. Ongoing monitoring should be pursued to ensure the sustainability of the rapid cycle interventions performed.

527 **IMPROVING HUMAN PAPILLOMA VIRUS VACCINATION RATES: QUALITY IMPROVEMENT**

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10.1136/jim-2015-000035.529

Purpose of Study Human Papilloma Virus (HPV) is an extremely common sexually transmitted infection, with a national prevalence rate of greater than 20 million. Approximately three quarters of these infections are among persons 15 to 24 years of age. The HPV vaccine has an excellent safety profile and has been shown to have near 100% efficacy for protection against the carcinogenic strains when all three doses are administered prior to natural exposure. Early prevention is the key, but national vaccination rates remain less than 50%. We sought to determine baseline data on HPV vaccine initiation in adolescents in a resident teaching practice and to improve the rate of initiation of the HPV vaccination series.

Methods Used Eligible patients included all children 9 through 13 years of age who presented to the resident clinic. It is an inner-city, urban, underserved population, and most are insured through Medicaid. Baseline data was obtained by analysis of vaccine initiation rate in the study population over one month. Interventions including resident education, nursing staff inservice, and early provision of Vaccine Information Sheets (VIS) were implemented on a monthly basis. Monthly chart reviews were performed to assess post-intervention immunizations initiation rates.

Summary of Results Baseline data included 109 patients age 9–13, both male and female. Preintervention vaccination initiation rate was 42%. The immunization rate 14 weeks postintervention has increased by 19% with a current rate of 61%.

Conclusions HPV vaccination is an important intervention for children and adolescents, but vaccination rates are lacking. Simple and practical interventions involving residents through this quality improvement project led to a marked increase in HPV vaccination in our patient population. Initiatives including EMR prompts are in progress to ensure ongoing improvement in vaccination rates.

528 **APPLYING THE BRAIN TO QUALITY IMPROVEMENT: ADHERENCE TO EVIDENCE-BASED SEVERE TRAUMATIC BRAIN INJURY MANAGEMENT GUIDELINES**

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10.1136/jim-2015-000035.530

Purpose of Study Evidence-based medicine has helped standardize and optimize the practice of medicine. However, there are few studies that have looked at adherence to evidence-based guidelines. This is especially true with more complex processes such as the management of traumatic brain injuries (TBI). We evaluated adherence to an existing Children's of Alabama (COA) algorithm derived from evidence-based guidelines for management of severe TBI and conducted a pilot study to improve said

adherence. We also determined the agreement between the pediatric intensive care unit (PICU) team's estimates of adherence with the TBI algorithm and the actual adherence prior to the pilot study.

Methods Used We performed a retrospective chart review of 85 COA patients admitted to the PICU for severe TBI not caused by child abuse from Jan 2013 to June 2015. Adherence to the TBI algorithm was determined by calculating the percent of time each patient reached the 10 management goals outlined in the COA TBI algorithm during the first 7 ICU days (cerebral perfusion pressure (CPP), central venous pressure, sodium, hematocrit, sedation, temperature, O₂ and CO₂, glucose, seizure prophylaxis, and enteral feeds). After determining adherence, we implemented a process change specifically targeting 3 management goals and conducted a pilot study for 1 patient in Sept 2015. We also surveyed 27 PICU staff about their familiarity with the COA TBI algorithm and their adherence estimates to the algorithm prior to the pilot.

Summary of Results Prior to the process change, adherence with the COA TBI algorithm for the 85 patients was 27%, much lower than the PICU staff's estimated adherence of 73%. Adherence to each of the ten management goals ranged from 12% to 75%. Adherence to the 3 goals for CPP, sodium and CO₂ were 47%, 75% and 22%, respectively. In the pilot study, the PICU team's adherence to the goals for CPP, sodium and CO₂ were 97%, 100% and 82%, respectively.

Conclusions Self-reported familiarity with COA's severe TBI algorithm overestimated adherence. Initial pilot study results suggest that implementing a process change may increase adherence to algorithms derived from evidence-based guidelines, thereby improving outcomes. Data monitoring for improvement is ongoing.

**Hematology and Oncology II
Concurrent Session
1:00 PM
Saturday, February 20, 2016**

529 **UNDERSTANDING THE ROLE OF LYMPH NODE STROMAL MICROENVIRONMENT IN ESOPHAGEAL ADENOCARCINOMA BY USING A PATIENT-DERIVED ORTHOTOPIC MODEL**

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10.1136/jim-2015-000035.531

Purpose of Study Incidence of esophageal adenocarcinoma (EA) has been rising in the western hemisphere over the past 30 years. The prognosis is poor with a 5-year survival rate of 19%, due to lymph node (LN) or distant organ metastasis. To understand the mechanism of metastasis and test novel therapies, it is necessary to develop clinically relevant animal models. Here, we established patient-derived orthotopic xenograft (PDOX) and subcutaneous xenografts models for EA and further explore the role of LN stromal cells (LNSC) in EA progress at cellular, molecular, and *in vivo* levels.

Methods Used Twenty-six EA patient specimens were collected and subcutaneously implanted in the flanks of NOD/SCID mice for generating cancer cells. Luciferase-tagged EA patient cancer cells (EA-PtCC-Luc) were injected in the sub-mucosa of the esophagus for the orthotopic study in the absence or presence of human LNSCs. Tumor progression in subcutaneous xenografts was monitored by tumor size while luciferase activity was determined in PDOX model. The morphology of tumors from the xenograft and PDOX models was compared to the original tumor in EA patients.

Summary of Results Clinical and pathologic profiles of the 26 EA patients and their *in vivo* tumor growth capacity were compared. Four of them exhibited consistent tumorigenesis with accelerated growth rate and shortened latency. Xenografts maintained similar histological and morphological characteristics even after multiple passages. EA-PtCC-Luc's were successfully implanted orthotopically, creating a reproducible and observable PDOX model for EA progression. Significant tumor growth with concurrent metastases was first time observed in EA-PtCC in the presence of LNSCs.

Conclusions We developed and characterized a PDOX model for EA patients that retain the features of primary tumors. LNSCs significantly promote EA progression and metastasis. This model is useful to study the mechanism of EA pathogenesis and to evaluate candidate therapeutic regimens.

530 COMPARING ABILITY OF PCR TO FISH TO DETECT ALK TRANSLOCATIONS: A LITERATURE REVIEW

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10.1136/jim-2015-000035.532

Purpose of Study Targeted therapy in metastatic non-small cell lung cancer is approved for patients with somatic variations in *EGFR*, *ALK*, and *ROS1*. *ALK* translocations may be detected by different methods. The National Comprehensive Cancer Network (NCCN) non-small cell lung cancer (NSCLC) guidelines state that "(t)he current standard method for detecting *ALK* NSCLC is fluorescent in situ hybridization (FISH), although other methods are currently being evaluated, including polymerase chain reaction (PCR) and (immunohistochemistry)." Commercial tests such as Pervenio™ Lung NGS by Life Technologies use quantitative PCR to detect translocations involving *ALK* in NSCLC. The purpose of this study is to review the published literature regarding the ability of PCR to detect *ALK* translocations.

Methods Used A Medline search using the terms "PCR and *ALK* and FISH" was performed. Abstracts were reviewed. Articles that included tabular data of samples tested by both PCR and FISH for *ALK* translocations were selected. Articles with incomplete data were excluded. The FISH test, endorsed by the NCCN as the current standard for detecting *ALK* rearrangements in NSCLC, was considered the gold standard when evaluating the sensitivity and specificity of PCR.

Summary of Results See Table

Abstract 530 Table 1 Sensitivity and Specificity of PCR vs FISH for ALK

First Author	Year	N	FISH		FISH-, PCR+	FISH-, PCR-	SNS	SPC
			+, PCR+	+, PCR-				
Lantuejoul S	2015	504	75	50	1	378	0.60	0.99
Soda M	2012	111	15	1	0	95	0.94	1.00
Wang J	2014	200	44	2	20	134	0.96	0.87
Wu Y	2013	305	7	5	2	291	0.58	0.99
Li Y	2013	161	38	6	0	117	0.86	1.00
Ying J	2013	196	62	1	7	126	0.98	0.95
Wallander ML	2012	46	7	5	4	30	0.64	0.88
SUM	-	1523	248	70	34	1171	0.78	0.97

Conclusions Targeted therapy for metastatic non-small cell lung cancer is approved for patients with variants in *EGFR*, *ALK*, and *ROS1*. Patients can only benefit from these therapies, however, if the method of testing detects a variant. In this population of cases enriched for *ALK* variant NSCLC (i.e. 21% of samples were positive), the 78% sensitivity by PCR for *ALK* variants, if it is the only test employed, may lead to appropriate therapies being not offered to patients because a variant was not detected.

531 VERY LATE RELAPSE METASTATIC RENAL CELL CARCINOMA: CHARACTERISTICS AND OUTCOMES OF PATIENTS WITH A DISEASE FREE INTERVAL OF GREATER THAN 10 YEARS

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10.1136/jim-2015-000035.533

Purpose of Study Late relapse of renal cell carcinoma (RCC), or presentation with metastatic disease after a disease free interval of >5 years, is a known behavior of RCC. Late relapse RCC is associated with favorable patient and tumor characteristics as well as an improved response to targeted therapy (TT) when compared to early relapse patients. Less studied are patients we consider very late relapsers, or those with a disease free interval >10 years, and so we evaluated the clinical characteristics, response to TT and outcomes of this unique population.

Methods Used We collected data on consecutive patients with mRCC with disease recurrence >10 years after nephrectomy. Outcomes were recorded using basic statistical techniques; adverse events (AEs) were graded using CTCAE v4.0 and treatment response using RECIST 1.1.

Summary of Results Among 720 mRCC patients, 8 relapsed after a >10 year (median: 16.7 yrs; range: 11.7–29.0) disease free interval. All patients presented with clear cell histology; 88% presented in favorable IMDC and MSKCC risk subgroups. All patients presented with multiple metastases, with the most common sites being lung and bone, while unusual sites such as soft tissue, pancreas

and adrenal were also detected. Median time on first-line TT was 20.1 months; 4, 3 and 1 patient received pazopanib (best response: PR), sunitinib (best response: SD) and cytokine (best response: PD) as first-line therapy, respectively. The median number of sequential TT received was 2 (range: 1–4). Four patients died, median OS was 46.6 months (range: 9.8–129), 3 year OS rate was 63%. Common AEs to TT were fatigue (88%), anorexia (38%) and diarrhea (50%) with 94% graded 1/2.

Conclusions Patients undergoing resection of localized RCC are at life-long risk of disease recurrence as it is possible for metastases to present >10 years after resection. The high metastatic burden and wide distribution of metastases suggest that diagnostic procedures capable of detecting recurrence in all organs may be taken into consideration during surveillance. Our cohort demonstrated favorable prognostic features and treatment responses when compared to historical controls.

532 SELECTED GERMLINE VARIATIONS IN PROSTATE CANCER PATIENTS WITH A SIGNIFICANT FAMILIAL CANCER HISTORY

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10.1136/jim-2015-000035.534

Purpose of Study Prostate cancer (PCa) is one of the most common adult malignancies. It is evident that subsets of PCa patients have a strong family history of cancer, both PCa and other malignancies. The goal of this study is to investigate the germline variants of known and uncertain significance (VUS) in selected cancer-related genes in men with PCa.

Methods Used In this single-institution study, 30 PCa patients from Tulane Hospital were identified to have a family history that met NCCN guidelines for genetic testing. Patients were interviewed and their family history was evaluated. The following genes were evaluated for sequence changes and exonic deletions/duplications: APC, ATM, BARD1, BMPR1A, BRCA1, BRCA2, BRIP1, CDH1, CDK4, CDKN2A, CHEK2, EPCAM, MLH1, MSH2, MSH6, MUTYH, NBN, PALB2, PMS2, PTEN, RAD51C, SMAD4, STK11, and TP53.

Summary of Results Among the 30 PCa patients who were tested, two pathogenic variants—BRCA1 c.5207 T>C and MUTYH c. 6198G>C, and 14 VUS's were found (36.7% of patients). The genes where VUS's are detected include BARD1, BRIP1, CHEK, MRE11A, ATM, BRCA1, BRCA2, MSH6, MLH1, NBN, and TP53. No pathogenic

variants or VUS's are found in 19 patients (63.3%). The incidence of prostate, breast, pancreatic, ovarian, and other malignancies in both the VUS group and the negative group are shown in Table 1. The VUS group and the negative group's family histories differ in composition with regards to incidence of prostate, breast, pancreatic, ovarian, and other malignancies. The age and Gleason scores at initial diagnosis are comparable in the VUS group and the negative group.

Conclusions The clinical implication of variants of uncertain significance (VUS) is usually unclear until study of the genotype and corresponding phenotype in a sufficiently large populations. Continuing to track patients, and their families, that have VUS may provide additional insights into the genetics of families of men with PCa.

533 ASSESSING BREAST TUMOR SIZE: COMPARING ULTRASOUND AND MAGNETIC RESONANCE IMAGING FOR WOMEN WITH DENSE BREAST TISSUE

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10.1136/jim-2015-000035.535

Purpose of Study Increased breast density has been shown to be a strong, independent risk factor for breast cancer. Unfortunately, mammography is less accurate on dense breast tissue compared to fattier breast tissue. There is a need to understand which imaging modality most accurately characterizes breast cancer in women with dense breast tissue to improve preoperative staging. Preoperative measurement of tumor size is accomplished with imaging and is useful as both a prognostic indicator and a tool for operative planning. At this time, the distinction between ultrasound (US) and MRI in preoperative assessment of cancer size is poorly understood. In particular, the accuracy of each modality for women with dense breast tissue merits further investigation.

Methods Used Retrospective analysis will be performed on data obtained from the Tulane Cancer Registry between October 2008 and February 2014 including patients newly diagnosed with ductal carcinoma in situ, invasive ductal carcinoma, and invasive lobular carcinoma. Patients with increased breast density will be identified from the most recent preoperative mammogram report, defined by BI-RADS terminology of either heterogeneously dense or extremely dense. Patients with both preoperative MRI and US measurements of maximum tumor size will be selected, and the concordance with measurements obtained during pathologic examination of the tissue will be evaluated.

Summary of Results Mean tumor size obtained by US, MRI, and pathology will be reported, and values will be compared for significant differences between patients with and without dense breast tissue. Lin's concordance correlation coefficient will be utilized to evaluate the agreement of each imaging modality with pathology for patients with dense breast tissue.

Conclusions Previous studies have demonstrated conflicting results regarding the accuracy of US and MRI in

Abstract 532 Table 1 Family History of Malignancies

	Prostate	Breast	Pancreas	Ovarian	Other Malignancies	Total
VUS Group	16 (37%)	12 (28%)	3 (7%)	1 (2%)	11 (26%)	43
Negative Group	33 (51%)	15 (23%)	4 (6%)	5 (8%)	8 (12%)	65

Table 1. Comparison of incidence of prostate, breast, pancreatic, ovarian, and other malignancies in the VUS group and the negative group

estimating breast tumor size. The differences in imaging modality for women with increased breast density is poorly understood. Improved understanding of the accuracy of US compared to MRI for this specific population of women presenting to Tulane Medical Center will be useful for preoperative management of these patients.

534 CANCELLED

535 A VERY RARE HEMOGLOBIN VARIANT – HEMOGLOBIN ABRAHAM LINCOLN WITH HB A2 PRIME TRAIT – A CASE REPORT OF AN UNUSUAL WAXING/WANING COURSE OF HEMOLYTIC ANEMIA WITH ELEVATED HEMOGLOBIN F LEVELS

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10.1136/jim-2015-000035.537

Case Report Unstable hemoglobins' are rare hemoglobin variants, which cause intracellular precipitation of hemoglobin. The presentation shows a high degree of variability in affected individuals. As such the age of diagnosis can vary from infancy to adulthood. One of these rare variants is hemoglobin Abraham Lincoln (also known as Hb Perth or Hb Kobe). This variant was discovered in a Caucasian and an African-American in 1973 by Honig et al., and Jackson et al., respectively. Usually these variants develop as a de novo mutation. This unstable hemoglobin (Hb) is due to a substitution of the leucine for a proline residue at position 32 of the B-globin gene. We report a patient with unstable hemoglobin Perth diagnosed in a toddler child with sub acute onset of hemolysis and a waxing and waning course. A 3 year old African American boy was seen in outpatient hematology clinic for anemia and splenomegaly. Further examination revealed pallor and scleral icterus. Red cell morphology showed marked anisopoikilocytosis with presence of inclusion body formation. The anemia was normocytic in nature with increased reticulocyte count and lactate dehydrogenase levels. Direct coombs test was negative confirming the diagnosis of non immune hemolytic anemia. Initial hemoglobin electrophoresis with Hb A 88 % HBS 1.8 % and HbF of 8%. Surprisingly there was presence of elevated hemoglobin F. Patient had a transient improvement of hemoglobin levels but after a period of observation he had recurrence of anemia. Beta gene analysis results revealed the presence of heterozygous mutation for hemoglobin Perth. Interestingly it also revealed hemoglobin A2 Prime trait with elevated hemoglobin F levels. In conclusion hemoglobin variants should be considered as a differential in pediatric patients with hemolytic anemia especially when initial work up is negative. Our patient was unique with an Hb A2 prime trait and persistence of fetal hemoglobin in the setting of a heterozygous Hb Perth. Our patient is only 6 months past the initial hemolytic episode and will require close follow up to monitor for further episodes of hemolysis.

536 LAMOTRIGINE VS LYMPHOMA: A CASE OF HEMOPHAGOCYtic LYMPHOHISTIOCYTOSIS

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10.1136/jim-2015-000035.538

Case Report Our case is a complex and interesting presentation of hematologic malignancy versus drug effect, and possible combined action of the two leading to the complex hematologic syndrome known as Hemophagocytic Lymphohistiocytosis (HLH Syndrome). A.M. is a 26 year-old male with a medical history of bipolar disorder and depression who presents with a chief complaint of fatigue, pallor, weight loss and increasing dyspnea for 2–3 months. He also reports that he was told after a recent primary care visit to present to the hospital with severe lab work abnormalities. He reports that 2–3 months ago he established with a primary care provider for management of his psychiatric conditions and was started on medication including lamotrigine. His admission examination was notable for obesity, pallor, splenomegaly and right axillary lymphadenopathy. Of note he also reported a strong family history of Non-Hodgkins Lymphoma in his father and paternal cousin. On admission he was found to have profound pancytopenia with leucopenia and neutropenia with a WBC Count <0.5, hemoglobin of 5 and platelet count in the 65. He was admitted to the Bone Marrow Hematology/Oncology service and a bone marrow biopsy was completed demonstrating morphology consistent with Diffuse Large B-Cell Lymphoma however PCR and flow cytometry failed to demonstrate any polyclonality of the B-cell line. The patient was positive for 6 of the 8 diagnostic criteria for HLH with pancytopenia, fever, splenomegaly, elevated ferritin>44,000, low fibrinogen and hemophagocytosis on biopsy. His initial presentation was diagnosed as Hemophagocytic Lymphohistiocytosis Syndrome 2nd to Lamotrigine. He was started on treatment with HLH-94 Protocol. Approximately 4 weeks after admission/initiation of treatment a repeat bone marrow biopsy was completed that demonstrated large atypical CD20 B-cells on a background of fibrosis and lymphohistiocytic infiltrate ultimately diagnosed as Diffuse Large B-Cell Lymphoma with HLH Syndrome. Our case demonstrates the interesting and significant possible harm associated with medications, as well as the potential for confounding and misdiagnosis of disease based on their use.

537 CAN ELEVATED COAGULATION FACTOR VIII CAUSE THROMBOSIS?

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10.1136/jim-2015-000035.539

Background Factor VIII is a procoagulant that is associated with activation of thrombin and ultimately in the formation of a fibrin-rich thrombus. High levels of FVIII are associated with thromboembolic conditions such as deep vein thrombosis (DVT), pulmonary embolism (PE) and myocardial infarction. **Case:** We are presenting a case of 38 year

old female with past medical history of postpartum DVT and PE at the age of 20 years for which she required hospitalization and was treated with heparin. She presented to our hospital complaining of acute, midsternal chest pain associated with left calf pain and swelling. She had no risk factors for thrombosis such as trauma, smoking history, birth control pills, or hormone therapy. Her family history was positive for unexplained thrombosis in her father at the age of 40. CT scan of the chest reported microembolus in the left upper pulmonary artery. Left lower extremity venous doppler showed an acute popliteal vein thrombus. Extensive workup was done which included PT, PTT, INR, antithrombin III, anti Xa level, lupus anticoagulant, B2 glycoprotein, cardiolipin, protein S, and Von Willebrand factor Ag were all found to be normal. The only abnormal value was elevated protein C >200%, factor VIII level >300% and factor III activity 192% of normal. Concomitantly, the patient was found to have iron deficiency anemia with ferritin level of 5.6 ng/dl, iron level 21 mcg/dl and hemoglobin of 9.4 gr/dl. She was started on anticoagulation and iron supplements. **Discussion:** High factor VIII level is considered a predisposing factor for deep vein thrombosis, by forming a complex with factor IXa, which leads to a marked acceleration of the activation of factor X, which then leads to high amounts fibrin formation. Kyrle et al studied 360 patients with venous thromboembolism, patients with plasma factor VIII had a relative risk of recurrence was 6.7. Cristine et al, found that in patients with a first idiopathic VTE, the risk of recurrence was fivefold higher in patients with high levels of FVIII, therefore making anticoagulation essential in the treatment of these patients. In our patient all coagulation studies were normal and she had no risk factors for DVT other than a high FVIII, making this the most likely cause of her recurrent DVT and PE.

538 AN INTERESTING PRESENTATION OF CEREBELLAR HEMANGIOBLASTOMA WITH POLYCYTHEMIA

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10.1136/jim-2015-000035.540

Introduction Hemangioblastoma is an uncommon neoplasm most commonly found in cerebellum, brain stem and spinal cord and rarely associated with erythrocytosis. We report a case of cerebellar hemangioblastoma with polycythemia.

Case A 41 year-old male with no significant past medical history presented with intermittent headache for 4 months. He denied visual change or gait instability. Physical examination did not show any neurological deficits. CT and MRI brain revealed a 2.7 cm mass in the left cerebellar hemisphere with extensive vasogenic edema, hydrocephalus and cerebellar herniation. Ophthalmology evaluation reported bilateral papilledema with no tumor. Laboratory findings were remarkable for hemoglobin 20.8 g/dL without leukocytosis or thrombocytosis. Erythropoietin level was not elevated. JAK2 V617 and JAK2 exon 12 mutation were not detected. The patient underwent subtotal removal of the tumor due to intraoperative bleeding. A pathology report

was confirmed to be hemangioblastoma. Second surgery for total tumor resection was recommended but the patient declined. The hemoglobin was back to normal after surgical resection. The patient was referred to radiation therapy. Because hemangioblastomas are the most common lesions associated with von Hippel-Lindau (VHL) disease, a genetic testing for VHL mutation was done but the result is pending. **Discussion** Of patients presenting with hemangioblastomas, 70% are sporadic cases, while 3–25% of these patients have tumors associated with VHL. VHL disease is an autosomal dominant syndrome of VHL involving chromosome 3, a tumor suppressor gene predisposing affected individuals to a variety of benign and malignant tumors including hemangioblastoma, retinal angioma and clear cell renal cell carcinoma. Because individual with VHL disease needs constant surveillance of tumors, it is worthwhile to rule out VHL in this patient. The polycythemia in our patient is likely from excessive erythropoietin production by the tumor. The treatment of choice for isolated hemangioblastoma is complete surgical resection. Radiation therapy may have a role in patients with multiple tumors or those with surgically inaccessible lesions. Chemotherapy such as bevacizumab, antiangiogenesis agent are being studied in clinical trials with limited success.

539 COMBINED HEREDITARY THROMBOPHILIAS PRESENTING AS BUDD-CHIARI SYNDROME

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10.1136/jim-2015-000035.541

Introduction Heterozygotes for the most common hereditary thrombophilia, Factor V Leiden, carry a 3–8 fold increased risk of developing a venous thromboembolism compared to the general population^{1, 3}. Patients with combined genetic mutations in natural anticoagulants have a much higher risk and warrant life-long anticoagulation.

Case Description A 64 year-old Caucasian female with no substantial medical history presented with one month of progressive epigastric and right upper quadrant abdominal pain with associated nausea, vomiting, and abdominal distention. Exam was notable for icteric sclera, a distended abdomen with shifting dullness, and deeply jaundiced skin. She was found to have acute renal failure, thrombocytopenia, coagulopathy, hyperbilirubinemia with equal direct and indirect fractions, and a serum-ascites albumin gradient of >1.1. Computed tomography of the abdomen revealed no substantial hepatic venous flow, and venogram performed during attempt at transjugular intrahepatic portosystemic shunt demonstrated occlusion of the main hepatic veins. Subsequent workup revealed the patient to have a single R506Q Factor V Leiden mutation and a single G20210A Prothrombin gene mutation. There was no prior personal or family history of any clotting disorder. In light of the patient's life-threatening disease process, and despite the coagulopathy from liver dysfunction, the decision was made to initiate anticoagulation with unfractionated heparin and to continue indefinitely. Heparin infusion was titrated to a therapeutic anti-factor Xa level between 0.2 to 0.4 units/mL and the total dose required to reach this level was then divided into twice daily subcutaneous dosing.

Discussion Venous thromboembolism (VTE) affects 1 in 1,000 patients annually.^{2,3} Hereditary thrombophilia most often presents with DVT and PE, though about 7% of patients present with Budd-Chiari syndrome.³ Double heterozygosity for Factor V Leiden and Prothrombin gene mutations confer a much higher risk of developing an initial VTE, with odds ratio of 20.0, and of developing recurrent VTE.²⁻⁴ This increased risk necessitates indefinite anticoagulation.

Infectious Diseases II Concurrent Session 1:00 PM Saturday, February 20, 2016

540 PREVALENCE OF *ESCHERICHIA COLI* CERVICAL COLONIZATION IN WOMEN IN PRETERM LABOR

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10.1136/jim-2015-000035.542

Purpose of Study *Escherichia coli* has become the leading cause of septicemia in premature newborns. *E. coli* is transmitted vertically, however, current genitourinary colonization rates in women in preterm labor (PTL) are unknown. Our primary objective was to determine the *E. coli* cervical colonization rate in women in PTL. Secondary objectives were to describe the strains' antibiotic susceptibilities and phylogroup classification, and the prevalence of bacterial vaginosis (BV).

Methods Used Cervical swab samples were prospectively obtained from women in PTL, which was defined as the presence of regular uterine contractions, and documented cervical effacement and/or dilatation ≥ 2 cm in patients < 37 weeks of gestation. Samples were analyzed for *E. coli* at the OU Medical Center clinical microbiology laboratory. Antibiotic susceptibilities of the recovered strains were performed with the MicroScan WalkAway plus System, and their phylogenetic group was determined by the updated quadruplex polymerase chain reaction Clermont method. A simultaneous vaginal swab was obtained to determine Nugent scores by a blinded pathologist.

Summary of Results From September, 2014, through August, 2015, 37 women were recruited. Their mean age was 26.3 (SD \pm 4.22) years, mean gestational age (GA) was 32.5 (SD \pm 3.19) weeks. *E. coli* was isolated in four women (10.8%) (95%CI 0.8–20.8) with GA ranging from 26–34 weeks. Three strains were susceptible to all antibiotics tested; one was resistant to ampicillin and ampicillin/sulbactam. Their phylogroups were B1, C, E, and F, respectively. N=14 (38%) women had BV, including one of the four colonized with *E. coli*.

Conclusions *E. coli* colonizes the cervix of women in PTL. Antibiotic resistance was not prevalent. BV was not more common in women colonized by *E. coli*. Phylogroups that occasionally cause neonatal bacteremia were identified but the traditionally invasive neonatal phylogroups B2 and D were not found. A larger study is

needed to determine whether *E. coli* cervical colonization is a risk factor for neonatal sepsis.

541 THE EFFECT OF CATHETER TYPE ON CATHETER-RELATED COMPLICATIONS IN CHILDREN WITH CANCER RECEIVING PARENTERAL NUTRITION

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10.1136/jim-2015-000035.543

Purpose of Study Long-term central venous catheters (CVCs) are essential to the care of pediatric oncology patients, but complications, such as occlusion and central line-associated bloodstream infection (CLABSI), are common. Although administration of parenteral nutrition (PN) increases the risk of complications, the effect of CVC-type on this increase is unknown. This study aimed to evaluate the effect of catheter type on catheter-related complications in pediatric oncology patients who require PN.

