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Effect of fenugreek seeds and rajma on type-2 diabetic patients

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Abstract

Diabetes is prevalent in India. Many drugs are commercially available for use in the management of diabetes. However, their side effects and high costs underscore the need for herbal alternative drugs. Fenugreek, an ancient herb has been known for its culinary and medicinal value in Indian Subcontinent. Its seeds, (*trigonellafoenum graecum*) are high in soluble fibre, which helps lower blood sugar by slowing down digestion and absorption of carbohydrates. This study designed to assess the anti-hyperglycemic effect of fenugreek seeds and Rajma in patients of Type 2 Diabetes Mellitus (DM) in age group of 45 to 73 yrs. The study carried out in village of ambejogai block i.e. snagav. This study shows that hypoglycemic effects of fenugreek seeds and Rajma are over and above the diet control and exercise.

Keywords: Fenugreek seeds, rajma on type-2 diabetic patients, *trigonellafoenum graecum*

Introduction

Health is the basic requirement for happiness and progress of an individual as well as community and nation. The prevalence of chronic non- communicable diseases (NCDs) is now reaching epidemic proportions in developing countries. Indeed, India already has the higher number of diabetic patients in the world (50.8 million) and this is projected to increase to 87 million by the year 2030 and hence India has been described as the “Diabetic capital of the world”. (Singh, 2005 and IDF, 2009). Diabetes is such a disease which can be easily controlled by proper dietary management. However less attention is given to the dietary management at household levels now a days, due to increase number of working housewives and changed food habits.

Cereals are staple diet in India and carbohydrate consumption constitutes the bulk of the total calorie intake. Upon digestion, carbohydrates produce glucose which is rapidly absorbed and utilized within the body. Hence, the intake of carbohydrate consideration has been a cornerstone for managing diabetes for many years. As the people have learned that blood sugar (glucose) levels are important because they affect their risk of developing diabetes, more consciousness developed among them with regard to intake of sugars and other carbohydrates which resulted in complete exclusion of table sugar from the diet.

Traditional Indian foods such as legumes and millets have been proved to be useful for consumption by diabetics. They are not only hypoglycaemic but also rich in microminerals and fiber. High proportion of non-starchy polysaccharides, i.e. dietary fiber present in cereals and millets has been found to be very effective in reducing the blood sugar level (Neena and Vaidehi, 1988) [7]. The pulses and beans such as cowpea, lentil, Bengal gram and rajmah were recommended for consumption by diabetics due to their low glycaemic

index value. (Nalwade *et al.*, 2001). Beans are known functional foods that are low in fat and high in fiber, vegetable protein, folate, iron, magnesium, zinc, omega-3 fatty acids, and antioxidants (Leterme P. and Darmadi-Blackberry I. 2004) [1]. They also contain phytate and phenolic compounds that may function in similar ways to glucosidase or amylase inhibitor type-2 diabetes medications like the oral hypoglycemic agent acarbose (Sievenpiper JL. *et al.*, 2009) [9]. Fenugreek, an ancient herb has been known for its culinary and medicinal value in Indian Subcontinent. Its seeds, (*trigonellafoenum graecum*) are high in soluble fibre, which helps lower blood sugar by slowing down digestion and absorption of carbohydrates. This suggests they may be effective in treating people with diabetes. its also rich in source of vitamins, minerals and antioxidants, which help protect the body’s cells from damage caused by unstable molecules known as free radicals. Multiple studies have been carried out to investigate the potential anti-diabetic benefits of fenugreek.

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Objective

To assess the anti-hyperglycemic effect of fenugreek seeds and Rajma in patients of Type-2 Diabetes Mellitus (DM)

Materials and Methods

Total Fifteen patients in the age group of 45 to 73 yrs of Type 2 diabetes mellitus diagnosed at least 6 months prior and on OHAs and insulin were included in the study. The study carried out in village of ambejogai block i.e. snagav. Before starting the study fasting and Post meal glucose level tested. Fingerprick blood samples were taken using Accu-Chek Active machine for testing the fasting and post meal. Weight and height was recorded. Height was measured in standard standing position without shoes by using a tape meter, while keeping shoulders in erect position. Body Mass Index (BMI) was calculated by the formula weight (kg) divided by height squared meter. Subjects with a BMI of 18.5- 24.9 kg/m² were classified as normal weight, 25.0-29.9 Kg/m² were classified as overweight and those with a BMI greater than or equal to 30 Kg/m² were defined as obese. Patients were randomized to receive 25 gm of fenugreek seeds and 25 gm of rajma in daily diet for three month. Strict dietary and exercise controls were followed as per the guidelines of American Diabetic Association protocols. Blood glucose level fasting and post meal measured after the three month by same process.

