

Case Report

Effect of takradhara and ayurvedic internal medications on stress-associated worsening of glycemic control in a patient with type 2 diabetes mellitus: a case report

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ABSTRACT

Diabetes is a chronic health condition characterized by impaired glucose regulation, which may result from inadequate insulin production or ineffective utilization of insulin. Uncontrolled diabetes can lead to complications affecting multiple organs, while psychological stress may further worsen glycemic control and quality of life. This case report describes a 61-year-old female patient with elevated blood glucose levels, emotional stress, and persistent fatigue who was admitted to the Kayachikitsa IPD of Vaidyaratnam Ayurveda College on 12/08/2024. The patient was assessed using the Quality-of-Life Instrument for Indian Diabetes Patients (QOLID). Management was primarily based on Prameha Chikitsa, with consideration of the Manovaha Srotas, using Nisakathakadi Kashaya, Chitrakatriphaladi Kashaya Choorna, Pramehoushadhi tablets, Chandraprabha tablets, Takradhara, and Abhyanga with Murivenna and Mahanarayana Taila. Following treatment, the patient showed marked relief from emotional stress and general weakness, along with improved glycemic control. The QOLID score increased from 65 to 83.46, indicating improvement in quality of life, and FBS reduced from 213 mg/dl to 136 mg/dl, while the insulin dosage was reduced from 30 U–30 U–15 U to 15 U–0–15 U. Although Prameha is considered a Yappa condition, the observed improvement suggests that Ayurvedic management may have a beneficial role in controlling stress-associated hyperglycemia and improving quality of life.

Keywords: Prameha, Stress-related hyperglycemia, Diabetes Mellitus, Takradhara

INTRODUCTION

Diabetes mellitus (DM) is a group of metabolic disorders characterized by hyperglycemia. Decreased production of the hormone insulin, decreased utilization of glucose, and increased production of glucose cause hyperglycemia. There are mainly two types of DM such as type 1 and type 2 DM. Type 1 diabetes mellitus is caused by the destruction of the pancreatic beta cells that secrete insulin, leading to decreased insulin production and poor glycemic control. In contrast, type 2 diabetes may develop due to

insulin resistance and defective insulin secretion. Persistent hyperglycemia for a long time can cause other complications such as neuropathy, nephropathy, retinopathy and atherosclerotic diseases.¹

The prevalence of patients with diabetes mellitus (DM) has increased significantly from 30 million in 1985 to 463 million in 2019, with a global prevalence of 9.3% in the population aged 20–79 years. That's roughly a 15-fold increase over three decades. These trends suggest that 642 million people would be affected by diabetes by the year

2040. The incidence of type 2 diabetes mellitus (T2DM) is increasing at a faster rate than type 1 diabetes mellitus (T1DM), with important contributing factors being obesity, changes in dietary patterns, reduced physical activity, an aging population and industrialization. In 2019, China had the highest number of people with diabetes (116.4 million), followed by India (77 million).²

Psychological stress can influence glycaemic control in patients with type 2 diabetes through both physiological and behavioural changes. During periods of stress, activation of the sympathetic nervous system and the hypothalamic–pituitary–adrenal axis increases the release of cortisol.^{3,4} Cortisol helps mobilize energy stores and increases the availability of glucose in the circulation, which may become important when stress is prolonged or repeated. The effects of chronic stress are not limited to hormonal changes, as it can also influence dietary habits, physical activity and adherence to medication.⁵

In patients who already have type 2 diabetes, psychological factors such as diabetes-related distress have been associated with poorer glycaemic control.^{6,7} Greater emotional distress has also been related to poorer treatment adherence, which may further affect glucose control.⁷ Some studies have also explored whether reducing the stress response can improve glucose regulation.

Progressive muscle relaxation was found to lower blood glucose in some insulin-requiring patients with type 2 diabetes, while relaxation training in another group of patients was associated with better glucose tolerance and a reduction in plasma cortisol.⁸⁻¹⁰ These findings suggest that psychological stress may contribute to worsening glycaemic control in some patients with type 2 diabetes and that measures aimed at reducing stress may have a supportive role alongside regular diabetes management.

