



## Emphasis of Naturopathy in the Management of Type 2 Diabetes Mellitus

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### ABSTRACT

The aim of the study was to test the efficacy of a four month naturopathy programme for patients with type 2 diabetes mellitus. In this randomized controlled study, 91 patients were selected as subjects, among them 46 participants in the intervention group were asked to attend 60 minutes of naturopathy session for a period of 4 months. The sessions were conducted five times in a week for first month, thrice in a week for second month, twice in a week for third month and once in a week for fourth month. The control group 45 subjects did not receive any naturopathy intervention only medications. Basal recordings of following criterion variables namely, System score (B.P, weight, BMI & W/H ratio), glycemic status (blood sugar fasting, post prandial and HBA1C), lipid profile (cholesterol, triglycerides and HDL), oxidative stress (glutathione peroxidase and total antioxidative capacity), hormonal status (adiponectin, insulin resistance, insulin sensitivity and beta cell function) were assessed before and after the period of four months in patients with Type 2 Diabetes Mellitus. The study showed a significant improvement in glycemic status (blood glucose fasting and PP, HBA1C), HDL, Adiponectin, glutathione peroxidase, Insulin sensitivity and beta cell function in intervention group while control group showed significant improvement in only few parameters. Naturopathy helps in inducing positive health, alleviating the symptoms of disease by acting at physical and mental levels.

**Keywords:** Type 2 Diabetes mellitus, Naturopathy, Fasting blood glucose (FBG), Post prandial blood glucose (PPBG), Body Mass Index (BMI).

### INTRODUCTION

Type 2 diabetes mellitus is a chronic metabolic lifestyle disorder characterized by an abnormally elevated level of blood sugar and excretion of excess glucose through urine. Its prevalence is

growing rapidly throughout the world affecting approximately 285 million people worldwide, that will increase to 439 million by 2030 <sup>(1), (2)</sup>. In type 2 diabetes mellitus, insulin is reduced quantitatively. The target cells are hyporesponsive to insulin

resulting in hyperglycemia as well as glycosuria and if uncontrolled, can lead to multiple complications including ischemic heart disease, stroke, blindness, limb amputations as well as dysfunction of nerves and kidneys<sup>[3]</sup>.

The human and economic toll of type 2 diabetes mellitus is likely to grow globally in the foreseeable future due to increasing rates of urbanization, rural-urban migration, physical inactivity, adoption of sedentary life style and unhealthy diet habits<sup>[(4), (5)]</sup>.

Nature cure believes that all the diseases arise due to accumulation of morbid matter in the body and if scope is given for its removal, it provides cure or relief.

Naturopathy is feasible, safe and compatible with other treatment systems in offsetting chronic diabetic conditions like hyperglycemia, hyperinsulinemia and insulin resistance with reduced population burden of diabetes. It may primarily stress to correct all the factors involved like glucose intolerance, insulin insensitivity, obesity, dyslipidemia, hypertension and stress and then allow the body to recover itself<sup>[6]</sup>.

## RESEARCH DESIGN & METHODS

### Population & recruitment

The study subjects were recruited through advertisements (wall posters, newspaper, banners) and organizing camps in nearby localities of the Hospital. Their age ranged from 35 to 60 years. The study protocol was approved by the Institutional Ethical Committee. Informed consent was obtained from study participants. The study was conducted for 4 months (44 sittings) of periods. All subjects were screened by taking a medical history and clinical examination.

### Study Groups

This randomized study with 91 subjects was conducted at Bapu Nature Cure Hospital &Yogashram, Delhi, India. Among them 46 participants in the intervention group (Group-1) underwent combined therapy of naturopathy and allopathic medication and 45 subjects in control group (Group-2) were treated only with allopathic

medications. All sessions were done under supervision – in the presence of a qualified naturopathy expert.

### Naturopathy intervention

The Naturopathy intervention was provided as a residential treatment for a period of four months at Bapu Nature Cure Hospital &Yogashram. The sessions were conducted five times in a week for first month, thrice in a week for second month, twice in a week for third month and once in a week for fourth month. Naturopathy session included Mud pack (20 minutes), Massage (20 minutes), and Hip bath (20 minutes).

**Mud Therapy:** Mud pack was applied to the patients of interventional group for 20 minutes over the abdominal region on empty stomach by the use of clay pack which is free from contamination. It helps to correct the imbalance of the digestive and endocrinal organs, which remain under active in diabetic patients resulting in accumulation of toxins. Mud pack on abdomen absorbs heat and produces soothing and cooling effect. It also improves blood circulation, removes congestion and tones up the tissues and organs<sup>[7, 8, 9]</sup>.

**Massage Therapy:** Sesame oil was smeared on the abdomen and spine to the patients of interventional group for 20 minutes which enhances not only blood circulation but also tones up the muscles while improving structural and functional status and hence insulin sensitivity. Massage also generates heat with increased circulation of blood bringing down all the impurities to the channel and expelling through sweat or urine. It is thus highly beneficial in the treatment of diabetes<sup>[10]</sup>.

**Cold Hip Bath (22°C to 32°C):** was given to the patients for 20 minutes which produces profound effect upon all bodily functions especially of the abdomen. It excites contraction of the muscular structures of visceral and thus helps to stimulate the

### Outcome Parameters

Clinical assessments of the patients were performed at the time of enrolment (baseline) and after 4 months of intervention. Clinical examination included measurement of symptoms score (urination, blurred vision, fatigue, and thirst). Other outcome measures included System score (B.P, weight, BMI & W/H ratio), glycemic status (blood sugar (fasting, post prandial and HBA1C), lipid profile (cholesterol, triglycerides and HDL), oxidative stress (glutathione peroxidase and total antioxidative capacity), hormonal status (adiponectin, insulin resistance, insulin sensitivity and beta cell function).

### Results

All data were statistically analysed using SPSS 16. The standard deviation was calculated. The significant values were expressed in terms of 'P' value by applying paired 't' test to compare within the groups.

The socio-demographic information of patients in both the groups is presented in Table-1. Finding shows that majority (54.34%) in group 1 and (46.66%) in group 2 of the diabetic patients were in the age group of 50-60 years; 54.34% of them were male in group 1 and 55.55% in group 2. Most of them received High school/Intermediate education. Regarding their occupation 36.9% of them were doing household jobs in intervention group. 54.34% were vegetarians. Most respondents in the intervention group are above poverty line (84.78%). With regard to their duration of illness 50% of them were having diabetes between three and six years.

Significant improvement was observed in glycemic status (blood glucose fasting and PP), HBA1C, HDL, Adiponectin, glutathione peroxidase, Insulin sensitivity and beta cell function, in the intervention group (taking combined therapy of naturopathy and allopathic medicines) after four months treatment as compared to control group (taking only allopathic medicines) which showed significant improvement in only few parameters (Table 2). The results suggested an encouraging role of naturopathy in controlling type II diabetes.

Data on the clinical symptoms of respondents with diabetes in both the groups are shown in Table 3. In group patients better improvement in urination was observed as (0%) patients were found in severe category at 4<sup>th</sup> month as compared to (39.1%) at baseline, whereas in group 2, (14.3 %) patients were found in severe category as compared to (44.4%) at baseline. On comparing blurred vision improvement was observed in both the groups. In case of fatigue, reduction was observed in both the groups as (10%) patients were found in severe category at 4<sup>th</sup> month as compared to (39.1%) at baseline in group 1 and (14.3%) patients were found in severe category at 4<sup>th</sup> month as compared to (44.4%) in group 2. Thirst was shown better improvement in intervention group as (6.7%) patients were found in severe category at 4<sup>th</sup> month as compared to (8.7%) at baseline whereas no improvement was observed in control group.

**Table 1:** Table1: Demographic Scenarios of Diabetic respondents (%)

CHARACTERISTICS	Group-1 (Intervention) (%)	Group-2 (Control) (%)
Gender		
Male	54.34	55.55
Female	45.65	44.44
Age in Years		
30-40	19.56	11.11
40-50	26.08	42.22
50-60	54.34	46.66
Duration of disease		
1-3 years	23.91	44.44
3-6 years	50	22.22
6-9 years	10.86	6.66
>9 years	15.21	26.66
Occupation		
Service	21.7	42.22
Business	21.7	13.33
Household jobs	36.9	35.55
Others	10.86	4.44
None/ Retired	8.69	4.44
Educational Status		
Illiterate	15.21	15.55
Primary/Middle	15.21	22.22
High school/intermediate	41.3	53.33
Graduate and above	28.26	8.88
Socioeconomic Status		
Below poverty line	15.21	28.88
Above poverty line	84.78	71.11
Marital Status		
Married	91.30	88.88
Unmarried/Single	8.69	11.11
Type of Food		
Vegetarian	54.34	57.77
Non Vegetarian	45.65	42.22

