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INTEGRATIVE CLINICAL APPROACH IN MANAGING POST-COVID DIABETES WITH AYURVEDIC PRINCIPLES OF PRAMEHA: A CASE STUDY

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ABSTRACT

Diabetes is on the rise and India is one of the top 10 in the prevalence table according to WHO. In post covid it is steadily increasing everywhere and has become a rising risk for healthcare globally. Diabetes is a metabolic disorder characterized by hyperglycaemia resulting from defects in insulin secretion, insulin action, or both. Recent studies show that diabetes is caused by impairment of the immune system, which has already been explored as one of the reasons causing Prameha in Ayurveda. Prameha maybe considered as a metabolic syndrome that includes clinical conditions and the primary goal in managing diabetes should not be merely to achieve normoglycemia but also to minimize the complications. In this context, Ayurvedic treatment can be considered to effectively manage diabetes. **Methodology:** A 63year male was suffering from frequent urination associated with increased appetite, burning sensation of palms and foot and lethargy. He was diagnosed with Diabetes mellitus with Hba1c of 12.5. The treatment protocol comprised of herbomineral internal medications and Panchakarma procedures. **Results**: At the end of the treatment, HbA1c was reduced to 6.5 from 12.5, and significant reduction in other parameters

as well as symptoms were noted. **Discussion:** *Prameham* occurs due to *Kapha Vata Medo Dushti*, and most of the medicines given have *Vatakaphahara* and *Madhura-Katu Vipaka*. **Conclusion**: The global burden of DM is reaching potentially high and morbidity and mortality rate becomes higher even though in this high-standards medical era, hence an attempt is made to reduce the burden through Ayurveda Samana chikitsa.

Keywords: Prameham, Diabetes Mellitus,Post covid Diabetes, New onset Diabetes, Panchakarma

INTRODUCTION

The COVID-19 pandemic, caused by the novel corona virus SARS-CoV-2, has profoundly impacted global health, reshaping healthcare priorities and presenting new challenges even beyond the acute phase of infection. While the initial focus was primarily on managing the respiratory and systemic manifestations of acute COVID-19, emerging evidence has highlighted a significant long-term complication: an increased incidence of **new-onset Diabetes Mellitus (DM)** in the post-COVID-19 phase.Globally, multiple studies and systematic reviews have reported a higher incidence of new-onset DM among individuals recovering from COVID-19, especially within the first three months after infection, compared to those who were never infected. The risk is notably greater among patients who had moderate to severe forms of the disease. Contributing risk factors identified include advanced age, smoking, pre-existing comorbidities, and the severity of the initial COVID-19 infection.Although the precise pathophysiology remains uncertain, several mechanisms have been proposed to explain this phenomenon. These include unmasking of previously undiagnosed diabetes, stress-induced hyperglycemia, steroid-induced hyperglycemia (common during COVID-19 treatment), and direct or indirect viral damage to pancreatic β-cells. Furthermore, the exaggerated immune response known as the “cytokine storm” may also contribute to beta-cell dysfunction and insulin resistance. In the Indian context, there have been only a limited number of studies addressing this issue. One study reported an increased risk of new-onset DM at 19.7%, and another noted an incidence of 13.8% among individuals with a prior history of COVID-19 compared to uninfected counterparts. However, comprehensive data, especially from rural populations, is lacking. For reference, the incidence of DM among the adult population in South India from a 10-year prospective cohort was reported at 24.5 per 1000 person-years, underscoring the baseline burden of disease. Understanding the long-term metabolic consequences of COVID-19 is crucial. The observed bi-directional relationship between COVID-19 and Diabetes Mellitus demands robust surveillance, early screening, and targeted interventions to prevent complications and improve outcomes in the post-COVID population[1].

The Current Rate of Diabetes Mellitus: The worldwide burden of diabetes mellitus has increased dramatically as of 2024. Since 1990, the number of adults living with diabetes worldwide has increased by more than fourfold, reaching over 800 million, according to the World Health Organization (WHO). About 11. 1% of the adult population between the ages of 20 and 79 worldwide suffers from diabetes, with over 40% being unaware of their illness, according to the International Diabetes Federation (IDF).The

worldwide diabetes epidemic is centered in India. Recent estimates show that diabetes affects about 101 million Indians. However, a study published in The Lancet found that India accounts for about 212 million of the world's diabetic population, which is cause for serious national health concerns. Furthermore, a national study examining HbA1c test findings discovered that about 49. 3% of the 1. 96 million individuals polled had abnormal glucose levels, suggesting a significant prevalence of prediabetes and undiagnosed diabetes cases. These data highlight the critical need for all-encompassing public health initiatives, such early screening, lifestyle changes, and greater awareness, to address the growing diabetes mellitus epidemic in India and around the world[10].