Stress can affect both Manas and Shareera, and prolonged psychological stress may therefore influence the normal physiological functions of the body. Manasika Vikaras such as Krodha (anger), Shoka (grief) and Bhaya (fear) can also produce changes at the Shareerika level by altering the normalcy of the body. Ayurvedic classics explain the influence of such Manasika Bhavas on digestion, where persistent manasika nidanas (Psychological factors) can interfere with the normal functioning of Agni.

Impairment of Agni may lead to improper digestion and the formation of Ama.¹¹ In this Ama Avastha, further vitiation of Doshas and disturbance of Srotas may occur, particularly involving Rasavaha, Medovaha and Mutravaha Srotas.

In the context of Prameha, the involvement of Meda along with increased Kapha and Kleda has an important role in the pathogenesis of the disease.¹² Thus, prolonged psychological stress, through its influence on Agni, Ama, Dosha, Dushya, and Srotas, may be considered as one of

the factors that can aggravate the underlying pathological process of Prameha. In the present case, Prameha Chikitsa along with Takradhara was administered, considering psychological stress as a possible factor contributing to the worsening of glycaemic control.

CASE REPORT

A 61-year-old female patient, who had been on treatment for diabetes mellitus for 20 years and for hypertension, dyslipidemia, and hypothyroidism for the past 7 years, presented to the Kayachikitsa OPD of our hospital on 12 August 2024. Her main complaints were persistently elevated blood glucose levels, emotional stress, and fatigue for the past 6 months. She was admitted to our hospital for 10 days for the management of the same.

Case history

A 61-year-old female patient, who had been receiving treatment for diabetes mellitus for the past 20 years and for hypertension, dyslipidaemia, and hypothyroidism for the past 7 years, presented with persistent fatigue, uncontrolled elevation of blood glucose levels, and emotional stress of 6 months' duration. She had undergone cholecystectomy 12 years earlier, following which insulin therapy was initiated for the management of hyperglycaemia. Over the preceding 6 months, she had been experiencing considerable emotional distress related to familial issues, which adversely affected her overall well-being.

During this period, she also noticed weight gain and a progressive rise in blood glucose levels, which led to an increase in her insulin dosage from 20 U–0–15 U to 30 U–30 U–15 U. She had previously been taking allopathic medications and had also received counselling for her emotional concerns; however, there was no satisfactory improvement in her symptoms or glycaemic control. With continued emotional stress, she gradually developed increased fatigue and weakness, along with reduced food intake and disturbed sleep.

As these complaints persisted and her overall condition gradually worsened, she sought Ayurvedic management and consulted the Kayachikitsa OPD of Vaidyaratnam Ayurveda College Hospital on 12 August 2024.

Personal history

She was on a mixed diet. Her appetite was reduced, and constipation was present. Micturition was within normal limits, while her sleep was reduced and disturbed on most days for the past 6 months. She does not have any addictions or history of allergy.

Medical, family and psychosocial history

She had been taking allopathic medications for diabetes mellitus for the past 20 years and for hypertension,

hypothyroidism, and dyslipidaemia for the past 7 years. A family history of diabetes was present, with her father, mother, brothers, and sisters all having a history of the condition. The patient reported experiencing emotional stress in relation to family related issues from the past 6 months.

Relevant past interventions with outcome

She had been taking allopathic medicines for diabetes mellitus, hypertension, hypothyroidism, and dyslipidaemia, along with insulin for blood glucose control. Even with regular medication and counselling for emotional stress, her blood sugar remained high, and she continued to experience fatigue, emotional stress, and disturbed sleep.

General examination

The patient was conscious and cooperative and was well oriented to time, place, and person. She appeared neat and tidy and had a moderate build. Her height was 160 cm and weight was 63.5 kg, giving a BMI of 24.8 kg/m². Her blood pressure was 140/90 mmHg.

Ayurvedic diagnostic assessment (Table 2)

Nidana

Aharaja nidanas: Intake of curd, oily foods, sweets and fried items; Viharaja nidanas: Diva swapnam, rathri jagaranam; Manasika nidanas- excessive thinking

Poorvaroopo

Mukha talu kanda shosham, Pipasa, Alasyam, sayyasana swapnasugharati.

