syndrome (PCOS). Early risk factors and subclinical CVD includes atherogenic dyslipidemia, obesity, insulin resistance, blood pressure, atherosclerosis and impaired cardiac function. Androgen exposure is associated with onset of adiposity, impaired insulin-glucose and lipid metabolism, and cardiac dysfunction. The mechanisms of increased risk of CVD and cardiac dysfunction in PCOS related to hyperandrogenemia, AR and estrogen receptor (ER) activation remain unclear. **Aim:** The aim of this study was to investigate the effect of androgen treatment on cardiac AR and ER activation, fatty acid metabolism and cardiac function in a PCOS-prone rodent model. **Methods:** A PCOS-prone rodent model at 6 wks of age with obesity, apoB-remnant lipemia and insulin resistance, and controls were treated with testosterone for 12 weeks. Cardiac function was assessed using transthoracic doppler echocardiography (M-Mode 2D-imaging), lipogenic, AR, ER and other metabolic gene and protein expression were assessed using RTPCR and SDS-PAGE western blot. **Results:** PCOS-prone animals exhibited left ventricular (LV) hypertrophy, with increased LV mass to body weight (551.6 ± 38.85 mg vs 999 ± 96.17 mg, $p<0.05$), LV posterior wall diastolic diameter and LV internal diastolic diameter compared to controls. Isovolumetric relaxation time (IVRT) was prolonged (15.91 ± 1.591 msec vs 23.75 ± 0.722 msec, $p<0.05$). Mild systolic dysfunction was evidenced by increased isovolumetric contraction time (IVCT; 22.5 ± 1.348 msec vs 28.96 ± 1.248 msec, $p<0.05$) and decreased % ejection fraction and % fractional shortening in PCOS-prone compared to controls. T treatment increased LV mass, IVCT and IVRT in controls but did not exacerbate cardiac function in PCOS-prone animals. T treatment increased cardiac protein expression of PPAR-α in PCOS-prone and controls, and T increased ACC in controls. AR protein expression tended to be reduced, and ER-α was reduced in both T treated control and PCOS-prone animals. **Conclusions:** The PCOS-prone rodent model demonstrates early cardiac LV hypertrophy and diastolic-systolic dysfunction and T treatment alters fatty acid metabolism, and AR and ER activation are associated with altered cardiac morphology and function in the PCOS-prone and control conditions.

Cardiovascular Endocrinology
CARDIOVASCULAR ENDOCRINOLOGY

Association Between Thyroid Hormones and Lipids Stratified by Race and Sex

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It has been well-established that thyroid hormones play a role in cholesterol and lipoprotein metabolism. However, there is limited data assessing the variability in the association between thyroid hormones and lipids across sex and race. We hypothesized that thyroid dysfunction is associated with changes in lipids and lipoproteins with no substantial variability in this association between races and sex. The electronic medical record of a large county hospital in Dallas, TX was queried to obtain data on all patients who had lipid panels and thyroid function tests checked on the same day from 1/1/2013 to 1/1/2018. The results were stratified into hypothyroid (TSH greater than 4.5 mcIU/L and Free T4 less than 0.8 ng/dL), hyperthyroid (TSH less than 0.5 mcIU/L and Free T4 greater than 1.8 ng/dL) and normal (TSH between 0.5 and 4.5 mcIU/L, Free T4 between 0.8 and 1.8 ng/dL). Results consistent with subclinical thyroid disease were excluded from further analysis. There were 25,290 unique results for thyroid hormones and lipid panels checked on the same day. The results were further stratified by race and sex, and the relationship between thyroid function and lipids was assessed. The correlation coefficient (r) was compared between sexes within each race for the following variables: TSH vs HDL-C, TSH vs LDL-C, TSH vs Total Cholesterol, TSH vs triglycerides, FT4 vs HDL-C, FT4 vs LDL-C, FT4 vs Total Cholesterol, and FT4 vs triglycerides. Among black males with hypothyroidism, there was a notably stronger correlation when compared to black females in the relationship between TSH vs LDL-C, and TSH vs Total Cholesterol. Specifically, the correlation coefficient of TSH vs LDL-C among Black males with hypothyroidism was 0.582, compared to 0.133 among Black females with hypothyroidism ($P=0.0053$). Furthermore, the correlation coefficient of TSH vs Total Cholesterol among Black males was 0.567 compared to 0.184 among Black females ($P=0.016$). In contrast, no difference in any of the relationships between thyroid and lipids was demonstrated between sexes amongst Whites, Asians, and Hispanics. Overall, we found differences in Black patients compared to patients of other races with regards to the association between thyroid and lipids. Specifically, it was found that Black males with hypothyroidism had a stronger positive correlation in TSH vs LDL-C and TSH vs Total Cholesterol than Black females. This type of difference between sexes was not found amongst any other race. These findings suggest that thyroid dysfunction is associated with changes in lipids, and the way these changes manifest may vary depending on the race and sex. This further highlights the importance of checking lipid panels in patients with thyroid dysfunction. Further research is needed to more clearly characterize the variation that is seen in thyroid and lipid function amongst races.

