Role of Neuropeptides in the Gastrointestinal Tract Disorder of Diabetic Rats

Munmun Chattopadhyay, PhD; Amanda Yanez, BS; Mayra Gonzalez, BS; Kristen Pennington, BS

Introduction
Gastrointestinal (GI) disorder is one of the common complications among diabetic patients. Recent evidence suggests that the inflammation may play a crucial role in the development of GI disorders. We hypothesize that a number of inflammatory mediators and peptide neurotransmitters may be involved in the GI disorder and interruption of inflammation would ameliorate this disorder in diabetic animals.

Materials and Methods
Streptozotocin-diabetic (STZ) and spontaneously diabetic ZDF (Zucker diabetic fatty) rats were used for Type 1 and Type 2 diabetes model to analyze the levels of neuropeptides and inflammatory mediators in the GI tract 8 weeks after diabetes. Animals with blood glucose level of ≥300 mg/dl were considered as diabetic. Immunohistochemistry and western blot analysis were used to determine whether there is a direct association between the expression of inflammatory markers: high mobility group box 1 (HMGB1), tumor necrosis factor alpha (TNFα) and interleukin 1-beta (IL-1β), and the release of the peptide neurotransmitters: calcitonin gene related peptide (CGRP), substance P (SP) and pituitary adenylate cyclase-activating polypeptide (PACAP) in the GI tract of the diabetic animals.

Results
Our preliminary data shows that there is a direct association between the expression of inflammatory markers, TNFα and IL-1β, and release of the peptide neurotransmitters, CGRP, SP and PACAP in the GI tract of the diabetic animals, by immunohistochemistry and Western blot analysis.

Conclusions
The results from this study suggest that the alterations of inflammatory mediators and peptide neurotransmitters in gut may be responsible for the development of gastric neuropathy in Type 1 and Type 2 diabetes.

Survey of Body Donor Personal Information Provided to Medical Students Attending United States Medical School

Johanna Gerwer, MSII; Thomas Gest, PhD

Introduction
Body Donor Programs in the United States must balance ethical concerns and educational needs. Each donation enables medical students to learn important anatomical structures and relationships. Beyond allowing science objectives to be fulfilled, body donations have the potential to provide additional learning. Medical students can begin to develop insight into the patient experience and empathy. To accomplish this, students should be provided with body donor personal information including: demographics, background, and medical history. Currently, among Donor Programs in the U.S., there is variability in the amount of information that is provided to medical students. The purpose of this study is to assesses the variability among U.S. medical schools and determine the reasons for providing the level of information offered.

Materials/Methods
Telephone interviews and email surveys were used to collect information concerning the use of donor personal information with medical students.

Results
Of the one hundred fifty-one donor programs in the US, Fifty-three programs participate. The survey results show variation, not only in the amount of personal donor information provided to medical students, but also in the attitudes and beliefs of the donor program personnel concerning such information.

Conclusions
This research documents the variability of educational use of donor personal information. By demonstrating inconsistency, we hope medical schools are encourages to increase the amount of information provided to students for the goal of enhancing the development of medical skills, while maintaining ethical standards.

Continued on page 12
Mother-Daughter Decision-Making to Obtain the HPV Vaccine: The Role of Cultural Factors

Julia Lechuga, PhD; Alex Barron; Martha Porras

Introduction

Although prior research has illuminated the relationship between ethnicity and vaccination initiation, such research has been largely silent about the role that contextual factors such as culture may play on the decision to vaccinate young children against a sexually transmitted infection. Prior research on HPV vaccine acceptability has concentrated on elucidating the role of personally-derived attitudes and beliefs, at the expense of contextual factors such as relational culture, culture-derived notions of sexuality and reproduction, and cultural norms regarding the communication of sexuality-related topics. Contextual factors may play a more predominant role than personally-derived attitudes in the decision to adopt preventive behaviors—not for the self—but for significant others, such as children.