Roopa

Prabhoothavila mootratha

Samprapthi

Nidana seva–Kapha; Pitha Vitiating-Vitiating rasa, rakta, mamsa; Medo dhatus–stana samsraya in vasti – Associated increase of kleda, sweda, mootra–Vata vitiation due to Ahara and Vihara – Causes avarana janya Madhumeha

Diagnostic assessments

The patient was diagnosed with diabetes mellitus based on the laboratory investigations, which showed a fasting blood sugar (FBS) level of 213 mg/dl and an HbA1c level of 10.8%. Both values were above the diagnostic criteria for diabetes mellitus recommended by the American Diabetes Association (ADA). Her postprandial blood sugar (PPBS) of 329 mg/dl which was also exceeded the normal limits.

Investigations

Blood investigations

FBS- 213 mg/dl, PPBS- 329 mg/dl, HbA1c – 10.8 %, ESR – 90 mm/hr.

Assessment criteria

Assessments were done on 0th and 10th day by using Quality of Life Instrument for Indian Diabetes Patients (QOLID) and FBS was monitored periodically during the treatment period to evaluate the changes in glycaemic status.

Table 1: Quality of life grading based on QOLID score.

QOLID score range	Quality of life category
125-169	Good
79-124	Moderate
34-78	Poor

Table 2: Ayurvedic diagnostic assessment: Dasavidha pareeksha.

Prakrithi	Kapha pitha
Doshas vitiated	Kapha, Vata, Pitha
Dhatu	Rasa, Raktha, Mamsa, Medas, Majja, Sukla
Mala	Mutra, Sweda
Upadhathu	Vasa, Lasika
Sara	Madhyama
Samhananam	Madhyama
Satva	Madhyama
Satmyam	Madhura, amla, lavana rasa satmya
Srotas affected	Medas, Mamsam, Mutram, Annava, Uda, kavaha
Pramanam	Madhyama
Aharasakthi	Abhyavaharana sakthi-Madhyamam Jarana sakthi- Madhyamam
Vyayama sakthi	Madhyama
Vaya	Madhyama
Kalam	Kshanadi-Varsha Vyadhyavastha - Puranam
Desam	Bhumi desam- sadharanam Deha desam- sarva deham
Rogamarga	Madhyamam

Therapeutic interventions

The treatment included both internal medications (Table 3) and external therapies (Table 4), with a focus on the management of Prameha and associated stress, along with improvement in the patient's quality of life. Internal

medications were started on the day of admission and included Nisakathakadi Kashaya, Chitrakatriphaladi Toya, Pramehoushadi tablet, and Chandraprabha tablet. External therapies were initiated from the following day and

consisted of Takradhara and Sarvanga Abhyanga with Murivenna and Mahanarayana Taila. These external therapies were continued for 10 days.

Table 3: Internal medicine.

Medicines	Dose	Time
Nisakathakadi kasayam	15 ml kashaya with 45 ml lukewarm water	BD, BF
Chitrakathriphaladi Kashaya choorna	10 gm churna, boiled in 1l of water, as drinking water	Frequently
Pramehoushadhi tab	1-0-1	AF
Chandraprabha tab	1-0-1	With kashayam

Table 4: External procedures.

Date	Procedure	Medicines	Remarks
13/08/24 - 22/08/24	Takradhara	Musta and Amalaki	As Sirodhara
13/08/24 - 22/08/24	Abhyangam	Murivenna + Mahanarayana taila	Sarvangam

Timeline with outcomes

Following 10 days of treatment with internal medications and external therapies, improvement was observed in both

glycaemic status and quality of life. Fasting blood sugar decreased from 213 mg/dl on Day 0 to 136 mg/dl after treatment (Table 5). The QOLID score increased from 65 at baseline to 83.46 after treatment (Table 6), indicating an improvement in the patient's overall quality of life.

Table 5: Assessment of FBS value.

Date	FBS value (mg/dl)
12/08/24	213
13/08/24	205
15/08/24	230
17/08/24	226
19/08/24	214
20/08/24	165
21/08/24	148
22/08/24	136

Table 6: Assessment of QOLID score.

QOLID score	
Before treatment (12/08/2024)	After treatment (22/08/2024)
65	83.46

Table 7: Comparison of insulin dosage-before and after treatment.