Cardiovascular Endocrinology
CARDIOVASCULAR ENDOCRINOLOGY

Black Women Have a Worse Cardio-Metabolic Risk Profile Compared to White Women with Polycystic Ovary Syndrome in the United States: A Systematic Review and Meta-Analysis

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Health disparities may influence cardio-metabolic risk in women with polycystic ovary syndrome (PCOS). The magnitude and direction of differences in cardio-metabolic risk between Black and White women with PCOS remain uncertain due to inconsistent reports. We conducted

a systematic review and meta-analysis to evaluate evidence on cardio-metabolic health disparities between Black and White women with PCOS in the US in response to the call for further delineation of these disparities by the International Evidence-based Guideline for the Assessment and Management of PCOS. Databases of MEDLINE, Web of Science, and Scopus were searched (January 1990 to September 2020) to identify observational studies documenting cardio-metabolic risk profile (glucoregulatory, lipid profile, anthropometric, blood pressure status) in Black and White women with PCOS. The primary outcome was fasting glucose. Further, cardiovascular events (stroke, coronary heart disease, heart failure) and mortality rate (cardiovascular death, total mortality) data were evaluated between groups. Studies on children (< 17 yrs.), pregnant or menopausal-aged (> 50 yrs.) women were excluded. Data were pooled by random-effects models and expressed as weighted mean differences and 95% confidence intervals. Eleven studies (n = 2,821; [626 Black; 2,195 White women]) evaluated cardio-metabolic risk profile, yet none reported on cardiovascular events/mortality rate. Black women had comparable fasting glucose (-0.61 [-1.69, 2.92] mg/dL; I^2 = 62.5%), yet exhibited increased fasting insulin (6.76 [4.97, 8.56] μIU/mL; I^2 = 59.0%); homeostatic model assessment of insulin resistance (HOMA-IR; 1.47 [0.86, 2.08]; I^2 = 83.2%); systolic blood pressure (SBP, 3.32 [0.34, 6.30] mmHg; I^2 = 52.0%) and decreased triglyceride (-32.56 [-54.69, -10.42] mg/dL; I^2 = 68.0%) when compared to White women with PCOS (All: P ≤ 0.03). Groups were comparable in total cholesterol, low-density lipoprotein cholesterol, high-density lipoprotein cholesterol, and diastolic blood pressure (All: P ≥ 0.06). Paucity in the number of studies that evaluated cardiovascular events or mortality limits any conclusions about potential disparities. Overall, Black women with PCOS have a greater tendency for an adverse cardio-metabolic risk profile (increased insulin, HOMA-IR, SBP), despite lower triglyceride levels than White women. Our observations support consideration of these disparities for diagnostic, monitoring, management, and public health practices, and for future guideline recommendations. Heterogeneity among studies warrants future research to address the relative contributions of biological, environmental, socioeconomic, and healthcare factors to the observed disparities. Longitudinal research should address cardiovascular events and mortality rate in Black women with PCOS (www.crd.york.ac.uk/PROSPERO ID, CRD42020183485).

Cardiovascular Endocrinology
CARDIOVASCULAR ENDOCRINOLOGY

CARF (CDKN2AIP) Regulates Hepatic Lipid Metabolism and Protects Against Development of Non-Alcoholic Fatty Liver Diseases

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Non-alcoholic fatty liver diseases (NAFLD) is the most common form of liver diseases in the USA with 30–40% of American being affected and about 12% with nonalcoholic steatohepatitis (NASH), a leading cause of end-stage liver diseases. NAFLD has been linked with insulin resistance, type2 diabetes, obesity, and cardiovascular diseases but molecular mechanisms underlying the development of NAFLD and its association with metabolic syndromes are poorly understood. In this study, we explored the role of CARF (collaborator of ARF) also known as CDKN2AIP, a novel gene of ARF-MDM2-p53 pathway in the development of NAFLD. It has been shown that, p53, beyond its tumor suppressor functions, can regulate the cellular glucose and lipid metabolism and its activation has been reported to induce hepatic steatosis in mice. However, as a regulator of p53 pathway, the role of CARF in the lipid metabolism and associated metabolic diseases has not been studied yet. Using high-fat diet (HFD) fed obesity mouse model of NAFLD we found that the expression of CARF along with Sirt1, pAMPK, and pACC was significantly decreased in the HFD induced fatty livers compared to control. Similarly, CARF expression was also down-regulated in palmitate (PA)-treated HepG2 cells, an in vitro model of steatosis. We also observed that shRNA mediated knockdown or lentiviral vector mediated overexpression of CARF induced or reduced the endogenous fat accumulation, respectively, in HepG2 cells, suggesting that CARF expression is negatively regulated in NAFLD. Additionally, we performed RNA seq analysis after CARF silencing in HepG2 cells and demonstrated that silencing of CARF altered the expression of genes regulating hepatic *de novo* lipogenesis, beta-oxidation, and lipid secretion all of which favor the accumulation of fat in the hepatocytes. Furthermore, genes associated with mitochondrial functions such as the TCA cycle and oxidative phosphorylation were also altered which could play a role in the development of NAFLD. Finally, we demonstrated that AAV mediated hepatic overexpression of CARF in HFD fed mouse model significantly reduced the fat accumulation in the liver as evident by H&E staining of liver sections and intrahepatic triglyceride level. Altogether we conclude that CARF plays a vital role in hepatic lipid metabolism and its downregulation perturbs lipid homeostasis leading to hepatic steatosis and the development of NAFLD.

Cardiovascular Endocrinology
CARDIOVASCULAR ENDOCRINOLOGY

Carotid Intima Media Thickness in Graves Disease: Comparing Overt Hyperthyroid and Remission State

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Background/Objective: Hyperthyroid has been associated with increased cardiovascular event. Carotidintima media thickness (CIMT) is oftenly measured to evaluate the risk of cardiovascularevent. The aim of this study is to measure CIMT in Graves' disease and to comparebetween subjects in overt hyperthyroidism and