Antidiabetic effect of aqueous extract of flowering tops of Trifolium pratense L

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Background:
Recent epidemiology study shows that prevalence rate of diabetes is increases exponentially and it has been estimated that by 2040 approximately 642 million people will be diabetic worldwide. Type 2 diabetes mellitus is an acquired metabolic disorder with persistent hyperglycemia due to impaired insulin secretion and sensitivity, and accounts for 90-95 % cases of all diabetes. Besides, persistent hyperglycemia in diabetes results into severe chronic vascular complications responsible for morbidity and mortality. Herbals are always considered as a source of medicine for various ailments including diabetes. Flowering tops of Trifolium pretense is used in various conditions such as asthma, bronchitis, fever, cancer, diabetes and as blood purifier. It is also used as phytoestrogen therapy in postmopausal women. The aim of the present study was to evaluate antidiabetic effect of aqueous extract of flowering tops of Trifolium pratense (AE) in experimental model of type 2 diabetes.

Method:
Sprague Dawley rats were fed with high fat diet for two weeks before administration of low dose of streptozotocin to mimic type 2 diabetic condition in the experimental animals. The animals with blood glucose level greater than 16.7 mmol/l was considered diabetic and designated for the study. Aqueous extract of flowering tops of Trifolium pratense was administered at the dose of 250, 500 and 1000 mg/kg of body weight, orally for 28 days. Various parameters such as blood glucose, TG, TC, HDL-C, LDL-C, HbAc1%, insulin and OGTT were measured. Liver glycogen content, Histopathological and immunohistochemistry of pancreatic tissue were performed.

Results:
The results of the study represents that treatment with the AE remarkably decreased the elevated blood glucose (p < 0.001) in diabetic animals. Treatment with AE (p<0.001, p<0.01) significantly improved lipid profile in diabetic rats. Plasma insulin concentration was also reduced significantly (p<0.01) after treatment with AE in diabetic rats. Treatment with AE reduced glycohaemoglobin and insulin resistance significantly (p<0.001) and improved glucose tolerance in diabetic rats.

Conclusion:
The outcome of the study showed that aqueous extract of flowering tops of Trifolium pretense can be considered as therapeutic option to control hyperglycemia in type 2 diabetes mellitus.