The effect of leaf hydroalcoholic extract of Ephedra pachyclada infertility in male rats treated with cyclophosphamide: An experimental study

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Abstract

Background: Cyclophosphamide (CP) has clinical applications in treating diverse malignancies and autoimmune disorders; at the same time, it also has harmful effects on the body tissues, particularly the genitals. The most significant side effects of CP are changing the reproductive system's function and infertility.

Objective:This study determines the Ephedra hydroalcoholic extract (EP) role on testicular tissue and the pituitary-gonadal axis in CP-treated male rats.

Materials and Methods: In this experimental study, 48 adult Wistar rats were separated into 6 groups (n = 8/each): control, sham, CP recipients, and CP recipients with gavage-fed EP (250, 500, and 1000 mg/kg). On the 29 th day, the blood of the weighed animals' was drawn from their heart, and serum concentrations of follicle-stimulating hormone, luteinizing hormone, and testosterone were measured. After preparing testicular tissue segments, cells were counted.

Results: While CP decreased follicle-stimulating hormone, luteinizing hormone, and testosterone levels ($p < 0.05$), the use of EP changed them and even reached the control. Serum gonadotropin-releasing hormone increased significantly in all EP groups compared to the control and CP groups. Compared to the control, a significant decrease in total antioxidant capacity and plasma glutathione peroxidase was observed in the CP groups. EP (all doses) significantly increased their concentration compared to the CP group ($p < 0.05$); significant reduction in serum total oxidant status and malondialdehyde in CP groups changed by EP ($p < 0.05$). Although CP's role on spermatogonia counts (57.5 ± 5.2 in CP, 67.1 ± 6.0 in control), higher doses of EP had no significant effect on this but did affect spermatocyte and spermatid cells count.

Conclusion: Due to its antioxidant characteristics, EP mitigated the effects of CP on the investigated parameters in rats.

Keywords: Ephedra, Cyclophosphamide, Cancer, Spermatogenesis, Sex hormones, ROS