

Understanding Ayurvedic Principles for Diabetes and Implementation of Specific Diet with Modification of Lifestyle - A Single Case Study

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Abstract: *Diabetes mellitus (DM) is one of the global problems of the present day and it is gaining more attention. It is expected to continue as a major health problem and lead to serious complications. India is one of the top 5 countries with the highest prevalence of DM. The IDF Diabetes Atlas (2021) reports that 10.5% of the adult population (20 - 79 years) has diabetes, with almost half unaware that they are living with the condition. Diabetes mellitus is defined as multiple etiological disorder characterized by chronic hyperglycemia and disturbed of metabolism leads into defective insulin secretion, action or both. Research showed 150 million people have diabetes mellitus worldwide, which can be doubled by the year 2025. This tremendous sudden increase is due to population growth, ageing, unhealthy diets, obesity and sedentary lifestyles. Living with diabetes is difficult. However, by adopting modifications to your food and lifestyle, you can improve your general health and successfully manage diabetes. A balanced diet, appropriate nutrition, and a healthy lifestyle are prioritized in the traditional Indian medical system known as Ayurveda.*

Keywords: Diabetes, Prameha, Meha, Diet, Lifestyle, Modification in diet, Modification in lifestyle, Single Case Study, Pilot Study

1. Introduction

Diabetes mellitus is described as multiple etiological disorder characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, action or both which in long term effects can lead to progressive development of retinopathy, nephropathy, neuropathy, foot ulcers, features of autonomic dysfunction along with failure of various organs. ^[1]

Prameha, which is explained as increased frequency and altered turbidity of urine. ^[2] According to Ayurveda Prameha is considered as one among the Mahagada. ^[3] Prameha can be correlated with diabetes mellitus based on signs and symptoms. Over indulgences in the pleasure of a sedentary lifestyle, excess sleep, a diet like curd, soup of the meat of domesticated and aquatic animals and animals residing marshy land, milk and its preparations, freshly harvested food articles, preparations of jaggery and all Kapha aghravating factors are responsible for the causation of Prameha. ^[4] It is classified into 3 types Kaphaja, Pittaja and Vataja and again subdivided into 10 (Kaphaja), 6 (Pittaja) and 4 (Vataja) types respectively. ^[5] The types of Doshas, which have entered the urinary tract in vitiating the condition give rise to the respective types of Meha with their dominance. ^[6] The treatment of diabetes without adverse side effects remains a major challenge, and Ayurvedic science can play an important role in it. Ayurvedic treatment for diabetes includes using herbal medicines, life style modifications, and dietary changes. As the study case was diabetic hence long duration was taken but the study suggests that modification in diet and lifestyle has considerable changes are observed. Similar clinical studies are required to establish efficacy of modification in diet and lifestyle.

2. Understanding Ayurvedic Principles for Diabetes

Ayurvedic Concept of Doshas and their Role in Diabetes

According to Ayurveda, diabetes is caused by an imbalance in the doshas, particularly the Kapha dosha. Imbalances in the doshas disrupt the natural flow of energy and lead to various health conditions, including diabetes. By understanding the Doshic imbalances associated with diabetes, Ayurveda provides valuable insights into dietary and lifestyle modifications to restore balance.

Ayurvedic Diet Recommendations for Diabetes

Emphasizing Whole, Unprocessed Foods

Ayurvedic diet strongly emphasizes the consumption of whole, natural foods that are rich in essential nutrients and free from chemical additives to control diabetes. By choosing such healthy options, you can fill your diet with essential vitamins, minerals and fiber and consume less sugary foods and unhealthy fats. A variety of whole grains, fresh fruits, vegetables, nuts, and seeds form the basis of an Ayurvedic diet for diabetes, which together provide a sound nutritional foundation to help you on your way to managing your diabetes.

Balancing the Doshas through Dietary Choices

Ayurveda recognizes that each individual has a unique constitution and imbalances in specific doshas. For diabetes management, Ayurvedic dietary recommendations aim to balance the Kapha dosha, which is associated with diabetes. This involves reducing heavy, oily, and sweet foods, and favoring lighter, drier, and more bitter tastes. Foods such as bitter melon, fenugreek, and turmeric are often recommended

for their balancing effects on the doshas and blood sugar regulation.

