

**Research Paper :**

## **Effect of neem (*Azadirachta indica*), methi (*Trigonella foenum-gracum*) and curry leaves (*Murraya koenigii*) on diabetic patients (Type II)**

**LAXMI SINGH AND SUNITA MISHRA**

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See end of the article for authors' affiliations

Correspondence to:

**LAXMI SINGH,**  
Department of Home  
Science, Mahila  
Mahavidyalaya, Banaras  
Hindu University,  
VARANSI (U.P) INDIA

### **ABSTRACT**

Diabetes mellitus has become a leading killer disease in recent years. About 16 million people suffers from diabetes in the U.S. alone, with an estimated 12 million suffers world wide. Now a days Ayurveda plays very important role to control and cure various disease with life style management, diet management and treatment with specific herbs. In this research we found that neem, methi and curry leaves have some medicinal values to central diabetes with diet therapy and nutrition education.

**Key words :** Hyperglycemia, Diet management, Nutrition education

**D**iabetes imposes a major public health burden in the developed and developing countries. According to WHO (1995), the number of people with diabetes in the world would reach 300 million by 2025 (Unwin and Marlin, 2004) A recent publication by WHO links 3.2 million death world wide to diabetes each year.

In United States diabetes is the sixth leading official cause of death, killing 73,000 people per year and contributes to 224,000 deaths a year (centres of disease control 2000). In developing countries, three million death per year are attributed to complication arising from diabetes mellitus. The large population of India base poses a major challenge, as the number of diabetic patient would be very high even with low prevalence rate. This is particularly true because a large number of individuals could have undetected diabetes. In 1994, there were 20 million diabetics in India; according to the World Health Organization, diabetes was responsible for 102,000 death in 1998, and up to 75 per cent do not even known that they are diabetics. Studies over the last three decades show a rising prevalence of NIDDM (Non insulin dependent diabetes mellitus) which affects indians earlier than in the west.

Ayurveda, the ancient healing system from India, has steadily increased in popularity in the western world in recent years. The role of traditional medicines in the solution of health problems is invaluable on a global level. This is the more striking, where we consider the fact that approximately 80 per cent of the people living in less developed countries rely exclusively on traditional

medicine for their health care needs (Subbu Lakshmi and Naik, 2004) Traditional medicine has been described as one of the surest means to achieve total health care coverage for the worlds population, using acceptable, safe and economically feasible methods.

In the next millennium, traditional medicine would be proved as backbone of biomedical research. It is estimated by an All India Co-ordinated Research Project in Ethno biology that 8000 species of medicinal plants were used by the local health practitioners which included herbs, shrubs, trees, and climbers (Vasanthmani and Sarita, 2001).

The present study aims at identifying the medicinal qualities of selected leaves namely, neem, methi and curry leaves.

The specific objectives of the research is to develop antihyperglycemic herbal powder and traditional food products from these leaves and evaluation of hypoglycemic properties of the selected leaves on non insulin dependent diabetic subjects.

### **METHODOLOGY**

252 non insulin dependent diabetics in the age group of 30 to 60 years were selected from different diagnostic centres of Varanasi city. All the subjects were divided in to 3 groups of 21 subjects each. The first experimental group were administered neem leaf powder (10g), second group were administered methi leaf powder (10g) and third group were administered curry leaf powder (10g) per day.

Nutrition education and diet counseling of the patient were done to aware the diabetics about nutrition part. Different traditional food products were developed from selected leaves and acceptability of the products were judged by 9 point hedonic scale rating test by the pannel of 6 members.

Biochemical indices were estimated such as blood glucose level before and after administration of the leaf powder after each 2 months, 4 months, 6 months duration.

## FINDINGS AND DISCUSSION

The results are summarized below according to objectives of the study :

### *Impact of selected leaves on the blood glucose level of the diabetics:*

Blood glucose values, fasting and post-prandial were estimated at the beginning and after administration of the selected leaves at the interval of two months, four months, six months and eight months, respectively.

Table 1 depicts the before and after mean blood glucose values of the diabetics, administered with neem leaves. It is evident from the table that the mean blood glucose values of the patients after 6 months of administration of the neem leaves had significantly reduced, though there was minor difference after two month (163.35 and 196.71) and four months (160.85 and 192.47) but after six months, blood glucose level reduced significantly. One more factor which was observed during the treatment was that the medicine doses of the diabetics have been reduced by the six month. Reduction in the doses of medicine revealed the fact that the green leaves poses hypoglycemic effect.

Table 2 and Table 3 depict mean blood glucose values of the patients administered with curry leaves and

methi leaves, respectively. Patients administered with curry leaves indicated slower reduction after 2 months and 4 months, but a significant difference was found after 6 months , where as patients who have taken Methi leaves showed visible reduction in blood glucose values after four months, a signifcant difference was found after six months when compared with the initial values.

Doses of medicine have been reduced by six months in both the cases where patients were given curry leaves and methi leaves.

Effect of curry and methi leaves on non-insulin dependent subjects showed that these leaves posses hypoglycemic effect on fasting and post post-prandial blood glucose level of the patients.

This fact has been revealed from the study that the neem, Methi and curry leaves are very good agents for supportive therapy in the control of non-insuline dependent diabetes.

According to the Lee glendinning, the Indian curry leaves contain agents that slow down the rate of starch to glucose breakdown, in people with diabetes (Lee, 2004).

