

Effect of Ethanolic Extract of *Fragaria Vesca* on serum glucose levels and body weight in diet induced obese rats

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Abstract

Objective: To evaluate the effect of ethanolic extract *Fragaria Vesca* on serum glucose levels in diet induced obese rats.

Material and methods: Male Wister albino rats weighing 200- 250 gm, were divided into 3 groups of 6 animals each. The animals of all the groups except normal group were given a lipid diet consisting of cholesterol (1%), cholic acid (0.5%), casein (20%), choline (0.25%), d-l-methionin1(0.4%), coconut oil (25%), multi vitamin mix (3.5%) and sucrose (48.4%) with standard pellet diet for 30 days. Growth rate was monitored during the treatment.

Results: There was significantly decrease in blood glucose in standard group compared to HFD model (P< 0.05). But there was no significant change among other groups

Conclusion: There was no significant change in the blood glucose level in all the groups except the standard group, but there was reduction in body weight.

Keywords: *Fragaria Vesca*, serum glucose, HFD, albino rats.

1. Introduction

Fragaria vesca is known as Woodland strawberry; a perennial herb spreading through runners. The leaves, borne on long stalks, are compound with three-foliolate and toothed. The flowers are white with five petals that fall off shortly after pollination, and from the receptacle forms the sweet and red fruit. Medicinal plant is traditionally in a number of ailments, such as Considered alterative, antiinflammatory, antioxidant, anticarcinogenic, astringent, calmative, depurative, diuretic, laxative, refrigerant and tonic, Cardiovascular Effect, Analgesic 1-4. But very few studies exists serum glucose levels of *fragaria vesca* [14]. Hence, the study aims at evaluation of Ethanolic Extract of *Fragaria Vesca* on serum glucose levels and body weight.

2. Materials and methods

2.1 Animals

Wister albino adult male rats weighing 200-250gm were housed in polypropylene cages in room where the congenial temperature 27°C ±1°C and 12 hrs light and dark cycles maintained. The animals were allowed to acclimatize to the environment for 7 days and supplied with a standard pellet diet. The institutional ethical clearance was obtained. (Reference IHEC/02/2013/despo no 229. 24.4.13.

2.2 High fat diet-induced hypercholesterolemia

Male Wister albino rats weighing 200- 250 gm, were divided into 6 groups of 6 animals each. The animals of all the groups except normal group were given a lipid diet consisting of cholesterol (1%), cholic acid (0.5%), casein (20%), choline (0.25%), d-l-methionin1(0.4%), coconut oil (25%), multi vitamin mix (3.5%) and sucrose (48.4%) with standard pellet diet for 30 days [20]. Growth rate was monitored during test.

2.2.1 Diet

The high fat diet components such as cholesterol, cholic acid, casein, choline, sucrose was purchased from Himedia Laboratories Pvt. Ltd., Chennai .and multivitamin multi mineral Capsules Becadexamin and Atorvastatin was obtained from institutional pharmacy.

2.2.2 Preparation of Extracts

The fruits were air-dried at 25 °C for 7 days. It was the pulverized using mortar and pestle into fine powdered. The pulverized fruits were extracted with ethanol using Soxhlet extractor. The extract was concentrated by allowing

evaporating at 30 °C on water bath and then stored in an air-tired sterile container until used.

2.2.3 Experimental design:

Total 18 animals

Groups Animal Models

Group-I : Fat model control

Group-II : Fat model + Ethanolic extract of fruit *Fragaria vesca*(250 mg/kg)

Group-III: Fat model + Ethanolic extract of fruit *Fragaria vesca*(500 mg/kg)

2.2.4 Blood

After 30 days blood was collected by retro orbital sinus puncture, under mild halothane anaesthesia. The collected samples were centrifuged for 10 minutes at 2000 r.p.m. and serum samples so collected were used for various biochemical tests. Blood sugar: Blood glucose levels were estimated using an electronic glucometer (AccuChek Active Glucometer - mg dL-1) by drawing blood from the tip of the tail of all the rats before and during the experimental period.

2.3 Statistical Analysis

Data was collected, Values were expressed as Mean ±SEM for six rats per group and analyzed by using one way ANOVA and p < 0.05 was considered significant.

3. Results

There was significantly decrease in blood glucose in standard treaded group compared to HFD model (P< 0.05). But there was no significant change among other groups. (Figure 1)

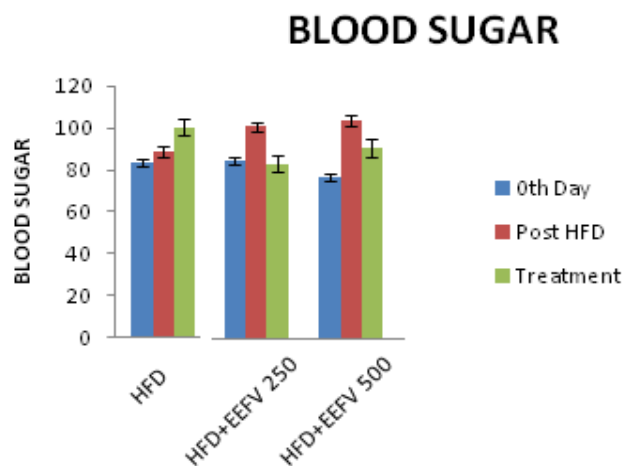


Figure 1: serum glucose levels in high fat diet (HFD), high fat diet with ethanolic extract of *fragaria vesca* 250mg and 500mg

Table 1: Effect of *Fragaria Vesca* Extract on serum glucose

Groups	Blood glucose (30 th day)	Blood glucose (60 th day)	Compare with Group- I to other groups	Compare with Group – I (STD) to other groups
Group –I	88.3±3.36	100.3±5.45	-	* P<0.05
Group -II	101±5.07	83.6±2.74	ns P>0.05	ns P>0.05
Group-III	101.16±4.58	79±4.39	ns P>0.05	ns P>0.05

P<0.05is significant

Table 2: Effect of *Fragaria Vesca* Extract on Body weight

Groups	Body weight (Before Treatment)	Body weight (After Treatment)	Compare with Group- I to other groups	Compare with Group – I(STD) to other groups
Group - I	343±13.58	375±15.5	-	** P<0.01
Group –II	317±8.09	313±13.17	** P<0.01	ns P>0.05
Group –III	320.5±12.26	295±5.42	*** P<0.001	ns P>0.05

Flavonoids activate multi enzyme systems, such as cytochrome P450 and b5 [12] and this action affects the whole metabolism, as these systems are involved in the metabolism of xenobiotics, including drugs, insecticides, and pollutants. Strawberry is reported to have great potential for reducing the risk of cardiovascular disease. In a recent well-controlled clinical trial, 123 healthy persons who were fed on a diet containing nine servings per day of fruits and vegetables significantly increased serum antioxidant capacity and decreased in vivo lipid peroxidation.[13]

4. Conclusion

The present study has shown that the ethanolic extract (250,500mg). There was no significant change in the blood glucose level in all the groups. Body weight of rats was increased after giving high fat diet in all groups. After treatment, body weight was reduced both in the control and test groups and there was significant deference between control and treated groups.

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