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Effect 0f testosterone on renal functions in male Wistar rats

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Introduction: Testosterone is an anabolic steroid and the principal male sex hormone from the androgen groups. It is secreted primarily by the testicles in males and in small amounts by the ovaries, and the adrenal glands in females. Androgens have been shown to increase tubular sodium and water reabsorption and activate various vasoconstrictor systems in the kidneys, such as the renin-aldosterone-angiotensin system (RAAS), and endothelin. Testosterones increases blood pressure and may also influence renal electrolyte excretion.

Materials & Methods: 15 adult male rats weighing 100-150 gm were used for this study. The rats were randomly divided into three groups of five (5) rats each. Group 1 rats (control) were given normal saline intramuscularly. Group 2 rats were given 3 mg/kg bw of testosterone intramuscularly; while group 3 rats were given 9 mg/kg bw of testosterone intramuscularly for two weeks. The animals were sacrificed by anaesthetizing them with chloroform and blood samples were collected through cardiac puncture.

Results: The result showed that the plasma urea levels of both low (2.02±0.23 mmol/L) and high (10.3±0.61 mmol/L) dose testosterone treated animals were higher when compared with the control group (1.94±0.07 mmol/L), but it was only significant ($p<0.05$) in the high dose. There was also a significant ($p<0.05$) increase in plasma creatinine level in animals injected with low dose testosterone (33.0±2.46 µmol/L) and high dose testosterone (46.0±5.67 µmol/L) when compared to the control group (25.2±3.91 µmol/L). There was an insignificant increase in sodium and potassium levels in low (114±3.36, 55.0±3.53 mmol/L) and high (115.0±2.81, 57.2±2.85 mmol/L) dose testosterone treated rats when compared to the control group (101.2±5.26, 54.2±2.81 mmol/L) respectively.

Conclusion: It was concluded from this study that exogenous administration of testosterone may alter normal kidney functions as seen by elevated levels of urea, creatinine, although these could also be dose-dependent. Great caution should be taken when testosterone supplements are used as it could predispose to abnormal renal functions that may consequently precipitate renal diseases.

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