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Association of metabolomic biomarkers with sleeve gastrectomy weight loss outcomes

Wendy Miller
Beaumont Health

Kathryn Ziegler
Beaumont Health

Stewart Graham
Beaumont Health

Michael Maddens
Beaumont Health

Matthew Sims
Beaumont Health

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reflux are typical symptoms, and gastric contents reflux into the esophagus to show clinical symptoms or cause morphological changes. The aim of this study is to investigate the relationship between a decrease in muscle mass and gastroesophageal reflux disease in healthy adults. **Methods:** This study was conducted with 1,709 adults who underwent gastroscopy with regular health check-ups. This study was divided into skeletal muscle mass, skeletal muscle mass / height2 (SMI), skeletal muscle mass in the upper and lower limbs, and extremity muscle mass / height2. **Results:** One of the baseline characteristics of the study population was 73.1% of the symptoms of gastroesophageal reflux disease among 1250 men and 26.9% of the symptoms among 459 women. After obtaining information on smoking, drinking, systolic blood pressure, diastolic blood pressure, fasting blood sugar, triglyceride, and high-density lipoprotein, the association with symptoms of gastroesophageal reflux disease was analyzed, but it was not statistically significant. Gastroesophageal reflux disease symptoms were significantly higher in men than in women. The lower the skeletal muscle mass and the SMI, the higher the rate of gastroesophageal reflux disease symptoms, which was statistically significant. However, there was no statistically significant difference in limb muscle mass and limb muscle mass / key square value from gastroesophageal reflux disease symptoms. **Conclusions:** Sarcopenia is associated with GERD in adult men and women aged 19 years and older. However, the criteria for diagnosing loss of skeletal muscle mass are not standardized, so there are limitations that the results may vary depending on each diagnostic method.

Poster 040

Association Between Weight and Fitness across Demographic Subgroups in NYC School Youth, 2006-2017

Cody Neshteruk, PhD *Durham,* Sarah Armstrong, MD *Durham NC*, Sophia Day, MA *Long Island City NY*, Kevin Konty, PhD *Long Island City NY*, Asheley Skinner, PhD *Durham NC*, Emily D'Agostino, DrPH, MS, MEd, MA

Background: There is an inverse relationship between child obesity and fitness, but less is known as the severity of obesity increases. The aim of this study was to examine the longitudinal association between weight status and fitness and identify demographic differences in this relationship in a large, diverse sample of children. **Methods:** A prospective cohort analysis was conducted with NYC public school children (11 cohorts; 2006-2017). Using the NYC Fitnessgram dataset, weight status was assessed using CDC growth charts and classes of obesity using %95th percentile. Fitness was measured as a composite fitness z-score based on the PACER, pushup and curlup muscular strength and endurance tests. Longitudinal mixed models with random-intercepts were developed to test the weight class-fitness association. Models were adjusted for sex, grade level, race/ethnicity, household poverty, English learner status, and time. Secondary models tested for interaction effects of demographic factors on the weight class-fitness association. **Results:** The sample included 1,114,333 children (50% male, 37.7% Hispanic, 26.4% non-Hispanic black, 10.9%, 3.6%, and 1.3% class I, II and III obesity, respectively). Compared to children with healthy weight, increasing level of obesity was associated with decreased fitness: overweight (b=-0.70, 95% CI: -0.71,-0.70), class 1 obesity (b=-1.41, 95% CI: -1.41, -1.40), class 2 obesity (b=-2.12, 95% CI: -2.13,-2.11), and class 3 obesity (b=-2.82; 95% CI: -2.84,-2.81). Models testing for interaction showed the inverse dose-response pattern of association between weight status and fitness was attenuated for females, elementary and middle school,

white, and non-English learner children (all p <.001). **Conclusions:** As the severity of obesity in children increases, fitness levels decline. This relationship is moderated by demographic factors. Given independent effects of fitness on health outcomes, children with severe obesity would benefit from treatment approaches designed to improve fitness.