### *Dietary pattern and mean nutrient intake of the selected diabetics:*

A days mean food intake was calculated and presented in Tables 4, 5 and 6. It could be inferred from Tables 4, 5 and 6 that the diet of the patients had been modified to suit the requirements of the diabetics. The intake of cereals and fat was low as compared to the recommended dietary allowances. Pulses and green leafy vegetables were taken in moderation by the diabetics. Diet which was suggested for a diabetic patient was high in fibre, protein and complex carbohydrate with green vegetable and fruits of low glycemic index such as apple and guava.

**Table 1 : Impact of neem leaves on the blood glucose level of the selected diabetics**

Blood glucose level	Before	After 2 months	After 4 months	After 6 months
Random (mean)	168.38±2.4	163.35±2.7	160.85±3.2	151.33±3.2
P.P. (mean)	199.57±3.2	196.71±3.5	192.47±3.8	179.61±3.1

**Table 2 : Impact of curry leaves on the blood glucose level of the selected diabetics**

Blood glucose level	Before	After 2 months	After 4 months	After 6 months
Random (mean)	168.52±8.6	164±7.6	160.90±7.6	153.24±6.8
P.P. (mean)	204.48±11.3	200.81±10.2	196.52±11.06	184.76±13.08

**Table 3 : Impact of methi leaves on the blood glucose level of the selected diabetics**

Blood glucose level	Before	After 2 months	After 4 months	After 6 months
Random (mean)	166.52±5.0	166.57±5.6	157.10±5.8	146.38±7.0
P.P. (mean)	217.76±7.2	201.10±8.0	190.38±7.8	180.28±6.6

**Table 4 : Mean nutrient intake of the selected diabetics (Neem leaves)**

Nutrients	R.D.A.		Before		After six months	
	M	F	M	F	M	F
Energy	2425	1875	2430	1643	2400	1789
Protein	60	50	60	52	66	55
Fat	20	20	26	30	22	21
Fibre	45	45	14	11	18	14

**Table 5 : Mean nutrient intake of the selected diabetics (curry leaves)**

Nutrients	R.D.A.		Before		After six months	
	M	F	M	F	M	F
Energy	2425	1875	2180	1780	2325	1800
Protein	60	50	60	45	65	58
Fat	20	20	40	35	15	15
Fibre	45	45	13	11	17	13

**Table 6 : Mean nutrient intake of the selected diabetics (methi leaves)**

Nutrients	R.D.A.		Before		After six months	
	M	F	M	F	M	F
Energy	2425	1875	2200	1810	2415	1816
Protein	60	50	42	41	65	63
Fat	20	20	39	34	20	20
Fibre	45	45	12	11	17	14

**Table 7 : Raita over all acceptability of products enriched with methi leaves**

Replication treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
To (control)	8.6	8.4	8.7	8.2	8.4	8.46± 0.02
T <sub>1</sub> (10%)	9.0	8.6	9.0	8.6	8.7	8.78± .01

Tables 4, 5 and Table 6 showed that the nutrient intake of the patient has been improved after six months, especially intake of protein and fibre was higher than the recommended dietary allowances.

#### **Overall acceptability of the products enriched with Methi leaves and curry leaves:**

Methi leaves were added in two products, the first one is Raita and the second one is mathari (Table 8).

Acceptability of both the products on 9 point hedonic scale was very good. Significant differences have been found between the control and the treatment group of both the products enriched with methi leaves and were liked more by the panel members due to its different aroma

**Table 8 : Mathari**

Replication treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
To (control)	8.2	8.2	8.3	8.4	8.2	8.26± 0.02
T <sub>1</sub> (5%)	8.6	8.3	8.2	8.2	8.0	8.2± .05

and taste. So, the acceptability of enriched products were higher than the control .

Curry leaves were used to develop Upma and Chutney, both the food products were highly acceptable by the pannel members, Chutney and Upma both the products scored maximum than the control group, that shows that addition of curry leaves in upma and chutney in appropriate praporton is a good approach and can be easily added in daily diet of a diabetic patient. There was significant difference between the control and treatment group. Overall acceptability of the product enriched with curry leaves was high and products were highly acceptable (Table 9 and 10).

**Table 9 : Nariyal Chutny**

Replication treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
To (control)	8.3	8.0	8.2	8.3	8.2	8.2± 0.08
T <sub>1</sub> (10%)	8.9	8.7	8.9	8.8	8.8	8.8± .07

**Table 10 : Upma**

Replication treatment	R <sub>1</sub>	R <sub>2</sub>	R <sub>3</sub>	R <sub>4</sub>	R <sub>5</sub>	Mean
To (control)	8.0	8.2	8.4	7.9	8.1	8.12± 0.09
T <sub>1</sub> (10%)	8.1	8.2	8.2	8.0	8.0	8.1± .04

#### **Conclusion:**

It is concluded that the green leaves namely of methi, curry and neem posses some hypoglycemic effect on diabetic patient and addition of these leaves in traditional food products can facilitate the consumption of these leaves, so we can say that use of these leaves with diet therapy can help diabetic patient to control the disease.

#### **Authors' affiliations:**

**SUNITA MISHRA**, Department of Home Science, Mahila Mahavidyalaya, Banaras Hindu University, VARANASI (U.P.) INDIA

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