

HYPOLIPIDEMIC EFFECT OF *Brassica juncea* (MUSTARD) IN ALLOXAN INDUCED DIABETIC RATS*

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ABSTRACT

Effect of mustard (Brassica Juncea) seed powder at two different doses (8g/kg and 2g/kg) on serum cholesterol and serum triglyceride were studied in alloxan induced diabetic rats. Administration of mustard seed powder at the rate of 8g/kg for 30 days produced significant reduction of serum cholesterol and serum triglyceride. On the other hand changes in rats fed with mustard seed powder at the rate of 2g/kg were not significant. The present study suggests that mustard seed powder at high dose rate would be considered as an effective hypolipidemic agent.

INTRODUCTION

Diabetes mellitus is one of the oldest diseases affecting millions of people all over the world. Diabetes mellitus associated hyperlipidemia is a current medical as well as a social problem. The frequency of hyperlipidemia is very high depending upon type of diabetes and degree of control. Now a days, there is an increasing demand for natural products with hypolipidemic property. Present study is directed towards investigation on the effectiveness of *Brassica juncea* (mustard) at two different doses for the treatment of hyperlipidemia associated with diabetes mellitus.

MATERIALS AND METHODS

The experiment was conducted in thirty two male albino rats weighing 150–200g. They were maintained on identical feeding and

managemental practice in the laboratory for one week before the commencement of study. Well dried seeds of mustard was taken and pulverized in a blender to get fine powder. The rats were randomly divided into four groups, each group comprising of eight animals.

Group I: (T₀) Normal control, no treatment was given.

Group II: (T₁) Alloxan (Diabetic) control, no treatment was given.

Group III: (T₂) Diabetic, feed incorporated with *Brassica juncea* seed powder at a dose of 2g / kg body weight from day 16 to day 45 (30 days).

Group IV: (T₃) Diabetic, feed incorporated with *Brassica juncea* seed powder at a dose of 8g / kg body weight from day 16 to day 45 (30 days).

All the treatment groups except normal control were made diabetic by subcutaneous injection of alloxan monohydrate at a rate of 120 mg / kg body weight on zero day. After 16 days blood glucose was estimated using O-toluidene method. The rats showing moderate hyperglycemia (200-250mg/100ml) were selected for specific drug treatment.

T₂ and T₃ were administered the fine mustard seed powder with feed daily at a dose of 2g/kg and 8g/kg body weights respectively for 30 days.

Blood was collected on last day of the experiment (45th day) retro orbitally from the inner canthus of the eye in fresh vials without any anticoagulant.

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Estimation of Cholesterol

Cholesterol level in serum was estimated by enzymatic CHOD-PAP method (Allain *et al.*, 1973) using kit from Agappe Diagnostics.

Estimation of Triglyceride

Triglyceride level in serum was estimated by enzymatic GPO-PAP method (Nussel and Arav., 1975) using kit from Agappe Diagnostics.

Statistical analysis of data

The data obtained were analyzed by using one way Analysis Of Variance for comparison between groups and student *t* test for within groups as described by Snedecor and Cochran(1985). The results are expressed as mean \pm standard deviation

RESULTS AND DISCUSSION

Serum cholesterol (mg%) estimated on 45th day of the experiment is presented in Table 1. The results are graphically represented in Fig.1. Animals of Group II remained hypercholesterolemic throughout the period of study. There was significant decrease in the cholesterol level of Group IV compared to Group II. Group III had the value 130.49 ± 15.33 mg% which was not significantly different from Group II.

The effects of treatments on serum Triglyceride estimated on 45th day of experiment is shown in Table-2 and is graphically represented in Figure-2. Group II and Group III exhibited a maximum Triglyceride level. Group IV showed a significant reduction in triglyceride level.

Table1. Effect of Mustard seed powder at two different doses on serum cholesterol (mg%)

Animal No.	Group I	Group II	Group III	Group IV
1	49.23	165.43	118.10	150.39
2	72.31	162.14	134.48	113.39
3	73.85	152.26	121.55	120.47
4	83.89	173.66	126.72	104.45
5	53.08	199.18	130.17	110.79
6	90.77	171.19	111.21	125.98
7	87.69	148.97	141.38	109.45
8	102.31	158.85	160.34	118.90
Mean \pm SD	76.64 \pm 18.38	166.46 \pm 15.70	130.49 \pm 15.33	118.01 \pm 15.52

