in children and the age and racial disparity is not well studied. The objectives are to examine the relation between Pb level and asthma status and to determine the age and racial/ethnic differences in this relation. METHODS/STUDY POPULATION: We analyzed data from National Health and Nutrition Examination Survey 1999-2016 for 22,885 children 1-15 years old. Asthma information was collected by questionnaire. Blood lead level was measured using mass spectrometry. The association between blood Pb level and asthma status was assessed by logistic regression after adjusting for children' age, gender, race/ethnicity, insurance status, and source of care; household poverty, mother's age and smoking status. Data were analyzed using Stata 14 considering design and sample weight and $p<0.05$ is statistically significant. RESULTS/ANTICIPATED RESULTS: Pb level was associated with asthma status (Adjusted Odds Ratio (AOR)=1.4, 95% Confidence Interval (CI) = 1.2-1.7, $p < 0.001$). Stratified analysis by age showed that blood Pb level is related to asthma only in children 1-5 years old (AOR = 1.3, 95% CI = 1.1-1.5, $p = 0.004$). There was no racial/ethnic difference in this association. DISCUSSION/SIGNIFICANCE OF IMPACT: Pb level is associated with asthma status in children especially young children. Health risk of low Pb is a concern. Preventive measures by reducing potential sources of Pb should be introduced early.

3394

Alpha-1-acid glycoprotein as outcome, independent predictor, and effect modifier in a randomized, placebo-controlled, factorial trial of recombinant human growth hormone and rosiglitazone in people living with HIV

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OBJECTIVES/SPECIFIC AIMS: In a randomized controlled trial in participants with HIV infection, recombinant human growth hormone (rhGH) reduced visceral adipose tissue (VAT); addition of rosiglitazone to rhGH prevented the accompanying decline in insulin sensitivity (SI). Within this parent RCT, we sought to determine the effect of rosiglitazone and rhGH intervention on alpha-1-acid glycoprotein (AGP), a biomarker of inflammation. We also investigated AGP as an independent risk factor for SI and VAT changes along with any potential effect modification by AGP of the intervention. METHODS/STUDY POPULATION: Participants with HIV-infection (n=72) with abdominal adiposity and insulin resistance were randomized to rosiglitazone, rhGH, combination, or placebo for 12 weeks (NCT00130286). SI was determined by frequently sampled intravenous glucose tolerance test, and VAT by whole body MRI. AGP concentrations were determined by immunoturbidimetric assay in available serum samples at baseline (time 0), 4, and 12 weeks (n=41 participants with samples at all 3 time points). A linear mixed model was used to assess the impact of intervention over time on AGP concentrations. General linear models were used to assess baseline AGP concentrations as an independent predictor of SI and VAT changes by treatment group with the model initially including age quartile, gender, race, ethnicity, BMI, HIV RNA <400 copies/mL, antiretroviral regimen, CD4 count, Stavudine use, and zidovudine use with step-by-step removal of least significant predictors. Effect modification was assessed by adding an interaction term between AGP and assigned intervention. RESULTS/ANTICIPATED RESULTS: AGP did not differ among treatment groups at baseline; overall median (Q1, Q3): 0.608 (.526,.727) g/L, $P = 0.92$. Treatment with rosiglitazone, rhGH, or the combination significantly reduced AGP concentrations from baseline to week 12, compared to placebo (time by treatment interaction, $P = 0.0038$). Baseline AGP was not a significant predictor or effect modifier of SI change in response to treatment ($P \geq 0.50$). Baseline AGP (g/L) was an independent predictor of VAT change (L) (β=1.91, SE=0.89, $P = 0.038$) in addition to a treatment effect ($P < 0.001$) and age quartile effect ($P < 0.001$). No other predictors or interactions were significant, including effect modification of AGP (AGP by treatment interaction $P = 0.50$). DISCUSSION/SIGNIFICANCE OF IMPACT: It is known that immune and metabolic pathways are highly integrated, and biomarkers of inflammation have predictive abilities for cardiovascular and metabolic disease outcomes. This analysis provides data showing that treatment with rosiglitazone or rhGH in the context of HIV reduces AGP concentrations, indicating efficacy in reducing systemic inflammation. Baseline AGP was an independent risk factor for VAT changes as those with lower AGP at baseline showed a greater reduction in VAT in response to treatment. Biomarkers of inflammation may provide prognostic information for individualized patient outcomes to help guide treatment and follow-up.

