HYPOLIPIDEMIC EFFECT OF FENUGREEK: A CLINICAL STUDY

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Objective: To investigate the hypolipidemic effect of fenugreek in hypercholesterolaemic patients.

Methods: Fenugreek (Trigonella foenum graecum) seeds (FG) were powdered and extracted with hexane to remove its lipid content and alcohol to remove the saponins. This powder was used for the study. The patients were divided into 3 groups of 6 each as follows: Group I received placebo 50 gm (rice powder and Bengal gram powder in equal measures); Group II - placebo 25 gm + FG 25 gm and Group III - FG 50 gm. Patients were directed to take each 50 gm pack orally before lunch and dinner every day for 20 days. Blood samples were collected after overnight fasting on 0, 10th and 20th days during test period and estimated for lipid profile.

Results: There were no significant changes in lipid profile of group I patients. In groups II and III serum cholesterol, triglycerides and VLDL levels were significantly decreased when compared to group I.

Conclusion: FG powder given orally before food at 25 and 50 gm twice a day may have hypolipidemic effect in hypercholesterolaemic patients.

SUMMARY

KEY WORDS

INTRODUCTION

Fenugreek (Trigonella Foenum Graecum) seeds (FG) have been shown to have hypoglycaemic and anticholesterolemic actions. Diabetes mellitus and hypercholesterolaemia are two risk factors for coronary heart disease. Any dietary change beneficial in both factors merits closer attention. Sharma and colleagues have reported in 10 subjects with hypercholesterolaemia that administration of defatted FG lowered cholesterol levels.

These promising reports warrant further studies involving more subjects. We have investigated the influence of FG on the lipid profile of 18 subjects with hypercholesterolaemia.

MATERIALS AND METHODS

Preparation of Fenugreek (FG) packs: FG seeds of good quality, obtained locally were ground to powder. It was first extracted for 10 h with (food grade) hexane to remove lipids and was spread out to dry for 5 days at room temperature (yield 93%). It was again extracted with ethyl alcohol for 24 h to remove saponins and again dried for 5 days (yield 87% of original weight). This forms the FG powder for clinical trial. Placebo powder was made by a mixture of same texture with equal proportions of rice and Bengal gram. Each patient received 40 packs (50 gm each packet) to be taken twice a day

Group I - Placebo 50 gm each
Group II - FG 25 gm + Placebo 25 gm (total 50 gm) each
Group III - FG 50 gm each

Subjects of study: From patients attending Cardiology Department, Gandhi Hospital, Hyderabad, 18 patients (11 men and 7 women age between 35-55 years) having lipid related problems with high serum cholesterol reports were selected. The study was approved by the Ethics committee. After clinical examination, their basal lipid profile was obtained and they were divided at random into 3 groups, 6 patients in each group. They were given the packs without revealing their identity, with instructions to take the contents of each pack twice a day with water or buttermilk just before lunch and dinner. The test packs
of FG and placebo did not have any taste or odour. There was a complete patient compliance. A few complained of transient and limited gastrointestinal discomfort.

Biochemical estimations: Lipid profile was determined from fasting blood samples collected on days 0, 10 and 20. Serum cholesterol was estimated according to Zlatkis et al. HDL by phosphotungstate/magnesium method, triglycerides by 'Autoenzyme triglyceride kit' (Accurex Biomedical, Mumbai), VLDL was calculated as triglycerides/5 and LDL was arrived by the equation: Total serum cholesterol - (HDL + VLDL).

The changes on the lipid levels of each group were statistically analysed using Student’s ‘t’ test.

RESULTS

There were no significant changes in the lipid profile of group I patients. In group II and III, serum cholesterol, triglycerides, LDL and VLDL levels were significantly reduced when compared to group I (Table 1).

Serum HDL levels showed a tendency to decrease on day 10 in groups II and III, but they rose again to near normal values on day 20. These changes were not statistically significant (Table 1).

DISCUSSION

Sharma et al reported that FG reduced serum cholesterol levels in 10 subjects with hypercholesterolaemia. When FG was given as part of diet in type I diabetic patients, the serum total cholesterol, LDL, VLDL and triglycerides levels were significantly reduced, in addition to a reduction of fasting blood glucose and improved glucose tolerance. FG was reported to lower serum cholesterol levels in rats and normal and diabetic dogs. The results of our study are in agreement with these reports.

In our study HDL levels showed a slight decrease on day 10, but became normal by day 20. This finding is in favour of FG, since low HDL levels are considered as a risk factor for coronary heart disease.

Subfractions of the FG seeds responsible for hypocholesterolaemic effect was investigated by Ribes et al in alloxan diabetic dogs. It was found that lipid fraction had no effect on the cholesterol level of normal or diabetic dogs. A study on the extent of degradation of the saponin and/or diosgenin and other steroid saponins in the alimentary tract of alloxan diabetic dogs suggested that steroid saponin and sapogenin might have a role in lowering cholesterol. In another trial in rats fed for 4 weeks with the...
purified saponin fraction extracted with ethanol from defatted FG, plasma cholesterol was reduced by 18 to 26% with a tendency to lower the liver cholesterol concentrations\(^\text{13}\). It was concluded that the ethanol extract containing probably saponins interact with bile acids in the digestive tract to reduce cholesterol. FG containing 90% of steroid saponins increased food intake in normal rats. In diabetic rats it stabilized food consumption and decreased total plasma cholesterol without any change in triglyceride levels\(^\text{14}\). Thus, there is experimental evidence that saponins also play a part in lowering cholesterol level but it does not change triglyceride levels.

In the present study and that of Sharma et al, FG, defatted by extraction with ether/hexane and desaponified with alcohol, still produced significant antihypercholesterolaemic effect. Since in humans both the defatted and alcohol extracted (saponin-free) fractions produced significant lipid lowering effect, it is possible that more than one fraction and probably more than one mechanism may be responsible for hypocholesterolaemic action of FG.

In conclusion, this study confirms that FG can be included in diet of hypercholesterolaemic patients for its hypolipidemic effect, which does not have hypocholesterolaemic effect, is necessary only to take away the bitter taste of the seeds for their acceptance in food.

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REFERENCES