



LIFESTYLE MODIFICATION FOR PREDIABETES THROUGH AYURVEDIC INTERVENTIONS – A CASE STUDY

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ABSTRACT:

Diabetes Mellitus is a metabolic disorder caused by an unhealthy lifestyle. Pre-diabetes is an asymptomatic condition, where blood sugar levels are elevated but are not high enough to be classified as T2DM and is considered a high-risk state for the development of diabetes. The estimated prevalence of prediabetes in India is 14 %. Early diagnosis and intervention with lifestyle modification can reduce the risk of Diabetes Mellitus. In the present case study 53 yrs. female patient with a raised blood sugar level and HbA1C is 6.4% which shows a prediabetic condition is treated with Ayurvedic medicine and Lifestyle modification. Diet and Yoga were advised. Ayurvedic Intervention reduces the elevated blood sugar level with an HbA1C value is 5.6% in 3 months. Lifestyle modification prevents the further progression of disease. Ayurvedic Interventions with lifestyle modification effectively control blood sugar levels in prediabetic conditions without any oral hypoglycaemic medication.

Keywords – Prediabetes, lifestyle Modification, Ayurveda Intervention

INTRODUCTION

Diabetes is rapidly becoming an epidemic in India, with more than 74 million individuals diagnosed with the disease. The overall prevalence of diabetes was 6.65% and that of prediabetes was 5.57%. [1]

Prediabetes, typically defined as blood glucose levels above normal but below diabetes thresholds, is a risk state that defines a high chance of developing diabetes. [2]

The American Diabetes Association (ADA) includes hemoglobin A1c between 5.7 and 6.4 percent in addition to IGT of 140-200 mg/dl and uses a lower cut-off value for IFG between 100 and 125 mg/dl.[3]

Lifestyle modification, metformin, and other drugs are prescribed for the prevention of prediabetes. Adverse effects of medicine with the sustainability of lifestyle modification are major hurdles in treatment. There is a need for safe and effective remedies for preventing the progression of prediabetes to diabetes.

In Ayurveda prediabetes and diabetes are described in the context of *Prameha*. The major categories of the etiological factors are (1) genetic and hereditary factors and (2) lifestyle-related errors such as sedentary habits and high-calorie diet. The texts also describe the pathogenesis of this disease in an extremely evolved manner, involving the three *Doshas* (Kapha predominant doshas)

and ten *Dushyas* (ranging from rasa to Ojas, especially Meda). [4]

The etiology of prediabetes is multifactorial and early intervention reduces the risk of development of diabetes. Multitargeted herbal drugs would be comparatively safe with lifestyle modifications such as diet and exercise to maintain blood sugar levels at normalcy in prediabetes.

CASE REPORT

The present case is a 57-year-old female who visited the *Swasthrakshan* OPD of GAC Nagpur with presenting complaints like right knee joint pain with crepitus and generalized weakness on a routine investigation blood sugar level was elevated. No symptoms of diabetes were observed and any blood investigation were not done before. The patient's case history revealed that there was a family history of first-degree relation suggestive of Diabetes Mellites. No personal history of any autoimmune disorders, Hypertension, or bronchial asthma.

Clinical findings –

BP – 110/70, Pulse- 70/min, Weight – 98 kg, Height – 177cm, BMI – 31.3

Baseline Haematological Investigations

were done which revealed

Hemoglobin (Hb) – 12.7 g/dl, Total Leukocyte Count (T.L.C) – 5300 cells/cumm, Fasting plasma glucose (FPG) – 116 mg/dL, Oral Glucose Tolerance Test (OGTT) – 150 mg/dL and Glycated haemoglobin (HbA1c) – 6.4%.

Total cholestrol - 193 mg/dl and Triglyceride – 126.0 mg/dl **Interventions:**

Table No. 1 : Ayurvedic Treatment

Date	Complaint	Drug	Dose
28/07/2023	Right Knee Joint Pain Crepitus presents Generalized weakness	<i>Trayodashand Guggul</i> <i>Rasnadi Kashaya</i> <i>Janu Basti with Ksheerabala Taila</i>	2 BD 20 ml BD Local
10/08/2023	Right Knee Joint Pain F – 116mg/dl P.P. – 150mg/dl HbA1C- 6.4%	GT Capsule <i>Phalatrikadi Kwath</i> Exercise and Diet	2 BD 40 ml BD
1/09/2023	F -111mg/dl P.P. - 181mg/dl	Niruha Basti – <i>Dashmoola, Rasna Kwath</i> <i>Anuvasan Basti – Tila Tail</i> <i>Phalatrikadi Kwath</i> Exercise and Diet	600ml 100ml 40 ml BD
9/10/2023	F- 104 mg/dl PP- 131mg/dl	<i>Phalatrikadi Kwath</i> Exercise and Diet	40 ml Bd
27/10/2023	F- 101 mg/dl PP- 133mg/dl	<i>Phalatrikadi Kwath</i> Exercise and Diet	40 ml Bd
07/11/2023	HbA1C- 5.6%	Exercise and Diet	
18/12/2023	F- 94 mg/dl PP- 119mg/dl	Exercise and Diet	

