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Management of type-2 Diabetes Mellitus - A Case Report

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ABSTRACT

Type 2 *Diabetes Mellitus* (T2DM) is a prevalent metabolic disorder characterized by elevated blood glucose levels. *Ayurveda* identifies a similar condition known as *Madhumeha,* a type of *Prameha* associated with an imbalance in *Kapha* and *Vata Doshas*. This study explores the efficacy of *Ayurvedic* treatment in managing T2DM. Methods: A 50-year-old male patient with T2DM and no significant history of major illness was treated using a holistic *Ayurveda* approach. The treatment regimen included *Ayurvedic* formulations such as *Madhumehari Churna*, *Ojaswani Churna, Chandraprabha Vati,* and *Phaltrikadi Kwath* and *Basti* procedure. Dietary and lifestyle modifications were also recommended, focusing on low glycemic foods and regular physical activity. The patient was monitored over three months, with assessments of fasting blood sugar (FBS), postprandial blood sugar (PPBS), and HbA1c levels before and after the treatment period. **Results:** Post-treatment, the patient showed a significant reduction in blood sugar levels and improvement in diabetes-related symptoms. FBS decreased from 150 mg/dl to 126 mg/dl, PPBS from 217 mg/dl to 158 mg/dl, and HbA1c from 9.2% to 6.9%. These results indicate the effectiveness of the *Ayurvedic* regimen in managing T2DM. **Conclusion:** The study demonstrates that *Ayurvedic* management, through a combination of *Ayurvedic* formulations, dietary interventions, and lifestyle modifications, can effectively control blood sugar levels and improve the quality of life for patients with T2DM.

Key words: *Type 2 Diabetes Mellitus, Madhumeha, Prameha, blood sugar control, Basti, lifestyle modification.*

INTRODUCTION

The term *Prameha* denotes the excessive discharge of turbid urine, characterized by *Prabhuta Mutrata* (excessive urination) and *Avila Mutrata* (turbid urine) within the category of *Prameha, Madhumeha* is identified as a *Vataj Prameha*, constituting one of the twenty distinct types of *Prameha*. *Acharya Charak* classified it as a *Santarpanjanya Vyadhi* (disease due to overnutrition). In *Ayurveda, Prameha* is considered an *Anusangi Vyadhi* (disease associated with various factors), with the strength of manifestation contingent on the robustness of the association between *Nidana* (causative factors), *Dosha* (bodily humors), and *Dushya* (affected tissues). Factors such as excessive sleeping, a sedentary lifestyle, and the consumption of specific food items, including curd, sweet products, and dairy, are implicated in *Prameha*. *Ayurveda* aims to treat *Dosha* imbalance and bring them into equilibrium.[1] The concepts of *Ahara* (diet), *Vihara* (lifestyle intervention), and *Yoga* are essential in controlling diabetes and improving the quality of life for those affected by this condition. Lifestyle modifications, dietary interventions, *Yoga,* and holistic management play crucial roles in controlling diabetes, preventing complications, and enhancing the quality of life for individuals with *Diabetes Mellitus.* Modern literature establishes a correlation between *Madhumeha* and Diabetes Mellitus (DM), characterized by elevated

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plasma blood glucose levels leading to hyperglycemia. DM is a clinical syndrome that impacts the metabolism of carbohydrates, fats, and proteins due to defects in insulin action, insulin secretion, or both. Type 1 diabetes arises from the autoimmune destruction of insulin- producing β-cells in the pancreas, resulting in absolute insulin deficiency. Conversely,Type 2 diabetes is marked by insulin resistance and insufficient insulin production to overcome this resistance. Persistent hyperglycemia in diabetes gives rise tomicrovascular complications such as retinopathy (affecting the eyes), nephropathy (affecting the kidneys), and neuropathy (affecting the feet). Diabetes Mellitus is a widespread metabolic disorder associated with symptoms such as excessive thirst, frequent urination, sweating, blurred vision, sudden weight loss, fatigue, and delayed wound healing. Chronic complications of DM encompass nephropathy, retinopathy, neuropathy, and cardiovascular diseases, posing a significant risk of mortality. The etiology of Diabetes Mellitus is multifaceted, with changes in lifestyle, dietary patterns, and stress playing pivotal roles.

