



## Effects of *Fumaria Parviflora* on Histopathology and Oxidative Stress of Kidney Tissue in Diabetic Rats

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**Background & Objectives:** Diabetes mellitus can lead to nephropathy. Presumably, one third to half of diabetic patients will finally develop diabetic nephropathy which is the most important cause of morbidity and mortality among diabetics. Diabetes mellitus has a close relation with oxidative stress due to the increased formation of oxygen free radicals. Increased oxidative stress has a pivotal role in the renal damage of patients with diabetes. Moreover, one of the complications of diabetic nephropathy is distention and destruction of glomeruli in the renal tissue. Because of the low accessibility and high expenses of most new therapies, finding new agents with less side effects such as herbal derivatives is further highlighted. One of these herbal plants is *Fumaria parviflora* (FP) that is a nature anti-oxidant. We conducted this study to investigate the effects of FP on renal histopathology and oxidative stress in diabetic rats.

**Materials and Methods:** In this experimental investigation, 32 male rats, weighing 200-250 g, were divided into four groups: 1. control, 2. control receiving treatment with FP, 3. diabetic, and 4. diabetic receiving treatment with FP. Rats with serum glucose levels below 130 mg/dl were selected for this study. Diabetes was induced by intraperitoneal injection of streptozotocin (60 mg/kg). Groups under treatment received food containing 6.25% of FP. After 6 weeks the rats were anesthetized with diethyl ether and kidneys were removed. Tissue levels of malondialdehyde (MDA) and protein were measured to evaluate the oxidative stress. In addition, renal histopathology was evaluated using hematoxylin and eosin (H & E) staining. Data were analyzed using ANOVA in the SPSS16 and P value less than 0.05 was considered significant for all analyses.

**Findings:** A significant increase in the renal tissue level of MDA was observed in diabetic and FP-treated diabetic groups versus control group ( $P = 0.007$ ). FP treatment significantly reduced the tissue level of MDA ( $P = 0.03$ ) and medication with FP in the control group has no significant changes versus control group ( $P = 0.32$ ). Also, diabetes caused a significant increase in glomerular size compared to the control group ( $p = 0.01$ ), and treatment of diabetic rats with FP caused a non-significant decrease in glomerular size compared to the diabetic group ( $p = 0.09$ ).

**Conclusion:** In the past studies FP reduced the level of glucose in diabetic groups. In our study oral administration of FP powder could reduce the oxidative stress in diabetic rats although has no effect on treatment of glomeruli. It can be said that anti-oxidant effect of FP is related to hypoglycemic effects. Taken together, long term treatment of diabetic rats with FP as a can partially protect the renal tissue via attenuation of oxidative stress and glomerular expansion.

### Keywords:

*Fumaria Parviflora*; Diabetes Mellitus; Kidney; Oxidative Stress; Rat