Exclusion Criteria

- Patients who are not willing to participate in the study and unable to give informed consent
- Patients with any diabetic complications
- Patients who are pregnant and lactating
- Patients on lipid-lowering therapy
- Human immunodeficiency virus (HIV) infection

Result and discussion

Table 1 reveals that the out 15 patient 07(47%) having normal

Body Mass Index (BMI) followed by 05(33%) and 03 (20%) comes under the category of overweight and obese respectively. It shown that patient whose BMI were normal there fasting sugar were below the 150 mg/dl and post meal glucose level below the 250 mg/dl vice versa whose BMI come under the overweight and obese category there fasting above 150 mg/dl and post meal glucose above 250 mg/dl. Means higher the BMI higher the sugar level. These findings are in accordance with other studies, which showed that overweight and obesity are consistent parameters associated with increased sugar level in most populations (Panagiotakos DB *et al* 2004 and McGee DL. *et al.* 2005) ^[8, 4]. With respect to the simple complimentary addition of fenugreek seeds and rajma in diet shows the drastic changes in before and after sugar level. The average fasting sugar level of patients before treatment was 165 mg/dl but after treatment it decreased up to 131mg/dl means fasting sugar decreased by 34 mg/dl and average post meal sugar was before treatment 272 mg/dl decreased up to 220mg/dl means postmeal decreased by 52mg/dl. Same result found by (Frank Greenway and Pennington Biomedical Research Center, 2015) ^[2].

Conclusion

In the present study, we have found a positive relation between fasting blood glucose level and BMI. Food habits, intensive lifestyle modifications and regular exercise may prevent new-onset of diabetes, especially in patients with high BMI and high glucose level. Fenugreek seeds and Rajma is widely available in India and cost effective product. This study shows that hypoglycemic effects of fenugreek seeds and Rajma are over and above the diet control and exercise. In a country like India, this can be promising complimentary option for diabetes controls in addition to diet, exercise and drug therapy. It may reduce requirement of drugs and can give better blood glucose control and can be helpful in preventing long-term morbidity.

Table 1: Characteristic of participated diabetic patient

| S. No. | Height | Weight | BMI | Wt. status | Age | Fasting Sugar level | | Post meal sugar level | |
|---------------------|--------|--------|------|-------------|-----|---------------------|-----------------|-----------------------|-----------------|
| | | | | | | Before Treatment | After Treatment | Before Treatment | After Treatment |
| 1 | 154 | 65 | 27.4 | Over weight | 73 | 189 | 145 | 299 | 271 |
| 2 | 151 | 62 | 27.1 | Over weight | 65 | 257 | 143 | 333 | 194 |
| 3 | 154 | 66 | 27.8 | Over weight | 65 | 191 | 80 | 313 | 150 |
| 4 | 153 | 57 | 24.3 | Normal | 75 | 156 | 149 | 249 | 302 |
| 5 | 158 | 65 | 26.0 | Over weight | 49 | 165 | 160 | 290 | 280 |
| 6 | 157 | 75 | 30.4 | Obses | 47 | 108 | 115 | 310 | 182 |
| 7 | 149 | 50 | 22.5 | Normal | 54 | 293 | 180 | 314 | 277 |
| 8 | 152 | 52 | 22.5 | Normal | 53 | 57 | 60 | 190 | 105 |
| 9 | 150 | 50 | 22.2 | Normal | 72 | 143 | 107 | 256 | 206 |
| 10 | 153 | 56 | 23.9 | Normal | 65 | 163 | 171 | 244 | 277 |
| 11 | 158 | 75 | 30.0 | Obses | 45 | 160 | 154 | 301 | 259 |
| 12 | 151 | 53 | 23.2 | Normal | 45 | 96 | 100 | 167 | 165 |
| 13 | 159 | 65 | 25.7 | Over weight | 73 | 155 | 140 | 290 | 210 |
| 14 | 162 | 80 | 30.4 | Obses | 55 | 202 | 154 | 319 | 290 |
| 15 | 150 | 55 | 24.4 | Normal | 58 | 140 | 109 | 215 | 145 |
| Average Sugar level | | | | | | 165 | 131 | 272 | 220 |

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