Lifestyle Tips for Managing Diabetes

Regular Exercise and Physical Activity

Managing diabetes requires making regular exercise and physical activity a part of your everyday routine. Ayurveda recommends engaging in activities that suit your body type and individual preferences. You can do activities like walking, yoga, swimming, or any exercise that benefits your heart, enhances insulin sensitivity, and supports a good body weight.

Stress Management Techniques

Blood sugar levels can be greatly influenced by stress. Ayurveda highlights the significance of handling stress by utilizing different methods like meditation, practicing deep breaths, and participating in activities that enhance relaxation and mental health. Prioritizing self-care and finding ways to reduce stress can positively impact diabetes management.

Importance of Adequate Sleep and Rest

Getting sufficient sleep and rest is essential for overall health and diabetes management. Ayurveda recommends establishing a regular sleep schedule, practicing good sleep

hygiene, and creating a calm and soothing sleep environment. Set a target of getting 7 - 8 hours of quality sleep each night to support optimal hormone balance, metabolism, and overall well-being.

Aim & Objective:

To establish an effective modified diet and lifestyle by understanding the Ayurvedic principles for diabetes.

3. Materials & Methods

The whole study is made on the basis of available literary material includes Brihatrayi, Laghutrayi, Ayurvedic classics, related topics from modern texts, available resources from the internet.

In this article an attempt has been made to add modified diet and lifestyle in diabetic patient to improve the signs and symptoms of the disease and finally to cure the disease.

Diet & Exercise:

In Ayurveda there is concept of wholesome and unwholesome diet. In classical text the detailed dietary guidelines have been given advised.^[7]

Table 1: Foods Advice to be consumed by the diabetic patient

S. N.	Group	Food to be Consumed
1.	Grains	Yava (Barley), Godhuma (Wheat), Shashti Shali (Rice), Kodrava (Grain variety), Uddalaka, Shyamaka, Bajara.
2.	Pulses	Chanak (Bengal Gram), Adhaki (Toor daal), Mudga (Green Gram), Kulattha (Horse Gram).
3.	Vegetables (Bitter & Astringent)	Methika (Fenugreek), Patola (Pointed Gourd), Karvellaka (Bitter Gourd), Tanduleyaka (Choulayee), Vastukam (Bathuva), Shobhanjana (Drum Stick), Karkotaka, Rasana (Garlic), Kadali (Raw Banana).
4.	Fruits	Jambu (Jamun), Amalaki (Gooseberry), Kapittha (Monkey fruit), Dadima (Pomegranate), Tinduka.
5.	Seeds	Methika, Kamala, Uttapala.
6.	Flesh (Fat free meat; forest animals, forest birds)	Harina (Deer flesh), Shashaka (Rabbit flesh), Birds likes – Kapot (Pigeon), Titira, Lavaka.
7.	Fermented or Alcoholic Liquids	Madhavika Sura, Madhvasava (In Kapha - Pittaja Prameha), Purana Sura – Old wine other natural products Madhu (Honey), Madhudaka (Honey mix with water).
8.	Oils	Nikumbha (Danti), Ingudi, Atasi, Sarshapa (Mustard).
9.	Other food articles and spices	Dhaniya (Popcorn of Jowar), Laja / Murmura (Puffed Rice), Maricha, Saindhava, Hingu, Haridra (Turmeric), Ardraka (Ginger).

Exercise

Through recent studies it is clearly understood that physical inactivity may lead to progression of disease. For diabetic person, exercise is equally important as diet and medication. In fact, the American Diabetes Association recommended at least 30 minutes of physical activity daily for five days per week increases the heart rate.^[8] Even in ancient time also it was already mentioned by Acharya Sushruta that one should walk regularly without wearing shoes and umbrella, walk at least hundred Yojan.^[9]

Yoga

Lifestyle changes play an important role in the development of Diabetes. Yoga provides natural and effective remedies with less toxic side-effects, and with benefits more beyond the physical. Yoga is a simple and natural programmed work on five main principles eg: exercise, breathing, relaxation, diet and positive thinking with meditation. It is a cost-effective lifestyle intervention technique.^[10]

Table 2: Exercises or Yoga advice to be done by diabetic patient

S. N.	Asanas	Benefits
1.	Paschimottanasana	Tones the abdominal pelvic organs. Reduces fatty deposits in the abdomen. Remove anxiety, anger and irritability. Calms the mind. It acts as a stress reliever.
2.	Padahasthasana	Useful in the toning of the abdominal organs. Blood circulation improved. Improved blood circulation will also help in keeping the hormone balance.