Date	Insulin dose		
	Before breakfast	Before lunch	Before dinner
Before Treatment (12/08/2024)	30 U	30 U	15 U
After Treatment (22/08/2024)	15 U	0 U	15 U

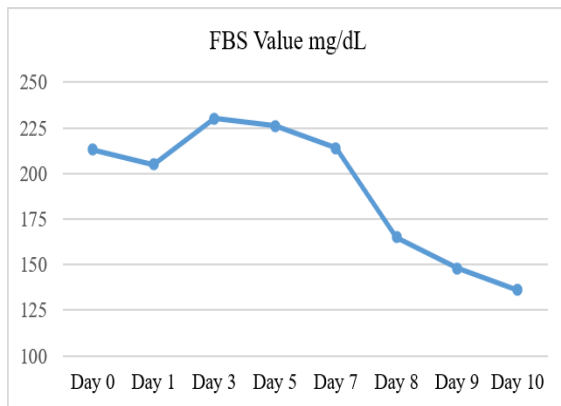


Figure 1: Improvement in FBS value.

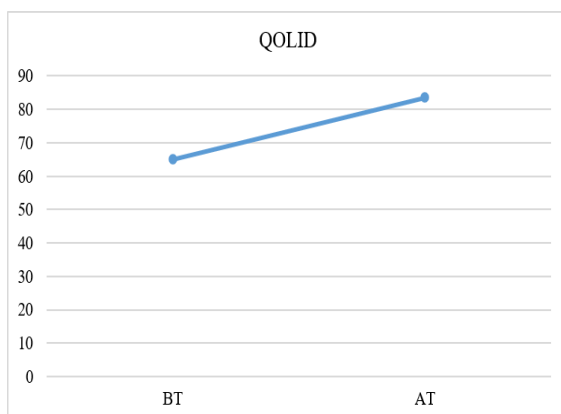


Figure 2: Improvement in QOLID.

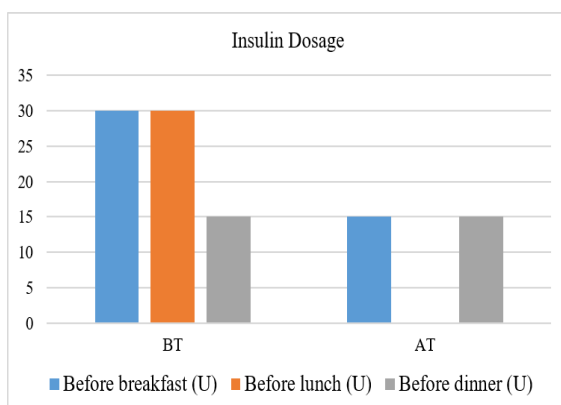


Figure 3: Comparison of insulin dosage-before and after treatment

DISCUSSION

Takradhara is traditionally indicated in Prameha and may be particularly useful when psychological stress contributes to poor glycaemic control. It possesses Sheeta and Stambhana properties, which may help pacify the Chala guna of Vata and the Ushna and Sara gunas of Pitta. Its cooling and stabilizing effects may further reduce the Vilayana of Kapha, thereby contributing to the restoration of Tridosha balance.

The continuous and rhythmic pouring of medicated Takra over the head may also produce a calming effect and promote relaxation. This has been proposed to influence the stress response, with a possible regulatory effect on the hypothalamic-pituitary-adrenal axis and cortisol secretion.¹⁴ Thus, Takradhara may have a supportive role in Prameha by reducing stress and promoting relaxation, which may in turn contribute to better glycaemic control and overall quality of life.

Abhyanga is described as a Vata-pacifying therapy and may be beneficial in conditions associated with psychological stress, as Vata is considered to have an important role in the regulation of mental activities. The Snigdha and Vatahara properties of Taila, together with the therapeutic action of Abhyanga, may help pacify aggravated Vata and promote physical and mental relaxation. Abhyanga administered along with Shirodhara has been associated with improvement in anxiety-related symptoms and observable changes in serum cortisol, suggesting a possible supportive role in stress reduction and improvement of quality of life.¹⁵

Nisakathakadi Kashaya is a classical formulation indicated in the management of Prameha. The formulation predominantly possesses Tikta-Kashaya rasa and Laghu-Ruksha guna, with Pramehahara, Tridosahara and particularly Kapha-hara properties. These properties may help counteract the involvement of Kapha, Meda and excessive Kleda in the pathogenesis of Prameha. Ruksha guna facilitates Kleda Shoshana, while its Deepana and Pachana actions help improve Jatharagni and Dhatwagni, thereby reducing Ama and supporting metabolic function. Its action on Dhatwagni and Srotodushti may further contribute to metabolic regulation.¹⁶

