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 ≥ 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