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Effect of Indigenous foods (Fenugreek, black sesame and bitter cumin) on blood glucose level of Type – 2 diabetic patients

Suvarna Kapoor[1*] and Nandini Sarwate[2]

[1*] MKHS Gujarati girls College, Indore - India
[2]Govt. MLB Post Degree Girls College, Indore- India

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Abstract-Type 2 diabetes is treated with tablets and regulated diet. In spite of this, in most diabetic patients, it is not possible to achieve and maintain completely normal blood glucose level throughout the entire day with these conventional therapies. Alternative treatments for diabetes have become increasingly popular in the last several years, including medicinal herbs, nutritional supplementation, acupuncture, and hot tub therapy. As an alternative approach, medicinal herbs with anti hyperglycemic activities are increasingly sought by diabetic patients and health care professionals. Herbal formulations are preferred due to lesser side effects and low cost. Fenugreek, Black Sesame and Bitter cumin are traditional herbs and medicinal indigenous ingredients science a long time herbal medicines have been used in the management of disease. We conducted a study to ascertain of fenugreek, black sesame, bitter cumin powder taken orally had any effect on the blood sugar level of type 2 diabetic patients.

Keywords- Fenugreek, black sesame, bitter cumin, blood glucose

Introduction

Diabetes Mellitus is a metabolic-cum-vascular syndrome of multiple etiologies characterized by chronic hyperglycemia with disturbances of carbohydrates, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both. This disorder is frequently associated with long term damage, which can lead to failure of organs like eyes, kidneys, nerves heart and blood vessels.

Type2 diabetes or non- insulin dependent diabetes (NIDDM), accounts for most cases of diabetes mellitus worldwide. It is estimated that in 2000 there were approximately 150 million individuals with the disease and that this number is likely to double by 2025. Type2 diabetes is the fourth or fifth leading cause of death in most developed countries and there is growing evidence that it has reached epidemic proportions in many developing and newly industrialized countries. The lowest rates of type 2 diabetes are found in rural communities where people retain traditional lifestyles, and consume traditional and herbal indigenous ingredients in their routine/daily meal.

Type 2 diabetes is treated with tablets and regulated diet. In spite of this, in most diabetic patients, it is not possible to achieve and maintain completely normal blood glucose level throughout the entire day with these conventional therapies. Alternative treatments for diabetes have become increasingly popular in the last several years, including medicinal herbs, nutritional supplementation, acupuncture, and hot tub therapy. As an alternative approach, medicinal herbs with anti hyperglycemic activities are increasingly sought by diabetic patients and health care professionals.

Herbs for Diabetes treatment are not new. Since ancient times, plants and plant extracts were used to combat diabetes. Many traditional medicines in use are derived from medicinal plant**s,** minerals and organic matter. The World Health Organization (WHO) has listed 21,000 plants, which are used for medicinal purposes around the world. Among these, out of which 150 species are used commercially on a fairly large scale (Zohary and Hopf, 2000).

Numerous studies related to diabetes have been conducted in past and many are under process presently. The present research focuses on effects of indigenous food ingredients *(*Fenugreek, Black Seasam and Bitter cumin *)* (FBB) on blood sugar level of NIDDM patients.

Herbal formulations are preferred due to lesser side effects and low cost. Fenugreek, Black Seasam and Bitter cumin are traditional herbs and medicinal indigenous ingredients science a long time herbal medicines have been used in the management of disease. We conducted a study to ascertain of fenugreek, black sesame, bitter cumin powder taken orally had any effect on the blood sugar level of type 2 diabetic patients.

Fenugreek (Methidana):-

Fenugreek in the leguminoseae family is an annual herb, native to western Asia and southern Europe, that is cultivated word wide and many part of India. The leaves and seeds of the fenugreek plant are used as powders and extracts for medicinal use. The fenugreek seeds contain an alkaloid trigonelline and another compound known as choline. These seeds have been reported to be hypoglycemic in hypoglycemic in nature.

Bitter cumin Kali jiri:- is a highly reputed remedy In Hindu medicines. Kalijiri (C. anthelminticum) exhibit ant hyperglycemic effect by reducing postprandial glucose through the modulation of amylase and glucosidse activity and thus it may be valuable iln management of diabetes mellitus.

(Black Seasum seed) Kale Til:- - For the thousands of years Kale til have been a source of food and oil. Due to the presence of magnesium and another nutrients Kale til and especially sesame oil, has been shown to combat diabetes. It is found that sesam oil "improved the effectiveness of the oral anti diabetic drug glibenclamide in type-2 diabetic patients.

Objective

To study the effect of indigenous food Fenugreek, black sesame and bitter cumin on blood sugar level of type 2 diabetic patients.

The Rationale of the Study

Diabetes mellitus is a chronic metabolic disorder, with a strong hereditary basis. Though more than 30 million people all over the world are affected with diabetes, not all are well informed about the nature of their disease. Today there is no longer one insulin regimen or hypoglycemic drug or a fixed prescription that can be applied to all people with diabetes. Based on recent advances in finding alternative treatments efforts are on to find suitable anti diabetic therapy. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications, medicinal plants, herbs and spices are preferred due to lesser side effects and low cost. Many conventional drugs have been derived from prototypic molecules in medicinal plants. To date over 400 traditional herbs and spices have been tried for the treatment of diabetes, especially Type 2 diabetes. The World Health Organization Expert committee on Diabetes has also recommended that traditional medicinal herbs be further investigated. To support this view of WHO the basic rationale of this study is to see the effect of combination of fenugreek, black sesame, bitter cumin powder on control of type 2 diabetes.