Methods Used This was a retrospective matched cohort study of pediatric oncology patients who received PN through subcutaneous ports or external CVCs. Complication rates were compared between CVC-types and between PN and non-PN periods using a log-negative binomial model.

Summary of Results The risk of CLABSI was higher during PN than non-PN periods for children with ports (RR 39.6, 95% CI 5.0–309; 3.6 vs. 0.1 events/1000 days) or external CVCs (RR 2.9, 95% CI 1.1–7.4; 2.7 vs. 0.7 events/1000 days). The increase in risk during PN was significantly greater for ports than for external CVCs (RRR 13.6, 95% CI 1.4–130.5). The relative increase in occlusion risk during PN was also significantly greater for ports than external CVCs (RRR 4.9, 95% CI 1.6–14.5; RR 10.0 vs. 2.0). Because of this, absolute complication rates were similar during PN.

Conclusions Despite advances in supportive care, children with cancer who receive PN are at increased risk of CLABSI and occlusion. The risk increase is greatest in children with ports, with a 40-fold increase in infection risk and 10-fold increase in occlusion risk. Due to the more severe clinical consequences of port-related complications, an external CVC is preferred for children with cancer who require PN.

542 LESSONS LEARNED IN THE TREATMENT OF STRONGYLOIDES HYPERINFECTIO IN A PATIENT WITH ACQUIRED IMMUNODEFICIENCY SYNDROME

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10.1136/jim-2015-000035.544

Case Report The helminth *Strongyloides stercoralis* preferentially infects the duodenum and jejunum causing strongyloidiasis. The immunocompromised host can develop hyperinfection, defined by a heavy parasite burden. Standard therapy for strongyloidiasis is 200 mcg/kg oral Ivermectin for two days, and is nearly 100% effective in

uncomplicated cases. However, no standard regimen for hyperinfection exists. We report a patient with acquired immunodeficiency syndrome (AIDS) and gastrointestinal (GI) hyperinfection requiring prolonged Ivermectin therapy for clinical and parasitological cure. A 44-year-old African-American male with AIDS (CD4 count 3) presented with 10 days of vomiting, diarrhea, and diffuse abdominal pain. Physical exam was remarkable for tachycardia and abdominal tenderness. Computed tomography (CT) abdomen denoted jejunitis, and stool ova and parasite (O&P) exam showed *S. stercoralis* larvae. Endoscopy revealed inflammation with mucosal edema. Stomach and duodenal biopsies confirmed GI hyperinfection with *S. stercoralis*. The patient received standard Ivermectin therapy and was discharged in stable condition. One week later, his initial symptoms recurred with additional melena and an unchanged physical exam. Hemoglobin and hematocrit were 5.6 g/dL and 18.3%. CT abdomen showed small bowel obstruction. Repeat endoscopy revealed innumerable oozing duodenal ulcers requiring emergent embolization of feeding arteries. Duodenal biopsies showed persistent hyperinfection with *S. stercoralis*. The patient received oral Albendazole and Ivermectin for 7 and 14 days, respectively. Repeat stool O&P exam was negative. His symptoms resolved, and he was discharged without further events. Standard Ivermectin therapy may fail to treat *Strongyloides* hyperinfection. This can be attributed to subtherapeutic Ivermectin levels due to poor GI absorption. Although no standard regimen exists for hyperinfection, some reports suggest effective treatment with prolonged oral Ivermectin, oral Ivermectin and Albendazole, or parenteral Ivermectin. Therapy in the immunocompromised with malabsorption secondary to *Strongyloides* hyperinfection should be more extensive than standard Ivermectin therapy.

543 REPORT ON WEST NILE INFECTIONS IN LOUISIANA

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10.1136/jim-2015-000035.545

Purpose of Study This report focuses on human surveillance. The main goal of human surveillance is to describe the disease burden in different populations, annual trends and the data to disseminate information to the medical community, and the vector control information for prevention.

Methods Used Passive reporting system is used in the state for surveillance and reports are commonly received in the National Electronic Disease Surveillance System Base System. Health care facility staff enters data on reportable diseases. The ID epi section can receive lab result directly through ELR, mail and fax. ID Epi disease surveillance specialists have real-time access and alerted to the data entered. They review the data, process the report, and complete case investigations. Data is submitted to the NNDSS at CDC. Access 2010 was used to analyze the data.

Summary of Results 80% of WN infections are asymptomatic; 19% have fever, 1% is NID. From 2002 to 2014; 937 cases are of NID; it represents 80% of all WN-NID,

the total number has been 1,170. If this represents only 1% of all WN infections, then there were approx. 117,000 persons infected. Out of a population of 4.5 million residents, it represents 2%. In 2002 the M:F ratio was 1:1 but it is increased to 1.5 for the period 2003–2014. The main difference between M and F occurs at the higher age groups. The proportion of African-American is around 30% of WNV-NID cases. In 2002, the incidence of new cases of NID remained between 0.1 to 5/100,000 from infancy to age 50, and then increased sharply to 15 and up to 25/100,000 for the older age group. Overall the case fatality rate was 8 to 9% of NID. It is strongly associated with age ranging from 2% in younger ages to 10% in the 60 s–70 s and to 25% in over 85.

Conclusions It appears that ecological changes caused by temperature, rainfall and other meteorological conditions influence mosquito and bird populations and are the major factors in the trends of WN. There are no consistent patterns in incidence and area. The consistent patterns are seasonal transmission starting from June to August and ending in October to December. Prevention consists of an early warning system to detect the presence of virus, reduction of the numbers of mosquitoes by destroying mosquito larvae, killing adult mosquitoes, prevent mosquitoes from biting people, and diagnose encephalitis early.

544 LISTERIA BACTEREMIA: A HIDDEN REASON TO AVOID THE DELI

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10.1136/jim-2015-000035.546

Case Report A 59 year old man presented to the Emergency Department (ED) with five days of subjective fevers, night sweats, and progressive shortness of breath with exertion. He also reported one month of generalized fatigue, decreased exercise tolerance, and two days of loose stools. In the ED, he was tachycardic to 110 bpm and febrile to 105.5 oF. On physical exam he was having rigors and had a new petechial rash on his lower extremities. He had no lymphadenopathy, meningeal signs, or cardiac murmurs. Labs were significant for thrombocytopenia (30 K/uL), leukocytosis (16.79 K/uL), anemia (hemoglobin 7.5 g/dl, hematocrit of 23.5%) and an elevated creatinine (1.5 mg/dl). Chest radiograph was unremarkable, CT abdomen only showed a non-obstructing left renal stone, and CTA chest was negative for PE but did showed splenomegaly. Blood and urine cultures were drawn and he was started on empiric vancomycin, piperacillin-tazobactam and Ciprofloxacin. Blood cultures grew out *Listeria monocytogenes* and antibiotics were changed to ampicillin. He was improving on exam but on day three his WBC started to trend up. The leukocytosis continued to trend up but the patient returned to his subjective baseline and on day seven he insisted on being discharged. On discharge he was noted to have leukocytosis (26.77 K/uL) and thrombocytopenia (30 K/uL). On follow up with Hematology/Oncology his WBC increased to 93.77 K/uL. A bone marrow biopsy showed hypercellular marrow 90–100% of which was replaced with mature T-cells. He was diagnosed with

T-cell polymorphocytic leukemia and was started on chemotherapy.

Discussion *Listeria monocytogenes* is a pathogen most commonly associated with neonates, pregnant women, elderly and the immunocompromised. *Listeria* is a small facultative intracellular anaerobic Gram positive rod with flagellae that favors refrigerated temperatures. *Listeria* commonly causes infection after ingestion of contaminated foods. T-cell lymphokine activation of macrophages clears *Listeria* from the blood and leads to immunity. Individuals with hematologic malignancies are at increased risk of *Listeria* infection and have higher mortality rates from listeriosis, leading one to believe that perhaps it's not just the pregnant women who should avoid the deli counter.

545 GENDER EFFECT ON CHANGE OF BODY MASS INDEX AMONG ANTIRETROVIRAL-NAIVE HIV-INFECTED INDIVIDUALS STARTING ANTIRETROVIRAL THERAPY

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10.1136/jim-2015-000035.547

Purpose of Study Historically HIV infection has been linked to a 'wasting syndrome', however overweight status and obesity occur frequently in HIV infected individuals receiving current anti-retroviral therapy (ART). We report on the BMI changes in a cohort of ART naïve HIV-infected individuals starting ART.

Methods Used This is a substudy of a retrospective, observational, longitudinal chart review of HIV-infected anti-retroviral naïve adult subjects who initiated their first combination ART between June 1, 2001 and December 31, 2011 and remained on ART for at least 1 year. Continuous data were compared using a Student's t-test and categorical data were compared using Chi-square statistics. Changes in weight were analyzed by a paired Student's t-test within a cohort and by a Student's t-test between the two cohorts. Repeated measures analyses of BMI were performed using proc mixed. Statistical analyses were performed using SAS, version 9.2 (SAS Institute; Cary, NC).

Summary of Results BMI and weight increased during the first 6 months of ART (23.7 to 26.1 kg/m², $p < 0.001$; 71.4 kg to 78.5 kg, $p < 0.001$) followed by an attenuated increase in BMI and weight from 6-months to 5 years of follow-up. Mean differences in BMI and weight over 5-years were 2.8 kg/m and 7.4 kg higher respectively in HIV-infected women compared to HIV-infected men ($p < 0.001$). During the first year of follow-up, young women (18–39 yrs) had the highest BMI (mean=31.5 kg/m² after 12-months of follow-up vs 25.6 kg/m² in young men). Multivariable analyses indicated that the 6-month BMI change was 0.8 kg/m² higher in females compared to males ($p = 0.02$), 0.6 kg/m² higher in patients treated with a boosted PI regimen compared to NNRTI ($p = 0.006$) and 0.9 kg/m² higher in patients less than 50 years of age compared to patients over 50 at enrollment ($p = 0.01$). The adjusted 6-month difference in weight gain was 2.9 kg

(95% CI: 0.68 to 5.11) higher in females than males ($p = 0.01$).

Conclusions In our cohort of HIV-infected patients, two thirds of the patients are overweight or obese at baseline, females more than males. After starting ART, the trends continue with women gaining more weight than men. Future studies should incorporate nutritional counseling and a weight loss program to the management of ART naïve individuals.

546 TODDLER WITH COCCIDIOIDES POSADASII MENINGITIS PRESENTING WITH HYDROCEPHALUS

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10.1136/jim-2015-000035.548

Introduction Coccidioidomycosis is a fungal infection that often presents with respiratory symptoms. In rare and serious cases, infections are disseminated and can cause meningitis and hydrocephalus. We describe a toddler presenting with hydrocephalus that was later revealed to be due to *Coccidioides posadasii*.

Case Description A 2-year-old male presents with hydrocephalus. A shunt was placed by neurosurgery. Cerebrospinal fluid (CSF) cultures and indices were sent and were negative. One year later, he presented for intermittent headaches and fever. A brain magnetic resonance imaging (MRI) revealed enlarged ventricles. He was diagnosed with a shunt malfunction and the proximal portion of the shunt was replaced. CSF studies at that time showed: 9 white blood cells (WBC)/ μ mL, Glucose 41 mmol/L, Protein 11 g/L. The culture was negative. A few days later, he was readmitted to the hospital for continued symptoms. Shunt tap revealed CSF with 86 WBC/ μ mL, Glucose 47 mmol/L, Protein 13 g/L. Gram stain showed large Gram variable filamentous structures, and the culture grew *C. posadasii* species. An enzyme linked assay was positive for IgM and IgG *Coccidioides* antibodies. Upon further discussion, the family revealed that he had visited family in Texas at 3 months of age. During his hospital stay, the patient had his shunt replaced. Fluconazole was started with improvement in symptoms.

Discussion Coccidioidomycosis, also known as valley fever, is endemic in arid regions of the Southwest region of the United States. *Coccidioides* is a dimorphic fungi that is transmitted by inhaling airborne arthrospores from soil. There are 3 different types of coccidioidomycosis infections—acute, chronic, and disseminated infection. Disseminated infection can involve meningitis affecting the basilar meninges and hydrocephalus in an estimated 0.1% of patients. Symptoms include persistent headache, vomiting, and altered mental status but respiratory symptoms are often absent. Cerebrospinal studies will demonstrate leukocytosis, increased protein, and decreased glucose. CSF cultures and *Coccidioides* serologies help determine the diagnosis. Preferred treatment is with lifelong fluconazole. Mortality is 95% within 2 years if left untreated.

547 **UNIQUE ASPECTS OF PEDIATRIC TUBERCULOSIS IN A MID SOUTH CHILDREN'S HOSPITAL: DEFYING NATIONAL NORMS**

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10.1136/jim-2015-000035.549

Purpose of Study While overall tuberculosis (TB) incidence in the United States (US) has been decreasing, the relative percentage of TB among foreign-born individuals has continued to rise. Recent CDC data show that foreign-born individuals account for the majority of TB cases in the U.S. with the case rate of TB among this group being 11 times higher than US born. We sought to determine if our local data are consistent with the national trends and describe the demographics and clinical characteristics of children with TB at our institution in Memphis, Tennessee.

Methods Used We retrospectively reviewed the records of all children with a diagnosis of TB admitted to Le Bonheur Children's Hospital from 2009 through 2014. CDC case definitions of active and latent TB were employed to further classify these cases. Relevant demographic, clinical, laboratory and radiologic data were extracted from the electronic medical record and summarized using descriptive statistics.

Summary of Results A total of 38 patients were identified, including 33 active and 5 latent cases. The active cases were further divided into 26 pulmonary and 7 extra-pulmonary cases. Surprisingly, of the 38 cases, only 11% were foreign-born or from foreign-born households. 82% self-identified as African American, and 60% of cases occurred in children under the age of 5. Of the confirmed TB cases, the most common presenting symptoms were chronic cough (58%), reported fever (42%), weight loss (36%), and night sweats (33%). Close contact with TB was the most common risk factor among TB cases (52%); however, 21% had no identifiable risk factor. Radiological findings revealed infiltrates in 55% of the cases and, hilar lymphadenopathy was observed in 33% of the cases. TB skin tests were positive in 75% of cases.