Materials and Methods

Sixty in-depth interviews with Hispanic/Latina mothers and their daughters were conducted. Assessment instruments assessed acculturation, interdependence, familism, the goal of reproduction, and mother-daughter communication about sexual and reproductive health.

Results

Results point to the importance of contextualizing adoption of preventive behaviors by taking into account the role of cultural and relationship factors.

Conclusions

Implications for interventions will be discussed.

Calcification Distribution in Coronary Arteries in End-Stage Renal Disease

Kyari Sumayin Ngamdu, MD; Sean M. Connery, MS; Juan M. Remirez, MD; Yasmin Sabet, MD; Pedro Blandon, MD; Azkiwe Nwosu, MD; Dehabrata Mukherjee, MD

Introduction

Cardiovascular disease is the leading cause of death in end-stage renal disease (ESRD). Vascular calcification is common in patients requiring maintenance dialysis, and may contribute to the high mortality rate from cardiovascular causes. Coronary Artery Calcium Score (CACS) of > 300 is associated with a high risk future
coronary heart disease and mortality. Specific coronary artery calcification distribution has not been previously investigated.

Methods
Retrospective analysis of 144 dialysis patients. CACS was measured by sub-second gated helical computed tomography. CAC score was determined using the standard Agatston scoring system; slice thickness 3mm. Number of coronary arteries with calcified lesions was also measured. Subjects were stratified based on Agatston score into 3 risk groups: Zero, 1-300, > 300.

Results
ESRD subjects: 56 ±11.4 yrs, 37 ±35.8 months dialysis, 80% of total had some coronary artery calcification, predominantly in Right Coronary Artery (RCA) & Left Anterior Descending (LAD) (65%). In clinically significant group CACS of >300; 98% had calcification in LAD, 95% in RCA, 78% in circumflex, and 69% in left main. RCA and LAD showed most calcification in the intermediate risk group. There was a significant increase of calcification in the Left Main in the highest risk group (71% vs 34%).

On 5 year follow-up, all-cause mortality was 51% in high risk, 34% intermediate, 7% for zero score groups respectively.

Conclusions
Calcification predominates in RCA & LAD and is significantly > in the Left Main in high risk group. Dialysis patients have high incidence of coronary artery calcification with variations in distribution between low and high risk groups.

Teen Focus Group Needs Assessment for Group Prenatal Care in High Schools

Amanda Poe, MSIII; Sireesha Reddy, MD

Introduction
Teen pregnancy is associated with adverse pregnancy outcomes. Group prenatal care (GPC) in schools improves access to obstetrical care. Focus groups (FG) assessed teens’ understanding of GPC and interest in GPC participation.

Materials and Methods
Needs assessment was performed consisting of several FGs involving approximately 60 pregnant teens at one local high school. Participants were asked about feelings toward their pregnancy, support systems, experiences with the healthcare system, and opinions regarding the GPC setting.

Results
Sample of a FG included 12 teens, ages 14-18, grades 7 to 12. 10% of teens were on second pregnancy, 50% were postpartum. Current obstetrical care included: 8% no provider, 25% private physician, and 25% no prenatal care at time of FG. The first visit accessing care ranged from 4 weeks to 16 weeks of pregnancy. 50% of teens reported family members with history of teen pregnancy: 33% sister, 33% mother, 20% aunt, 10% grandmother; 25% with multiple family members. FG answers showed support of GPC due to access of care and not missing school. During pregnancy, main concern was social stigma. Family support was the main item that would make pregnancy easier.

Conclusions
We modified wording in subsequent sessions due to confusion over terminology. FGs provide insight into teen’s experiences and also provide a way to make teens aware about GPC. Teens’ greatest concern was family support. Therefore, our follow-up will include a FG of family members.

