EUROPEAN JOURNAL OF BIOMEDICAL AND PHARMACEUTICAL SCIENCES
http://www.ejbps.com

ISSN 2349-8870
Volume: 6
Issue: 13
289-292
Year: 2019

EFFECT OF FENUGREEK SEEDS WITH ABDOMINAL PACK ON TYPE 2 DIABETES MELLITUS

Grishma Patlolu (BNYS)*, Shashikiran H.C. (BNYS, MD) and Prashanth Shetty (BNYS, MSc, PhD)

India.

***Corresponding Author: Grishma Patlolu (BNYS)**
India.

Article Received on 26/09/2019 **Article Revised on 17/10/2019** **Article Accepted on 07/11/2019**

ABSTRACT

Background: Diabetes mellitus comprises of a group of common metabolic Disorders that share phenotype of hyperglycemia. The effect of fenugreek seeds was less understood on diabetes mellitus. Hence, this study was conducted to evaluate the effect of fenugreek seeds on type diabetes individuals. **Materials and method:** Thirty (n=30) individuals with diabetes were selected for the study after proper screening according to diagnostic criteria. Subjects were recruited from SDM yoga and nature cure centre. After a thorough and detailed case history, the subjects were taken in the study and treatment was given. The blood glucose levels (FBS and PPBS) were checked at the 1st day before we start with treatment and the post data was collected on 10th day. This procedure is done along with abdominal pack every day in the evening. Fasting blood sugar and Post prandial blood sugar were checked. **Result:** After including fenugreek powder on empty stomach and abdominal pack in their daily routine there was a significant reduction in Fasting blood sugar levels and Post prandial blood Sugar levels. There was also reduction total cholesterol, triglycerides and LDL cholesterol. **Conclusion:** The present study shows that adding fenugreek seeds powder on empty stomach and abdominal pack, targets the elevated blood sugar levels in patients with Diabetes.

KEYWORDS: Diabetes Mellitus 2, Abdominal Pack, Blood Sugar, Fenugreek Powder.

INTRODUCTION

Though India has emerged out as super power in the last decades and has come out as great decocratic country and a great technical cyber hub in the world it is very sad to say it has also emerged out as a worst Diabetic Hub in the world. It is because of sedentary lifestyle, without regular excises and intake of more carbohydrate rich diets, unwanted stress life style leads the present Indian a diabetic at his 30's in general. In the last decade, the incidence of diabetes mellitus has tremendous increase among the Indian population.[1] The effect of diabetes has increased because of worsening obesity, global papulation aging and decrease in physical activity.[2]

The effect of diabetes has increased because of worsening obesity, global papulation aging and decrease in physical activity.[2]

Cardiovascular complications such as hypertension, stroke are the leading cause of morbidity, mortality and expenditures in type2 Diabetes Mellitus.[5,6] Diabetic management can be divided into two main groups: Pharmacological and Non pharmacological ones. One of the most significant pharmacological diabetic management is that almost every drug that is used for diabetes cause some undesirable effects such as lower blood sugar level, stomach upset, weight gain, constipation, tiredness or dizziness, risk of liver disease, etc.[7]

The main goals of the treatment of diabetes are to prevent or delay the late complications, todecrease the mortality rate and to maintain the good quality of life.[8] Complementary and alternative medicine (CAM) includes physical activities, herbal plant extracts and dietary recommendation, which reduce the blood sugar level in type2 diabetes mellitus and it considered as first line clinical approach for type2 diabetes mellitus.[9] In a survey around 48% of patients with diabetes reported using CAM in United States of America.[10] Several complementary and alternative medicine modalities like naturopathy, acupuncture, therapeutic massage, reflexology, dietetics are found to be effective in the management of T2DM.[11]

People living with type 2 diabetes ae more vulnerable to various forms of both short and long term complications, which often lead to premature death. This tendency of increased morbidity and morality is seen in patients with type 2 Diabetes.

Fenugreek is one of the oldest medicinal plants with exceptional medicinal and nutritional profile.[12] Fenugreek seed also known as Trigonella foenum-graecum is commonly used. Fenugreek belongs to Fabaceae family.

It has been commonly used as herbal preparation for Diabetes treatment.[13] Fenugreek seeds contains a substantial amount of fiber, phospholipids, glycolipids, oleic acid, linolenic acid, linoleic acid, choline, vitamins A, B1, B2, C, nicotinic acid and many more functional elements.