3442

Among Hospitalized Patients, Cannabis use is Associated with Reduced risk of Clostridium Difficile infection

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OBJECTIVES/SPECIFIC AIMS: Clostridium Difficile Infection (CDI), a prevalent cause of diarrhea, is the most notorious hospital-acquired infection, resulting in an alarming mortality and health care utilization rates. Herein, we investigate the impact of cannabis use, which is gaining significant legalization for recreational use, on the risk of CDI. METHODS/STUDY POPULATION: We selected adult records (age ≥ 18 years) from the Nationwide Inpatient Sample 2014, and identified cannabis users and other clinical conditions using ICD-9-CM codes. With multivariate logistic modeling, we generated propensity scores for cannabis users and matched them to non-users in a 1:1 ratio (104,936:104,936). We then estimated the adjusted relative risk (aRR) for having CDI using conditional Possion regression models with generalized estimating equations [SAS 9.4]. RESULTS/ANTICIPATED RESULTS: Among the matched hospitalizations (n=209,872), cannabis usage was associated with a reduced incidence of CDI (505.8[464.7-550.6] vs. 694.9[645.8-747.70] per 100,000 hospitalizations), resulting in a 27% reduced risk of CDI (aRR:0.73[0.65-0.81]; p-value:<0.0001). Non-dependent and dependent cannabis users respectively had 22% and 78% reduced likelihood of CDI when compared to non-cannabis users (0.78[0.69-0.90] & 0.22[0.12-0.40]). Furthermore, dependent users had less risk of CDI compared to non-dependent users (0.28[0.16-0.51]). Comparatively, abusive use of other substances like alcohol and tobacco was associated with increased risk for CDI (1.30[1.13-1.49] & 1.24[1.10-1.40]) DISCUSSION/SIGNIFICANCE OF IMPACT: Unlike alcohol and tobacco abuse which are associated with elevated risk for CDI, cannabis use, is related to a decreased

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risk of CDI amongst hospitalized patients. Further prospective and molecular mechanistic studies are required to elucidate how cannabis impacts CDI.

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Association between HIV and early weight loss and the impact on subsequent treatment outcomes among patients with tuberculosis

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OBJECTIVES/SPECIFIC AIMS: Previous research suggests that weight loss during early TB treatment (first two months of anti-TB therapy) is a predictor of poor tuberculosis (TB) treatment outcomes among HIV-negative populations, but the relationship has not been well studied in the context of HIV. We examined the association between HIV and weight change during the first two months of anti-tuberculosis treatment, and also assessed the effects of HIV and early weight change on tuberculosis (TB) treatment outcomes. METHODS/STUDY POPULATION: Adults with culture-confirmed, drug-susceptible, pulmonary TB, regardless of HIV status, were enrolled into the Regional Prospective Observational Research for Tuberculosis (RePORT)-Brazil cohort and followed on standard anti-TB therapy. For the primary analysis, we compared weight change in persons living with HIV (PLWH) and HIV-negative patients between baseline and two months using multivariable bootstrapped quantile regression and modified Poisson regression. For secondary analysis, we examined the separate effects of HIV and weight change on poor TB treatment outcome (treatment failure, TB recurrence, or death) using Cox proportional hazards regression. RESULTS/ANTICIPATED RESULTS: Among 323 participants, 45 (14%) were HIV-positive. On average, PLWH lost 0.7% (interquartile range (IQR): −5.1%, 4.4%) of their baseline body weight between baseline and two months; those without HIV gained 3.5% (IQR: 0.8%, 6.7%). After adjusting for age, sex, and baseline BMI, PLWH lost 4.1% (95% confidence interval (CI): −6.5%, −1.6%) more weight during the first two months of anti-TB treatment than HIV-negative individuals. HIV infection was associated with weight loss ≥5% (adjusted odds ratio = 9.3; 95% CI: 4.2-20.6). Regarding the secondary analysis, 14 patients had a poor TB treatment outcome: 2 treatment failures, 4 cases of recurrent TB, and 8 deaths. PLWH and patients who lost ≥5% weight had significantly increased risk of poor TB treatment outcome with hazard ratios of 8.77 (95% CI: 2.96-25.94) and 4.09 (95% CI: 1.11-15.14), respectively. DISCUSSION/SIGNIFICANCE OF IMPACT: Our results suggest that HIV is associated with weight loss during early TB treatment, and both HIV and early weight loss were associated with poor treatment outcome. Future research should examine the potential etiologies of these findings and identify the types of interventions that would best promote weight gain during TB treatment, especially among PLWH, in order to prevent poor TB treatment outcomes.

