

Quinestrol treatment induces testicular damage via oxidative stress in male Mongolian gerbils (*Meriones unguiculatus*)

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The hypothesis that quinestrol exerts testicular damage via oxidative stress was investigated in male gerbils using a daily oral gavage of 3.5 mg/kg body weight for 2 weeks (the multiple-dose treated group, n=15) or 35 mg/kg body weight (single-dose treated group, n=15). The testicular histological morphology, antioxidant capacity and malondialdehyde (MDA) concentration in testicular tissue and plasma were assessed at 15, 30, and 60 days following the single or multiple treatment. Five gerbils per group were killed at the different time points. The results showed that the activity of the antioxidant enzymes, including superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px), and total antioxidant capacity (T-AOC) in testicular tissue decreased at 15 days after treatment. These effects led to increased MDA concentrations while at the same time germ cells were reduced and showed an irregular distribution in the seminiferous tubules of quinestrol-treated gerbils. At 30 days, the testicular weight and antioxidant capacity had continued to decrease, while the MDA concentrations continued to increase and testicular histopathological changes were more pronounced. Single-dose and multiple-dose treatment had a similar effect on the antioxidant enzymes and MDA, but testicular damage was more severe at 15 and 30 days after the end of the multiple-dose treatment. By 60 days after treatment withdrawal, however, the above parameters had recovered to control levels. The results show that quinestrol causes reversible damage to gerbil testes and this may be caused by oxidative stress. Furthermore, multiple-dose treatment has greater disruptive effects on testicular morphology compared to a single higher dose treatment.

Keywords: oxidative damage, quinestrol, reversibility, testicular damage