3.	Ardhamastyendrasna	Massages abdominal organs, simultaneously stretches the muscles on one side of back & abdomen.
4.	Bhujangasana	It helps in giving a gentle massage to the internal organs and will stimulate the digestive system to function well. Useful in treating the symptoms of stress like fatigue, headache and weakness.
5.	Vajrasana	Calms the mind and bring stability in mind.
6.	Savasana	It relaxes whole body. Releases stress, fatigue, depression and tension. Calms the mind and improves mental health.
7.	Suryanamaskara	Harmonizes the endocrinal system helping to remove any irregularities by directly massaging the relevant glands and improving their blood flow.

4. Studied Case Report

Case Details:

A 48 years old male patient came with the chief complaints which includes increased thirst, frequent urination, fatigue and blurred vision, diagnosed with type 2 diabetes through blood investigation showing elevated fasting and post meal blood glucose levels and managed with oral medications like metformin 500mg twice in a day, glimepiride 1mg twice in a day and voglibose 0.2 mg twice in a day; potential complications with high cholesterol and early signs of diabetic neuropathy for 3 years.

Brief History (Including Onset and Progress):

Patient is a case of Diabetes Mellitus (On oral Anti - Diabetic Drugs) for 3 years with early signs of Diabetic neuropathy for 6 months. Suddenly 3 years back the patient started feeling very thirsty, urinating excessively, feeling tired and having blurred vision. For these reasons, the patient went to a private clinic and got some blood investigations done. Blood investigations revealed that the patient's blood glucose level had increased significantly both fasting and post meal and cholesterol was also increased. He was undergoing treatment for 3 years but he didn't get relief hence came to Arogya clinic for further management.

Diet & Exercise Advice:

The diet and exercise advice to the diabetic patient was shown in table no.1 and 2, for 3 months.

5. Observations and Result

Table 3: Investigations of parameters before and after modification

Investigations	Before Modification of Diet & Exercise	After Modification of Diet & Exercise
S. Cholesterol	354.2 mg/dl	148.7 mg/dl
S. triglycerides	183.1 mg/dl	87.4 mg/dl
HDL	36.8 mg/dl	43.2 mg/dl
LDL	142 mg/dl	84.18 mg/dl
VLDL	38.22 mg/dl	19.23 mg/dl
S. Cholesterol / HDLC ratio	5.65	3.28
HbA1C	6.9 %	5.18%
Sr. Urea	27.8 mg/dl	21.9 mg/dl
Sr. Creatinine	0.7 mg/dl	0.6 mg/dl
Sodium	146 mmol/lit	142 mmol/lit
Potassium	4.2 mmol/lit	3.9 mmol/lit
BSL (R)	323 mg/dl	128 mg/dl
BSL (F) (PP)	224 mg/dl	114 mg/dl
	335 mg/dl	148 mg/dl

6. Discussion

Prameha diet in Ayurveda, essentially referring to a diet for managing diabetes, emphasizes consuming foods rich in fiber, particularly whole grains like barley (Yava), while strictly limiting sugary and high - fat foods, focusing on bitter vegetables, and prioritizing moderate portion sizes to regulate blood sugar levels; key aspects include prioritizing foods with a "Laghu" (light) and "Ruksha" (dry) quality, avoiding excessive "Madhura" (sweet) rasa, and tailoring the diet based on individual Dosha imbalances.