It may grow well under diverse and a wide range of conditions; it is moderately tolerant to drought and salinity, and can be even grown on marginl lands. Fenugreek green leaves are one of the most ancient medicinal herbs containing beta carotene, ascorbate, fiber, zinc, iron, calcium. Fenugreek seeds are biologically endosperm, seeds are fibrous, sticky and gummy in nature.[14-16] Dietary fiber from fenugreek blunts glucose and cholesterol after a meal and regulates the production of cholesterol in the liver. Fenugreek seeds contains 45.4% dietary fiber (32% insoluble and 13.3% soluble) and the gum is composed of galactose and mannose. The latte compounds are associated with reduced glycemia.[13]

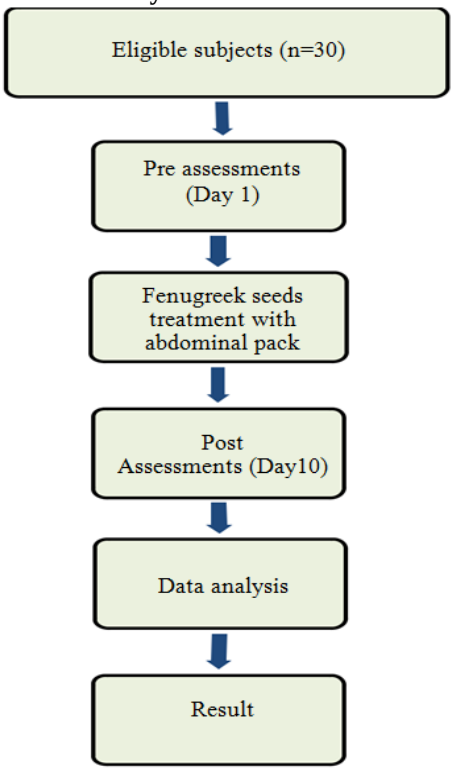
METHODOLOGY

Sources of subjects: 30 Subjects who were diagnosed with type 2 Diabetes individuals were recruited for the study. Subjects who fulfilled the inclusion and exclusion criteria were apprised about the purpose of the study and their rights as a research subject. The subjects will be taken from in-patient of Shri Dharmasthala Manjunatheshwara Yoga & Nature Cure Hospital, Ujire.

The subjects with Type II diabetes mellitus, both the genders, age between 30-65 were included and whereas the subjects with type I diabetes mellitus, any complication of diabetes, alcoholic, on anti-psychotic drugs were excluded.

The subjects were verbally explained in detail about the intervention involved in the study and its related assessments in the form of pre and post data of FBS and PPBS. A signed informed consent was taken from each subject before commencement of the intervention. The institutional ethics committee of SDMCNYS has approved this study.

Illustration of Study Plan



Assessment: The pre and post FBS (Fasting blood sugar), PPBS (Post prandial blood sugar) and was checked of the patient and noted down on both 1st day and at the 10th day after the patient is admitted to nature cure hospital. Finally compared the blood sugar levels (both FBS and PPBS) and of 1st and 10th day.

Intervention

6:30am	9.00am	11.30am	2.00pm	4.00pm	6.30am	7.30pm	8.00pm
3 grams of fenugreek powder mixed in water on an empty stomach	Normal Breakfast	!00 grams of seasonal fruit	Normal Lunch	30 grams of nuts	Cold abdominal pack	2 roti and a bowl of vegetable curry	60-100ml of milk

RESULTS

Fasting blood glucose levels: Paired Samples test.

Pre-FBG –post FBG		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	PRE_FBG - POST_FBG	17.102	10.782	1.525	14.033	20.165	11.212	49	.000

Post-prandial Blood Glucose levels: Paired Sample test.

Pre-PPBG -postPPBG		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair1	PRE_PPBG - POST_PPBG	18.650	15.333	2.169	14.301	**23.018**	8.605	49	.000

DISCUSSION

The present study assessed the impact of fenugreek seeds on the type 2 Diabetes individuals, 30 diabetic individuals were recruited in the study. 30 subjects undergone treatment of fenugreek seeds on empty stomach and abdominal pack for 10 days and Fasting blood sugar levels and post prandial sugar levels was assessed pre and post after treatment. There was significant change in the blood sugar levels. We observe that the pre and post-measurement of the all variables are under consideration are significant at the 5 percent level of significance with p.value < 0.05.