Conclusions In contrast to national epidemiologic trends, the overwhelming majority of pediatric TB cases in Memphis occur in U.S.-born children. Cases occur predominantly in African-American children, many of whom lack identifiable risk factors for TB disease. Awareness of local epidemiologic trends can aid clinicians in maintaining an appropriate index of suspicion for TB in children.

548 **SERRATIA MARCESCENS INFECTIOUS ENDOCARDITIS: HIGH INCIDENCE OF LEFT-SIDED DISEASE AND POOR OUTCOMES**

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10.1136/jim-2015-000035.550

Purpose of Study *S. marcescens* infectious endocarditis (SMIE) is an uncommon disease. Based on recent cases seen at our institution, we sought to review the clinical syndrome of this disease.

Abstract 548 Table 1

	Published Cases	Emory Cohort	Total
IDU n(%)	30 (55.6%)	3 (60%)	33 (56%)
Native valve n(%)	36 (66.7%)	5 (100%)	41 (69%)
Left heart disease n(%)	29 (53.7%)	3 (60%)	32 (54%)
Embolic phenomena n (%)	30 (55.6%)	3 (60%)	33 (56%)
Vegetation size (mm) (mean/standard deviation)	15.5 (2.1)	14.2 (2.9)	15.2 (2.3)
Survival to discharge n (%)	23 (42.6%)	3 (60%)	26 (44%)

Methods Used We reviewed records for patients with *S. marcescens* bacteremia (SMB) or positive cardiac valve cultures in the Emory University Health System between January 2003 and December 2014. We searched PubMed for all studies published in the English language through January 2015 using the terms "endocarditis" and "*Serratia*". Patients from the Emory cohort and published cases were classified according to the modified Duke criteria for infectious endocarditis. Patients and published cases that met definite criteria for infectious endocarditis were included in the study. Nominal variables were analyzed by Fisher's exact test. Comparison of parametric data were performed using the Student t test.

Summary of Results We reviewed 321 episodes of SMB at our institution and found 5 cases of SMIE. Cases were significantly more likely to have a history injection drug use (IDU) compared to non cases (p=0.001). Central line infections were the most common source of SMB in our cohort (31.2%). The only source of SMB significantly associated with SMIE was IDU (p=0.007). Diabetes mellitus, immunodeficiency, and end stage renal disease were not associated with SMIE. 54 published cases met inclusion criteria resulting in 59 patients in the final analysis. Native valve disease predominated, and patients typically had large vegetations with embolic complications. IDU was reported in 56% of cases, and 62% of IDU cases had left-sided disease. Survival to discharge was poor (table1).

Conclusions SMIE is a rare complication of SMB; however, mortality during index admission is high, possibly related to the relatively large size of vegetations. Interestingly, left-sided disease was more common among IDU, differing from the typical presentation of infectious endocarditis in IDU.

549 **DIVERGENT CHOLINE-BINDING PROTEIN PATTERNS CHARACTERIZE PENICILLIN SUSCEPTIBLE AND RESISTANT SEROTYPES OF STREPTOCOCCUS PNEUMONIAE**

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10.1136/jim-2015-000035.551

Purpose of Study *Streptococcus pneumoniae*, the most common cause of community-acquired pneumonia,

contains choline binding proteins (cbp) that are bacterial surface proteins involved in pathogenesis. They bind non-covalently to choline in teichoic and lipoteichoic acids found in the cell wall and membrane of *S. pneumoniae*, respectively. We investigated invasive *S. pneumoniae* isolates for cbpA and cbpG and penicillin resistance.

Methods Used We tested 199 isolates recovered from patients with invasive disease admitted to three area hospitals from 1981 to 2014. Isolates serotyped by Quellung reaction and penicillin susceptibility determined by Etest®. The genomic DNA from harvested colonies was extracted using a Qiagen DNeasy kit and amplified by PCR for detection of cbpA and cbpG genes. All isolates were tested using the first of two different primer sets and isolates which did not show cbpA bands were amplified for cbpA with a second primer set. Positive results were assigned to either cbpA clade A or B.

Summary of Results Of 199 isolates, 80 showed cbpA bands with the first primer set and 108 showed cbpA bands with the second primer set that were categorized into two clades, 36 clade A and 72 clade B. Eleven (5.5%) isolates showed no bands. The 5 sensitive only serotypes exhibited only clade B, 41 of 72 clade B. Of the 10 serotypes which developed penicillin resistance, T14 had 15 clade A and 3 B; T19A and T19F together had no clade A and 14 B; T35B and T35F together had 10 clade A and 1 B; T15 had no clade A and 4 B. The other four serotypes had about equal clade A and B. Ninety-eight isolates showed cbpG bands distributed among one-half of the isolates with cbpA clade A and B.

Conclusions Resistant serotypes differed from sensitive only serotypes and also resistant serotypes differed from one another by clade patterns. Our findings suggest that the association of clades of cbpA and penicillin susceptible or resistance serotypes reflect the propensity of cbp to promote or stabilize colonization thereby increasing the opportunities for exposure to penicillin and for exchange of genes between penicillin susceptible and resistant *S. pneumoniae*.

Medical Education, Medical Ethics, and Advocacy

Concurrent Session

1:00 PM

Saturday, February 20, 2016

550 I-SPY ON I-PASS: MEDICAL STUDENT AUDITING OF PATIENT HANDOFFS

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10.1136/jim-2015-000035.552

Purpose of Study An ACGME Clinical Learning Environment Review at our institution in 2013 identified opportunities for improving patient (pt) hand-off (HO) processes. A new hospital HO protocol was adopted in 2014. First year medical students (M1s) were offered a paid summer opportunity in 2015 to audit HO processes in 10 clinical departments (CDs) to assess compliance with hospital HO protocol, review HO training for residents,

and identify opportunities for HO improvement.

Methods Used Five M1s participated in the project and underwent extensive training in recognized best practices in patient care HOs. They reviewed internal data on patient harm, available hand-off literature, and watched videos of "good" and "bad" HOs. They were each assigned to round for 2–5 days in the CDs, observing a minimal 2 HO encounters in each (total 10 per CD). M1s used a written audit tool to assess HOs with a focus on location, duration, distractions, pt status, pt summary, action items, contingency planning, engagement of receiving physician, and utility of the written tools used. M1s collated their observations, identified opportunities for process improvement, and feedback was provided to CDs. Time allowed for re-audit after feedback of only 1 CD to date.

Summary of Results M1s identified opportunities in all CDs for improvement in HOs. Few HO's occurred in distraction minimized locations, no CD's routinely included pt status to assist in triage if needed, action items were often incomplete, and little contingency planning advice was provided. Most observed residents received little formal HO training, and few articulated critical role of HOs in preventing pt harm. Re-audit of the Internal Medicine CD six weeks after feedback revealed significant changes. All HOs now take place in quiet team rooms. A revised written tool assures assigned pt status, clearly defines required action plans, and provides contingency planning. Hospital HO protocol is reviewed monthly with all ward teams and all residents audited recognized critical importance of HOs in reducing pt harm.

Conclusions With appropriate training, pre-clinical medical students can effectively review patient HO processes resulting in improved communication, an enhanced institutional culture of safety, and likely reduction in patient harm events.

551 PHYSICIANS IN TRAINING WITH PHYSICAL DISABILITIES: REMOVING BARRIERS THROUGH CULTURAL COMPETENCY AND ADAPTIVE STRATEGIES

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10.1136/jim-2015-000035.553

Purpose of Study Statistics on healthcare workers with disabilities are difficult to ascertain. In 1997, the president of the AAMC challenged the medical profession to increase the diversification of physicians, including disability. Yet, reports on the matriculation of medical students with disabilities has minimally increased due to persistent barriers and lack of disclosure. Residents work in various clinical settings to meet the ACGME's core competencies. Competency in patient care is a primary concern for those with physical impairments. Programs face the challenge of how to accommodate trainees while upholding patient safety. No guidelines exist for training programs that offer adaptive guidelines. We identified accommodation strategies using current literature, U.S. law, and the experiences of five young physicians with physical challenges.

Methods Used Strategies implemented include: 1) GME

Disabilities Services Coordinator 2) walkthroughs of work environments 3) ADA-compliant areas 4) individualized environmental modifications 5) individualized supplies and assistive technology 6) available support staff 7) modified procedural skills 8) awareness for increased fatigability

Summary of Results The primary author uses a power wheelchair, has a form of dwarfism, and completed her first two years of residency using these strategies, with the exception of a GME Disabilities Services Coordinator. She is currently applying to fellowship programs as a third-year resident. Additionally, four young physicians with physical impairments (spinal cord injuries, cerebral palsy, a collagen/joint disorder, and dwarfism) throughout the U.S. are pursuing careers in clinical medicine through many of these strategies.

Conclusions Benefits to accommodating trainees include improved productivity, morale, and access to healthcare by patients. Statistical research, documented experiences for successful models, and awareness training about physicians with disabilities are lacking. A national mentoring network is needed to offer strategies and career counseling as well. Thus, programs are encouraged to rank applicants with disabilities and plan for their success through increased awareness, mentorship, and formalized accommodation strategies.

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SMOKING CESSATION COUNSELING: A SIMULATION ENHANCED CURRICULUM TO IMPROVE COMMUNICATION SKILLS IN PEDIATRIC RESIDENTS

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Purpose of Study The burden of tobacco smoke is well known to healthcare providers. Despite this, pediatric residents often have little education on evidence-based smoking cessation counseling. Our objective was to improve resident comfort and skill in smoking cessation counseling for caregivers of pediatric patients.

Methods Used This was a single institution intervention study. A multidisciplinary team was assembled to create the simulation curriculum on smoking cessation counseling for caregivers of pediatric patients. Residents participated during their Pediatric Pulmonology rotation and received didactic training including the 5 A's (Ask, Advise, Assess, Assist, Arrange), 1-800 QUIT NOW, NRT, and motivational interviewing. The residents participated in one of two clinical scenarios involving a standardized "patient." The didactic session was 20 minutes with each scenario being 10 minutes of counseling and 10 minutes of debriefing. Confederates participated in the debriefing. Survey data was collected pre and immediately post-curriculum on participant comfort level to provide varied aspects of smoking cessation counseling. Statistical analysis using a paired student t-test comparing pre and post intervention date was done with SPSS software.

Summary of Results 24 residents participated in the simulation curriculum between Nov 2014 to Aug 2015. 17 (68%) were in their first year of residency and the remaining 3 (32%) were second year or greater. There were 16

medical schools represented and 11 (44%) residents had no formal prior smoking cessation counseling training. Survey scores improved significantly after the simulation in 5 of 6 areas including comfort in counseling parents ($p < 0.0001$), perceived effectiveness in counseling ($p < 0.0001$), familiarity with NRT ($p < 0.0001$), comfort recommending NRT ($p < 0.0001$), and familiarity with 1-800 QUIT NOW ($p < 0.0001$). In summary, pre survey totals were 18.4 +/- 4.6 and increased post survey to 27.0 +/- 2.3 ($p < 0.0001$).

Conclusions Smoking cessation counseling training via simulated patient encounters complimenting didactic education is effective in increasing pediatric resident comfort levels and perceived effectiveness of smoking cessation counseling.

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THE OKLAHOMA CHAPTER AAP OBESITY PROVIDER AND PARENT HANDOUTS: TOOLS TO ENCOURAGE LIFESTYLE CHANGES TO MANAGE AND PREVENT PEDIATRIC OBESITY

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Purpose of Study Studies show that pediatric primary care providers report concern for childhood obesity, yet lack resources to assist with behavioral counseling. In response, the Oklahoma AAP Chapter (OKAAP) Obesity Committee developed a toolkit consisting of provider and parent handouts to assist pediatricians in behavioral counseling on healthy habits. The goal of this advocacy project is to report on the process of the toolkit design and implementation.

Methods Used The OKAAP Obesity Committee reviewed existing AAP resources and Expert Committee Recommendations on obesity prevention and management. Eight topics were chosen for the handouts: sugar-sweetened beverages, screen time, sleep, breakfast, family mealtime, physical activity, balanced meals, and food quality. A literature review was conducted for each topic, and Committee members met regularly to determine content and design of the handouts. Each parent handout included information on one of the eight healthy behaviors along with tips to elicit change. An accompanying provider handout was developed to provide counseling information on each topic. The provider handouts also include four steps, utilizing motivational interviewing techniques, to assist with facilitating behavior change: obtaining patient history, discussing the health behavior and family reasons to change, setting a realistic goal for change, and contracting goals. The Oklahoma City County Health Department provided funding for the project.

Summary of Results The final toolkit will include the following components: a patient questionnaire on health habits to assist with identification of behaviors to change, eight provider and parent handouts on healthy behaviors, and a motivational interviewing guide. All toolkit components will be loaded onto flash drives to allow for electronic access of materials. Implementation will include presentation and distribution of the toolkit at the Annual Pediatrics and OKAAP Meeting in Spring 2016.

Conclusions The OKAAP Pediatric Obesity Toolkit is an evidence-based resource designed to assist primary care providers in encouraging behavioral change for obesity prevention and management in everyday practice. A follow up survey will be conducted to assess the utility of the toolkit.

554 RESIDENT CAPACITY AND EFFICIENCY ACROSS TRAINING YEARS IN A PEDIATRIC EMERGENCY MEDICINE DEPARTMENT

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10.1136/jim-2015-000035.556

Purpose of Study Teaching centers strive to give residents quality patient data feedback during residency rotations. The medical literature highlights data on residents, attendings, and mid-level providers in the adult emergency department; however, little data is reported in pediatric training centers. Our study takes a closer look at patients seen per hour in a busy pediatric level 1 trauma center, which evaluated 69,158 patients from July 2014 through June 2015.

Methods Used The electronic health record of our pediatric emergency department was queried for resident involvement in patient care. Number of patients seen, hours worked and acuity scores were collected for each PGY. Comparison of total number patients, patients per hour and acuity were done using Bon-ferrani T test.

Summary of Results 56 residents, 96 total resident months, were evaluated retrospectively, with data spanning 16,000 patient encounters. Number of hours varied based on length of rotations and number of months worked. Number of patients seen and average patients per hour (PPH) each increased with increasing PGY (T= 3.4 and 3.9 respectively; p=0.05). This suggests statistical significance between post graduate year and average PPH. Triage assigned acuity numbers (5=lowest, 1=highest) were found to be approximately the same with the averages being 3.601, 3.568, and 3.593 for PGY1, 2, 3, respectively.

