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Evaluation of combined efficacy of Astragalus extract, vitamin E, and selenium on lead induced toxicity and apoptosis in rat ovaries

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Lead (Pb), a pervasive environmental pollutant, has been linked to various reproductive health issues, including infertility and hormonal imbalances. Species of *Astragalus*, renowned for their antioxidant and anti-apoptotic properties, may mitigate these adverse effects by promoting folliculogenesis and restoring hormone levels disrupted by Pb exposure. In this study, the protective potential of astragalus polysaccharides (APS) against lead induced ovarian toxicity was investigated, both when administered alone and in combination with vitamin E and selenium. The aim was to determine whether the observed protective effects are linked to the antioxidant capacity of APS, and to explore the possible contribution of its anti-apoptotic properties. Thirty-six female Wistar rats (220-250 g) were divided into treatment groups and administered lead, APS, vitamin E, and selenium for a duration of 15 days. Estradiol, luteinizing hormone (LH), follicle-stimulating hormone (FSH), and antioxidant levels were measured at the end of the study. Additionally, ovarian tissue damage and apoptosis were assessed through immunohistochemistry. The results indicated that Pb induced reductions in hormone levels were significantly restored to near control levels in the APS treated groups. Moreover, antioxidant levels were notably elevated in these groups. Immunohistochemical analysis revealed a significant reduction in stromal and follicular degeneration in the ovaries of rats treated with APS. In conclusion, APS, both independently and in combination with vitamin E and selenium, exhibited substantial protective effects against Pb induced ovarian toxicity.

Keywords: Astragalus polysaccharides, Lead toxicity, Ovarian damage, Apoptosis, Oxidative stress