The formulation contains Haridra, Kataka, Amalaki, Techiver, Lodhra, Bhadraka, Ekanayakam and Ramacham, several of which are individually described as Pramehahara or Mehanashana. Experimental studies on individual ingredients have reported antidiabetic, antioxidant and immunomodulatory activities. Some ingredients have also shown effects on insulin secretion and action, pancreatic β -cell function and peripheral glucose utilization, which may support the traditional use of this formulation in Prameha.^{14,17-21}

Chitraka Triphaladi Kashaya is a classical formulation containing Chitraka (*Plumbago zeylanica*), Triphala, Darvi (*Berberis aristata*) and Kalinga Beeja (*Holarrhena antidysenterica*). Triphala comprises the dried fruits of Amalaki (*Embllica officinalis*), Vibhitaki (*Terminalia bellirica*) and Haritaki (*Terminalia chebula*).²² Experimental evidence also supports the antidiabetic potential of this formulation.

An in-vitro study demonstrated α -amylase inhibitory activity of Chitraka Triphaladi Kashaya, suggesting a possible role in slowing carbohydrate digestion and moderating postprandial glucose release. GC-MS analysis

and molecular docking further identified bioactive compounds with potential interactions with diabetes-related targets, including the insulin receptor, PPAR- γ and DPP-IV. These findings provide preliminary pharmacological support for its traditional use in Prameha.²³

Chandraprabha Vati is a classical Ayurvedic polyherbo-mineral formulation widely used in the management of Prameha. It contains 37 ingredients, many of which have individually demonstrated glucose- and lipid-lowering activities.²⁴ Constituents such as Vacha, Musta, Guduchi, Haridra, Daruharidra, Pippali, Haritaki, Bibhitaki, Amalaki, Vidanga, Shunthi, Maricha, Tvak and Shilajatu have shown antidiabetic activity in experimental studies. Their collective action may contribute to glucose regulation through effects on insulin action, peripheral glucose utilization and glucose homeostasis.

Experimental evidence also provides support for the traditional use of Chandraprabha Vati in Prameha. The formulation has been reported to improve glucose tolerance and reduce plasma glucose levels in hyperglycaemic animals, without a significant reduction in basal glucose levels in healthy animals. It also reduced elevated cholesterol and triglyceride levels. This may be relevant in diabetes, where disturbances in lipid metabolism frequently coexist with impaired glycaemic control. Constituents such as Guggulu, Musta and Shilajatu may contribute to these lipid-modulating effects. Thus, the observed antihyperglycaemic and lipid-modulating actions provide a pharmacological basis for its use in Prameha.²⁵⁻³⁴

Pramehoushadhi is a polyherbal formulation indicated for diabetes mellitus. Ingredients such as Ekanayakam, Amalaki, Haridra, Methika and Karavellaka have demonstrated antidiabetic activity through different mechanisms, including modulation of postprandial glucose response, insulin sensitivity and secretion, and glucose and lipid metabolism. Clinical studies on *Salacia oblonga*, *Emblica officinalis*, *Trigonella foenum-graecum* and *Momordica charantia* have reported beneficial effects on glycaemic parameters. The combined action of these ingredients may therefore support glucose regulation in Prameha.³⁵⁻³⁸

CONCLUSION

The present case describes the management of stress-associated worsening of glycaemic control in a 61-year-old female patient with type 2 diabetes mellitus using a combination of internal medications and external therapies. Takradhara and Abhyanga were administered externally, while Nisakathakadi Kashaya, Chandraprabha Tablet, Chitrakatriphaladi Toya and Pramehoushadi Tablet were given internally. Following 10 days of treatment, considerable improvement was observed in fasting blood sugar (Table 5 and Figure 1) and QOLID score (Table 6 and Figure 2), along with improvement in sleep and overall

quality of life. The insulin requirement was also reduced from 30 U–30 U–15 U to 15 U–0–15 U (Table 7 and Figure 3).

The treatment approach focused on addressing psychological stress along with maintaining glycaemic control. The findings of this case suggest a possible role for Ayurvedic interventions in improving glycaemic status and quality of life in Prameha associated with psychological stress. However, further evaluation through well-designed controlled clinical studies with larger sample sizes and adequate follow-up is required to substantiate these observations and determine whether similar outcomes can be reproduced in a wider population.

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