Correlation between Sex Hormones and Dyslipidemia

A correlation between sex hormones and lipids has been previously demonstrated in males, but no studies have fully explored the relationship between sex hormones and dyslipidemia. The objective of this study was to investigate the hypothesis that a correlation exists between sex hormones and dyslipidemia, and to evaluate the confounding effect of age, gender, race/ethnicity, and menopausal status on this correlation. This retrospective cross-sectional study included 442 male subjects from the 2003-2004 survey and 2122 male or female subjects from the 2011-2012 survey from Centers for Disease Control and Prevention's National Health and Examination Survey (NHANES) database. Multiple logistic regression was used to determine whether there was a correlation between sex hormones including estradiol (E2), sex hormone-binding globulin (SHBG), total testosterone (TST), and androstenedione (AED) and dyslipidemia including total cholesterol, direct high-density lipoprotein, and calculated low-density lipoprotein. Mann Whitney U tests were used to examine whether age, gender, race/ethnicity, and menopausal status affected the correlation between TST and dyslipidemia. Results suggested that there was no significant correlation between E2, SHBG, or AED and dyslipidemia in males. Testosterone significantly affected the prevalence of dyslipidemia depending on gender ($p = < 0.001$ for males, and 0.003 for females). In males, the effect of testosterone on the prevalence of dyslipidemia depended significantly on age and race/ethnicity ($p = 0.011$ for 18- to 30-year-olds, 0.031 for Mexican Americans, and 0.038 for non-Hispanic whites). In females, the effect of testosterone on the prevalence of dyslipidemia depended significantly on menopausal status and race/ethnicity ($p = 0.013$ for non-menopausal women, 0.011 for Mexican Americans, and 0.010 for non-Hispanic blacks). The study concluded that testosterone significantly affects dyslipidemia when gender, age, race/ethnicity, and menopausal

status are considered. Future research should include conducting longitudinal studies so that the temporal sequence of testosterone abnormalities versus dyslipidemia can be studied in specific demographic groups.