In human body secreted insulin consists of 51 amino acids with molecular weight of. 8kDa. However, the insulin gene encodes a 110-amino acid precursor known as preproinsulin. As with other secreted proteins, preproinsulin contains a hydrophobic N-terminal single peptide, which interacts with cytosolic ribonucleoprotien signal recognition particles.[17] Glucose metabolism is the most important physiological even that stimulates insulin gene transcription and mRNA translation.[18] In 3-day fasted rats, glucose injection increased relative proinsulin mRNA levels by three to four-fold within 24 h and this effect was blocked by pharmacological inhibition of transcription with actionmycin D.[19] These results suggest that glucose plays a central role in regulation of insulin biosynthesis which is controlled at least partially via alterations of proinsulin mRNA stability. Results from in vitro studies demonstrated that insulin mRNA stability was reduced under low glucose concentrations and increased under higher glucose concentrations.[20,21]

Most animals have only single copy of the insulin gene, but rodents have two non-allelic insulin genes (insulin I and II). They differ in their number of introns and chromosomal locations.[22] In all insulin gene the 5'-flanking region determines its tissue and cell-type-specific expression.[23] The transcriptional factor binding sites that determines insulin's exclusive expression in beta cells are located between -520and +1 base pairs relative to the transcription start site in both human and rat insulin genes.[24,25] Most transcriptional regulation occurs through interactions within these conserved sequences. Studies have shown that the sequence between -340 and +90 is the major insulin gene transcription enchance region, which determines cell-specific and glucose-regulated insulin gene expression.[26,27]

Trigonella foenum- graecum is widely used in the Indian subcontinent as dietary supplement. It is known that it since long possess antidiabetic properties. Scientists have demonstrated that the amino acid 4-OH Ile in fenugreek seeds increases glucose- induced insulin relese in vitro in human and rat pancreatic islet cells[28] while others showed that fenugreek seeds extract phosphorylates a number of proteins, including the insulin receptor, insulin receptor substrate 1 and p85 subunit of p13-K, in both 3T3-L1adipocytes and human hepatoma cells, HepG2.[29] Unique major free amino acid, 4-OH Ile, has been characterized as one of the active ingredients for blood glucose control.[30]

The dose of fenugreek powder also effects the blood sugar levels and higher doses can show hypoglycemic effect. The dose ranging from 2 to 25g/day can be given.[31] In this study 3g/day fenugreek powder is given because was on the medication the patient was asked to inform us when he/she feels giddy or numbness at that time the medications dose was reduced. In this study few patients medication dose was reduced. Various authors tried to assess impact of fenugreek on blood control and majority of them showed significant improvement in diabetes control when assessed in terms of fasting blood sugar levels.

This study statistically proves that hypoglycemic effects of fenugreek are over and above the diet, exercise and drug therapy. In country like India this can be promising complimentary option for Diabetes control. It may help reducing the drug requirement and can give better blood glucose control and can be helpful in preventing long term morbidity.

REFERENCES

1. J.M. Garcia-Vivas, C. Galaviz-Hernandez, F. Becerril-Chavez, F. Lozano-Rodriguez, A. Zamorano-Carrillo, C. Lopez-Camarillo, et al. Acupoints catgut embedding therapy with moxibustion reduces the risk of diabetes in obese women J Res Med Sci., 2014; 19: 610-616. International Diabetes Federation. 5th ed. 2011. Diabetes Atlas. Brussels, Belgium.
2. International Diabetes Federation. 5th ed. 2011. Diabetes Atlas. Brussels, Belgium
3. Rajala U., Pajunpää H., Koskela P., Keinänen-Kiukaanniemi S. High cardiovascular disease mortality in subjects with visual impairment caused by diabetic retinopathy. Diabetes Care, 2000; 23: 957–961.
4. Klein R., Klein B.E., Moss S.E., Cruickshanks K.J. Association of ocular disease and mortality in a

