Original Article

Effects of Vitamin E and Ginseng Extract on Fertility Changes Induced by Cyclophosphamide in Rats

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Abstract

Background: Cyclophosphamide (CP) is a mustard alkylating agent used in the treatment of some neoplastic diseases such as leukemia, breast and pulmonary cancers. CP administration induces oxidative stress and has cytotoxic effects on normal cells, especially in the reproductive organs. A major side-effect of CP is the alteration of male reproductive function which may result in oligospermia or azoospermia. The aim of the present study was to evaluate the protective effects of vitamin E and ginseng extract on the reproductive system of male rats during cyclophosphamide administration.

Methods: Fifty-six adult male Wistar rats (220±30 *g*) were randomly divided into seven groups of eight. To eliminate the stress induced by gavage, the animals in the first group were considered as the control group and only received water and food. The second group received the placebo for CP via gavage. The third group received CP, 6.1 *mg/kg/day*, through intraperitoneal administration. The fourth and fifth groups, respectively, received Ginseng, 500 *mg/kg/day*, and vitamin E 100 *mg/kg/day* via gavage. The eighth group received both antioxidants by intubation 1 h prior to CP administration for 50 days. The animals were sacrificed one day after the last injection. The testes, body weight, sperm parameters and fertility status of animals were evaluated at the end of the experiments. For the evaluation of fertility index, the male rats were mated with untreated female rats on the 40th day of the treatment period.

Results: Cyclophosphamide decreased sperm count, lowered fertility rate and decreased testis weight while it increased the number of dead and abnormal sperms ($p < 0.01$). In addition, the number of pregnant animals and viable offspring were reduced too; while antioxidant use diminished the adverse effects of CP.

Conclusion: The results of the study showed that antioxidative agents vitamin E and Ginseng could diminish the adverse effects of cyclophosphamide in the reproductive system of male rats during cyclophosphamide administration.

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