**Table 2:** Paired t-test, mean comparison for paired data

Parameters	Time	Intervention		Control	
		Mean + SD	P value	Mean + SD	P value
WEIGHT	Baseline	77.34 ± 14.96		68.25 ± 13.74	
	4th Month	76.3 ± 15.5	0.202	68.1 ± 11.9	0.222
BMI	Baseline	30.26 ± 4.71		27.13 ± 5.58	
	4th Month	29.7 ± 4.6	0.203	27.3 ± 5.0	0.334
W/H RATIO	Baseline	0.96 ± 0.07		0.97 ± 0.05	
	4th Month	0.96 ± 0.06	0.577	0.98 ± 0.06	0.964
B.P (Systolic)	Baseline	131.18 ± 18.00		125.77 ± 17.42	
	4th Month	128.7 ± 12.1	0.173	126.4 ± 15.5	0.232
B.P (Diastolic)	Baseline	82.65 ± 8.17		79.81 ± 9.33	
	4th Month	78.3 ± 17.4	0.141	76.1 ± 15.4	0.328
SUGAR FASTING	Baseline	155.73 ± 64.40		147.73 ± 70.14	
	4th Month	137.8 ± 49.9**	0.001	169.5 ± 65.0	0.276
SUGAR PP	Baseline	252.82 ± 92.39		247.66 ± 74.45	
	4th Month	207.9 ± 75.4***	0.000	262.3 ± 83.0	0.976
HBA1C	Baseline	9.3 ± 1.7		9.0 ± 1.9	
	4th Month	8.0 ± 1.6***	0.000	8.1 ± 1.6**	0.002
TOTAL CHOLESTEROL	Baseline	178.2 ± 43.4		186.4 ± 10.7	
	4th Month	184.5 ± 40.7	0.369	191.0 ± 54.5	0.552
TRIGLYCERIDES	Baseline	173.0 ± 103.6		201.6 ± 183.8	
	4th Month	161.1 ± 97.2	0.265	173.4 ± 135.7*	0.019
HDL	Baseline	41.8 ± 11.1		41.1 ± 12.0	
	4th Month	56.07 ± 17.3***	0.000	50.6 ± 18.3***	0.000
TAC	Baseline	1.5 ± 0.3		1.5 ± 0.34	
	4th Month	1.7 ± 0.4	0.145	1.5 ± 0.21	0.378
GLUTATHIONE PEROXIDASE	Baseline	360.4 ± 30.5		352.01 ± 41.8	
	4th Month	345.0 ± 28.9***	0.000	355.0 ± 35.1	0.718
ADIPONECTIN	Baseline	7.8 ± 7.5		8.24 ± 6.5	
	4th Month	12.3 ± 9.3*	0.025	9.78 ± 8.4	0.159
INSULIN SENSITIVITY	Baseline	56.5 ± 27.6		55.9 ± 32.2	
	4th Month	92.6 ± 61.0**	0.005	71.3 ± 32.6*	0.015
INSULIN RESISTANCE	Baseline	5.1 ± 3.0		7.0 ± 4.2	
	4th Month	4.2 ± 3.2	0.101	4.6 ± 3.5**	0.007
BETA CELL FUNCTION	Baseline	62.0 ± 53.1		73.7 ± 63.4	
	4th Month	127.8 ± 92.3**	0.002	73.5 ± 46.2	0.990

Note: \* (P<0.05), \*\* (p < 0.01) and \*\*\* (p < 0.001).

**Table 3:** Symptoms Score (%)

Test	Time	Intervention			Control		
		Normal	Mild	Severe	Normal	Mild	Severe
Urination	Baseline	61.5	3.8	34.6	44.4	16.7	38.9
	4th Month	69.2	28.8	1.9	48.1	38.9	13.0
Blurred Vision	Baseline	63.5	25.0	11.5	42.6	31.5	25.9
	4th Month	73.1	21.2	5.8	50.0	35.2	14.8
Fatigue	Baseline	28.8	32.7	38.5	31.5	29.6	38.9
	4th Month	53.8	40.4	5.8	31.5	55.6	13.0
Thirst	Baseline	48.1	7.7	44.2	38.9	16.7	44.4
	4th Month	63.5	32.7	3.8	51.9	44.4	3.7

## DISCUSSION

Complementary and alternative medicine has been increasingly becoming popular among consumers of healthcare <sup>[11]</sup>. The ultimate aim of Naturopathic medicine is to promote the inherent power within the human body and to accelerate self-healing capacity <sup>[12]</sup>.

Normally, blood glucose levels are tightly controlled by insulin, a hormone produced by the pancreas. When the blood glucose elevates, insulin is released from the pancreas to normalize the glucose level. If the pancreas does not produce enough insulin or the produced insulin does not work properly, the glucose cannot enter the body cells. So glucose stays in blood which makes the blood sugar level high. A study of Lima (2008) and Fenicchia (2004) showed that yoga and naturopathy help to reduce blood sugar. <sup>[13]</sup>

Diabetes control by naturopathy following hydrotherapy enhances the muscle capacities to metabolize the sugar level in blood and increase blood circulation throughout the body. These lower the excessive high sugar levels in blood and take it to normal levels. Hydrotherapy helps to reduce stress, detoxify the body, cure insomnia, reduce excess fats hence doing away with obesity and do away with diabetes mellitus type 2 <sup>[14]</sup>.

Retrospective observational studies also suggest ND care reduces risk for T2DM and hypertension, including improved glucose control and reduced blood pressure, respectively <sup>[(15), (16)]</sup>.

Three published results ([17]-[19]) of two trials and one unpublished preliminary study have examined

the positive effect of massage on normalizing blood glucose.

Mud therapy gives coolness to the body. It dilutes and absorbs the toxic substances of body and ultimately eliminates them from body <sup>[20]</sup>. A study demonstrates the modifications in risk-factors that occur with long-term naturopathic care for T2DM with notable percentages of patients achieving improvements in glucose levels as measured by HbA1c and blood pressure measures <sup>[21]</sup> (Bradley et al., 2009)

The finding of the above said studies support the present study.

## CONCLUSION

The current study provides evidence that if practiced regularly, a combined intervention of naturopathy and conventional medications is an effective alternative treatment for type 2 diabetes mellitus. This indicates that naturopathy can be recommended as a strong adjuvant in the treatment of type 2 diabetes mellitus. However we need further to conduct long-term large scale studies in this direction to draw more conclusive results.

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