The rising prevalence of diabetes globally underscores its status as a major contributorto non-communicable disease mortality. Diabetes affects an estimated 537 million adults worldwide between the ages of 20 to 79 (10.5% of all adults in this age range). By 2030, 643 million people are expected to have diabetes globally, increasing to 783 million by 2045. The prevalence rate is projected to exceed 12.8% by 2045.[2]

Past History

No any history of major illness

Family history

Father and mother has history DM-II

General Examination

1.	Pallor	Absent
2.	Icterus	Absent
3.	Cynosis	Absent
4.	Clubbing	Absent
5.	Lymph Nodes	Not Enlarged
6.	Edema	Absent
7.	Blood Pressure	120/70 mm of Hg
8.	Pulse Rate	76 / Min
9.	Respiratory Rate	18/ Min
10.	Temperature	96.2° F

Personal History

On examination, the patient was having *Vata Kaphaj Prakriti* (body constitution). Patient has dryness over body (*Rukshata*). Patient was moderately built with Body Mass Index of the patient was well oriented and there was no Pallor, Icterus, Cyanosis, clubbing, Lymphadenopathy or Edema, In systemic examination no abnormality was detected. *Satva*, *Satmya* and *Vyayam Shakti* were *Madhyam.*

Systemic Examination

Examination of respiratory system - no any abnormality detected in respiratory system

Examination of cardio vascular system - no any abnormality detected in cardiovascular system

Examination of gastro intestinal system - scaphoid shaped abdomen centrally placed umbilicus, no tenderness, no organomegaly

Examination of nervous system - Higher mental functions were intact

Samprapti Ghatak

Dosha	*Kapha*
Dushya	*Meda, Mutra*
Strotas	*Medovaha, Mutravaha, Annavaha*
Udbhavasthan	*Pakvashaya Samutthaja*
Adhishthan	*Mutravaha Strotas*
Upadrava	*Nil*
Vyadhimarga	*Abhyantara*

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Diagnosis

Vataj Prameha (Madhumeha), *Navina Avastha* (type 2 DM)

Diagnostic assessment

It is based on subjective and objective criteria

1) Subjective criteria

Prabhootamutrata

Grade 0 - Up to 5 times in day hours 0-1 time at night

Grade 1 - 6-7 times in day hours and 2- 3 times at night

Grade 2 - 8-9 times in day hours and 4-5 times at night

Grade 3 - More than or equal to 10 times in day and more than 5 times at night

Daurbalyanubhuti

Grade 0 - Ability to perform routine activity with no feeling of exhaustion

Grade 1 - Unable to perform routine activity without feeling of exhaustion

Grade 2 - Feeling of exhaustion even on accustomed work

Grade 3 - Exhaustion even at rest

2) Objective criteria

- FBS
- PPBS
- HbA1C

SN	Drug	Dose and frequency	Route of administration	*Anupana*
1.	*Madhumehari Churna +* *Ojaswani Churan*	4 GM + 2 GM	Oral, before meal	Lukewarm water
	Chandraprabha Vati	500 mg		
	Phaltrikadi Kwath	20 ml		
2.	*Pramehara Churna*	3 gm	Oral, before meal	Lukewarm water
	Chandraprabha Vati	500 mg	Oral, After meal	
	Erand Bhrist Haritki Churan	3 gm	Oral, After meal	
3.	*Panchtiktpanch PrasratikaBasti* each day for 15 day	400 ml	After meal	Anal root
	Gokshura Kwath	20 ml	Oral, before meal	Lukewarm water
	Trikatika Gutika + *Ojaswani Churan*	250 gm 2gm	Oral, before meal	Lukewarm water
	Madumehari yoga + Tarkeshwar Ras + Udumber fruit Churan	250 gm 125 gm 1 gm	Oral, before meal	Milk

Pathya (Wholesome diet)

Yava (Barley), *Godhoom* (Wheat), *Bajara* (Pearl Millet), *Mung Dal* (Mung Bean), *Lauki* (Bottle Gourd), *Karavellaka* (Bitter Gourd), *Rasona* (Garlic), *Udumbar* (Cluster Fig), *Haldi* (Turmeric), *Tinda* (Indian Round Gourd), *Turae* (Ridge Gourd), *Jambu* (Java Plum/Black Plum), *Aawla* (Indian Gooseberry), *Methika*(Fenugreek*), Nimba Patra* (Neem Leaf), *Shadabahar Patra* (Periwinkle Leaf).

Exercise daily for 30 - 45 minutes or walk 3 - 5 km.

