Effect of Supplementation of Mulberry leaf Powder on the Blodo Sugar levels of the Selected NIDDM Subjects

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Abstract- Diabetes is a disorder characterized by the passage of sweet urine, excessive urine production, thirst, excessive hunger and in some cases, weight loss. Diabetes mellitus can be defined as a group of disorders with a common characteristic of hyperglycemia. Hyperglycemia means an elevated level of glucose in the blood. In the management of diabetes mellitus, diet has been recognized as a corner stone of therapy. In recent years, there has been much speculation over the dietary formulation, which may be the most effective in achieving better control of blood sugar and in addition, is most likely to prevent or delay the debilitating complications of diabetes. The present study was designed to see the effect of supplementation of mulberry leaf powder supplement on NIDDM subjects. An initial sample of 200 NIDDM subjects were randomly selected from one private and two government health centers of Tirupati who were between the age group of 30 to 60 years. A purposive sample of n=120 NIDDM subjects were selected from which control group n=60 and experimental group n=60 were divided. Mulberry leaf powder supplementation was given for experimental group for a period of 60 days. Results reveals that a significant difference at 1% was identified in the experimental group of subjects when compared to the control group clearly tells that mulberry leaf powder supplementation helped in controlling blood sugar levels.

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I. INTRODUCTION

Mulberry leaf is commonly used for sericulture in almost every part of the world. But its potential to be utilized for human consumption is not well recognized. Many studies reveal that, mulberry has the properties of reducing blood serum glucose, lowering blood cholesterol and lipid levels, fighting arterial plaque etc. Various components present in mulberry that attribute to such therapeutic benefits are GABA (Gamma Amino Butyric Acid), Phytosterol DNJ (Deoxy Nojirimycin) flavonoids, alkaloids, steroids.

The primary goal in the management of diabetes mellitus is the attainment of near-normal glycaemia. In India, more than half of patients have poor glycaemic control and have vascular complications. Therefore, there is an urgent need to develop novel therapeutic agents of diabetes without the development and progression of complications or compromising on safety. Hence the present study was undertaken to see the effect of mulberry leaf powder on the selected NIDDM subjects.

II. OBJECTIVES OF THE STUDY

- To assess the nutrient intake of the selected diabetes NIDDM subjects.
- To study the supplementation of mulberry leaf powder and its effect on controlling the blood sugar levels in the selected NIDDM subjects.

III. MATERIALS & METHODS

An initial sample of 200 NIDDM subjects with the age group of 30 – 60 years were randomly selected and a purposive sample of n=120 NIDDM subjects were selected, from which control group (n=60) and experimental group (n=60) subjects were divided. The experimental samples were given 30gm of mulberry leaf powder and are advised that, the dietary supplement can be mixed and ingested with plain water, butter milk, tea even with foods like breakfast items, snacks, soups etc for a period of 2 months. Blood glucose were analyzed using glucometer. The SPSS (13.1 version) package programme was used for statistical analysis of the data. Means and standard deviations were calculated. Independent sample student's t-test was used to know the significant difference between the independent like blood sugar variables. Paired t-test was used to know the significant difference between experiment and control groups.

IV. RESULTS & DISCUSSION

As per the objectives of the study the sample study consists of selected NIDDM subjects in the age group of 30 to 60 years. Initially the nutritional status of randomly selected 200 diabetic subjects was assessed with the help of a well designed questionnaire.

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Table 1 : Percentage distribution of the sample according to their nutrient intake

S.No	Type of work	Males				Females			
		Energy (K.Cal)	CHO (g)	Proteins (g)	Fats (g)	Energy (K.Cal)	CHO (g)	Proteins (g)	Fats (g)
1.	Sedentary	2800	500	97	45	2665	475	90	44
2.	Moderate	2330	380	90	50	2035	400	60	35
3.	Heavy work	2540	290	100	60	2490	420	90	50

Table-1 shows the percent prevalence of selected diabetic patients with regard to diet pattern. The mean intake of calories were found to be 2800 k.cal among male sedentary workers and 2665 k.cal among female sedentary workers whereas the normal requirement range of male sedentary workers is 2400 k. cal and among females 1800kcal.

This clearly shows that the study subjects are not following diabetes menu plan regularly. The mean calorie intake observed was 2330 k.cal in male moderate workers and among females the mean calorie intake was 2035 k.cal the intake was less than the recommended dietary allowances whereas the normal requirement range of male moderate workers is 3900 k.cal and in females it is 3000 k.cal.

From the present study it is clearly evident that in the sedentary workers intake of calories was more. The reason is in the diet survey through 24 hour –recall method of selected diabetic patients that it has seen that consumption of calories was higher than the recommended values. Consumption of fruits and vegetables is considerably low. Foods such as meat, chicken, eggs, and milk are taken more than the vegetables, cereals, pulses and grains that increased the calorie levels.

As per the second objective mentioned in the study, supplementation of mulberry leaf powder was given to the selected experimental group of subjects for a period of 60 days and the results were analyzed are given Table-2.

Table 2 : Mean blood Sugar levels of the selected diabetic patients

S.No	Group	Test	Blood Sugar (mg/dl) Normal Value: 70-125 (mg/dl)	N	Standard Deviation(±)	t-value	p-value
1.	Control Group	Initial	145.93	60	62.89	1.88	0.06
		Final	145.82	60	63.04		
2.	Experimental Group	Initial	114.82	60	45.40	5.72**	0.00
		Final	88.77	60	22.89		

** Significant at 1 percent level

The blood sugar levels of the selected NIDDM patients are given in the table-2. In the present study a significant difference of blood sugar was found in both control and experimental groups after supplementation of mulberry leaves. In the control group the mean blood sugar level change from 145.93 ± 62.89 mg/dl to 145.82 ± 63.04 mg/dl which is not statistically significant.

Hence it is clearly understood that as the control group is not given any supplementation there was no decrease in blood sugar levels.

In the experimental group that is after supplementation of mulberry leaf powder, the mean blood sugar levels were decreased to 88.77 ± 22.89 mg/dl from 114.82 ± 45.40 mg/dl. Hence it is clear that the mulberry supplementation has shown a remarkable decrease in blood sugar levels when compared to control group and is shown in figure no.1.
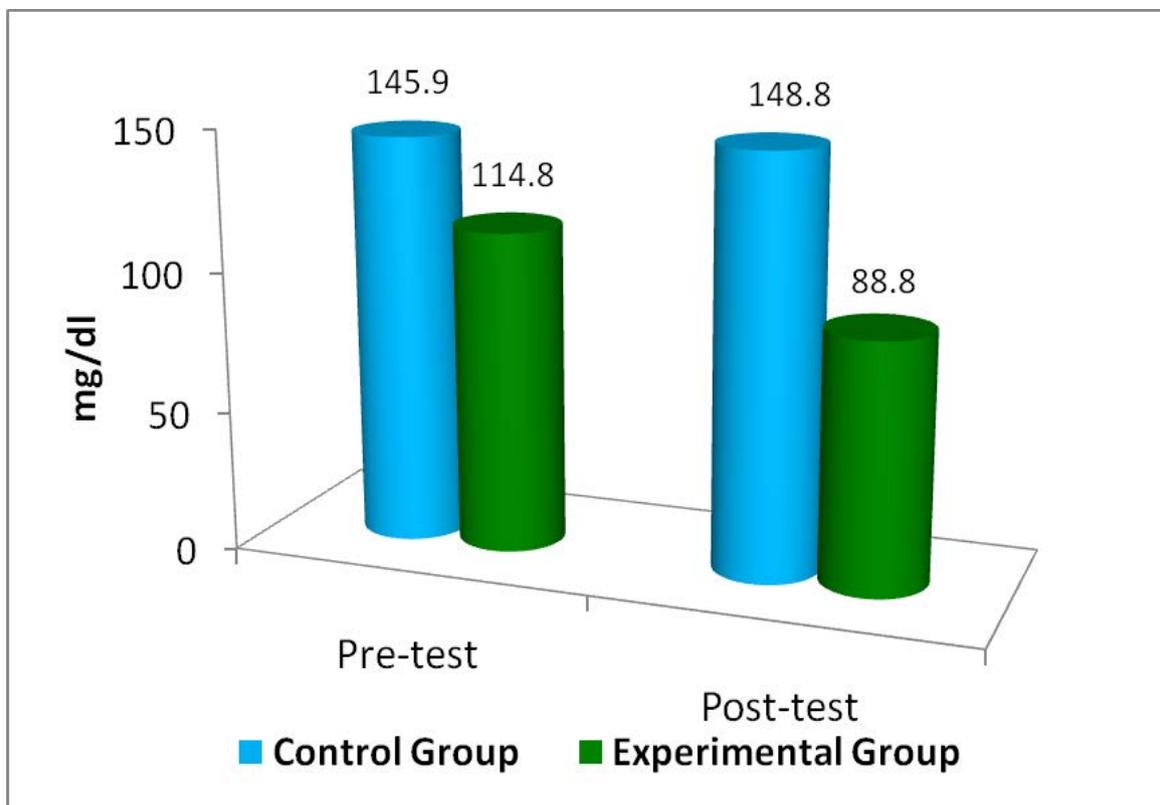
Fig 1 : Change in the blood sugar levels of the selected type II diabetic patients

V. Conclusion

The approach to the dietary treatment of diabetes and the therapeutic implications of mulberry has been illustrated in many investigations. No disease evokes greater emphasis on dietary management than diabetes. A well managed diabetic is one who no longer dreads the disease, has good life expectancy, has been guided correctly to understand the status of the health develops skills to manage this disease and leads near normal, active and healthy life. In conclusion the present study provides the data suggest that, mulberry therapy is capable of enhancing glycemic control in NIDDM subjects.

VI. Recommendations

Mulberry is grown for sericulture practices in several centuries. Recent researches tell that mulberry has created a new dimension that it has been cultivated even for human consumption because of its nutritive values and its therapeutic properties as well as low cost and without any side effects. Instead of drug therapy, mulberry leaves can be used as a natural diabetic treating herb. So that, mulberry farming can generate income for its farmers not only through sericulture, when it is utilized for human consumption can also generate income for the mulberry farmers.

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