Poster 042

Association of Cerebral Blood Flow Changes and Food Intake in Normal Weight, Anorexia, and Obesity

Tomas Marek, MD *Rochester MN*, Gerardo Calderon, MD *Rochester MN*, Daniel Gonzalez Izundegui, MD *Rochester MN*, Oscar Garcia, MD, Mandie Maroney, John Port, MD, PhD *Rochester MN*, Andres Acosta, MD, PhD, ABOM *Rochester MN*

Background: Brain response to food intake has been looked at from many points of view including, among others, hormonal, EEG and fMRI changes. In this study we present our findings of changes in cerebral blood flow (CBF) in various brain regions in response to food intake. We studied patients with a clinical diagnosis of anorexia, obesity and compared to normal weight healthy subjects. **Methods:** A total number of 26 subjects were analyzed. This included anorexic (n=7), normal weight (n=9) and obesity (n=10) patients, based on BMI and clinical data. The obesity group was further subdivided into 2 subgroups, based on calories to reach fullness into: high caloric intake - hungry brain (n=4) and low/normal caloric intake - non-hungry brain (n=6). All subjects received 4 brain MRI examinations on a 3T scanner, corresponding to 4 timepoints in a nutrient drink test satiation feeding paradigm (i.e., A - fasting, B - usual fullness, C – maximum fullness, and D - 30 minutes after maximal fullness). The nutrient drink test consisted of drinking Ensure® at a rate of 30 mL/min until reaching maximal fullness. Each scan consisted of anatomical T2-W and 3D pseudo-continuous arterial spin labeling (pCASL) sequences. CBF maps were reconstructed from the ASL data. Regions of interest (ROI's), corresponding to various brain regions, were drawn on the T2-W images and were transferred to the CBF maps. The blood flow in each ROI (in ml/100g/min) were recorded and analyzed. **Results:** Our analysis showed statistically significant differences (p<0.05) in CBF between the groups in left putamen at usual fullness and left and right nucleus accumbens at maximal fullness. Detailed analysis also revealed that subjects with anorexia and subjects with hungry brain obesity demonstrated similar trends in cerebral blood flow across various brain regions as well as timepoints. **Conclusions:** Our findings demonstrate complex relations of food intake and CBF in various brain regions in relation to subject's BMI. Although further research is necessary to uncover additional associations, our study shows interesting findings of CBF data in patients with anorexia and obesity as well as normal-weight subjects.

Poster 043

Association of Metabolomic Biomarkers With Sleeve Gastrectomy Weight Loss Outcomes

Wendy Miller, MD *Royal Oak MI*, Kathryn Ziegler, MD FACS *Royal Oak MI*, Stewart Graham, PhD *Royal Oak,* Michael Maddens, MD, Matthew Sims, MD, PhD

Background: Factors influencing weight loss variability following sleeve gastrectomy (SG) are not well understood. We evaluated the correlation of metabolomic biomarkers with weight loss outcomes.

Methods: This prospective study evaluated the metabolomic profile of feces and serum prior to SG and three months post-SG, along with weight loss outcomes at three months post-SG (N=45). Serum and fecal samples were quantitatively profiled using a combination of 1H NMR and DI-LC-MS/MS (AbsoluteIDQ P180 kit (Biocrates, Innsbruck)). **Results:** Percent total weight loss (%TWL) for the lowest versus the highest weight loss tertiles (T1 vs T3) was 11.1 + 0.8% and 17.0 + 1.3%, p<0.001. Patients with successful weight loss (T3) at 3 months, when compared to all patients at baseline, were found to have significant alterations in arachidonic acid (AA) metabolism, taurine and hypotaurine metabolism, and bile acid biosynthesis (p<0.05). Compared to patients at baseline, patients with poor post-op weight loss (T1) at 3 months had significant alterations in metabolites related to porphyrin metabolism, ammonia recycling, and bile acid biosynthesis, but not AA metabolism (p<0.05). Serum analyses are pending. **Conclusions:** Studies have examined alterations in post-surgical metabolomics in bariatric patients, but this is the first to evaluate weight-loss outcome-specific differences in fecal and serum metabolites. We found that significant alterations in fecal AA metabolism correlates with increased weight loss, while significant alterations in porphyrin metabolism correlates with poor weight loss. AA metabolites have been linked to the pathophysiology of obesity and the initiation and resolution of inflammation. Disorders of porphyrin metabolism have been associated with insulin resistance and metabolic syndrome. Further, we anticipate finding correlations between serum metabolites and weight loss outcomes.