3480

Association of Clopidogrel Resistance Determinants and MACE Ocurrence in Peripheral Arterial Disease

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OBJECTIVES/SPECIFIC AIMS: The study aims to identify the short and long-term associations of HTPR and presence of CYP2C19 polymorphism in the occurrence of major adverse cardiovascular events (MACE). The primary outcome of the study will be the presence of MACE including stent thrombosis, need for revascularization, acute limb ischemia events, myocardial infarction and death in relation to the presence of HTPR and CYP2C19 polymorphism. Secondary outcomes will include the prevalence of HTPR and CYP2C19 polymorphism in patients with PAD, and association with other medications including aspirin and cilostazol. METHODS/STUDY POPULATION: Patients above 21 years of age with the diagnosis of PAD using clopidogrel therapy for at least for seven days will be recruited at the University of Puerto Rico District Hospital and Cardiovascular Hospital of Puerto Rico and the Caribbean. RESULTS/ANTICIPATED RESULTS: A total of 200 patients from Puertorrican, Dominican and Cuban ethnicity will be expected to be recruited. The most common comorbidities will include, coronary artery disease, hypertension, dyslipidemia, and diabetes mellitus type 2. No significant distr DISCUSSION/SIGNIFICANCE OF IMPACT: The status quo as it pertains to resistance to clopidogrel in PAD patients is to improve antiplatelet resistance using antiplatelet therapy guided by platelet assays in order to reduce MACE occurrence. Although HTPR and presence of CYP2C19 polymorphisms have been studied on the PAD population, currently there is no gold standard test for measuring antiplatelet resistance. In that regard, this study will expect to identify the contribution that HTPR and CYP2C19 polymorphism might have on MACE in patients with PAD. In this way, the results will allow identification of abnormality parameters in HTPR and CYP2C19 testing in relation to the impact on risk of having MACE. Once the association of these variables with MACE is established, testing for clopidogrel resistance could become a potential strategy to optimize antiplatelet therapy and reduce the impact that MACE have in this population.

3129

Association of concurrent unhealthy alcohol use, tobacco use, and depressive symptoms on incident cardiovascular disease among HIV-infected and uninfected adults: Veterans Aging Cohort Study

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OBJECTIVES/SPECIFIC AIMS: This study applied a syndemic framework to 1) assess whether the concurrence of unhealthy alcohol use, smoking, and depressive symptoms is associated with increased risk for incident CVD among people living with and without HIV and 2) determine whether the association between this syndemic and incident CVD is differential by HIV status. METHODS/STUDY POPULATION: We evaluated 5731 participants (50.3% HIV+) without baseline CVD from the Veterans Aging Cohort Study, a prospective, observational cohort of PLWH and matched uninfected veterans enrolled in 2002 and followed through 2015. We assessed baseline number of conditions (syndemic score: 0-3; unhealthy alcohol use (>14 drinks per week for men [women] or 5 or

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