Low glycemic foods should be used and *Tikta Rasa* should be followed. Eat small and frequent meals. Regularly eat more green vegetables, leafy vegetables and fiber rich foods

Apathyakar Ahara (Unwholesome)

Dugdha (cream Milk), *Dadhi* (Curd), *Khir* (Rice Pudding), *Ikshurasa* (Sugar Cane Juice), *Guda* (Jaggery), Pizza, Burger, Sandwich, Chicken, Cold drink water (Soft Drinks), Toast, Dhosa, Pasta, Idli Sambar, Chikki,

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Ice Cream, Potato, Aam (Mango), Kela (Banana), Chiku (Sapodilla), Sitaphal (Custard Apple), Shakarkand (Sweet Potato), Chukandar (Beet root), Paneer, Ghee

Vegadharan (suppression of natural urges) smoking, - *Sukha - Asana, Sukha - Sayana, Diva - Sayana, Ati - Maithuna.*

Yoga Asana *- Bhujangasana, Mandukasana, Kapalbhati, Surya Namaskar, Tadasan, Paschimottanasan, Bhujangasan, Bhramari, Pavanmuktasan.*

Before Treatment

SN	Investigation	Before Treatment
1.	Fasting blood sugar	150 mg /dl
2.	Post prandial blood sugar	217 mg/ dl
3.	HbA1c	9.20 %

After Treatment

SN	Investigation	After Treatment
1.	Fasting blood sugar	126 mg /dl
2.	Post prandial blood sugar	158 mg/dl
3.	HbA1c	6.9 %

Anupashaya**:** *Sukha - Asana, Sukha - Sayana, Diva - Sayana, Ati - Maithuna, Vegadharanad* (suppression of natural urges)

This observation shows that *Ayurvedic* treatment shows significant result in management of *Madhumeha*

Patient perspective

Patient reported not only improved blood sugar levels but also enhanced overall well-being, including better digestion, increased energy levels, and reduced stress. Overall, from a patient's perspective, *Ayurvedic* treatment for *Madhumeha* offers a comprehensive, natural, and empowering approach to managing diabetes

Discussion

Present case is a case of *Santarpanajanya Madhumeha* (Type 2 DM) with *Kapha* dominant constitutional clinical presentation. As patient was overweight diabetic with constipation so *Aptarpana* (one with reducing properties) line of treatment was adoptedin this case i.e., *Aampachana* (digesting the metabolic wastes), *Deepana* (stimulatesdigestive fire), *Kapha* & *Kleda* (water soluble wastes) pacifying treatment[3] *Madhumehar*i *Churna* contains *Jambu, Amra, Karvellaka, Mesasrngi, Methika, Bilva, Nimba, Sunthi, Satapushpa, Sonamukh, Bala* and *Babbula*. Most of the ingredients of*Madhumehari Churna* have *Kashaya* and *Tikta Rasa* property due to this it helps to reducethe blood sugar level. It pacifies the symptoms of *Kapha* due to *Kashaya* and *Tikta Rasa*and also pacifies the symptoms of *Pitta*.[4] *Ojaswani Churna* helps by regulating blood glucose, improving insulin function, enhancing digestive health, reducing inflammation and oxidative stress. *Chandraprabha Vati* an *Ayurvedic* composition offered in traditional *Vati* form. It is used in *Ayurvedic* system of medicine for various indications[5] such as *Vibandha* (Constipation), *Anaha* (Distension of abdomen due to obstruction to passage of urine and stools), *Shula* (Colicky Pain), *Granthi* (Cyst), *Pandu* (Anaemia), *Kamala* (Jaundice), *Mutrakricchra* (Dysuria), *Ashmari* (Calculus), *Arsha (*Hemorrhoids), *Arbuda* (Tumor), *Mutraghata* (Urinary obstruction), *Antra-Vrddhi* (Hernia) etc.[6] The effects of *Chandraprabha Vati* are highly noteworthy in mitigating*Prameha*, which is closely associated with obesity, metabolic syndrome, and diabetes mellitus *(Madhumeha)*.[7] In experiments, the majority of these substances shown the ability to decrease cholesterol and glucose levels shown that *Chandraprabha vati* can treat diabetes induced by streptozotocin. Even though *Chandraprabha Vati* has been used for diabetes for a long time and its constituent plants have antidiabetic and lipid lowering properties, comprehensive scientific research are still needed to define and validate the plant's therapeutic value in managing diabetes. Thus, the current investigation shows how *Chandraprabha*

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Vati affects the hyperglycemia and altered lipid profile in rats that are caused by inducing alloxan.[8]