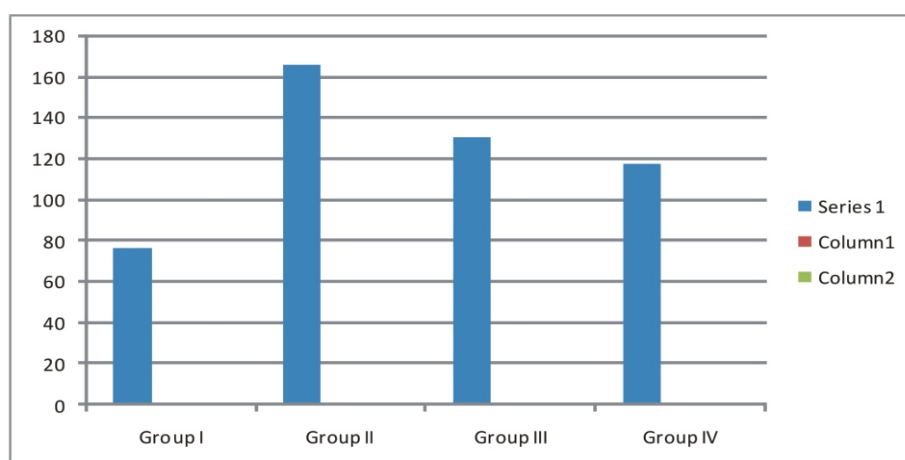


Figure 1

Table 2. Effect of Mustard seed powder at two different doses on serum Triglyceride (mg%)

Animal No.	Group I	Group II	Group III	Group IV
1	48.73	173.47	106.77	152.12
2	61.39	162.59	134.48	146.62
3	77.22	135.37	121.53	132.82
4	81.65	182.99	130.83	95.75
5	54.43	193.20	145.11	82.63
6	90.51	179.59	90.98	142.86
7	87.34	121.77	157.14	105.02
8	96.20	147.62	166.17	132.82
Mean \pm SD	74.68 \pm 17.68	162.08 \pm 25.04	133.14 \pm 25.65	121.14 \pm 24.22

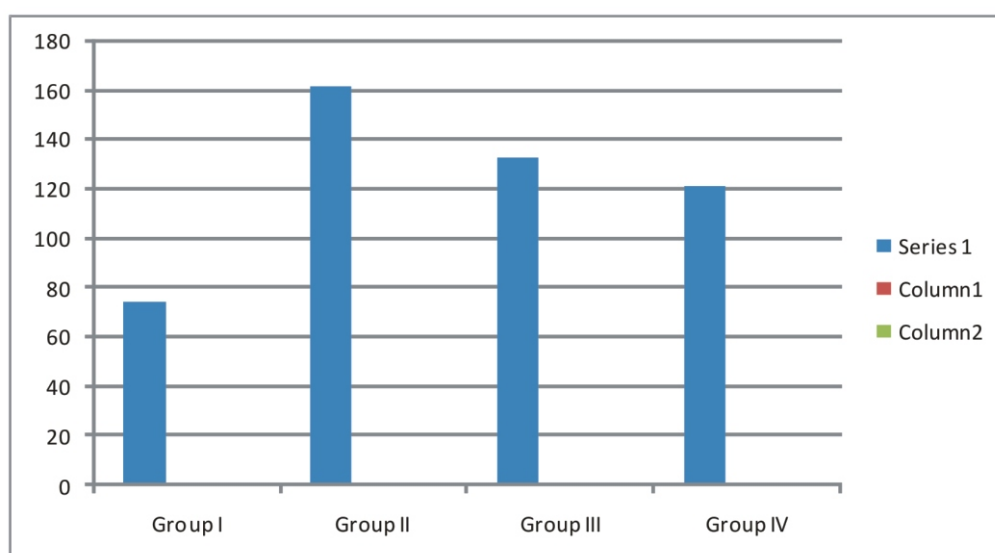


Figure 2

Grover *et al.*, (2002) reported that *Brassica juncea* in diet at a strength of 10 percent and 15percent showed significant antihyperglycemic effect in alloxan-diabetic rats. Khan *et al.*, (1995) found that mustard seed powder exerted its hypoglycemic activity by enhancing glycolysis, glycogenesis and decreasing glycogenolysis. According to Prince and Menon (1998), the marked hyperlipidemia that characterized the diabetic stage is a consequence of the uninhibited

action of lipolytic enzymes on the fat depots. Hypolipidemic activity of mustard seeds may be due to its insulinomimetic activity.

CONCLUSION

The results of present study indicated that the mustard seed powder at high dose (8g/kg body weight) is having potent hypolipidemic effect. But the serum cholesterol and triglyceride levels in

animals treated with mustard at 2g/kg body weight remained similar to that obtained for diabetic control ie, no hypolipidemic effect for low doses of mustard.

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