Acute Response of Testosterone to Muscular Endurance Resistance Exercise in Obese vs. Lean Children

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BACKGROUND: Following resistance exercise of sufficient intensity, adult males display an acute increase in testosterone (T); such increase appears diminished in obesity. While the predominant source of T production in men is the testes, adrenocortical production of T makes up a greater relative proportion of T's. Adrenocortical production of both T and cortisol respond to stress such as exercise. Although obesity diminishes testicular T production, obesity increases activity of the hypothalamic-pituitary-adrenal (HPA) axis. Methods: Subjects consisted of eight obese boys (age 9±1yr, height 142±7cm, mass 48±9kg, lean mass 27±4kg, body fat 40.5±5.0%) and six lean boys (age 9±1yr, height 143±8cm, mass 32±5kg, lean mass 26±4kg, body fat 15.0±3.1%)

RESULTS: Increases in T following exercise in obese boys may be the result of greater activity of the HPA axis. Concentrations were increased following exercise in obese boys and changes in T correlated to changes in cortisol in all boys. Increases in T following exercise in obese boys may be the result of greater activity of the HPA axis.

PURPOSE: Obese men have lower resting concentrations of testosterone (T), and we have observed that obese men also have a smaller acute T response to the exercise protocol used in this study. However the majority of T in men is produced by adult Leydig cells in the testes which are not differentiated until puberty.2 Another source of T is from the zona reticularis of the adrenal cortex, which increases production of glucocorticoids and androgens during adrenarche that occurs around age 7-8 independent of puberty. Obesity increases the adrenocortical hypothalamic-pituitary-adrenal (HPA) axis activity and responsiveness to stress.3 The purpose of this study was to determine whether boys would display an acute response in T to a bout of exercise using independent samples t-test.

METHODS: Participants first warmed up for five minutes on a cycle ergometer, and then performed six sets of ten repetitions per leg of weighted step exercise using independent samples t-test. Participants first warmed up for five minutes on a cycle ergometer, and then performed six sets of ten repetitions per leg of weighted step exercise using independent samples t-test. Significance was accepted at p < 0.05.

DISCUSSION: The majority of research on the T response to resistance exercise has been in lean men. The only previous study in children found T increases of 10% following a short bout of exercise in children Tanner stage II (n=6) and stage III (n=6), but not in stage I (n=6). The majority of research on the T response to resistance exercise has been in lean men. The only previous study in children found T increases of 10% following a short bout of exercise in children Tanner stage II (n=6) and stage III (n=6), but not in stage I (n=6).

REFERENCES: