



Effect of ethnobotanical medicinal plants on blood glucose in *Diabetes mellitus*

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Abstract: The aim of this study was to observe the effect of Bitter Gourd and fenugreek on Blood Glucose level. Ethnobotany is an interdisciplinary field exploring the relationship between plants and people. The blood samples were collected from diabetes mellitus patients from different hospitals (Out Patient Door) and tested for Blood glucose by GOD- POD (glucose- oxidase- peroxidase) method in pathology laboratory and it was found that Bitter Gourd and fenugreek is to have significant impact on blood glucose in diabetes mellitus and observed that Blood glucose found to be the decrease in Bitter gourd by 0.77% level and Blood glucose is found to be decrease by 0.80% in fenugreek.

Key words: Blood glucose; Bitter Gourd; Fenugreek; Diabetes mellitus; GOD- POD method

Introduction

Diabetes is a chronic metabolic syndrome caused by body's inability to produce enough insulin or to use the insulin that it available as a result there is an increase in the concentration of glucose metabolic abnormalities (Saurabh *et al.*, 2013, American Diabetic Association, 2013, Ronald *et al.*, 2006). Diabetes can take a toll on nearly every organ in body, including the Heart and blood vessels. Eyes, Kidneys, Nerves and teeth (American Diabetic Association, 2010). Insuline resistance can be defined as the inability of insulin to usual biological actions at circulating concentration that are effective in normal subjects, there are defects in both insulin and glucagon secretion in type 2 diabetes, the exact cause of which remains speculative. While family history and genetic factors appear to play a significant role in determining the susceptibility to over type diabetes. The only certain aspect of its aetiology and pathogenesis is that its incidence can very significantly be reduced by increasing physical activity and avoiding obesity (Hannele, 2011). The classic symptoms of untreated diabetes are weight loss, polyphagia, polyuria, polydipsia in type 1 diabetes, while they usually develop much more slowly and may be subtle or absent in type 2 diabetes (Kenny, 2014).

Bitter Gourd (*Momordica charantia*) supplements to prevent diabetes mellitus to control blood sugar levels. The Bitter gourd contains at least three active substances with anti diabetic properties, including *chardntin*, which has been confirmed to have blood glucose lowering effect (Chung *et al.*, 2012). Bitter gourd, belongs to Cucurbitaceae family. In India from ancient time the patients of Madhumeha Regularly use ethnobotanical medicines to control the disease. The Bitter gourd (karella) & Fenugreek seeds are easily available for the

consumption of common people in india (Nathan *et al.*, 2011).

Fenugreek seeds (*Trigonella foenum-graecum*) are having high contents of insoluble fiber, which helps to lower blood sugar by slowing down digestion and absorption of carbohydrates this suggested they may be effective in treating people with diabetes. This plant is widely grown in south Asia, North Africa. The plant has small round leaves and also produces long pods that contain distinctive bitter tasting seeds (Munippan *et al.*, 2011). *M. charantia* has significant antidiabetic as well as hypolipidemic activity so that it can be used as an adjuvant along with allopathic treatment of medicine to treat diabetes as well as to delay the late complications of diabetes. In the present review, we have elucidated the possible antidiabetic activity of *M. charantia* and its medicinal potency responsible for the hypoglycemic activity (Baby and Jini, 2013).

The study was undertaken to study the effect of traditionally used vegetables and supplements as bitter gourd and fenugreek seeds, on the blood sugar level of type 2 diabetic patients in Amravati region.

Material and Methods

The study, involving the diabetic patients who use the ethnobotanical medicinal plants for the control of Blood Glucose. Total 30 Patients selected from different hospitals (Out Patient Door) from Amravati region area. The fasting Blood from the people involved in the study before and after treatment with ethnomedicinal plants to testing blood glucose as their routine blood sugar testing. Peoples are divided into two groups one group was suggested to take the one cup juice of Bitter

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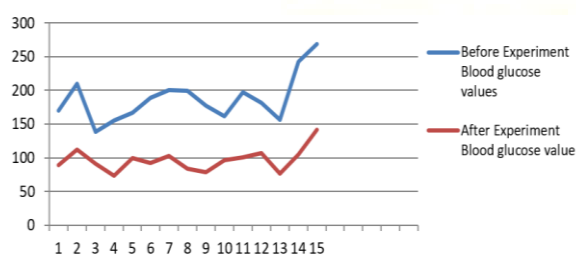
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gourd fruit daily at early morning with empty stomach for three months and another group suggested taking 5gm fenugreek seeds powder daily at early morning with empty stomach for three months. After that both group were again tested for blood glucose. Both pre-and post-experiment the blood glucose tested by GOD-POD (Glucose Oxidase Peroxidase) colorimetric method (Trinder, 1969) and confirmed by automatic analyzer in the pathological laboratory. The data was tabulated, statistically analyzed for paired “t” test and graphs plotted accordingly.

