

Effect of an Aqueous Extract of Fenugreek (*Trigonella Foenum Graecum*) seeds on Hyperglycemia Induced with Alloxan

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Abstract

Background: Diabetes mellitus is a metabolic disease that causes high blood sugar. The number of people suffering from the disease worldwide is increasing at an alarming rate. Fenugreek (*Trigonella foenum-graecum*) is an herb long used in alternative medicine. This herb has many health benefits. These benefits may be due to fenugreek's role in improving insulin function.

Objectives: To evaluate antidiabetic effects of Fenugreek seeds extract on Alloxan-induced diabetic mice.

Methods: The total of 30 mice (n=10) were grouped randomly into 3 groups as followings: Group I: Normal control (NC), Group II: Diabetic control (DC) and Group III: Treatment Diabetic Group (DT). Mice were injected with subcutaneous injection 180mg/kg body of freshly prepared of Alloxan and Diabetes mellitus confirmed by testing blood glucose, and mice with blood glucose level of ≥ 200 mg/dl were considered as diabetic. Diabetic mice were received 10mg/kg of body weight from fenugreek extract.

Result: All Diabetic mice that received extract showed a significant decrease in blood sugar ($P < 0.01$).

Conclusion: Fenugreek seeds reduce blood sugar levels.

Keywords: Fenugreek; *Trigonella foenum graecum*; Alloxan; Diabetes

Abbreviations: NC: Normal Control; DC: Diabetic Control; DT: Diabetic Treatment Group

Introduction

For long times, the people looked for drugs in nature. With the passage of time, the reasons for the usage of specific medicinal plants for treatment of certain diseases were being discovered and became founded on explicatory facts and plants had been the source of prophylaxis and treatment. Wide interest in products of medicinal plants has been observed within last years, due to the natural antimicrobial agents, cosmetics, pharmaceutical and food preservation systems [1]. Huge medicinal values of fenugreek are attributed to its chemical composition; gitogenin and yamogenin have been identified and determined as the main component for its various biological effects [2]. Also, fenugreek contains mucilaginous soluble fiber, steroidal saponins, alkaloids. In clinical study, increased insulin sensitivity was observed in fenugreek recipients, and in another one, with newly-diagnosed type-2 diabetes mellitus, serum triglycerides were reduced in patients who received a hydroalcoholic extract of fenugreek seeds 1g/day [3]. The aim of this study to investigate antidiabetic effects of local Fenugreek seeds extract on Alloxan-induced diabetic mice.

Material and Methods

Plant material and extraction procedure

The dry seeds were collected from local market, seeds were completely pulverized and 125g soaked in 500ml distilled water and placed on incubator with shaking for 24 hours at 37 °C. The solution was filtered through a filter paper and dried in the oven at 39 °C.

Experimental animal

Adult and healthy mice (*Mus musculus*) of 25-32g was used. The total of 30 mice (n=10) were grouped randomly into 3 groups as followings:

Group I: Normal control (NC): mice of this group did not receive induction and treatment.

Group II: Diabetic control (DC): diabetic mice of this group did not receive any treatment.

Group III: Diabetic Treatment (DT): Diabetics from this group received 10mg/kg of body weight from fenugreek extract.

Diabetic induction

Alloxan was used to induce diabetes. Mice were injected with subcutaneous injection 180mg/kg body of freshly prepared of Alloxan. Diabetes mellitus confirmed by testing blood glucose, and mice with blood glucose level of ≥ 200 mg/dl were considered as diabetic.

Results

Effect of alloxan on blood glucose

Before Alloxan administration, basal blood glucose levels did not differ significantly between groups (106-123mg/dl), whereas 24h after Alloxan administration they were significantly higher in diabetic mice, between (219-569mg/dl).

Effect of aqueous extract on blood glucose

(Table 1 & Figure 1) show the effect of treatment with the extract on blood glucose levels. In the diabetes treated groups with 10mg/kg of body weight showed a significant decrease in blood sugar ($P < 0.01$).

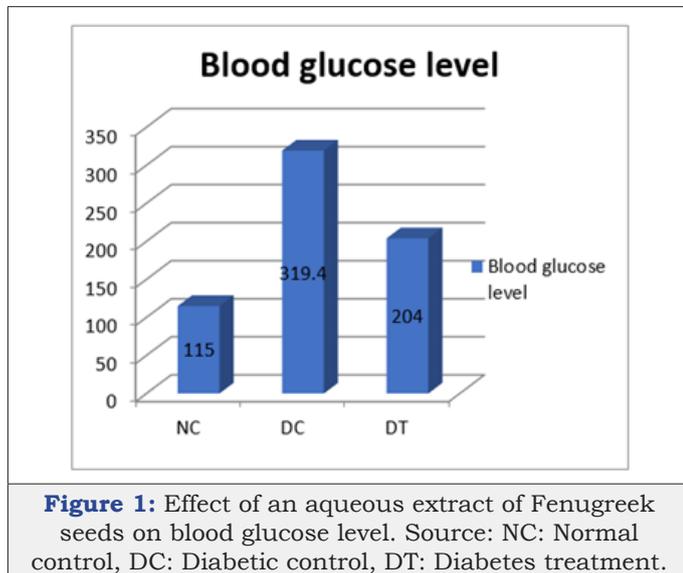


Table 1: Effect of treatment with an aqueous extract of Fenugreek seeds on blood glucose level. Mice were received extract 10mg/kg of body weight.

Blood Glucose Level mg/dl (Means \pm SD)		
Normal Control (NC)	DC (Diabetic Control)	Diabetes Treatment (DT)
115 \pm 0.07a	319.4 \pm 0.1c	204 \pm 0.08b

Discussion

Our results agree with a lot of studies that showed hypoglycemic effects of fenugreek seeds type 2 diabetics. It has been reported that soluble fiber of fenugreek postpones digestion and absorption of carbohydrate resulting improvement of glucose homeostasis [4]. It could be by the large gel formation and low viscosity of the resulting gels inside the intestine. Galactomannan, a soluble fiber and is isolated from fenugreek seeds, responsible for decrease of blood glucose level after eating food meal, galactomannan has ability to reduce intestinal absorption of high or concentration of glucose Because of its viscous property [5].

Conclusion

Fenugreek seeds reduce blood sugar levels and advise diabetic patients to taking 0.5g of seeds per day.

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