our projected sample size is small and may impact the ability to examine this interaction. DISCUSSION/SIGNIFICANCE: Black Americans, particularly in the Deep South, are at elevated risk for PAD and critical limb ischemic events, such as amputation. Understanding CV health metrics and SDoH characteristics among adults with PAD is essential to reduce disparities in care and provide valuable information for those at highest risk for complications.

The Transcriptional Function of TCF7L2 is Spatially Restricted in Liver and Regulates Zonated Metabolic Pathways Which Contribute to Liver Disease*

Iriscilla Imabary Ayala¹, Skanda K Hebbale², Chris E. Shannon², Ivan Valdez², Marcel Fourcaudot², Terry M. Bakewell², Madelaine Sholto³, Thomas Vallim³ and Sami Heikkinen⁴ ¹University of Texas Health Science Center; ²Diabetes Division, University of Texas Health, San Antonio, TX, USA; ³Department of Medicine, Division of Cardiology, University of California, Los Angeles (UCLA), Los Angeles, CA, USA and ⁴Department of Medicine, University of Eastern Finland, Kuopio, Finland Luke Norton, Diabetes Division, University of Texas Health, San Antonio, TX, USA

OBJECTIVES/GOALS: Single nucleotide polymorphisms in the transcription factor 7-like 2 (TCF7L2) gene are associated with Type 2 Diabetes (T2D) and nonalcoholic fatty liver disease (NAFLD). The metabolic function of TCF7L2 in the liver remains to be fully elucidated, but we hypothesized that TCF7L2 contributes to NAFLD through regulation of zonal metabolic pathways. METHODS/STUDY POPULATION: Using single nuclei RNA sequencing, we examined Tcf7l2 expression in periportal (PP) hepatocytes around the portal triad and pericentral (PC) hepatocytes surrounding the central vein of the liver. To visualize TCF7L2 transcriptional activity we used a TCF reporter mice, which expresses an H2B-eGFP fusion protein downstream of the conserved TCF DNA binding site. We disrupted Tcf7l2 transcriptional activity in mouse liver by breeding mice with a floxed Tcf7l2 exon 11, which encodes part of the DNA binding domain (DBD), to albumin-Cre mice (Hep-TCF7L2∆DBD). Eight-week-old mice were fed a choline-deficient amino acid-defined high fat (CDAHFD) diet for 8 weeks. In liver samples harvested from these mice, we examined disruption to several key zonated metabolic pathways, and quantified the development of fibrosis. RESULTS/ANTICIPATED RESULTS: Single nuclei analysis revealed that Tcf7l2 mRNA was expressed primarily in parenchymal cells of the liver but was ubiquitous across the liver lobule. However, in immunofluorescence analysis of TCF reporter mice, the transcriptional activity of TCF7L2 was highly restricted to PC hepatocytes. Classic PC hepatocyte markers, including glutamine synthetase (Glul), were absent in Hep-TCF7L2\DeltaDBD mice. Following the CDAHFD, Hep-TCF7L2∆DBD mice developed more severe fibrosis in histological analysis, and expressed elevated levels of genes involved in fibrogenesis, collagen synthesis and TGFB signaling. Hep-TCF7L2ΔDBD mice also displayed hepatic cholesterol accumulation following the CDAHFD, which was likely the result of impaired pericentral bile acid synthesis. DISCUSSION/ SIGNIFICANCE: Our results suggest that TCF7L2 plays an important role in the regulation of zonated metabolic pathways, which may contribute to the development of fibrosis. Ongoing analyses are exploring the mechanisms regulating the zonal transcriptional activity of TCF7L2.

26

Evaluating serum copper and kidney function in a cohort of bariatric surgery patients

Katherine McKeon¹, Michael Cook², John Baker³, Kyle LaPenna², Hua He³, Amanda Anderson⁴ and Felicia Rabito¹

¹Tulane University School of Public Health and Tropical Medicine; ²Louisiana State University Health Sciences Center, University Medical Center New Orleans; ³Tulane University School of Medicine, University Medical Center New Orleans and ⁴University of Alabama-Huntsville

OBJECTIVES/GOALS: High serum copper (Cu) levels have previously been described in bariatric patients. The kidneys are a target organ for Cu toxic insult but the role of Cu on kidney function (eGFR) is uncertain. This study examines the association between Cu and eGFR in a bariatric population in Southeast Louisiana. METHODS/STUDY POPULATION: Seven hundred fifty patients will be recruited from the Bariatric Center of the University Medical Center in New Orleans. Inclusion criteria include: age \geq 18 years, clinic visit between June 1, 2018 – May 31st 2024, and having a serum Cu test result. Covariables such as inflammatory markers and hormonal contraception use will be assessed as potential confounders. Blood pressure will be assessed as a potential effect modifier. Data will be obtained from electronic medical records. Two cohorts will be assembled, a pre-surgery cross-sectional cohort and another followed post-surgery. Separate models will be developed stratified by race-ethnicity. RESULTS/ANTICIPATED RESULTS: In a pilot study of bariatric patients 26% had elevated (>155 mcg/dl) serum Cu and pronounced racial differences were noted. Characteristics consisted of a mean BMI of approximately 50 kg/m2; 91% were female and 69% were Black. Black patients had approximately double the prevalence (OR 1.98; 95% CI: 1.15, 3.4) compared to white patients. Due to the dual nature of the kidneys' involvement in metabolism via excretion and being the target organ for toxic insult, racial differences in exposure, coupled with the disproportionate rates of chronic kidney disease in Black adults, may be an explanation for the association between elevated Cu levels and eGFR in Black adults in this study. DISCUSSION/ SIGNIFICANCE: Results from this study will provide insight into the prevalence of Cu and its association with kidney function in a bariatric population. Chronic kidney disease or other forms of renal impairment may result in the need for more conservative guidelines for dietary copper in bariatric medicine.

Avoiding Death From Stimulant Toxicity: Resiliency Among People Who Use Stimulants

Nigel Parker Anderson, Phillip Coffin and Vanessa McMahan University of California, San Francsico

OBJECTIVES/GOALS: The project investigates the role that resiliency may play within individual, interpersonal, social, and structural contexts in protecting against acute lethal stimulant (meth/amphetamine or cocaine) toxicity. Identifying preventative factors is crucial in developing and implementing risk reduction strategies for people who use stimulants. METHODS/STUDY POPULATION: This is a qualitative study involving in-depth interviews via questionnaire assessing resiliency factors among persons living in San Francisco

24