The relationship between serum total testosterone levels and metabolic syndrome in premenopausal obese women.

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Objectives: Men with low testosterone levels face an increased risk of metabolic syndrome, irrespective of age or obesity. However, the relationship between obesity, metabolic syndrome, and testosterone levels in women remains inconsistent across various studies. This study aims to compare the concentrations of total testosterone in two groups of premenopausal obese women - those with and without metabolic syndrome. Additionally, the study aims to explore the factors that affect total testosterone levels in premenopausal obese women.

Methods: A retrospective analysis was conducted on the medical records of 580 premenopausal obese patients who had their first appointment at a university hospital's outpatient clinic seeking weight loss treatment. The diagnostic criteria for metabolic syndrome were established based on the guidelines outlined by the National Cholesterol Education Program's Adult Treatment Panel III.

Results: The participants had a mean age of 38.8±8.4 years, a mean body weight of 78.0±11.8 kg and a mean body mass index of 30.0±4.1 kg/m^2. The metabolic syndrome group (385 women) had a significantly lower mean total testosterone concentration (0.22±0.10 ng/mL) compared to the non-metabolic syndrome group (195 women; 0.24±0.11 ng/mL) with a P-value <0.001 (Table 2, Figure 1). There were statistically significant negative correlations between age (r=-0.334), systolic blood pressure (r=-0.084), and triglycerides (-0.093) with total testosterone concentration. Conversely, weight (r=0.144), body mass index (r=0.140), waist circumference (r=0.133), body fat mass (r=0.167), and body fat percentage (r=0.167) showed statistically significant positive correlations with total testosterone concentration (Table 3). After performing stepwise regression analysis, age (β=-0.004, P<0.001), body mass index (β=0.003, P=0.004), and high-density lipoprotein (HDL) cholesterol levels (β=0.001, P=0.019) were found to be independent variables that affect the concentration of total testosterone. (Adjusted R^2 = 12.6%) (Table 4).

Conclusion: This study concludes that premenopausal obese women with metabolic syndrome had significantly lower serum total testosterone concentrations compared to those without metabolic syndrome. Furthermore, the study found independent associations between total testosterone concentrations and age, body mass index, and HDL cholesterol levels.