Poster 044

Association of Number of Bites and Eating Speed With Energy Intake Using Wearables in the Real World

Nabil Alshurafa, PhD *Chicago IL*, Shibo Zhang, MA *Evanston IL*, Christopher Romano, BS *CHICAGO,* Hui Zhang, PhD *Chicago IL*, Angela Pfammatter, PhD *Chicago IL*, Annie Lin, PhD, RD *IL*

Background: This study investigated associations between eating behavior and time of day with energy intake using a wearable camera under free-living conditions and explored if obesity modifies the associations. **Methods:** Sixteen participants (50% with obesity) recorded eating behaviors using a wearable fish-eye camera for 14 days under free-living conditions. Video recordings were viewed by trained annotators who confirmed number of bites, eating speed, and time of day for each eating episode. Energy intake was determined by a trained dietitian performing 24-hour diet recalls. **Results:** Greater number of bites, reduced eating speed, and increased BMI significantly predicted higher energy intake among all participants (P<0.05, each). There were no significant interactions between obesity and number of bites, eating speed, or time of day (p>0.05). Greater number of bites and reduced eating speed were significantly associated with higher energy intake in participants without obesity. **Conclusions:** Under free-living conditions, greater number of bites and slower eating speed predicted higher energy intake when examining consumption of foods with beverages. Obesity did not modify these associations. Findings highlight how eating behaviors can impact energy balance and subsequently inform weight management interventions using wearable technology.

Poster 045

Association of Plasma Branched-Chain Amino Acids With Gastric Emptying and Satiety in Obesity

Maria Laura Ricardo Silgado, MD *Rochester MN*, Gerardo Calderon, MD *Rochester MN*, Alison McRae, MS *Rochester MN*, Daniel Gonzalez Izundegui, MD *Rochester MN*, Sneha Singh, MD, Duane Burton, MHA *Rochester MN*, Andres Acosta, MD, PhD, ABOM *Rochester MN*

Background: Plasma branched-chain amino acids [(BCAA) Isoleucine, leucine, and valine] are elevated in obesity, and BCAA in the gastric content have been related to delayed gastric emptying (GE) in humans. It is unknown if there is an association of plasma BCAA with food intake regulation. The aim of this study was to assess the correlation between plasma BCAA with food intake regulation in obesity. **Methods:** We studied 120 participants with median (IQR) age of 38 (30-44) years, BMI 36.4 (32.8-41.7) kg/m2, 73% females. After overnight fasting, blood was collected; a validated visual analog scale for appetite was performed for hunger, satisfaction, fullness, and desire to eat, before and after a standard meal, and then every 30 minutes for the first 2 hours and at 4 hours. Overall appetite score (OAS) was calculated [(100-hunger) + fullness + satisfied + (100-desire to eat)]. Participants completed GE test, measured by scintigraphy after a standard 320 kcal meal (30% fat), and amino acids were quantified in plasma by derivatizing with 6-aminoquinolyl-N-hydroxysuccinimidyl carbamate (Waters MassTrak kit) and ultra-performance liquid chromatography system (Waters). BCAA Concentration was calculated. Spearman correlation determined the association of GE rate and BCAA. **Results:** The OAS was not associated with any of the BCAA. Fasting leucine was associated with sensation of "hunger" (AUC0-240m, r=0.27, p=0.01), and sensation of desire to eat (AUC0-240m, r=0.26, p=0.02). The percentage of GE at 120 minutes was positively correlated with fasting valine (r=0.25, p=0.02), isoleucine (r=0.23, p=0.03) and leucine (r=0.29, p=0.006). GE (T1/2, min) was negatively associated with fasting valine (r=0.21, p=0.05), and leucine (r=0.23, p=0.03). **Conclusions:** BCAA are correlated with appetite sensations and GE. These findings suggest that higher fasting plasma levels of BCAA, previously associated with obesity and insulin resistance, are also associated with rapid GE and high sensation of hunger and desire to eat.

Poster 046

Association of Pre- and Inter-conception Cardiometabolic Risk Factors with Recurrent Preeclampsia

S. Michelle Ogunwole, MD *Baltimore MD*, George Mwinnyaa, MHS *Baltimore MD*, Xiaobin Wang, ScD, Xiumei Hong, MD, PhD, Janice Henderson, MD, Wendy Bennett, MD *Baltimore MD*

Background: Women with recurrent preeclampsia represent a group at uniquely high risk for maternal and perinatal morbidity, as well as future cardiovascular, renal, and metabolic complications. Identifying modifiable risk factors for recurrent preeclampsia will inform targeted interconception interventions that can improve future pregnancy outcomes as well as women's long-term health. The aim of this study is to examine the association of cardiometabolic risk factors with recurrent preeclampsia. **Methods:** The Boston Birth Cohort is a racially/ethnically diverse cohort. We identified 619 women who had repeat