Key components of a Prameha diet:

1) High - fiber foods:

- **Barley (Yava):** Considered the most beneficial grain for Prameha due to its high fiber content and ability to stabilize blood sugar.
- **Green leafy vegetables:** Like spinach, kale, and bitter melon (Karela)
- **Legumes:** Lentils, chickpeas, and kidney beans
- **Fiber - rich fruits:** Berries, guava, and pear

2) Bitter vegetables (Tikta Rasa):

- Bitter melon (Karela)
- Neem leaves
- Fenugreek seeds (Methi)
- Garlic

3) Other important foods:

- **Old cereals:** Preferably older grains like old rice or wheat
- **Spices:** Ginger, cinnamon, cloves
- **Yogurt (Dahi):** Moderate consumption with meals
- **Honey (in moderation):** Considered beneficial in some Ayurvedic texts

4) Foods to avoid in Prameha:

- **Sugary foods:** Refined sugar, sugary drinks, sweet fruits like mango
- **Fatty foods:** Fried foods, red meat, excessive ghee
- **Heavy foods:** Rich, creamy dishes, excessive starchy foods
- **Processed foods:** Packaged snacks, white bread

While describing the prognosis of Prameha Acharya Charak Has explained Prameha in Ashtomahagad. ^[11] Acharya Charak has been described the Utpatti of Prameha in Nidansthan. He stated that Prameha is a Kulaj Vikar (Hereditary) and Jataj Prameha (Juvenile diabetes) is Incurable. ^[12] Due to lack of proper management it becomes Asadhya in later stage. There is increased frequency of micturition and increase urinary output in this disease. Therefore, it is called Prameha.

As Prameha is Tridoshaj Vyadhi with Ten Dushyas there is possibility of loss of combination of dosh dushyas. Ayurvedic

Samhita state that Sahaj Prameha occurs due to defect in Beej. In Prameha dushta Kapha is called as Bahu Drava Shleshma that means increase in Drava Guna of Kapha.

Dosha Dushya Sangraha of Prameha is as - Dosha - Kapha, Pitta, Vata. Involved Dushya are Rasa, Rakta, Mansa, Meda, Majja, Shukra, Oja, Ambu, Vasa, Lasika. Except Raktadhatu all Dushyas Kapha category. Meda and Mamsa are important Dushyas and are compulsory involved in all types of Prameha. Pecularity of Meda and Mamsa Dhatu is both of them are Bahu (excess in quantity) and Abadha (Aghana i. e., flabby or loosely bonded). Without proper knowledge of Hetusevan and Dosha Dushyas Sangraha one cannot suggest Nidan Parivarjan to any patient. ^[13 - 14]

The burden of diabetes on the health care system mandates efforts to more optimally treat those with the disease and to prevent its development in those at risk. Early and intensive intervention in patients with diabetes reduces the risk of microvascular and macrovascular complications and disease progression. Current challenges in diabetes management include: (a) optimizing the use of currently available therapies to ensure adequate glycemic, blood pressure, and lipid control and to reduce complications; (b) educating patients on diabetes self - management; (c) improving patient adherence to lifestyle and pharmacologic interventions; (d) reducing barriers to the early use of insulin; and (e) improving the delivery of health care to people with chronic conditions.

In present case patient was suffering from diabetes and had taken modern medicines 3 years. Patient was not feeling any relief from modern medicines and hence came for Ayurvedic treatment. As per Ayurvedic point of view patient has Dushti of mainly Rasa - Rakta Dhatu and Dhatu Shaithilya. In such case maintaining Dhatu Samyata of Rasa - Rakta Dhatu, increasing Oja, controlling Madhumeh (Blood glucose level) are the key points.

Considering these facts, the modification in diet and exercise has decided which can be explained further on. Diet is specifically indicated for diabetes is high fiber food, bitter vegetables and it is a Tikta Rasa which helps in purification of Rasa & Rakta Dhatu which ultimately help in reducing Dhatu Shaithilya. High fiber food has ability to stabilize blood sugar.

In Ayurveda, "Prameha" refers to diabetes, and exercise plays a crucial role in its management, considered essential for controlling blood sugar levels and mitigating complications associated with the condition; ancient Ayurvedic texts like Charaka Samhita and Sushruta Samhita highlight the importance of physical activity (Vyayam) in treating Prameha, recommending exercises like walking, moderate aerobic activities, and specific yoga postures depending on the individual's Prakriti (body type).

All these facts helped in breaking some Samprapti of the diseased condition and hence gave good relief in studied case. Although the duration of study is long but it suggests enough significant relief in the disease.

7. Conclusion

As the studied case was diabetic hence long duration was taken but the study suggests that the modified diet and lifestyle in the diabetic patient has significant changes. Clinical studies of modified diet and lifestyle on large sample size are required to establish its efficacy. Present study is a single case report but can be considered as torchbearer for future research work.

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