The Effects of Testosterone on Lipid Profile

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Abstract—Sex steroids play multiple roles in the regulation of metabolism and physiological functions in the body. The aim of this study was to evaluate the effect of orchidectomy and testosterone replacement therapy on lipid profiles. In this experimental study, male rats were randomly divided to control, testosterone receiving, orchidectomised and orchidectomised testosterone receiving, olive oil receiving and sham groups. Testosterone enanthate (10 mg/kg) was injected daily. After 7 weeks, blood samples were prepared and lipid profile was assayed. Data were analyzed using ANOVA. The results showed a significant decrease in serum levels of triglyceride in orchidectomised testosterone receiving group compared with control animals (P<0.05). There was also significant decrease in serum levels of cholesterol in orchidectomised, testosterone and orchidectomised testosterone receiving groups compared with control animals (P<0.05). There was significant decrease in serum levels of VLDL in orchidectomised testosterone receiving group compared with control animals (P<0.05). The findings show that testosterone may affect on some aspects of lipid profile.

Index Terms—Orchidectomy, Testosterone, Lipid profile.

I. INTRODUCTION

Lipid profile or lipid panel is a panel of blood tests that serves as an initial broad medical screening tool for abnormalities in lipids, such as cholesterol (CHOL) and triglycerides (TG) [1]-[3]. Abnormal changes of lipid profile can be as risk factors for cardiovascular disease [4],[5]. Testosterone is a steroid hormone and the most potent naturally occurring androgen that is formed by the interstitial cells of the testes, and possibly by the ovary and adrenal cortex, may be produced in nonglandular tissues from precursors such as androstenedione, and is used in the treatment of hypogonadism, cryptorchism, carcinomas, and menorrhagia [6]. Also changes in serum level of this hormone can have effects on biochemical factors such as lipid profile[7],[8]. The use of testosterone to enhance physical abilities may be the highest damage to organs such as heart, kidney, brain, liver, and muscle. The aim of this study was to evaluate the effect of orchidectomy and testosterone replacement therapy on lipid profiles.

II. MATERIAL AND METHODS

In this experimental study, male rats were randomly divided to control, testosterone receiving, orchidectomised and orchidectomised testosterone receiving, olive oil receiving and sham groups. Testosterone enanthate (10 mg/kg) was injected daily. After 7 weeks, blood samples were prepared and lipid profile was assayed. Data were analyzed using ANOVA.

III. RESULTS

Figure I shows serum levels of TG in control, olive oil receiving and sham group. There was no significant difference between the groups.

![Graph showing serum levels of TG in different groups](image1.png)

Figure II shows serum TG levels in control, orchidectomised and orchidectomised testosterone receiving group. There was significant decrease in serum levels of TG in orchidectomised testosterone receiving group compared with control animals.

![Graph showing serum TG levels in different groups](image2.png)
Figure III shows serum cholesterol (CHOL) in control, olive oil receiving and sham group. There was no significant difference between the groups.

![Fig. 3. Serum cholesterol (CHOL) in control, olive oil receiving and sham group.](image)

Figure IV shows serum CHOL levels in control, orchidectomised and orchidectomised testosterone receiving group. There was significant decrease in serum levels of CHOL in orchidectomised, testosterone and orchidectomised testosterone receiving groups compared with control animals (P<0.05).

![Fig. 4. Serum CHOL levels in control, orchidectomised and orchidectomised testosterone receiving group](image)

Figure V shows serum HDL levels in control, olive oil receiving and sham group. There was no significant difference between the groups.

![Fig. 5. Serum HDL levels in control, olive oil receiving and sham group.](image)

Figure VI shows serum HDL levels in control, orchidectomised and orchidectomised testosterone receiving group. There was no significant difference between the groups.

![Fig. 6. Serum HDL levels in control, orchidectomised and orchidectomised testosterone receiving group](image)

Figure VII shows serum VLDL levels in control, olive oil receiving and sham group. There was no significant difference between the groups.

![Fig. 7. Serum VLDL levels in control, olive oil receiving and sham group.](image)
The disorders related to lipid profile have high prevalence and the costs of these disorders are extensive. [9],[10] Our findings showed a significant decrease in serum levels of triglyceride in orchidectomised testosterone receiving group and also significant decrease in serum levels of cholesterol in orchidectomised, testosterone and orchidectomised testosterone receiving groups.

Probably testosterone with stimulatory effects on thyroid gland might change the level of lipid profile since thyroid hormones with sex steroids have role in balance of body energy.[11]-[14].

IV. DISCUSSION

We have shown that testosterone may affect on some aspects of lipid profile.

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REFERENCES


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