Phalatrikadi Kashaya works by enhancing *Agni* (all enzymatic activity) and eliminating the accumulated, hazardous metabolites and their purgative (*Virechaka*) effect.[9] *Citrullus cholocynthis* is one of *Phalatrikadi Kashaya's* ingredients. It has been shown to have bowel clearance properties and to be effective in reducing the accumulation of advanced glycation end products by blocking the actions of amylase and a-glucosidase, which in turn slows down the progression of diabetes pathogenesis and rejuvenates the Islet of Langerhans' degenerated cells.[10] *Erandabhrisht Haritaki Churan* has two ingredient, one is *Eranda Tail* and *Haritaki Churna, Eranda Taila* opens the bodily pathways that are clogged in the *Srotas*, relieving *Vata* vitiation. *Vata Kaphahara* and *Adhobhaga Doshahara* (disorders of lower regions of the body) are referenced in the *Samhitas.*[11] Because of all these qualities, the *Eranda Taila* is also employed in *Madhumeha* and aids in *Virechana Karma*. The body's blood sugar levels are significantly reduced by *Haritaki's* superior hypoglycemic quality. Taking this wonder fruit activates the ß-pancreatic cells' synthesis of insulin. It aids in slowing down the conversion of starch to glucose. Thus, consistent use of *Haritaki* powder lowers blood sugar levels and cures a number of symptoms associated with diabetes, including increased thirst, frequent urination, weight loss, etc. *Gokshura Churna* has been shown to exhibit hypoglycemic properties. It helps in lowering blood glucose levels by increasing insulin sensitivity and improving glucose uptake by cells. Most ofthe drugs in *Trikatu Gutika* have *Katu, Tikta Rasa*, *Laghu, Ruksha Guna, Ushna Virya,Vata-Kapha Shamaka* and *Dipana-Pachana* properties. *Kapha* on the other hand is *Guru*, *Snigdha, Shita.* Because of all these properties, *Trikatu Gutika* has the ability to counteract the effect of *Kapha*. Thus, the aggravated *Kapha* subsides resulting in proper functioning of *Agni* and hence preventing *Marg Avarodhjanya Vata Prakopa* thereby breaking the pathogenesis of the disease. It not only helps by breaking the pathogenesis of *Madhumeha* but also has direct impact on various symptoms of *Madhumeha* like burning sensation in hands and feet, weakness, polyuria, sexual debility etc. The *Rasayana* effect of some drugs in *Trikatu Gutika* helps in restoration of *Oja.* Even various research works have shown the hypoglycemic effect of these constituents. So, we can say that *Trikatu Gutika* could be useful in the management of diabetes mellitus.[12]

Panchatikta Panchaprasutik Niruha Vasti: According to Charaka Samhita[13]

Drug	*Rasa*	*Guna*	*Virya*	*Vipaka*	*Doshaghnata*
Saindhav Lavana	*Lavan, Madhura*	*Laghu, Snigdhdha, Tikta, Sukhma*	*Sheeta*	*Madhura*	*Tridosh shamak*
Til Tail	*Madhura, Katu, Tikta, Kashaya*	*Guru, Snighdha*	*Ushna*	*Madhura*	*Vata Shamak, Kapha - Pitta Shamak*
Go Ghrita	*Madhura*	*Guru, Snighdha, Mrudu*	*Sheeta*	*Madhura*	*Vata-Pittashamaka*
Rasna	*Tikta*	*Guru*	*Ushna*	*Katu*	*Kapha-Vatashamak*
Sarshapa	*Tikta, Katu*	*Snigdha, Tikshna*	*Ushna*	*Katu*	*Kapha-Pittashamak*
Patol	*Tikta*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Tridosh Shamak*
Nimba	*Tikta, Kashaya*	*Laghu*	*Ushna*	*Katu*	
Chirayata	*Tikta*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Tridosh shamak*
Saptaparna	*Tikta, Kashaya*	*Laghu, Ruksha*	*Ushna*	*Katu*	

The ideal situation to apply this kind of *Kledahara* & *Shodhana Vasti* is *Prameha*. Additionally, a significant

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Dushya Sangraha is engaged in the *Samprapti* (pathogenesis) of this illness.[14] This *Vasti's* contents are all *Tikta Rasatmak, Katu Vipaki,* and *Ushna Viryatmak,* which means that *Deepan Pachan, Anulomak,* and *Krumighna* are found in nature.[15]

In diabetes, polyuria (excessive urination) is a common symptom due to high blood sugar levels leading to osmotic diuresis. The diuretic action of *Gokshura* helps in regulating urine production and can assist in normalizing urine output by improving the kidneys' efficiency in fluid management.

Conclusion

Ayurveda not only cures this disease but also prevents it by knowing *Aharaja* and *Viharaja Nidana*. *Nidana Parivarajana* helps control this disease. Diet plays an important role in the treatment of *Madhumeha* or diabetes. When we recommend a diet to a patient, we must consider the total carbohydrate content and glycemic index of the food, as well as its Ayurvedic properties.

Declaration of patient consent

The patient has given consent for reporting case along with images and other clinical information in the journal.

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