Table No. 2 - Special Plan of Diet and Lifestyle

Time	Event	
5:30-6:00 a.m.	Wake up	
6:00-7:00 a.m.	Padagamana (walking) Yogasanans	
7:25-7:45 a.m.	light breakfast	Mudga Yusha (soup) and Upama, Paratha, cow milk
12:00-12:30 p.m.	Lunch as per Agni Bala	Takra, Dal, Roti, Rice, Sabji
Afternoon: 4:30 p.m.	Fruits and light snacks	Amalaki, Dadima or Jambu or Yusha, laja, roastes papad

Evening: 7:00 p.m.	Dinner as per Agni bala	Jowar Roti, Sabji, Dal, rice (less quantity)
8.00 p.m.	100 steps Padagaman	leisure walking
10:00 p.m.	Nidra (bedtime)	

Table no. 3 : Pathya and Apathya (Do and Don't)

Pathya	Apathya
Barley, wheat, sorghum, barnyard millet, green gram beans, tur, horse gram, chana dal, Drumsticks, bitter gourd, snake gourd, ivy gourd, spiny gourd, turmeric, radish, fenugreek, mustard, garlic, onion, ginger, Jamun, papaya, raw mango, amla, guava, Ghee, buttermilk, Sesame, clove, cardamom, poppy seeds, betel leaf, lotus seeds (<i>Makhana</i>), flax seeds	New rice, refined flour, corn, Black gram, Sweet potato, potatoes, Mango, Chickoo, grapes, sugarcane, jackfruit, watermelon, Curd, cheese, milk, sweets prepared out of milk, khoa, Pork, prawn, beef, Sugar cane juice, sugar, jaggery, ripened banana, sweets, sprouts, tea, <i>Diwaswap</i>

Table 4 : Yoga and Pranayam Advice to Patients

Exercise	Time
Walking	15 min
Warm-up	5 min
Asan <i>Tadasan, Paschimottanasan, Vakrasan, Bhujangasan, Shalabhasan, Naukasan, Makrasan, Setubandhasan, Pavanmauktasan, Uttanpadasan</i>	20 min
Pranayam <i>Anuloma Vilom</i> <i>Bhastrika</i> <i>Bhramari</i>	5- 10 min 3- 5 min 5 rounds
AUM Chanting	5 Min
<i>Avayav Dhyam</i>	5 min

Follow-up: The patients were followed up once a month up to five months.

RESULTS:

Table no. 5 : Showing changes before and after tretment

Criteria	Before treatment	After Treatment
Weight	98 kg	96 kg
Height	177cm	177cm
BMI	31.3	30.3
FBS	116mg/dl	94 mg/dl
PPS	150mg/dl	119mg/dl
HbA1c	6.4%	5.6%

The effect of therapy was assessed based on objective criteria HbA1c, Blood Sugar level, and BMI which show significant results in reducing glycated hemoglobin from prediabetic to a normal level. Blood sugar levels also reduce and maintain to normal levels only on diet and exercise even after stopping medication. Body weight is reduced to 2 kg in 3 months.

DISCUSSION

The pathophysiology of prediabetes is similar to type 2 diabetes mellitus, two basic defects are insulin resistance and early beta cell failure. [5] A sedentary lifestyle is the main cause of *Prameha* which is responsible for the formation of *Ama* in the body. *Ama* is formed due to reduced digestive power and vitiates all three *Dosha* in the body.[6] *Phalatrikadi Kwath* contains drugs namely *Triphala* (fruits of *Amalaki*, *Vibhitaki*, *Haritaki*), Root of *Musta* and *Indrayav*, stem of *Daruharidra*, *Nisha* which act as *Amapachan* and act on the basic pathology of *Prameha*. [7] Research has shown that drugs in *Phalatrikadi Kwath* have an Anti-hyperglycemic effect and most of them possess antioxidant properties and act as *Rasayan*. [6]

Prediabetes is a lifestyle disorder in which metabolism is hampered by a faulty diet and lifestyle. So, the proper dietary chart was advised to the patient (Table 5). In *Pathya*, patients were instructed to take old cereals and grains, vegetables, and fruits as mentioned in the Ayurvedic text, which are easy to digest and increase metabolism. It was observed that the *Pathya* and *Apathya* slow or stop the progression of disease and satisfactory recovery with an increase in quality of life.

Yoga effectively reduces stress, thereby helping diabetes control. The various postures during yoga practice help to improve the sensitivity of β -cells to glucose, thereby improving insulin secretion, and increasing the blood supply to the muscle and muscle relaxation, thereby improving glucose uptake. The slow breathing technique in *Pranayama* causes comprehensive changes in body physiology by controlling the autonomic nervous system; it regularizes the rate and pattern of breathing and regulates the heart rate and its variability. [8]

CONCLUSION

Obesity and physical inactivity were identified as the two most important modifiable risk factors in this patient which were changed through lifestyle intervention. *Phalatrikadi Kwath* was used here in dealing with the prediabetes of the patient which dealt with reducing the blood glucose levels. It can be concluded that Ayurvedic modalities like *Aahar*(diet), *Dincharya*, and *Yoga* played a crucial role in weight management and ultimately in diabetes management. A large number of samples are needed to draw a definite conclusion.

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