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EFFECT OF CALENDULA OFFICINALIS HYDROALCOHOLIC EXTRACT ON SERUM LEVELS OF TNF-A, GLUCOSE, AND LEPTIN IN TYPE 1 DIABETIC MALE RATS

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ABSTRACT

Objectives: Diabetes is a chronic disease characterized by decreasing insulin secretion due to impairment of the function of beta cells in the pancreas or increased insulin resistance. The tendency to treat diabetes by herbal medicines, which has less side effects than chemical drugs, is spreading day by day. High blood glucose levels in chronic diabetes mellitus cause multiple complications including increased inflammatory factors such as TNF- α and a decrease in leptin levels in blood and other tissues. Therefore, it is important to reduce the destructive effects of these factors. Herbal drugs are considered to reduce complications of diabetes. In this respect, the positive effects of hydroalcoholic extract of *Calendula officinalis* in some tissues have been observed and it has been suggested that it may be effective in reversing the levels of leptin and TNF- α . Therefore, in this study, the effect of *Calendula officinalis*'s extract on blood glucose, TNF- α , and leptin was evaluated by experiments on diabetic male rats. **Materials and Methods:** Sixty male Wistar rats considering 300-250 g were separated into 6 groups in equal and random order: healthy group, diabetic group, diabetic group with normal saline gavage, and three diabetic groups receiving extract of *Calendula officinalis* with doses of 100, 150, and 250 mg / kg. Diabetes was persuaded by injection of 60 mg / kg Streptozotocin (Sigma-Germany). The duration of treatment of rats was 4 weeks. To measure the variables, after anesthetizing the animals, the blood sample was collected to define the levels of TNF- α and leptin by ELISA, and the fasting glucose levels by an enzymatic method. **Results:** The body weight of diabetic rats after 4 weeks of intervention was significantly less than that of control rats, and treatment with extract of *Calendula officinalis* had no important effect on the weight of rats. Meanwhile, persuaded diabetes significantly increased abstaining blood glucose in diabetic groups than in the control group. In diabetic groups receiving the extract of *Calendula officinalis*, fasting blood sugar decreased significantly in compression to diabetic control group. TNF- α levels increased in diabetic condition, and behavior of diabetic rats with extract of *Calendula officinalis* decreased this inflammatory factor. Serum leptin decreased by induction of diabetes than healthy control group, and the extract of *Calendula officinalis* did not significantly affect the level of this cytokine. **Conclusion:** The extract of *Calendula officinalis* showed some of the anti-diabetic properties such as decreasing blood glucose and anti-inflammatory effects, and reduces TNF- α , which is an important inflammatory marker for the pathogenesis of diabetes, with no significant effect on serum leptin levels.

Key words: Diabetes, TNF- α , leptin, *Calendula officinalis* extract