Origanum vulgare L. leaves extract alleviates testis and sperm damages induced by finasteride: Biochemical, Immunohistological and apoptosis genes based evidences

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The aim of the current study was to investigate antioxidant, anti-inflammatory and anti-apoptotic effects of *Origanum vulgare* on finasteride-induced oxidative injury in mouse testis and sperm parameters. Thirty BALB/c mice were divided into 5 groups: negative control, received 0.5 ml/day distilled water; positive control, received 25 mg/kg finasteride orally; and three groups received 100, 200 and 400 mg/kg/day *O. vulgare*

extract plus 25 mg kg−1 day−1 finasteride for 35 days. At day 36, serum luteinizing hormone, follicle-stimulating hormone and testosterone, inflammatory cytokines (IL-6, TNF-α, IL-1β), glutathione peroxidase, superoxide dismutase and nitric oxide levels were assessed. Also, apoptotic changes investigated through genes expression and immunohistochemical staining. Finasteride in 35 days resulted in significant destructive alterations in the testis architecture, suppressed antioxidant enzymes and increased lipid peroxidation. The expression of *Bcl*-2 was down-regulated, whereas p53 and caspase-3 were up-regulated. *Origanum vulgare* improved the serum level of hormones and restored the antioxidant defence. 200 and 400 mg/kg/day of *O. vulgare* alleviated the testis structure and sperm parameters, up-regulated the anti-apoptotic gene Bcl-2 and down-regulated the p53, caspase-3 genes in treated groups. The findings indicate that *O. vulgare* extract improved function and structure of testis tissue against finasteride-induced testicular toxicity.