First research

Title:

Histomorphological Changes in a Rat Model of Polycystic Ovary Syndrome and the Contribution of Stevia Leaf Extract in Modulating the Ovarian Fibrosis, VEGF, and TGF-β Immunoexpressions: Comparison with Metformin

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ABSTRACT

Polycystic ovary syndrome (PCOS) is a common endocrine disorder of fertile females. It has been reported that stevia leaf extract (SLE) has antidiabetic and antihyperlipidemic properties. Therefore, the current study hypothesized and investigated the role and mechanistic aspects of a natural sweetener; SLE in treating a rat model of letrozole-induced PCOS and to compare it with metformin. Thirty-five female Wistar albino rats were divided into 5 groups: control, PCOS-induced group (letrozole, 1 mg/kg/d, for 21 days), SLE, metformin, and combination-treated groups (300 mg/kg/d, for the next 28 days in SLE and metformin- treated groups). Vaginal smears were done. The levels of glucose, lipid, and hormonal profiles were measured in the serum meanwhile, malonyl dialdehyde (MDA), superoxide dismutase (SOD), and tumour necrosis factor (TNF-α) were measured in the ovary. Ovarian sections were subjected to hematoxylin and eosin, Masson, and immunohistochemical identification of VEGF and TGF-β followed by morphometric analysis. PCOS rats showed altered hormonal and lipid profiles, in addition to hyperglycemia. Also, the ovarian tissue levels of MDA and TNF-α were elevated, and SOD was decreased. Numerous cystic follicles, decrease/absence of corpora lutea, interstitial fibrosis with positive VEGF and TGF-β immunoreactivity were evident. SLE improved all altered

parameters. SLE showed potential therapeutic merits in letrozole-induced PCOS via anti-inflammatory, antioxidant, anti-fibrotic, and angiogenesis regulating mechanisms. Its effects were almost comparable to metformin, and the combination of both has no further synergistic effect.

Key words: letrozole-induced polycystic ovary, stevia leaf extract, angiogenesis, TGF-β immunohistochemistry, rats.