

Correlation between Sex Hormones and Dyslipidemia

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ABSTRACT

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 participants from the 2003–2004 survey and 2122 male or female participants from the 2011–2012 survey from the Centers for Disease Control and Prevention's National Health and Nutrition Examination Survey database. Multiple logistic regression was used to determine whether there was a correlation among sex hormones—including estradiol (E2), sex hormone-binding globulin (SHBG), total testosterone (TST), and androstenedione (AED)—and dyslipidemia, which includes 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 18–30 years of age, $P = 0.031$ for Mexican Americans, and $P = 0.038$ 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 nonmenopausal women, $P = 0.011$ for Mexican Americans, and $P = 0.010$ 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.

ABBREVIATIONS: AED - androstenedione, E2 - estradiol, SHBG - sex hormone-binding globulin, TST - total testosterone.

Clin Lab Sci 2019;32(3):106

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