(HC). METHODS/STUDY POPULATION: We did chromatography-based HDL purification and SWATH-MS-based proteomic quantitation. Proteomic alterations of HDL fractions and their association with glycemic control was examined. Study population: 26 patients with T1DM and 13 HC. RESULTS/ANTICIPATED RESULTS: We quantified 78 proteins in isolated HDL, using mass spectrometry and label-free SWATH quantification. Youth with T1DM had significantly higher protein levels of A1BG ($P = 0.008$), A2AP ($P = 0.0448$), APOA4 ($P = 0.0366$), CFAH ($P = 0.0476$), FHR2 ($P = 0.0005$), ITIH4($P = 0.01$), PGRP2 ($P = 0.0167$) and lower levels of ALBU ($P = 0.0164$) and CO3 ($P = 0.019$) compared to HC. A1BG ($r=0.541$, $P<0.001$) and ITIH4 ($r=0.357$, $P = 0.026$) were significantly positively correlated with HbA1c. DISCUSSION/SIGNIFICANCE OF IMPACT: Youth with T1DM have proteomic alterations of their HDL compared to HC, despite similar concentration of HDL cholesterol, that might affect the cardioprotective mechanisms of HDL. Future efforts should focus on investigating the role of these HDL associated proteins in regard to HDL function and their role in CVD risk in patients with T1DM.

3510

Academic influence in gynecologic oncology is associated with industry funding: an analysis of the Open Payments database

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OBJECTIVES/SPECIFIC AIMS: Industry payments to physicians can present a conflict of interest. The Physician Payments Sunshine Act mandates the disclosure of these financial relationships to increase transparency. Recent studies in other surgical specialties have shown that research productivity is associated with greater industry funding. In this study, we characterize the relationship between academic influence and industry funding among academic gynecologic oncologists. METHODS/STUDY POPULATION: Departmental websites were used to identify academic gynecologist oncologists and their demographic information. The Hirsch index (h-index) relates an author's number of publications to number of times referenced by other publications, a validated measure of an author's academic influence. This was obtained from the Scopus database. The Center for Medicaid and Medicare Services Open Payments online database was searched for all industry payments in 2017. The NIH Reporter online database was searched for active grants. Goodness of fit testing showed that all variables followed nonparametric distributions. Medians were compared using Mann-Whitney U tests and Kruskal-Wallis analysis of variance with post-hoc Dunn's test. RESULTS/ANTICIPATED RESULTS: Four hundred and sixty-six academic gynecologic oncologists were included in the analysis. In 2017, 89.7% of this group received industry funding totaling $41.4 million. Median industry funding was $453 [IQR $67-19684] and median h-index was 14 [IQR 8-26]. Only 8.1% of gynecologic oncologists were NIH grant recipients and they received significantly higher industry payments ($357 vs. 11,168, $P<0.01$). Gender and academic rank were not associated with industry funding. Gynecologic oncologists in the highest decile of industry funding received a median payment of $447,651[N=46, IQR $285,770 – 896,310] totaling $36.5 million. The median h-index for this top-earning decile was 23 [N=46, IQR 16.5-30.3]. When stratified by payment amount, median h index increased but only reached statistical significance in the highest cohort receiving >$100,000 ($N = 63$, $P<0.05$). DISCUSSION/SIGNIFICANCE OF IMPACT: The majority of academic gynecologic oncologists receive industry funding although there are large variations in payments. Those receiving the largest payments are more likely to hold NIH grants and have greater academic influence.

3577

Adiposity and Fibroblast Growth Factor 23 in nondiabetic patients with moderate-to-severe Chronic Kidney Disease

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OBJECTIVES/SPECIFIC AIMS: The main aim of this study was to investigate the relationship between measures of adiposity and FGF-23 in a sample of patients with CKD stages 3-4. METHODS/STUDY POPULATION: This study was a clinic-based cross-sectional investigation of 71 CKD patients who underwent body composition and anthropometric assessments as part of the relationship of insulin sensitivity in kidney disease and vascular health (RISKD) study. Dual energy x-ray absorptiometry (DEXA) scans were used to measure total fat mass and body mass index (BMI) was computed using baseline weight and height measurements. Biomarkers included serum FGF-23 (C-terminal), serum leptin, high sensitivity C-reactive protein (hsCRP), serum triglycerides, high density lipoprotein (HDL) cholesterol and total cholesterol. Creatinine-based estimated glomerular filtration rate (eGFR) was computed using the CKD-EPI equation. Multiple linear regression with robust standard errors was used to investigate the relationship between FGF2-3 and measures of adiposity (BMI, total fat mass and serum leptin). Log-transformation was performed for variables (FGF-23, hsCRP and serum lipids) with considerable skewness. RESULTS/ANTICIPATED RESULTS: The median age of the study participants was 68 (IQR: 60, 73) years; 26% were female and 23% were African-American. Median eGFR was 46.9 ml/min/1.73m2 (IQR: 41.9, 52.8), median BMI was 31 kg/m2 (IQR: 27, 35). Log FGF-23 had a significant positive correlation with BMI ($r = 0.27$, $p = 0.02$), total fat mass ($r = 0.30$, $p = 0.01$) and serum leptin ($r = 0.43$, $p < 0.0001$). After full adjustment for age, sex, race, eGFR, log hsCRP, log HDL and log triglycerides, a 50% increase in FGF-23 was associated with a 1 kg/m2 [95% CI: 0.1, 1.9; $p = 0.03$] increase in BMI, a 2.5 kg [95% CI: 0.2, 4.8; $p = 0.03$] increase in total fat mass and a 6.7 ng/mL [95% CI: 1.0, 12.4; $p = 0.02$] increase in serum leptin. DISCUSSION/SIGNIFICANCE OF IMPACT: In this sample of patients with moderate-to-severe CKD, we found a significant independent association between higher FGF-23 levels and higher adiposity (BMI, total fat mass and the pro-atherogenic adipocytokine, leptin). The underlying causes and the implications of these associations − particularly in bone and vascular health − need to be further investigated.

3469

Age and racial variation in the relation between blood lead level and asthma in children: Data from National Health and Nutrition Examination Survey 1999-2016

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OBJECTIVES/SPECIFIC AIMS: Lead (Pb) exposure can seriously affect nervous system and kidney. Young children are vulnerable to Pb exposure. However, the role of low-level Pb exposure in asthma

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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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