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The potential gonadoprotective effects of grape seed extract against the histopathological alterations elicited in an animal model of cadmium-induced testicular toxicity

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Background: Grape seed extract (GSE) is a powerful antioxidant containing high levels of bioflavonoids, vitamin C and vitamin E. The aim of the work is to study the possible protective and ameliorative effects of grape seed extract in an animal model of cadmium (Cd)-induced testicular toxicity in rats.

Materials and Methods: A thirty-day oral gavage study in adult male albino rats was performed using 32 animals, randomly divided into 4 equal groups; negative control, cadmium (5 mg/k/day), grape seed extract (100 mg/k/day), and cadmium + GSE. Testicular weights were measured. Hematoxylin & eosin (H&E) staining and proliferating nuclear cell antigen (PCNA) immunohistochemistry, as a marker for proliferation were done. Morphometric parameters were assessed and subjected to statistical analysis.

Results: The H&E results showed atrophy and distortion of the seminiferous tubules (STs) with sloughing of the spermatogenic epithelium in cadmium group. The interstitial spaces were widened and showed edema and mononuclear cell infiltrations. No remarkable changes were observed in the grape-seed-only group when compared to the control group. In both combined groups, maintaining of the STs and their lining cells was evident. The immunohistochemical results showed marked positive PCNA immunoreactivity in both control and GSE groups, while negative immunoreaction was noticed in Cd group. Limited positive PCNA immunoreactivity was ameliorated in Cd+ GSE group.

Conclusions: GSE protected against cadmium-induced testicular toxicity in rats, reducing induced histopathological changes and maintaining testicular histoarchitecture.

Keywords: cadmium, grape seed extract, testis, seminiferous tubules, proliferating nuclear cell antigen