The similar ailment is referred to in Ayurveda as *Prameha*, which refers to a family of urinary problems distinguished by high urine production and poor urine quality. *Madhumeha*, one of the twenty types of *Prameha* listed in Ayurvedic literature, is thought to be similar to Diabetes Mellitus, especially in cases of persistent hyperglycemia. The imbalance of the three *Doshas Vata, Pitta,* and *Kapha* along with derangement of *Medas* (fat), *Mamsa* (muscle tissue), and *Kleda* (fluid balance) are all thought to contribute to *Prameha*. Ayurvedic treatment places a strong emphasis on lifestyle changes, dietary adjustments, herbal preparations, and detox treatments like *Panchakarma*.

Different facets of Madhumeha are explained in Ayurvedic classics. It would be known that ancient sages placed a strong emphasis on its prognostic value and potential risks. The majority of the information there is consistent with what contemporary scientists have discovered. The decline of *Bala-mamsa*, the manifestation of no symptoms, few symptoms, all the symptoms, sudden onset early manifestation, late manifestation, non-curability, and the development of carbuncles and other complications should be taken into consideration, as should the involvement of the tissue systems, body fluids, and three basic humors of the body. Whereas *Charaka* and *Vagbhata* thought of *Madhumeha* as a variation of *Vatika Prameha*, *Sushruta* stated that all the *Pramehas* would eventually develop into *Madhumeha* and become incurable if not treated in time. Patients who cannot be treated at all nowadays, which reflects the insulin-dependence stage, may be considered under this category. In defining *Madhumeha*, *Vagbhata* stated that the urine and the body both become sweet. *Charaka* also categorized the *Madhumeha* patients as *Atisthula* and *Krusha* and noted that the new born baby might be *Madhumehi* due to defects in sperm or ovum. *Prameha* is a member of the *Santarpanajanya Tridoshaja Vyadhi*. Excessive *Pramehotpadaka Aahara-Vihara* leads to vitiation of *Prakrutha Vata, Pitta,* and *Kapha,* which then combines with *Medodhatu*, according to Sushruta. At *Basti*, these contaminated *Dosha* and *Dhatu* drop down the *Mutravaha Srotas* and settle there, leading to *Prameha*. According to Ayurveda, *Madhumeha* (*Vataja Prameha*) is incurable (*Asadhya*), but its symptoms may be controlled with medication. In addition, Vagbhata describes the state of *Arishtalinagam*, which indicates a drop in particular activities. He also highlights the contribution of overeating sugary and fatty foods, a sedentary lifestyle and employment, and a lack of physical activity or labor in the etiology of *Madhumeha*, adding that the urinary bladder is where *Ojas* is transported as a result of blocked *Vayu* channels[9,2]. These opinions are a sign of the decline or demise of the insulin-secreting cells in the pancreas and or a decrease in insulin production. There are descriptions of hundreds of herbal and herbomineral medicines as well as *Panchakarma* procedures for the treatment of *Madhumeha*. The treatment schedule includes *Pathya Aahara*, *Vihara*, and *Shamana Chikitsa*. In Ayurvedic classics, the symptoms of diabetes peripheral neuropathy are described as *Purvarupa* of *Prameha* and *Daha* is also described among the *Upadrava* (complications) of *Prameha*. These characteristics are commonly observed in diabetic sensory poly neuropathy. Diabetic neuropathy involves the participation of the *Pitta* and *Vata Dosha*. Since Ayurveda's benefits are all greater for individuals who were not reacting to conventional medications, it is the solution. Ayurvedic treatment has been shown

to be cost-effective, productive, and free of adverse effects. For this reason, many of the natural resources that the Ayurvedic system of medicine's wisdom has pointed out have not yet been verified in the area of diabetes mellitus. Research has restored confidence to scientific debates, and it has the potential to benefit hundreds of diabetes sufferers[2].

Using both Ayurvedic and modern views to comprehend diabetes mellitus offers a holistic strategy to prevention and treatment, combining biomedical science with ancient holistic healing methods.

Case Report:

A 63-year-old male who was a retired government staff visited the OPD of Kayachikitsa department of Sri Jayendra Saraswathi Ayurveda College and Hospital with complaints of frequent urination associated with increased appetite, burning sensation of palms and foot and letharginess. He was diagnosed with Diabetes mellitus with Hba1c of 12.5 along with fasting blood sugar of 210 mg/dL and postprandial of 300 mg/dL. Gradually he developed increased urination during night time and diagnosed has type 2 Diabetes mellitus in contemporary medicine. Patient was not interested in taking other medicines hence he came to our college for betterment.