Stability of Levonorgestrel in Improperly Stored Emergency Contraceptive Kits

Laura Puckett, MSII; Kazimierz Surowiec, PhD; Yehia Mechef, PhD; Rui Zhu, PhD; Dale Quest, PhD

Introduction
Levonorgestrel (LNG) is the active progestin in Plan B One-Step® emergency contraceptive kits. The monograph says, “Store away from heat, moisture and light at 20°C to 25°C. Brief storage 15-30 °C permitted...”. Reserved for emergency use, kits are likely kept for long periods under less-than-ideal conditions. This study assessed the extent that improper storage degraded LNG in the kits. If the product withstands extreme conditions over a 6 week period, assume it would withstand typical storage conditions for a longer portion of the approved shelf-life.

Materials and Methods
LNG reference standard was donated by U.S. Pharmacopel Convention. Plan B One Step® emergency contraceptive kits were purchased at a local pharmacy: 2 kits stored according to monograph; 2 kits left outdoors in shade for 30 days recording daily temperatures & humidity; 2 kits stored according to 6 weekly alternating freeze/thaw cycles. At the end of the experimental storage period the tablets were solubilized, and LNG content quantified using LC/ MS/MS.

Results
LNG content of improperly-stored kits differed significantly from LNG content of properly-stored kits. Properly-stored kits contain the highest amount of intact LNG, followed by outdoor storage followed by freeze/thaw cycle storage.

Conclusions
Kits subjected to 6 weekly freeze/thaw cycles would not meet regulatory requirements. The extent to which decomposition of LNG might compromise contraceptive efficacy is uncertain. The results of this study provide impetus to follow the product monograph storage recommendations. Failure in an emergency could cause a life.
Right Knee Pain in a Female Softball Player

Jason Read, MD; Arthur Islas, MD; Justin Wright, MD

Introduction
A 15 year old female softball player presented to sports clinic with worsening right knee pain. She noted intermittent pain for the last 2 years with worsening pain, locking, and instability symptoms for the last 6 months. Patient also noted intermittent bruising and swelling along her right pes anserine area for the last year.

Materials and Methods
Physical exam revealed a normal foot, ankle and hip exam bilaterally. Gait exam was also normal with mild pain noted along the medial joint line of her right knee with ambulation. Mild swelling and tenderness to palpation was noted along her right pes anserine area. She had normal knee range of motion with mild medial joint line pain on full right knee flexion. She had a negative Lachmans, McMurray, Thessaly and Apley tests. There was no ligament laxity with valgus or varus testing. Anterior and posterior drawer tests were negative.

Results
X-rays of the right knee showed multiple osteochondromas. MRI results of the right knee revealed no acute abnormality. Ligaments, tendons and menisci were normal. Multiple osteochondromas were seen at the medial distal metaphysis of the femur and posterior aspect of the proximal tibial metaphysis. Dynamic Ultrasound was also performed in clinic which was concerning for the right leg pes anserine tendons catching on the osteochondroma located on the patient’s proximal tibia.

Conclusions
Due to continued pain, patient referred to a pediatric orthopedic specialist for evaluation for surgery. Patient underwent successful surgery for removal of multiple osteochondromas. On follow up, patient’s initial presenting symptoms had resolved.

Guidelines Regarding the Optimal Age for Cochlear Implantation in Hearing Impaired Children Using Functional Data Analysis

Introduction
A cochlear implant is a surgically implanted electronic device providing a sense of sound to a person who is profoundly deaf or hard of hearing. The best age for implantation in children has not been determined. The varying levels of success in the outcome of cochlear implants are believed due to the plasticity of the central auditory system, that is, the ability of the brain to respond to sound signals with electrical activity. This electrical activity is quantified by a cortical auditory evoked potential (CAEP) curve.

Materials and Methods
The P1 wave of the CAEP is the first positive peak after presentation of the synthetic auditory stimulus. P1 latency, the location of the P1 wave in time, is used as a biomarker for maturation (plasticity) of central auditory pathways. The P1 latency captures just one feature of the CAEP curve; we consider other dimension reduction techniques by extending Principal Differential Analysis (PDA) to allow for the covariate of age.