Conclusions As a resident matriculates through their education, resident efficiency does increase, even while seeing patients with a higher or equivalent acuity score. This is an important tool in delivering patient-data feedback for residents, as well as attempting to set pediatric emergency medicine rotation standard expectations for efficiency. The data can be used for developing the most optimal staffing

for our particular institution, and future considerations would include examining resident perception of their own efficiency compared to reality and examining the effect of shift length on resident efficiency in pediatrics.

555 APPLICATION OF PEDIATRIC SIMULATION TRAINING FOR EMERGENCY PREHOSPITAL PROVIDERS

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10.1136/jim-2015-000035.557

Purpose of Study Pediatric patients account for a small percent of Emergency Medical Services (EMS) calls and few require critical care. Since prehospital providers have few opportunities to acquire and maintain pediatric knowledge and skills, a simulation based curriculum has been successfully developed and evaluated in 1 EMS system. This study examined change in knowledge and satisfaction when adapting this curriculum in another EMS system.

Methods Used EMS providers from 3 agencies participated in a simulation-based course focused on assessment and treatment of ill and injured children which included 4 standardized pediatric high-fidelity simulations followed by group debriefings. Pre- and Post-tests specific to the learner's level of training were utilized to assess change in knowledge. Satisfaction was assessed with a 5 point, Likert-based scale on post-course evaluations. Pre- and post-test scores were compared using a Wilcoxon Signed-Ranks Test. Descriptive analysis was used for the post course satisfaction ratings.

Summary of Results Twenty-eight EMS providers participated. Two providers were excluded. The mean pre-test score was 16.1 out of 25 (median 16.5, std dev 3.0). The mean post-test score was 18.1 (median 18.5, std dev 2.5), which was significantly higher than pre-test scores (p<0.001). The mean satisfaction score for the course was 4.96 (median 5). Providers rated the course's potential impact on clinical performance with a mean score 4.93 (median 5).

Conclusions Use of a pediatric-specific simulation based curriculum significantly improved immediate provider knowledge. Use of a simulation-based curriculum was associated with high learner satisfaction. Providers also believed the course would improve their clinical performance.

Abstract 554 Table 1

PGY	N	Patients				PPH				Acuity			
		Avg	Max	Min	SD	Avg	Max	Min	SD	Avg	Max	Min	SD
1	36	157	232	87	34	0.98	1.57	0.66	0.18	3.6	3.97	2.98	0.18
2	41	183	307	110	43	1.14	1.66	0.66	0.19	3.56	3.95	3.30	0.19
3	18	187	260	126	36	1.21	1.84	0.78	0.28	3.59	3.99	3.36	0.28

556

LOOK WHO'S TALKING: INSIGHT INTO PROVIDER TO PROVIDER COMMUNICATION IN CHILDREN WITH DEVELOPMENTAL CHALLENGES

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10.1136/jim-2015-000035.558

Purpose of Study This study aims to gain insight into communication between surgical subspecialists and primary care physicians (PCP) at our home institution who care for children with autism, developmental delays, and/or intellectual disabilities, specifically with regards to managing post-operative care. This is a preliminary study to identify communication procedures and to assess interest in pursuing changes to current practices.

Methods Used Two separate surveys were sent to pediatric surgical subspecialists and primary care providers at our home institution. They were delivered using an anonymous online vehicle via survey monkey and were not linked to any particular individual. Participants had to opt-in to the study by completing the survey. Each survey consisted of five simple questions to assess current communication practices regarding postoperative management of the population described above and determine if there is a desire for changes in the future. The surveys were analyzed using standard statistical methods. IRB approval was obtained for this study.

Summary of Results There is currently little communication prior to surgical interventions on children with autism, developmental delays, and/or intellectual disabilities among surgeons and primary care providers at our home institution. Primary care physicians have expressed a desire to improve communication. Analysis of results from the surgical subspecialists is currently underway.

Conclusions Little literature exists regarding postoperative care of children with autism, developmental delays, and/or intellectual disabilities. Caring for these children can be challenging and communication is often difficult with regards to medical and surgical procedures. Surgeons have had to think creatively in determining effective postoperative care for these patients, but they often do this without involving the PCP, who is typically more familiar with the child's individual needs. Involving the child's PCP in these discussions has the potential to improve this care, even if it is only to help the child and his/her family feel more comfortable with the plan. Physicians at our institution have expressed a desire to open more lines of communication prior to procedures being completed. Future studies will look to determine how best to achieve this so that we can optimize the care these children receive.

557

NEONATAL INTENSIVE CARE UNIT BOOT CAMP: A SUPPLEMENTAL, PREPARATORY CURRICULUM FOR HOUSE OFFICERS

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10.1136/jim-2015-000035.559

Purpose of Study Medical education and resident training have undergone significant changes in recent years with the introduction of duty hour restrictions, milestone-based competency evaluations, and a shift towards a more resident-driven career path-directed curriculum. With these changes, residents are doing fewer required ICU rotations. The ACGME residency guidelines require residents to have "two units of NICU" during three years of training. Additionally, since the 1999 Institute of Medicine's publication "To Err is Human: Building a Safer System," much focus has been placed on patient safety and reducing medical error. In an effort to combine these two dichotomous extremes of less exposure with less medical error, we introduced "NICU Boot Camp" as a supplemental curriculum immediately prior to beginning a rotation in the neonatal intensive care unit with the intention of preparing residents.

Methods Used Our boot camp consists of 3 one-hour sessions. Two didactic sessions encompass expectations, infection control, calculations, nutrition, respiratory management, and on-call problems. One simulation session combines the knowledge received with three hands-on real-life scenarios. At the completion of their NICU month, residents were given a survey to complete about the boot camp experience.

Summary of Results A total of 32 residents have participated in the sessions, and overwhelmingly support the curriculum. Out of a usefulness max score of 4, Session 1 (Orientation/Calculations) received 3.39, Session 2 (Respiratory/On Call Problems) received 3.35, and Session 3 (Simulation) received 3.44. Eighty-four percent of responders felt it would be useful to repeat the boot camp prior to each rotation.

Conclusions Translation of success with less patient error will take time to evaluate. However, this boot camp gives residents the opportunity to feel more comfortable while in an unfamiliar high stakes, high stress environment. With ongoing changes in medical education requirements, there is room for further expansion to other disciplines by planning a similar boot camp curriculum.

558

AN EDUCATIONAL INTERVENTION TO ENHANCE RETENTION OF KNOWLEDGE AND SKILLS OF NEONATAL RESUSCITATION IN PGY2 AND 3 PEDIATRIC RESIDENTS IN ONE RESIDENCY PROGRAM.

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10.1136/jim-2015-000035.560

Purpose of Study To improve neonatal resuscitation knowledge and skills of pediatric residents' and enhance their retention of learned material in one urban academic hospital by providing an intensive neonatal resuscitation course which combines an instructor led refresher course with a series of self-directed brief skill practice sessions during the Neonatal Intensive Care Unit rotation month.

Methods Used Prospective, randomized controlled trial with intervention and control groups. Pediatric residents post graduate year 2 (class of 2015) and post graduate year

3 (class 2014) rotating through the Children's Memorial Hermann Hospital Houston neonatal intensive care unit (NICU) were cluster randomized into intervention and control groups by month of NICU rotation using sealed opaque envelopes given to the instructor on arrival to the training for that group. All study participants baseline knowledge and resuscitation skills were assessed at the beginning and end of the month long rotation. The intervention group received a 2 hour neonatal resuscitation refresher at the beginning of the month with a weekly ten minute self directed skills practice. The control group did not. All participants knowledge and skills were reevaluated 6 months or later after completing the NICU rotation to assess retention of learned material.

Summary of Results Preliminary results show an average score of 72% on the knowledge pretest in the control group range (40–100%) and a 14% pass rate on the skills assessment. At the end of the month, there was an 8 point increase in the knowledge test and 28% pass rate on NRP skills assessment. For the intervention group, the average score at on the knowledge pretest in the was 64% with a 15 point improvement by the end of the month. On the skills assessment, there was a 100% fail rate with 89% pass rate on the skills test by the end of the month. These findings are consistent with the available literature.

Conclusions Study follow up is ongoing to evaluate if the intervention results in improved retention of knowledge and skills.

Perinatal Medicine II

Concurrent Session

1:00 PM

Saturday, February 20, 2016

559 THE ROLE OF ADIPONECTIN IN GLUCOSE HOMEOSTASIS IN THE PREMATURE BABOON MODEL

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10.1136/jim-2015-000035.561

Purpose of Study Neonatal hyperglycemia, reported in 80% of premature infants, is thought to be due to multiple factors including skeletal muscle insulin resistance, persistent hepatic glucose production and alterations in adipose tissue endocrine hormone production. In response to insulin stimulation, adipose tissue secretes adiponectin, which then enhances insulin sensitivity at target tissues including skeletal muscle and liver, thereby decreasing serum glucose levels. The endocrine function of adipose tissue and its role in glucose homeostasis in premature infants has yet to be elucidated.

Methods Used Eleven baboons were delivered prematurely via C-section at 125 d gestational age (GA) or near term at 175 d GA (term=185 d GA) and survived for 14 days. A hyperinsulinemic, euglycemic clamp was performed on day of life (DOL) 5 and 14 to evaluate the response of tissues to maximal insulin stimulation. Total serum adiponectin and high molecular weight (HMW) adiponectin were measured by ELISA at the end of the clamp. Adipose

tissue was obtained on DOL 14 and quantitative mRNA expression of key adiponectin signal proteins [insulin receptor (INSR), insulin receptor substrate-1 (IRS-1), protein kinase B (Akt), and peroxisome proliferator-activated receptor gamma (PPAR γ)] within adipocytes were measured by RT-PCR. Statistical analysis was performed using SPSS v.22.

Summary of Results Insulin sensitivity (M value) was significantly lower in preterm baboons as compared to term (18.8 \pm 2.8 vs. 13.7 \pm 1.3 respectively, $p<0.05$). Total adiponectin was significantly reduced in preterm baboons at DOL 14 (29% of term baboons $p<0.01$). HMW adiponectin was also reduced in preterm baboons at DOL 14 (19% of term baboons $p<0.05$). Relative mRNA expression of PPAR γ and INSR was decreased in preterm baboons (54% and 71% of term baboons respectively, $p<0.05$). No differences in the mRNA expression of Akt and IRS-1 were noted.

Conclusions Preterm baboons have decreased serum levels of total and HMW adiponectin. This decrease in adiponectin secretion is likely due to down regulation of key intracellular adipocyte signaling molecules. The significantly decreased levels of HMW adiponectin, the most active tetramer at peripheral receptors, may play a role in the pathogenesis of insulin resistance and hyperglycemia of prematurity.

560 LIPID AND ENERGY LOSSES ARE GREATER WITH PROLONGED FEEDING TIMES

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10.1136/jim-2015-000035.562

Purpose of Study To determine the lipid and energy losses (%) that occur with gastric tube feedings.

Methods Used This study was determined to be exempt by the University of Louisville IRB. Samples of frozen, native human milk (de-identified) which would have been discarded, were collected. Milk samples were thawed in the refrigerator overnight, pooled and an initial sample was analyzed (Calais Human Milk Analyzer, North American Instruments, Solon, OH) for macronutrients. Eight 35 mL syringes (Neomed, Woodstock, GA) were prepared to simulate a 24-hour feeding regimen (q 3 hr) with polyurethane or silicone 5 FR NG tubes. Milk was delivered via gravity or by 1-hr infusion (Medfusion 3500, Smiths Medical ASD Inc., St. Paul, MN). Pump set-up included a 60" extension tube. Each feeding aliquot was collected and subsequently analyzed. All scenarios were run in triplicate.

Abstract 560 Table 1

	Gravity (NG only)		1-hour feeding pump (NG+60" extension tube)	
	Silicone	Polyurethane	Silicone	Polyurethane
Fat	-5.9 \pm 3.5	-7.4 \pm 0.7	-17.7 \pm 11.0	-22.3 \pm 7.1*, ^
Energy	-2.7 \pm 1.5	-4.2 \pm 0.6	-7.8 \pm 4.6	-12.1 \pm 3.6**, ^^

* $p=0.032$ compared to polyurethane NG (gravity)

^ $p=0.02$ compared to silicone NG (gravity)

** $p=0.017$ compared to polyurethane NG (gravity)

^^ $p=0.006$ compared to silicone NG (gravity)

Summary of Results Results are shown as percent change from baseline milk analysis

Conclusions Statistically significant lipid and energy losses occurred with prolonged pump infusions when compared to gravity. Lipid loss with silicone NG tubes (gravity) trended to be lower than with polyurethane tubes but did not reach statistical significance. Shorter feeding times resulted in less energy and fat loss and appear to be preferred.

561 PHENOLOGS: REDEFINING THE STUDY OF HUMAN DISEASE IN MODEL ORGANISMS

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10.1136/jim-2015-000035.563

Purpose of Study The study of human diseases with model organisms is refined by the concept of phenologs. A phenolog, or orthologous phenotype, is identified not by qualitative similarity between organisms, but by phenotypes having a larger set of orthologous genes in common than is explained by chance. Rather than a model organism outwardly resembling a disease state, a phenolog relies on evolutionary homology. Conservation of molecular function is expected. To prove the utility of phenologs in human craniofacial disease, we created knock-in mutations of ablepharon macrostomia syndrome (AMS), Barber-Say syndrome (BSS), and a novel Saethren-Chatzen-like Syndrome (SCLS) in *C. elegans*. We characterized the phenotypes of *C. elegans* carrying the mutant alleles to create disease phenologs for future studies.

Methods Used TWIST1 and TWIST2 are basic helix-loop-helix transcription factors in humans. Mutations in conserved residues are responsible for SCLS, AMS and BSS. In *C. elegans*, HLH-8 is the sole TWIST homolog and contains the conserved bHLH domain. Twist proteins are crucial for mesodermal development in all organisms. To model these diseases in *C. elegans*, we mutated E29 to the specific amino acids observed in patients utilizing CRISPR/Cas9 technology. A comparison was made between 7 different *hlh-8* alleles and their homozygous phenotypes.

Summary of Results For each of the *hlh-8* alleles, variable combinations and severities of the previously described *hlh-8* null defects in egg-laying, defecation, and tail morphology were observed. The E29K mutant, or AMS equivalent, was most severely affected, while others were more variable.