Results and Discussion

The Results for Bitter gourd are shown in table1 and fenugreek in table 2 and graphs are plotted respectively. It was found that the patients taking Bitter gourd juice were shown to have decrease in blood glucose level. The average difference decrease was found the use of effect 52. 8 mg/dl and table values for two tail “t” test 0. 77% level of significance at 0. 5%.



Graph: Blood glucose level of diabetes mellitus patient with the Bitter gourd study.

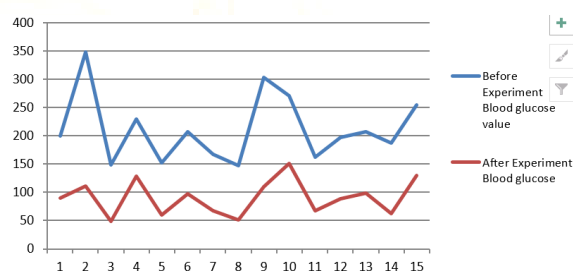
Table 1: Blood glucose level of diabetes mellitus patient with the Bitter gourd study.

No. of Patients	Control Group mg/dl	Before Study blood glucose Values in mg/dl	After study blood glucose values in mg/dl
1	100	200	90
2	77	349	111
3	98		
4	86	149	90
5	81	230	129
6	97	152	88
7	85	207	97
8	73	167	98
9	94	148	101
10	92	303	110
11	83	271	151
12	89	162	107
13	98	207	189
14	75	187	99
15	99	255	162
	78	198	130

In table 2 we calculate the significant difference in Blood glucose level. The patients assigned to experiment showed average difference decrease was found 72. 26 mg/dl and table value for two tail “t” test 0. 80% level of significant at 0. 5%.

Table 2: Blood glucose level of diabetes mellitus patient with the Fenugreek study

No. of Patients	Control Group mg/dl	Before Study blood glucose Values in mg/dl	After study blood glucose values in mg/dl
1	92	170	89
2	98	210	112
3	79	139	91
4	84	155	73
5	78	167	100
6	79	189	92
7	88	201	103
8	95	199	84
9	72	177	79
10	78	162	97
11	90	197	101
12	87	182	107
13	100	156	97
14	102	242	105
15	93	269	142



Graph: Blood glucose level of diabetes mellitus patient with the Fenugreek study

Present study showed the similar result with the work of other investigator and focuses on the use of effect of different ethnobotanical plants on diabetes and related disorder to maintain the blood glucose level. Bitter Gourd has been used as a folk remedy for treating cancer, aiding digestion and fighting viral infection (Jasmin *et al.*, 2011). The fruit has also been used medicinally in South America to lower blood glucose levels (Patel *et al.*, 1968). Fenugreek seeds may helpful to people with diabetes because they contain fiber and other chemicals that are thought to slow digestion and body's absorption of carbohydrates and sugar (Goldman *et al.*, 2014). *Coccinia grandis* leaves has a blood sugar lowering effects (Munasinge *et al.*, 2011). *Syzygium* is one of the widely used medicinal plants in the treatment of various diseases particular in diabetes (Munippan *et al.*, 2011). *M. charantia* has significant antidiabetic as well as hypolipidemic activity so that it can be used as an adjuvant along with allopathic treatment of medicine to treat diabetes as well as to delay the late complications of diabetes (Patel *et al.*, 1968). In the present review, we have elucidated the possible antidiabetic activity of *M. charantia* and its medicinal potency responsible for the hypoglycemic activity (Patel *et al.*, 2012). Fenugreek may help keep blood sugar in a healthy range body converts nutrients consume into glucose, an important energy source that travels in blood to reach all cells. Although maintaining an adequate supply of glucose is critical for

your health, when blood glucose, or blood sugar, becomes too high after a meal or stays elevated for long periods, this can raise risk of diabetes. Fenugreek is an herbal remedy that may help keep blood sugar under control [Joanne, 1981, Goldman, 2014]. Bitter Melon contains a lectin that reduces blood glucose concentrations by acting on peripheral tissue and suppressing appetite similar to the effect of insulin in the brain. This lectin is thought to be a major factor behind the hypoglycemic effect that develops after eating bitter melon (Diabetes. Co. Uk, 2017). Scientists from China, Australia and Germany reported that four compounds in bitter melon activate the AMPK enzyme which moves glucose from blood to cells and also regulate metabolism (Jasmin, 2011). The glucose lowering effect of fenugreek seeds is largely due to the presence of soluble fiber. According to the study, the soluble fiber fraction delayed carbohydrate digestion and absorption, while increasing the action of insulin, these studies indicate the regular fenugreek consumption can be beneficial during diabetes therapy (Natural Health, 2007).

Conclusion

It has shown from this study that both plants are useful for Diabetic patients for lowering the blood glucose level. Ethnobotanical medicinal plants such as Bitter Gourd and fenugreek were associated with significantly reduction on blood glucose with diabetes mellitus patients.

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