Results
PDA estimates a linear differential operator L that comes close to annihilating the CAEP curves. Once the linear differential operator is estimated, a nonparametric basis of functions for the null space of L is computed using iterative methods. We examined changes in the shape of the basis functions across age.

Conclusions
An exploratory PDA analysis allowing for the covariate of age indicates that the best age for implantation in children is before the age of 4 years, although there are subgroups of children for whom earlier implantation is best.

Acceptance and Commitment Therapy in Psychosis: A Meta-Analysis

Silvina B. Tonarelli, MD; Andrea V. Cancellare, MSIS; Luis Andres Alvarado, MS; Alok Kumar Dwivedi, PhD; Rebecca M. Pasillas, PhD

Introduction
Acceptance and Commitment Therapy (ACT) is a therapy that applies mindfulness and acceptance methods with commitment and behavior change processes. It is based on the view that many maladaptive behaviors are produced by “unhealthy attempts to avoid thoughts, feelings, or bodily sensations”. ACT teaches patients to accept the existence of symptoms rather than avoid them. This therapy has benefits for several mental disorders but their effectiveness for psychosis is still under research. A meta-analysis was conducted to measure the efficacy of ACT in treatment of psychotic symptoms.

Materials and Methods
We searched PsychINFO, MEDLINE, SCOPUS and PubMed from 1990 to 2014 for articles with the following keywords: Acceptance and Commitment Therapy, randomized, clinical trials, psychosis, bipolar disorder, schizophrenia, and major depressive with psychosis. All abstracts were read by two investigators and checked for eligibility. Studies were included if: randomly allocated to ACT or usual treatment and psychosis was psychiatric diagnosis. Study quality was rated using a methodology rating form. Re-hospitalization rates and effect of ACT on positive and negative symptoms of psychosis were analyzed. Random effects model was used for estimating the effect size and 95% confidence interval. Meta-analysis was carried out using STATA 12.1.

Results
A total of 190 patients from 4 Randomized Clinical Trials were included in the analysis. Most of the patients had a diagnosis of schizophrenia, and 50% were receiving ACT treatment during
hospitalization.

**Conclusions**
ACT is a promising adjunctive therapy for patients with psychosis.

---

**Comparative Analysis of Outcomes of an ACE Unit in a Predominantly Hispanic Population**

Jason Wang, MSIV; Paul Casner, MD

**Introduction**
Acute Care for Elderly Units focus on vulnerabilities of older patients that put them at increased risk for hospital associated disability. ACE Units have been shown to improve care in multiple areas. A pilot study was performed comparing outcomes on an ACE Unit to a General Medical (GM) Unit at UMC in El Paso.

**Materials and Methods**
A retrospective chart review was performed for 25 patients to the ACE Unit and 25 patients from the GM Unit between December 2012 and December 2013. Patients were older than 65 and medically unstable or scheduled for surgery were excluded. Variables analyzed were cost/patient, LOS, use of Foley catheters, use of restraints, number of medications ordered, use of antipsychotics and benzodiazepines, 30 day readmission and discharge to home.

**Results**
Mean age was similar (77.2 years, ACE; 77.8 years, GM). LOS was not significantly different (6.48 days ACE; 5.16 days GM p=0.27). Cost of care was higher in the ACE unit but did not attain statistical significance ($35,144/patient ACE; $24,167/patient GM, p=0.15). There was a 3-fold greater use of Foley catheters on the GM Unit compared to the ACE Unit. There were no significant differences in other categories.

**Conclusions**
There were no significant differences in a number of parameters of care in this small pilot study comparing outcomes of an ACE Unit to a GM Unit. There was a 3 fold decreased use of Foley catheters in the ACE Unit. This would be expected to reduce the impact of Foley catheter complications such as UTIs, falls and delirium.