Conclusions The absence of a face does not preclude *C. elegans* as a model organism for the study of craniofacial disease if a phenolog is utilized. Other examples of using phenologs to study human diseases exist in the literature; the *ksr* gene identified in *Drosophila* and *C. elegans* screens was later shown to be needed for ras-mediated tumorigenesis in humans. We created disease phenologs of the human diseases AMS, BSS, and SCLS in *C. elegans* and characterized the disordered mesodermal development that results. We plan to now identify suppressors of these *hlh-8* phenotypes through EMS mutagenesis.

562 INTRA UTERINE GROWTH RESTRICTION INCREASES HYPOXIC-ISCHEMIC BRAIN INJURY IN NEWBORN RATS

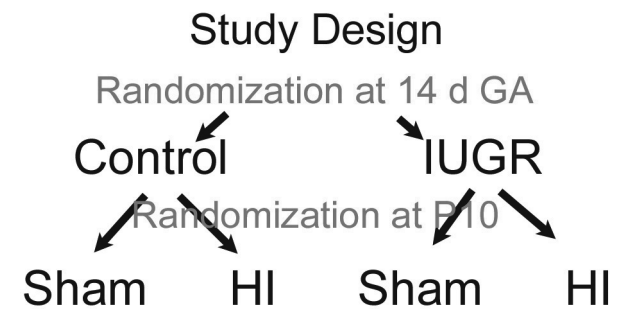
R Narang, N Ojeda, Y Feng, Y Pang, K Carter, A Bhatt. University of Mississippi Medical Center, Jackson, MS

10.1136/jim-2015-000035.564

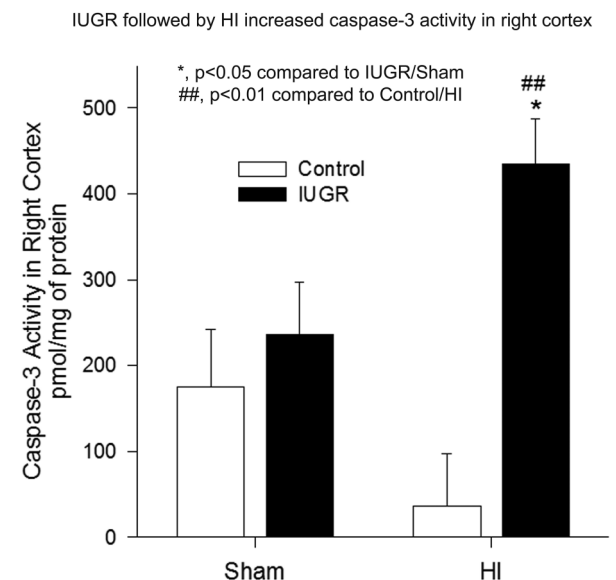
Purpose of Study The incidence of death and disability from hypoxic ischemic (HI) brain injury remains high even after moderate hypothermia (HT) treatment. There is a critical lack of knowledge of factors that might prevent adequate response to HT. One likely factor is intra uterine growth restriction (IUGR). We aim to characterize a reproducible, rat model of neonatal HI in IUGR pups.

Methods Used Rodent model of IUGR induced by placental insufficiency in dams at 14 days of gestation was used. HI was induced at postnatal day (P) 10 by permanent carotid artery ligation followed by 90 min of hypoxia (8% oxygen), Fig 1.

Summary of Results IUGR without HI did not but HI ($p < 0.05$) and IUGR followed by HI increased caspase-3 activity in right cortex at 24 h after HI (Two-way ANOVA, $F(1, 21) = 7.79$; $P = 0.011$, post hoc Holm-Sidak test, $n = 5$ –



Abstract 562 Figure 1



Abstract 562 Figure 2

8 pups, Fig 2). Results of caspase-3 activity in hippocampus and cerebellum at P11, microscopic markers of apoptosis at P13 and neurobehavioral tests at later age are pending.

Conclusions These findings suggest that IUGR newborn rats have increased susceptibility for brain injury following HI exposure.

563 EARLY URINARY BIOMARKERS OF ACUTE KIDNEY INJURY IN PRETERM INFANTS

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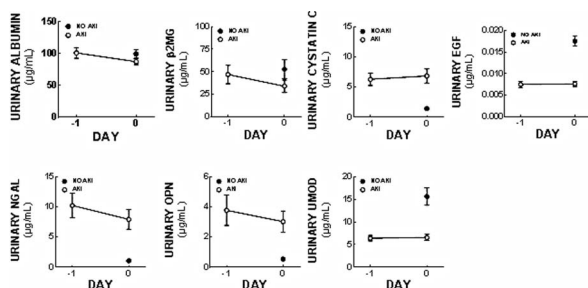
10.1136/jim-2015-000035.565

Purpose of Study Acute Kidney Injury (AKI) in the neonatal intensive care setting is multifactorial and is associated with significant morbidity and mortality. This study evaluates the utility of novel urinary biomarkers to predict the development and/or severity AKI in preterm infants. Our aim was to determine whether urinary biomarkers concentrations increase before SCr elevation, and to evaluate the sensitivity and specificity of these biomarkers to predict the clinical course of AKI.

Methods Used We performed a case control study on a prospective cohort of preterm infants (<32 weeks), to compare 7 urine biomarkers between 25 infants with AKI and 20 infants without AKI. Urine was collected daily for the first 7 days of life and serum creatinine was also collected daily.

Summary of Results Infants with AKI had significantly higher urinary Cys C levels (median CTRL vs. AKI; 0.98 µg/ml vs. 6.09 µg/ml; $p < 0.001$), higher NGAL (median, CTRL vs. AKI; 0.598 µg/ml vs. 4.24 µg/ml; $p < 0.0001$), and higher OPN (median, CTRL vs. AKI; 0.403 µg/ml vs. 1.64 µg/ml; $p < 0.001$). In contrast, urinary EGF levels were significantly lower in infants who developed AKI compared to controls (median, CTRL vs. AKI; 0.016 µg/ml vs. 0.006 µg/ml; $p < 0.001$). Similarly, infants with AKI had significantly lower urinary UMOD levels (median, CTRL vs. AKI; 13.61 µg/ml vs. 5.84 µg/ml; $p < 0.001$).

Conclusions Urinary biomarkers may be useful to predict AKI development prior to SCr in preterm infants.



Abstract 563 Figure 1 Urine values of Albumin, β2MG, Cys C, EGF, NGAL, OPN, and UMOD in infants with AKI (gray circles) and infants without AKI (black circles) on day-1 and day 0.

564 EFFECT OF MECHANICAL VENTILATION AND POSTNATAL ADAPTATION ON MESENCHYMAL STROMAL CELLS ISOLATED FROM LATE PRETERM RABBIT LUNG

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10.1136/jim-2015-000035.566

Purpose of Study Therapeutic benefits of instilling exogenous mesenchymal stromal cells (MSCs) into the lung appear to result from paracrine effects on the endogenous MSCs rather than direct effects by engraftment. Multiple studies have described an attenuation in lung injury following intratracheal administration of exogenous MSCs or conditioned media following hyperoxic injury. The objective of this study is to determine if the properties of endogenous lung MSCs are altered even with relatively brief periods of mechanical ventilation (MV) during postnatal adaptation in late preterm rabbits.

Methods Used Preterm rabbit fetuses were delivered at 29 d gestational age (GA, term=31 d). Following delivery, pups were randomized into two groups (n=4-6/group): sacrificed at birth (SAB) or subjected to MV for 4 h (MV4). Pups were then necropsied and lung tissue was either frozen or processed for the isolation of endogenous MSCs. Lung MSCs were isolated by enzymatic digestion followed by Ficoll-purification. Recovered MSCs were characterized by: (1) surface antigen markers using flow cytometry, (2) ability to differentiate into adipogenic, chondrogenic, and osteogenic lineages following *in vitro* stimulation, and (3) colony forming unit efficiency (CFU-E).

Summary of Results Lung MSCs isolated from both groups adhered to plastic tissue culture flasks and displayed characteristic spindle-shaped fibroblast-like morphology when cultured under standard conditions. MSCs derived from both groups expressed CD44 (SAB 92 ± 0.8%; MV4 93 ± 0.2%) and CD81 (SAB 93 ± 1.7%; MV4 88 ± 3%). MSCs from both groups were negative for CD11b, CD79a, HLA-DR and CD117. MSCs isolated from the SAB group underwent robust adipogenic, chondrogenic and osteogenic differentiation. However, MSCs from the MV4 group exhibited a decreased ability to differentiate into adipocytes as verified by the existence of lipid droplets positively stained red with Oil Red-O. MV reduced CFU-E by 44% compared to SAB MSCs.

Conclusions Endogenous MSCs can be successfully isolated from fetal rabbit lung. Following only a short period of exposure to MV during postnatal adaptation, MSCs already exhibit differences in their ability to differentiate and their CFU-E.

565 SEX-SPECIFIC DIFFERENCES IN NEONATAL HYPEROXIC LUNG INJURY

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10.1136/jim-2015-000035.567

Purpose of Study Bronchopulmonary dysplasia (BPD) is one of the most common causes for short- and long-term morbidity in premature neonates. BPD is characterized by an arrest in lung development with marked impairment of alveolar septation and vascular development. Exposure to high concentrations of oxygen (hyperoxia) contributes to the development of BPD. Neonatal mice exposed to hyperoxia develop lung pathology that resembles BPD. Neonatal outcomes for males are worse than for females for many diseases, including BPD. Male sex is considered an independent predictor for the development of BPD after adjusting for other confounders. The reasons underlying sexually dimorphic outcomes in premature neonates are not known, and a focused investigation of the effect of sex/gender on hyperoxic lung injury and the underlying mechanisms has not been attempted. We tested the hypothesis that male neonatal mice will be more susceptible to hyperoxic lung injury and will display greater arrest in lung development after postnatal hyperoxia exposure.

Methods Used Neonatal male and female mice (C57BL/6) were exposed to hyperoxia (95% FiO₂, PND 1–5:saccular stage) and sacrificed on PND 7 and 21. Alveolarization, pulmonary vascularization and inflammation analyzed and compared to room air controls.

Summary of Results Male neonatal mice displayed higher mortality compared to female mice. Assessment of inflammation showed greater macrophage infiltration by immunohistochemistry in male mice. Lung development as assessed by morphometric measurement showed a greater mean linear intercept (MLI) and therefore greater arrest in lung development in male mice. This was accompanied with a greater decrease in vascular density (CD31 positivity) and decreased VEGFR2 expression in males after hyperoxia exposure compared to females

Conclusions Thus, we show that male neonatal mice are more susceptible to hyperoxic lung injury and display greater mortality, inflammation, arrest in alveolarization and angiogenesis after postnatal hyperoxia exposure. This shows that sex/gender plays a crucial role in hyperoxia mediated lung injury in this model. Elucidation of the underlying molecular mechanisms behind the sexually dimorphic incidence of BPD will aid in the development of novel targeted therapies to prevent BPD.

566 CHOOSING WISELY: REDUCTION OF ANTIBIOTICS USE FOR EARLY ONSET SEPSIS PROPHYLAXIS IN NEONATES

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10.1136/jim-2015-000035.568

Purpose of Study Prophylactic antibiotics (abx) for neonates are justified in situations of high risk peripartum milieu. Symptomatic neonates with or without abnormal laboratory values may be continued on abx beyond the 48 h mark of sterile cultures. However, abx therapy without indications should be promptly discontinued. Our data from 2013 showed prolongation of empiric abx beyond 48 h in 85% of cases. We implemented abx stewardship focusing on discontinuing abx within 48 h. We

re-evaluated our practice after over a year of implementation of stewardship and reinforcement with education and data sharing to see the impact on duration of empiric abx usage for early onset sepsis in our NICU.

Methods Used A chart review was done for all neonates born during the Feb-May 2015 (Period 2). Infants with positive blood culture/meningitis were excluded. Medical records were reviewed after IRB approval and data collected from neonates who were started on abx included infant demographics, maternal history, duration and type of abx, laboratory values and clinical symptoms. Data was compared to similar previous data from March-June 2013 (Period 1).

Summary of Results In period 2, 202 infants received abx soon after birth compared to 218 in period 1. Mean BW was 2620 gm vs 2666 gm with mean GA 36 wk vs 35 wk. Over 98% infants received Penicillin and Gentamicin. Mean duration of abx therapy in period 2 was 77:55 h vs 88:52 h in period 1 (p=.008). Maternal risk factors were comparable in 2 periods; chorioamnionitis (23% vs 27%), positive GBS status (22% vs 16.5%), maternal UTI (12.6% vs 10%) and PROM (14% vs 15%). Only 67% (136/202) in period 2 received abx >48 h compared to 85% (184/218) in period 1 (p<.001). Of these 136 infants, physicians' notes indicated stopping abx at 48 h but infant received longer duration of abx because of delay in discontinuation order in 33 (24%). In Period 2, no reason was documented for continuing abx for only 8 (4%) infants compared to 64 (30%) in period 1 (p<.001). The reasons for continuing abx include clinical symptoms, elevated CRP or chorioamnionitis.

Conclusions Antibiotic stewardship significantly reduced the use of >48 h abx with a significant improvement in documentation for the need of abx. Continuation of antibiotics in face of abnormal lab values in asymptomatic infants should also be re-evaluated.

567 PARENT AND NURSE PERCEPTIONS OF INFANT READINESS FOR NEONATAL INTENSIVE CARE DISCHARGE

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10.1136/jim-2015-000035.569

Purpose of Study Optimizing transition of care from hospital to home is associated with reduced overall healthcare costs. To develop the best methods to improve neonatal intensive care infant discharge, parent and nurse perception of infant discharge readiness was compared.

Methods Used Parents were surveyed prior to infant discharge. Survey was adapted from the American Academy of Pediatrics Infant Readiness Guidelines (AAPIRG). A focus group of neonatal nurses was performed with nominal group technique to identify the most important factors of infant discharge readiness. Transcribed audio was coded and analyzed. Parent survey and nurse focus group results were compared.

Summary of Results 15 parents, with median age 28 years, parity 2, 58% African American, 100% non-Hispanic, and 85% non-private insurance, had infants

with median birth gestation 29 weeks and weight 1540 grams. Six nurses were median age 39 years, 100% white, 100% non-Hispanic, 100% female with median 13 years nursing practice. The ranking as important indicators for discharge of 15 items was from 73 to 100% of parents. 100% of parents identified “maintain normal body temperature”, “assess for anemia, receive appropriate treatment”, and “develop home-care plan with appropriate services and specialty doctors” as important indicators of discharge readiness. Only 73% of parents ranked “receive appropriate immunizations” as important indicator for discharge. Nurses identified the top 3 indicators as “stable heartrate and breathing”, “risk for poor nutrition or poor growth evaluated with plan”, and “infant is feeding well by breast or bottle without heartrate or breathing difficulties”. Of note, only 80% of parents ranked “risk for poor nutrition or poor growth evaluated with plan” as an important indicator.