diabetic population. Arch Ophthalmol, 1999; 117: 1487–1495.
5. Haffner S.M., Lentos S., Ronnemaa T., Pyörälä K., Laakso M. Mortality from coronary heart disease in subjects with type 2 diabetes and in nondiabetic subjects with and without prior myocardial infarction. N Engl J Med., 1998; 339: 229–234.
6. Brun E., Nelson R.G., Bennett P.H. Diabetes duration and cause-specific mortality in the Verona diabetes study. Diabetes Care, 2000; 23: 1119–1123.
7. Bennett W.L., Wilson L.M., Bolen S. Johns Hopkins University Evidence-based Practice Center; 2011. Oral Diabetes Medications for Adults with Type 2 Diabetes: An Update.
8. Rafael S., Cristina H. Treatment of diabetes mellitus: general goals and clinical practice management. J Rev Esp Cardiol, 2002; 55: 845–860.
9. Bradley R., Oberg E.B. Naturopathic medicine and type 2diabetes: a retrospective analysis from an academic clinic. J Altern Med Rev., 2006; 11: 30–39.
10. Donald G., Leonard E. National patterns and correlates of complementary and alternative medicine use in adults with diabetes. J Altern Complement Med., 2006; 9: 895–902.
11. G. Selvakumar. Immediate effect of bitter gourd, ash gourd, knol-khol juices on blood sugar levels of patients with type 2 diabetes mellitus: A pilot study.
12. Yach D, Hawkes C, Gloud CL, Hofman KJ. The global burden of chronic diseases: overcoming impediments to prevention and control. JAMA, Jan 29, 2004; 1(21): 2616-2622. 10.1001/jama.291.21.2616
13. Hegde SV, Adhikari P, Kotian S, Pinto VJ, D'Souza S,D'Souza V. Effect of 3-month yoga on oxidative stress in type 2 diabetes with or without complications: a controlled clinical trial. Diabetes Care, 2011; 34: 2208-10.
14. Gordon L, Morrison EY, McGrowder D, Penas YF, Zamoraz EM, Garwood D, et al. Effect of yoga and traditional physical exercise on hormones and percentage insulin binding receptor in patients with type 2 diabetes. Am J Biochem Biotechnol, 2008; 4: 3542.
15. Sahay BK. Yoga and diabetes. J Assoc Physicians India, 1986; 34: 645-8.
16. De Meyts P, Whittaker j. Structural biology of insulin and IGFI receptors: implications the drug design. Nat Rev Drug DISCOV, 2002; 1(10): 769-83.
17. Manchnada S.C., Narang R., Reddy K.S., Sachdev V. Retardation of coronary atherosclerosis with yoga lifestyle intervention. J Asso Physiocians in India, 2000; 48: 487–494.
18. Vyas R., Dikshit N. Effect of meditation on respiratory system, cardiovascular system and lipid profile. Indian J Physio Pharmacol, 2001; 45(4): 493–496.
19. Bjorntorp P. Metabolic implications of body fat distribution. Diabetes Care, 1991; 14: 1132–1143.
20. Chrousos G.P., Gold P.W. A healthy body in a healthy mind and vice versa: the damaging power of uncontrollable stress. J Clin Endocrinol Metab, 1998; 83: 1842– 1845.
21. Giugliano D. Morphine, opioid peptides, and pancreatic islet function. Diabetes Care, 1984; 7: 92–98.
22. Udupa K., Madanmohan, Ananda B.B., Vijayalakshmi P., Krishnamoorthy N. Effect of pranayama training on cardiac function in normal young volunteers. Indian J Physiol Pharmacol, 2003; 47: 27–33.
23. Damodaran A., Malathi A., Patil N., Shah N., Suryananshi, Marathe S. Therapeutic potential of yoga practices in modifying cardiovascular risk profile in middle aged men and women. J Assoc Physicians India, 2002; 50: 633–640.
24. Jyotsna VP. Prediabetes and type 2 diabetes mellitus: evi-dence for effect of yoga. Indian J Endocrinol Metab, 2014; 18: 745-9.
25. Youngwanichsetha S, Phumdoung S, Ingkathawornwong T. The effects of mindfulness eating and yoga exercise on blood sugar levels of pregnant women with gestational dia-betes mellitus. Appl Nurs Res., 2014; 27: 227-30.
26. Miller CK, Kristeller JL, Headings A, Nagaraja H, Miser WF. Comparative effectiveness of a mindful eating inter-vention to a diabetes self-management intervention among adults with type 2 diabetes: a pilot study. J Acad Nutr Diet, 2012; 112: 1835-42.
27. Jindal N, Joshi NP. Comparative study of Vamana and Vi-rechanakarma in controlling blood sugar levels in diabetes mellitus. Ayu., 2013; 34: 263-9.
28. Sauvaire Y, Petit P, Broca C, Manteghetti M, Bassac Y, Fernandez-Alvarez J, et al. 4-OH: A novel amino acid potentiator of insulin secretion. Diabetes, 1998; 47: 206-10.
29. Flammang AM, Cifone MA, Erexson GL, Stankowski., Genotoxocity testing of a fenugreek extract. Food chem Toxicol, 2004; 42: 1769-75.
30. Gupta, Gupta R, Lal B. Effect of fenugreek seeds on glycaemic control and insulin resistance in type 2 Diabetic people: A double blind placebo controlled study J. Assoc Physicians India, 2001; 49: 1057-61.
31. Raghuram T, Sharma RD, SIivakumar B, Sahay BK. Effect of fenugreek seeds on intravenous glucose disposition in non insulin dependent diabetic patients. Phytothers Res., 1994; 8: 83-86.