



Thymoquinone and vitamin E supplementation improve the reproductive characteristics of heat stressed male mice

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Abstract:

Previous studies have shown that dietary supplementation with antioxidants such as vitamin E affects the reproduction parameters in heat stressed males mice. Nevertheless, the impact of thymoquinone (TQ) on the reproductive system during heat stress is still poorly studied. Therefore, the aim of current study was to investigate changes in the reproductive parameters during heat stress and the impact of vitamin E (positive control) and TQ during this period. Forty male mice were distributed into four groups: group I was a control group that was orally supplemented with distilled water; group 2 was subjected to HS (at a humidity of 50 to 55% and a temperature of 42°C) for 75 days; Group 3 was subjected to HS and orally supplemented with vitamin E (20 IU/kg/day for 75 days) and group 4 was subjected to HS and orally supplemented with TQ (5 mg/kg body weight/day for 75 days). We found that HS significantly increased free radicals (FR) without significant effect on the testosterone level. Additionally, semen analysis of the heat stressed mice revealed a significant decrease in sperm concentration, sperm velocity straight line (SVSL), sperm velocity curved line (SVCL), and sperm velocity average path (SVAP). Moreover, histopathological examination of seminiferous tubules of heat stressed mice presented maturation arrest in the germinal layers. Notably, supplementation with either TQ or vitamin E completely restored the FR levels, semen quality and histopathological changes that were induced by HS. Our data revealed the beneficial impacts of TQ and vitamin E supplementation in improving heat stress-induced complications.

Keywords:

Free radicals, heat stress, semen quality, testis, thymoquinone (TQ), vitamin E.

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