

# Central obesity in women and its association with serum level of testosterone and estradiol

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## Abstract

Central obesity is an important cause of hyperlipidemia, hypertension, diabetes mellitus and coronary heart disease. The relationship between sex hormones, especially androgens, and body fat distribution in women is controversial. This study investigated the relationship between sex hormones, such as total testosterone, DHEA-S, LH, FSH, estradiol and insulin, with Body Mass Index (BMI) and Waist to Hip Ratio (WHR) in 176 women with age:  $25.8 \pm 6.0$  years (18-43) and BMI:  $27.3 \pm 4.4$  ( $17-51 \text{ kg/m}^2$ ). Serum level of sex hormones including total testosterone, estradiol, FSH, LH, Dehydroepiandrosterone Sulfate (DHEA-S) were measured by radio immuno assay. Our findings showed that WHR was positively correlated with serum level of testosterone ( $r=0.15$ ,  $P=0.05$ ) and it was negatively related to serum level of estradiol ( $r=-0.1$ ,  $P=0.05$ ). Sex hormone concentrations were not different in obese and normal weight women, but women with central obesity ( $\text{WHR} > 0.85$ ) had significantly higher levels of testosterone ( $2.4 \pm 0.7$  vs  $2.1 \pm 0.7 \text{ nmol/L}$ ,  $P=0.001$ ) and lower levels of serum estradiol ( $24.1 \pm 8.7$  vs  $57.6 \pm 14.5 \text{ pmol/L}$ ,  $P=0.009$ ) than women with low WHR ( $\text{WHR} < 0.85$ ). In conclusion, these data showed that high serum testosterone and low serum estradiol levels were associated with upper body fat distribution in women. Serum level of estradiol versus testosterone possibly affects body fat distribution in women.

**Keywords:** WHR, BMI, Testosterone, Estradiol, Central Obesity, and Sex hormones.

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