Conclusions The majority of parents agree that the AAPIRG indicators are important with “receive appropriate immunizations” ranked lowest. Discrepancy between nurse and parent perception of the importance of “risk for poor nutrition or poor growth evaluated with plan” existed with only 80% of parents identifying this indicator as important but with nurses ranking as in the top 3 of 15.

568 FOLATE TRANSPORTER MUTATIONS AND MYELOMENINGOCELE

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10.1136/jim-2015-000035.570

Purpose of Study Folate deficiency is a risk factor for neural tube defects (NTD), and improved maternal folate status reduces NTD risk. Many studies have shown that genetic factors play a role in NTD. The biologic relationship between folate and NTD risk is unclear. Folate transporters *SLC46A1* and *SLC19A1* are suggested to play essential roles in transporting folate during pregnancy, and loss of function variants in these genes may affect folate availability for embryogenesis and contribute to NTD risk. My hypothesis is single nucleotide polymorphisms (SNPs) and mutations within folate transporters *SLC19A1* and *SLC46A1* are associated with an increased risk for myelomeningocele (MM).

Methods Used 96 patients born before 1998 were selected from 864 patients with MM enrolled in spina bifida clinics. Primers were designed for PCR amplification of the exons in *SLC19A1* using the reference sequence. Amplified exons were verified by gel electrophoresis and sequenced using Sanger sequencing method to identify variants. Sequences of the patient’s exons that differ from the reference sequence were considered variants. SNPs are variants previously reported in dbSNP databases, while novel mutations are those not previously reported. Frequencies of alleles of SNPs in MM patients were compared to those from ethnically-matched reference population by Fisher’s exact method to evaluate alleles associated risk for MM. In an ongoing whole exome sequencing project, 500 additional

MM patients were examined for mutations in *SLC19A1* and *SLC46A1*. Deleterious mutations were verified by Sanger sequencing.

Summary of Results We have identified known and novel variants within and near the exons of *SLC19A1* and *SLC46A1*. Functional significance for the novel variants will be presented. For example, a c.584A>T (p.F195Y) mutation in *SLC19A1* found in one patient is predicted to be deleterious. In another patient, a c.1265G deletion in *SLC19A1* results in an early stop codon. We will examine and report association of rare allele of SNPs and risk for MM.

Conclusions This study discovered novel variants with potential loss of function in the folate transporter genes of MM patients. The results support association between novel mutations and SNPs within the folate transporters *SLC19A1* and *SLC46A1* and risk for MM.

569 DO LATE PRETERM INFANTS UTILIZE HEALTHCARE MORE THAN TERM INFANTS?

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10.1136/jim-2015-000035.571

Purpose of Study Late preterm infants (34–36 weeks) have increased perinatal morbidity. It is unclear if this increased morbidity persists throughout infancy and leads to increased healthcare utilization. The objective is to assess differences in healthcare utilization between late preterm and term infants.

Methods Used This retrospective cohort study using Medicaid claims data linked to birth certificates included all live, singleton births in Missouri with 6 months of continuous Medicaid coverage from 2000–2005. The primary predictor was term (37–40 weeks) versus late preterm (34–36 weeks). The outcome was healthcare utilization during the first year of life, a count of healthcare encounters categorized as office, hospital, emergency, or other. T-tests were used to compare differences in healthcare utilization by term, and multivariate Poisson regressions were used to compare trends in healthcare utilization by term.

Summary of Results The population included 69,067 term and 9,635 (12.2%) late preterm infants. The mean number of hospital visits for term infants was 1.2 versus 3.7 for late preterm infants, $p < 0.001$ (see Table). After adjusting for maternal age and race, and infant gender and birth weight, late preterm infants were significantly more

Abstract 569 Table 1 Health Care Utilization in Late Preterm versus Term Infants*

	Office	Emergency Room	Hospital	Other
Term	6.8 (±4.7)	1.0 (±1.9)	1.2 (±5.0)	2.6 (±4.5)
Late preterm	6.9 (±4.8)	1.2 (±2.1)	3.7 (±10.1)	3.4 (±6.6)
Poisson regression † –IRR††	0.08	3.3	0.38	0.73

likely to use all categories of healthcare ($p < 0.001$). Specifically, late preterm infants were 3.3 times more likely to have more hospital visits than term infants.

Conclusions Given the high prevalence of late preterm births, even small increases in healthcare utilization among late preterm infants seen here translate to a significant public health impact.

Renal, Electrolyte and Hypertension II Concurrent Session

1:00 PM

Saturday, February 20, 2016

570 ENERGY METABOLISM PROFILE OF NEPHRON PROGENITOR CELL

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10.1136/jim-2015-000035.572

Purpose of Study Nephron deficit predisposes to chronic kidney disease and hypertension. Nephron endowment at birth is contingent upon the availability of nephron progenitor cells (NPCs) and the balance between self-renewal and differentiation in embryonic life. NPC self-renewal capacity declines with age. Emerging data implicates balanced glycolysis versus oxidative phosphorylation (OxPhos) and fatty acid oxidation (FAO) in cell fate decisions. The metabolic pathways used by the NPC at early and late developmental stages are unknown. We hypothesize that young self-renewing NPC are metabolically distinct from old non-self-renewing NPC. We further assessed the contribution of fatty acids to OxPhos in NPC by inhibiting CPT1, an essential enzyme in the fatty acid oxidation (FAO) pathway.

Methods Used 1) Real time measurement of glycolytic rate by measuring lactate production and OxPhos by oxygen consumption on isolated NPC grown under controlled media conditions using the Seahorse Extracellular Flux Analyzer. 2) Inhibition of FAO was achieved by etomoxir administration. Etomoxir (5 μM and 50 μM , with vehicle control) was added to E12.5 embryonic kidneys in organ culture for 24 h. Kidneys were fixed and processed for whole mount immunofluorescence staining with NPC (Six2) and nascent nephron (Lhx1) markers. Isolated NPCs were treated with same doses of Etomoxir, and OxPhos rate measured by real-time measurement of oxygen consumption.

Summary of Results 1. E13.5 (young) NPC have a 2-fold higher glycolysis rate than E19.5 (old) NPC. 2. Etomoxir (5 μM) treated kidneys showed increased nephrogenesis over control kidneys. Quantitatively, treated kidneys display on average 48.34% more nascent nephrons than untreated control kidney. Chi-square test of nephron number show difference in counts to be highly significance ($p < 0.005$). Qualitatively, nascent nephrons are smaller and appear less complex in the treated kidneys. NPC cultured with etomoxir for 24 hours at 5 μM , show increased oxidative phosphorylation compared to control. However, high dose Etomoxir

treatment had no apparent effect on nephrogenesis or OxPhos. Increased OxPhos after FAO inhibition with low dose Etomoxir suggests compensation by an alternate fuel type (oxidative glycolysis or glutaminolysis) by the NPC.

Conclusions Our data indicate differential metabolic pathway use between young and old NPC and suggest a role for FAO in NPC renewal.

571 METABOLIC CONTROL OF NEPHRON PROGENITOR CELL RENEWAL AND DIFFERENTIATION

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10.1136/jim-2015-000035.573

Purpose of Study Low nephron endowment results in hypertension and chronic kidney disease, both clinically significant diseases without a cure. Nephron progenitor cell (NPC) availability during kidney development is a major determinant of nephron endowment. The Cited1+/Six2+ cells are the self-renewing NPCs. Emerging data emphasizes the significance of energy metabolism in cell fate determination. Metabolic dysfunction at a systemic level such as hyperglycemia impairs cardiac stem cell function and alters neural stem cell fate in the developing brain. Nephron deficit in kidneys of infants of diabetic mothers is known; however effects on NPC renewal and nephrogenesis are unknown. The metabolic parameters of renewing NPCs are also not known. Based on the published stem cell data, we hypothesized that NPC self-renewal and differentiation are balanced by energy metabolism.

Methods Used Fetal kidneys were exposed to a hyperglycemic maternal environment using Streptozotocin at gestation day 12.5. P0 kidneys were sectioned and immunostained to detect molecular markers of NPC maintenance (Six2, Sall1, NCAM) or differentiation (Lef1, Lhx1, Jag1). Measurement of glycolysis and oxidative phosphorylation in NPC of a genetic model (conditional p53 deletion) of impaired cap mesenchyme renewal.

Summary of Results Kidneys of P0 pups from hyperglycemic (300–500 mg/dl) mothers showed decrease in NPCs, abnormal differentiation and a smaller nephrogenic zone. Conditional deletion of p53 in NPC (Six2^{Cre}GFP⁺;p53^{fl/fl}) resulted in NPC depletion independent of apoptosis. p53-mutant NPC show reduced basal oxygen consumption rate and decreased maximal respiratory capacity, indicative of impaired mitochondrial respiration. The mutant cells exhibit a nearly two-fold decrease in ATP ($p < 0.005$, $n = 3$) and a 30% decrease in ROS levels. Baseline glycolysis rate is unchanged in p53 mutant NPC. However, mild inhibition of glycolysis impairs nephrogenesis and growth in contrast to wild-type littermate kidneys.

Conclusions Our data are consistent with the idea that the metabolic status of the NPC is a critical determinant of the balance between renewal and differentiation. The metabolic crisis in p53-null NPC and decrease in ATP explains the apparent paradox of why p53 loss impeded rather than enhanced NPC proliferation.

572 INHIBITION OF GLYCOLYSIS ACCELERATES NEPHROGENESIS IN EMBRYONIC KIDNEYS

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10.1136/jim-2015-000035.574

Purpose of Study Nephron function affects blood volume, solute concentration, and blood pressure. Balanced self-renewal and differentiation of nephron progenitor cells (NPC) is critical to ensure sufficient nephron number at birth. Low nephron endowment at birth results in hypertension and chronic kidney disease, both clinically significant diseases without a cure. The NPC reside in a niche that supports self-renewal and differentiation. Recently, bioenergetic pathways have emerged as important regulators of cell fate. Preliminary data from the lab suggest young self-renewing NPC (E13.5) preferentially utilize glycolysis versus older NPC (E19.5) that have decreased self-renewal and are poised to undergo differentiation. Based on these data we hypothesize that inhibition of glycolysis will inhibit self-renewal and promote nephrogenesis.

Methods Used YN1 inhibits glycolysis activator 6-phosphofructo-2-kinase (PFKFB3), thereby causing a decrease in glycolysis. Kidneys were harvested at E12.5 and cultured in DMEM/F12/10%FBS media with YN1 (5 uM), using contra-lateral kidney as vehicle control. After 24 hours of treatment kidneys were processed for immunofluorescence with NPC (Six2, Pax2) and nascent nephron (Lhx1) markers. Glycolysis flux measurement was done by extracellular flux measurement (Seahorse XFe).

Summary of Results 5 uM YN1 treatment decreased glycolysis in E13.5 NPCs by nearly 2-fold. Glycolysis inhibition resulted in a smaller, dispersed cap mesenchyme (CM), accelerated differentiation of the NPC with up to a 50% increase in Lhx1+ nascent nephrons at 24–48 h post-treatment, and decreased Cited1 expression by QPCR in isolated NPC. UB tip and branch numbers were unchanged. Thus, increased nephrogenesis was independent of UB branching. Expression of Wnt4 was unchanged at 24–48 h post treatment.

Conclusions Our data strongly suggest the dependence of NPC self-renewal and differentiation on energy metabolic homeostasis.

573 NaDC1 KNOCKOUT: EFFECTS ON BLOOD PRESSURE AND URINE PH

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10.1136/jim-2015-000035.575

Purpose of Study NaDC1 reabsorbs filtered citrate (Cit), thus its regulation is important in preventing calcium nephrolithiasis. Importantly NaDC1 reabsorbs other Krebs cycle intermediates such as succinate (Suc) and α KG. Recently Suc and α KG have been found to be important in paracrine signaling as their luminal presence stimulates distal nephron G-protein coupled receptors GPCR91 and GPCR99, respectively. Luminal Suc via GPCR91 has been found to stimulate renin release, while α KG via GPCR99

stimulates bicarbonate secretion by type B intercalated cells. The purpose was to determine whether knockout of NaDC1 produces hemodynamic or urine pH changes that might be anticipated by activation of these receptors.

Methods Used Adult NaDC1 KO, heterozygous (Het), and wild type mice (WT), under normal or acid diet for 72 hr, were studied using standard clearance techniques. After anesthesia direct measurements of hemodynamic parameters were determined in real time. Urine, blood and tissue were collected for measurement of Suc, Cit, α KG, and pH.

Summary of Results NaDC1 KO produced 2, 4, and 10 fold increases in urinary Suc, Cit, and α KG, respectively. There was substantial residual reabsorption of Cit and Suc in KO mice, indicating other transporters involved in reabsorption of these substrates. Despite the increase in urinary α KG there was no significant increase in urine pH (normal or acid diet), in fact on normal diet urine pH was lower in KO mice (5.41 ± 0.04 vs 5.90 ± 0.13 WT, $p < 0.001$). The lower urine pH in KO mice on normal diet may be a response to loss of potential bicarbonate in the form of increased Krebs cycle intermediate excretion. There was no change in the ability of KO animals to excrete ammonia. In regard to potential hemodynamic effects mediated by NaDC1 KO and increased urinary Suc, no change in MAP was determined comparing WT, Het or KO either on normal or acid diet.

Conclusions In sum, NaDC1 is responsible for significant reabsorption of filtered α KG and Suc, but knockout of NaDC1 does not impair acidbase homeostasis or BP changes on normal or acid diets.

574 GENOMIC PROFILING OF ZSF1 DIABETIC KIDNEY-EFFECTS OF PARICALCITOL TREATMENT

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10.1136/jim-2015-000035.576

Purpose of Study Diabetic nephropathy (DN) is the most common cause of end stage renal disease. Yet the therapeutic options for DN are very limited. Recent studies (including ours in ZSF₁ rats) showed that activators of the vitamin D receptor such as paricalcitol (PAR) have protective effects in DN. The ZSF₁ rat is a hybrid strain that develops metabolic syndrome and DN that is consistent with human disease. We hypothesized that PAR treatment would lead to changes in gene expression that are associated with protective pathways in the kidney.