Review of Literature

This Chapter has presented an exhaustive review of literature in term of diabetes, nutrition, food habits and diabetes, use of various indigenous foods (herbs) in treatment of diabetes. The available literature has been presented to highlight the gaps in knowledge to supplement the primary objectives of the study.

Diabetes mellitus is a heterogeneous metabolic disorder characterized by altered carbohydrate, lipid and protein metabolism (Mutalik et al., 2003). It is a common endocrine disorder in which there occur increased food and water intake (Pal et al., 2001) and characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both (Expert Committee on the Diagnosis and Classification of Diabetes Mellitus, 2003). India has today become the diabetic capital of the world with over 20 million diabetics and this number is set to increase to 57 million by 2025 (Sridhar, 2000). This astronomic increase in the prevalence of diabetes has made diabetes a major public health challenge for India.

Certain herbs may lower blood glucose (Yin et al., 2008; Kuriyan et al., 2008); however, their test results are subject to several factors. Firstly, each herb contains thousands of components, only a few of which may be therapeutically effective (Angelova et al., 2008). Secondly, different parts of an herb have different ingredient profiles. Moreover, different extraction methods may yield different active ingredients (Shan et al., 2007). There are many herbal remedies suggested for diabetes and diabetic complications. Medicinal plants form the main ingredients of these formulations.

In Ayurveda diabetes falls under the term Madhumeha. Various types of herbal preparations such as decoctions (boiled extracts), Swaras (expressed juices), Asav-Arisht (fermented juices), and powders have been mentioned for the treatment of Madhumeha. (Tripathi, 1998). These formulations are basically of plant origin but some inorganic compounds and animal products have also been used (Sharma, 1993). These indigenous medicines may not have adverse effects in therapeutic doses. It is mentioned in ancient texts such as the Charak Samhinta (Shastri, 1994) that a single herb exerts different actions on many diseases and that each herb may have one dominating effect and other comparatively subsidiary effects. It is also mentioned that a herbal drug can also have synergistic and antagonist effects in combination with other herbs (Pendse and Iyengar, 1961). More than 800 plants are used as traditional remedies in some form or another for the treatment of diabetes according to ethnobotanical information. However, only a few herbs have been evaluated scientifically. (Ajgaonkar, 1979; Alarcon- Aguilara et al., 1998).

Method

Hundred samples were selected under this study irrespective to any socioeconomic status, cast religion or sex and divided into two groups. Each group had a sample size of 50.

In Group I –Type 2 diabetic patients who were on oral hypoglycemic drugs and willing to take FBB powder for their treatment.
Group II – Type 2 diabetic patients who were an oral hypoglycemic drug and willing to take FBB powder with their regular medication.
Both the groups were fed 10 gms of FBB powder twice a day15 minute before meals for one month.
Fasting blood glucose level and Postprandial Blood Glucose Level was measured before starting the experiment and after one month of feeding of FBB powder by using GOD-POD method.

Data Analysis

For the data analysis Consultations were made with statisticians and then statistical package of social science SPSS was used for whole data analysis process. The collected data was analyzed for statistical significance by applying t test using SPSS.

Result

a. Effect on Fasting Blood Glucose Level
It was found that the mean score value of fasting sugar level of two groups before experiment was 141.8 mg/dl and 129.5 mg/dl. For group I and group II respectively. At the end of the experiment the mean value of the fasting sugar level after the experiment was found to be 121 mg/dl and 114mg/dl for group I and group II respectively, In group I there was a reduction of 20mg/dl in their fasting blood glucose level, and similar after treatment there was reduction of 15mg/dl in fasting blood glucose level in group II.

b. Effect on Postprandial Blood Glucose Level
To see the effect of FBB powder on postprandial blood glucose level of both the groups. It was found that before experiment the mean score value of Postprandial Blood Glucose Level was found to be 204.8 mg/dl and 195.3mg/dl for group I and group II respectively. The mean value of postprandial blood glucose level after experiment was found to be 175.3mg/dl for group 1 and 175.9 mg/dl for group 2 respectively. The result shows that there was a significant reduction of postprandial blood glucose level by 29 mg/dl and 20mg/dl for group 1 and group 2 respectively. It signifies that FBB has a very significant effect on fasting and postprandial Blood glucose level of both the groups.

Conclusion

Normally type 2 diabetes is treated with oral hypoglycemic drugs. But they have long term side effects, thus alternative therapies with anti hyperglycemic effects are increasingly sought by patients, society and medical practioners. Among these, herbal medication is the most important alternative therapy for blood sugar control. From this study following conclusions were drawn: FBB powder reduces fasting and postprandial blood glucose level in both the groups. The efficiency of FBB powder was similar to oral hypoglycemic drugs. There are no adverse effects found in any patients, who were taking FBB powder.
In conclusion, FBB powder helps in controlling fasting and postprandial blood glucose level of diabetic patients. Hence FBB powder can be used as a substitute to control blood glucose level of type -2 diabetic patients.

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