

The role of androgens for body composition and physical performance in women

A L Hirschberg (SE) [1]

Context

Androgens are considered beneficial for athletic performance by anabolic effects on muscle tissue, stimulating erythropoiesis and immune system, and affecting behavior. However, most studies have been performed in men, and surprisingly little is known about endogenous androgens and physical performance in women.

Objective

We investigated the serum androgen profile in relation to body composition and physical performance in female Olympic athletes and compared endocrine variables and body composition with controls.

Methods

106 Swedish female Olympic athletes and 117 age- and body mass index-matched sedentary controls participated in the study. Blood sampling was performed in a rested, fasting state for measurement of serum androgens and their metabolites by liquid chromatography-tandem mass spectrometry. Body composition was determined by dual-energy X-ray absorptiometry. The athletes performed standardized performance tests including squat jump (SJ) and counter movement jump (CMJ)).

Main outcome measures

The serum androgen profile, including precursors and metabolites, in relation to body composition and physical performance in female athletes.

Results

The athletes demonstrated significantly higher levels of precursor androgens including dehydroepiandrosterone (DHEA) and 5-androstene-3 β , 17 β -diol (5-DIOL) and the metabolite etiocholanolone glucuronide (Etio-G) and significantly lower levels of estrone ($p < 0.05$, respectively). Furthermore, the athletes had higher bone mineral density ($p < 0.001$) and more lean mass ($p < 0.001$) compared with controls. Serum levels of DHEA, 5-DIOL and Etio-G correlated positively to lean mass variables and physical performance in the athletes. DHEA and lean mass legs explained 66% of the variance in SJ, whereas lean mass explained 52% of the variance in CMJ.

Conclusions

Our data show that endogenous androgens are associated with a more anabolic body composition and enhanced physical performance in female athletes. These results are of importance for the current discussion regarding hyperandrogenism in female athletes.

[1] Karolinska Institutet, Stockholm