Methods Used ZSF₁ male rats were either untreated (control) or treated for 10 weeks with 0.2 μ g PAR twice a week and sacrificed at 31 weeks age to harvest the kidneys. mRNA library was prepared from isolated kidney RNA using TruSeq Stranded mRNA Library Kit. Gene expression quantification and transcriptome analysis was performed using Illumina HiSeq 2000. The differential gene list from this analysis was imported into Ingenuity® Pathway Analysis which was used for analysis of data.

Summary of Results PAR had a significant effect on the following canonical pathways: OX40 Pathway which

regulates NFkB, T Helper Cell Differentiation, and Gs Signaling, Allograft Rejection Signaling, Graft-vs-Host Disease Signaling. Up-regulated molecules included Mt1 m/Mt, associated with cellular response to erythropoietin and nitric oxide mediated signal transduction; Klre1 which activates natural killer cells; LEMD2 which negatively regulates the MAPK cascade and Defb10/Defb9, associated with the defense response to bacterium. Down-regulated molecules included: CPNE1, involved in lipid metabolism, vesicle-mediated transport and regulation of Akt signaling; OPCML, regulated by calmodulin and PD98059 (a selective inhibitor of MAPK/ERK kinase); CDNF, involved in cell degeneration and quantity; GREM2, associated with the BMP pathway and Akr1b10, which binds NOS2 and NADPH and involved in the oxidation-reduction process.

Conclusions Gene profiling studies showed significant modulation of many pathways including OX-40 and Gs protein signaling. Specific up regulation was observed in nitric oxide and erythropoietin response and down regulation of cell degeneration and oxidative pathways. These changes could account for reno-protective effects of PAR.

575 VASCULAR ACCESS AND TRANSPLANT REFERRAL RATES IN CKD: AN ONGOING PERFORMANCE IMPROVEMENT PROJECT FOR NEPHROLOGY FELLOWS

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10.1136/jim-2015-000035.577

Purpose of Study Referral for vascular access (Ac) and kidney transplantation (Tx) are important management facets of CKD. We previously conducted a performance improvement project assessing Ac and Tx referral rates (RR) in CKD patients from the Nephrology fellows' clinics, and showed an improvement in transplant RR (JASN 25:786A, 2014). To evaluate the sustainability of this initiative, we conducted a follow-up analysis

Methods Used This performance improvement project was conducted in 3 phases at the Charlie Norwood VAMC; Phase 1 (baseline, 1/1–4/30, 2013), Phase 2 (post-intervention, 8/1–11/30, 2013) and Phase 3 (follow-up, 1/1–4/30, 2015). Data extraction was conducted by three, 2-fellow teams, each reviewing the other's RR for all

Abstract 575 Table 1 Referral in patients with GFR<20 in different study phases. Results presented as N(%)

	Phase 1		Phase 2		Phase 3	
	GFR 15-20	GFR<15	GFR 15-20	GFR<15	GFR 15-20	GFR<15
N	79	36	30	22	18	29
Transplant Referral	9 (11%)	18 (50%)	11 (37%)	15 (67%)	8 (44%)	19 (66%)
Vascular Access Referral		26 (72%)		16 (73%)		21 (72%)

patients seen in the previous 4-month period. The analysis was sorted by eGFR (ml/min/1.73 m²): for eGFR<15, both Ac and Tx RR were recorded. In addition, Tx RR for eGFR 15–20 was documented.

Summary of Results 1114 total records were reviewed (349, 361, and 404 for Phases 1, 2 and 3, respectively). Table 1 indicates the number of patients and RR in those with GFR<20. RR for Ac through all 3 phases were steady at 72–73%. Tx RR were improved after intervention and were sustained in Phase 3. Table 1. Referral in patients with GFR <20 in different study phases. Results presented as N(%)

Conclusions Referral rates for kidney transplantation by Nephrology fellows improved after a chart review and educational intervention were performed. Vascular access referrals from this study remained stable. This work suggests that outpatient performance improvement projects conducted by Nephrology fellows confer peer review accountability for outpatient practice habits, heightens trainee awareness of key referral issues, and appears to help sustain or improve referral rates for vascular access and kidney transplantation.

576 SEPTIC ARTHRITIS IN END-STAGE RENAL DISEASE

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Purpose of Study Septic arthritis (SA) occurs via hematogenous seeding or direct inoculation of bacteria into joints. In patients with end-stage renal disease (ESRD), hemodialysis (HD) access creates a pathway for pathogens to enter the bloodstream.

Methods Used We examined the incidence of and risk factors for SA in a cohort of patients on HD. The United States Renal Data System was queried for a diagnosis of SA in patients who initiated HD between 2005 and 2010. SA and potential clinical risk factors were identified via ICD-9 and CPT-4 codes. Multivariable logistic regression was used to determine the adjusted relative risk (aRR) of potential risk factors.

Summary of Results 7,009 cases of SA were identified, an incidence of 514.8 per 100,000 per year. Median time to SA diagnosis was 459 days after incident HD. Of the 2179 subjects who had an infection with a specified organism, staphylococci (69.4%) were the most common, followed by streptococci (15.1%) and gram-negative organisms (14.7%). Significantly increased risk for SA was associated with underlying joint disease, including joint prosthesis (aRR=2.67, 95% CI 2.44–2.92) and hemarthrosis (aRR=2.37, 95% CI 1.66–3.39). Bacteremia (aRR=2.64, 95% CI 2.07–3.35), diabetes (aRR=2.13, 95% CI 2.03–2.24), HIV (aRR=1.77, 95% CI 1.41–2.21), and urinary tract infection (aRR=2.20, 95% CI 1.88–2.58) were also associated with increased risk. Dialyzing via a catheter was associated with increased risk (aRR=1.40, 95% CI 1.30–1.50) of SA compared to arteriovenous fistula (AVF).

Conclusions History of joint pathology, bacteremia, immune dysfunction, and non-AVF access are associated with increased risk for septic arthritis in patients on HD.

577 **OUTCOMES OF SIMULTANEOUS ARTERIOVENOUS FISTULA CREATION DURING PERITONEAL DIALYSIS CATHETER INSERTION IN ESRD PATIENTS**

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10.1136/jim-2015-000035.579

Purpose of Study Peritoneal dialysis (PD) is a home-administered therapy for patients with ESRD. However, up to 55% of patients discontinue PD and transition to hemodialysis (HD) within 3 years. It is not always possible to predict impending PD failure for timely permanent HD access creation and central tunneled catheters (CVC) avoidance. No data exist to support a placement of a back-up arteriovenous fistula (AVF) at the time of PD catheter insertion. We investigated outcomes of simultaneous PD catheter and AVF placement in ESRD patients.

Methods Used We prospectively studied a cohort of 30 ESRD patients (mean age 50.9 years, 86.7% African-Americans, 60% females) who had simultaneous PD catheter placement and AVF creation by a single surgeon in the period between 01/2012 and 12/2013. Baseline characteristics were compared using the Mann-Whitney test and two-tailed t-test for nonparametric and parametric continuous variables, respectively, and chi-square test for categorical data.

Summary of Results After a mean (SD) follow-up 25.3 (3.8) months, 18(60%) patients continued to use PD catheter for dialysis. In 12(40%) patients, PD was discontinued after mean (SD) 11.2(6.4) months for the following reasons: PD failure in 6(20%), PD-associated peritonitis in 3(10%), kidney transplantation in 2(6.7%), and death in 1 (3.3%) patient. AVF was used as initial HD access at the time of PD discontinuation for non-kidney transplantation or death reasons in 3 out of 9 patients (33.3%). Remaining patients required revision or superficialization of existing AVF (3 patients) or new AVF creation (3 patients). Among 30 AVF, 9(30%) had primary failure, 3(10%) were ligated due to complications, and a total 18(60%) AVF matured. Among mature AVF, 11 were never used, 6 AVF were used for HD access after PD failure, and 1 AVF used once in the setting of hyperkalemia but a patient subsequently continued PD.

Conclusions The presence of a backup AVF created during PD catheter placement reduced the need for CVC at the time of PD discontinuation for reasons other than death or kidney transplantation by 33.3%. More studies are needed to evaluate outcomes of simultaneous AVF creation at the time of PD catheter insertion in ESRD patients.

578 **CLASS II. OBESITY (BODY MASS INDEX>35 KG/M2) DOES NOT REPRESENT A SELECTIVE DISADVANTAGE FOR SUCCESSFUL PERITONEAL DIALYSIS - A SINGLE-CENTER EXPERIENCE**

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10.1136/jim-2015-000035.580

Purpose of Study Lack of permanent access is very common among end-stage renal disease (ESRD) patients upon initiation of renal dialysis, prompting temporary vascular access (TVA) placement. Peritoneal dialysis (PD) obviates need for TVA, but extremes of weight or obesity has been viewed historically as a relative contraindication for PD.

Methods Used We have performed a cross-sectional review of 75 current or past (vintage >6 months) PD patients with regard to weight, body mass index (BMI), dialysis adequacy and multiple clinical and laboratory variables. We have reviewed dialysis adequacy parameters for those with excess (\geq class 2) obesity (BMI \geq 35 kg/m²) and compared those with normal weight (BMI 20–25). Results were expressed with means (SD) and percent (%); between-group comparison was performed with independent sample t-test or Pearson's Chi-square as appropriate

Summary of Results Obese (n=15) subjects had a mean weight of 110 (SD=28) kg and BMI 39.6 (4.7) kg/m². Age was 44.9 (10) years with PD vintage 19.2 (18.2) months; 80% were African-American, 53% female and diabetic both. Weekly Kt/V was 2.02 (0.51), creatinine clearance 86.9 (44.8) liter (L)/week/1.73 m² with total exchanged volume 11.2 (2.5) L. Residual urine output (RUO) measured 584 (542) mL and residual creatinine clearance 47.8 (48.5) L/week. The lean (n=20) subjects had mean weight of 66.5 (9.8) kg and BMI 23.3 (1.4) kg/m². While weight (p=0.002) and BMI (p=0.001) differed significantly, PD vintage, weekly Kt/V, creatinine clearance, RUO or residual clearance did not (p=NS). Serum albumin, calcium, phosphorus, hemoglobin and parathyroid hormone levels did not differ, either.

Conclusions While the data may be influenced by pre-enrollment selection bias, it does not support a selective disadvantage of excess obesity (BMI >35 kg/m²) for successful PD from this Southwest cohort of patients.

579 **COMPARISON OF VANCOMYCIN PHARMACOKINETICS IN PEDIATRIC PATIENTS BEFORE AND AFTER A DOSING PROTOCOL CHANGE**

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10.1136/jim-2015-000035.581

Purpose of Study Vancomycin is widely used to effectively treat methicillin-resistant *Staphylococcus aureus* infections. Current guidelines recommend a dosing range for pediatric patients, although recent studies have challenged whether this dosing strategy enables patients to achieve goal vancomycin trough concentrations (10–20 mg/L, based on indication). In response to sub-therapeutic trough concentrations observed at The Children's Hospital at OU Medical Center using a current hospital protocol, a modified vancomycin dosing and monitoring protocol was implemented.

Methods Used This study is a retrospective chart review of patients admitted to The Children's Hospital at OU Medical

Center before and after the modified dosing protocol was implemented. Patients were included if they had an appropriate vancomycin trough drawn and renal or alternative dosing was not required based on clinical criteria. Data collected included patient characteristics, vancomycin trough, serum creatinine, and any concomitant nephrotoxic drug use.

Summary of Results With the previous recommended initial dosing of 60 mg/kg/day, the goal trough was reached only 13.5% of the time on the first trough obtained. The average obtained first trough was 9.9 mg/L. The newer protocol is undergoing widespread dissemination now; a small sample pull after the protocol was implemented showed compliance 31% of the time in vancomycin dosing of 80 mg/kg/day, with an average initial trough of 13 mg/L. Goal troughs were obtained 44% of the time with initial dosing, with only one supra-therapeutic dose. More data will be available by conference presentation.

Conclusions The previously used dosing protocol, while consistent with national published guidelines, does not achieve an appropriately therapeutic vancomycin trough in the majority of patients at our institution. Vancomycin exhibits concentration-dependent killing of gram-positive bacteria, making therapeutic trough concentrations an important marker for efficacy; the updated protocol, while in its initial phases of implementation, already demonstrates a higher initial trough measurement and reached the goal trough quicker, making it likely more clinically effective.

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A CASE OF HAT IN A PATIENT WITH LN AND APA SYNDROME

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10.1136/jim-2015-000035.582

Introduction Recent articles and reviews have reported evidence of hemodialysis associated thrombocytopenia (HAT), most notably in those using electron beam sterilized filters with up to a 50% drop in platelet counts after dialysis. It has been proposed that electron beam sterilization can alter surface properties of polysulfone (PS) filters, possibly causing platelet activation and aggregation. Here we present a case of HAT in a patient with lupus nephritis (LN), a positive heparin induced thrombocytopenia (HIT) panel, and antiphospholipid antibody (APA) syndrome.

Case The patient is a 37 year old Honduran female with LN, CKD5, hypertension, and APA syndrome who presented with five days of nausea, vomiting, and dysgeusia. She had a BUN of 70 mg/dL and creatinine of 11.7 mg/dL. She underwent urgent dialysis. She received heparin with her dialysis, and during this time, platelets fell from 173,000 to 28,000 over 7 days. Patient had moderate to high 4T score and a HIT panel was sent. Heparin was held and argatroban was started. The patient had improvement in platelet counts initially, only to drop again significantly following dialysis (see figure 1). HAT was considered, so dialyzer was switched from a electron beam sterilized to ethylene oxide sterilized dialyzer with improvement in platelet counts. HIT panel was mildly positive and a serotonin release assay was negative. As such, heparin was restarted without any significant thrombocytopenia thereafter.

Discussion HAT is a rare but important cause of thrombocytopenia in dialysis patients. Here we have a case of thrombocytopenia in a dialysis patient with LN and APA syndrome that was originally attributed to HIT. HAT was considered, and the patient was switched from an electron beam sterilized filter to an ethylene oxide sterilized filter with normalization of platelet counts. Careful monitoring of platelet levels before and after hemodialysis is needed for a diagnosis of HAT.