History of Present illness: Patient had apparently well before May 2022. He developed frequent micturition, increased hunger and tiredness associated with burning sensation of palms and foot post covid.

History of Past illness: Patient had covid attack at March 2022 and got admitted in hospital for treatment.
Family History: There is nothing specific family history.
Surgical History: Nothing Specific.
Medical History: Nothing Specific.
Psycho - Social History: Nothing Specific.

Personal history:

- ✓ DIET**:** Vegetarian
- ✓ APPETITE**:** Increased appetite
- ✓ SLEEP**:** Disturbed
- ✓ BOWELS**:** Regular
- ✓ MICTURATION**:** Increased during night time
- ✓ HABIT**:** Coffee 5 times a day
- ✓ ADDICTION**:** Nil

General examination:

- BP: 110/80mmHg
- Pulse rate: 75bpm
- Respiration Rate: 18rpm
- Weight: 75kg
- Temperature: 35.9 degree Celsius

Systemic examinations:

- CVS**:** S1S2 heard
- RS**:** NVBS positive

- CNS**:** Conscious & Oriented
- ABDOMEN**:** Soft & Nontender.

Ashtavidha pareeksha:

- Nadi: Kaphavatam
- Mootram: Prabhoota (4 times at night time and 6 times at day time)
- Malam: Regular
- Jihwa: Liptam
- Sabda: Madhyama
- Sparsha: Anushnasheeta
- Drik: Pravara
- Aakruti: Madhyama

Dasavidha pareeksha:

- Prakruti: Vata
- Vikruti: Kaphavatam
- Sara: Sarva
- Samhana: Pravara
- Pramana: Avara
- Satmya: Sarvarasa
- Satva: Madhyama
- Aharasakthi: Avara
- Vyayamasakthi: Avara
- Vayas: Vriddha

Subjective criteria:

- ✓ FBS
- ✓ PPBS
- ✓ HbA1C

TREATMENT GIVEN:

Table 1: Representing Internal medicines

SI.NO	MEDICINE NAME	REFERENCE	INGREDIENTS
1	NISHAKATAKHADHI KASHYAYAM	Sahasrayogam	*Nisha, Kataka, Paranthi, Lodhra, Amalaki, Bhadrika, Meharimoola and Usheera.*
2	NISHAAMALAKI CHOORNAM	Cakradatta	*Haridra, Amalaki*
3	VASANTAKUSUMAKARA RAS	Rasendra Sara Sangraha	*Swarna Bhasma, Rajata Bhasma, Vanga Bhasma, Naga Bhasma, Loha Bhasma,*

			Abhraka Bhasma, Pravala Bhasma, Mukta Bhasma, Godugdha,Swarasa of *Ikshu, Vasa, Laksha, Udeechya. Shatapatra, Malati, Mrigamada.*
4	CHANDRAPRABHA VATI	Bhaisajya Ratnavali	
5	Tab. SHILAJITH		

Therapeutic Intervention:

Table 2: Panchakarma details day wise:

From Date	To Date	Procedure	Treatment Medicine
10-06-2022	15-06-2022	Snehapanam	Guggulu Thiktaka Ghritam
16-06-2022	18-06-2022	Abhyangam + Bhaspa Swedam	Ksheerabala Tailam for Abhyangam & Dasamoola Kwatha for Bhaspa Swedam
18-06-2022		Vamanam	Madhanaphala Yoga
19-06-2025	23-06-2025	Samsarjana Krama	For 5 days
24-06-2025	01-07-2025	Udvartana	Kolakulathadhi Choornam + Triphala Choornam

Therapeutic Intervention:

The treatment commenced with ***Snehapana*** using Guggulutiktaka Ghrita in an *Arohana* Matra (increasing dose pattern) over five days, starting from 30 ml and gradually increased up to 150 ml. This was followed by ***Abhyanga*** (oil massage) and ***Bhaspa Sveda*** (steam sudation) for three consecutive days as preparatory procedures. Subsequently, *Vamana-karma* (emesis) was administered using Madanaphala Yoga. Post-emesis care included ***Samsarjana Krama*** for five days to restore digestive strength and metabolism. Finally, ***Udvartana*** (dry powder massage) was performed to address ***Medo Dushti*** (vitiation of adipose tissue) and ***Kleda*** (excessive moisture or fluid imbalance).

Follow Up and Outcome:

Table 3: Showing results from before and after treatment.

Symptoms	Before treatment (26-05-2023)	After treatment (26-02-2023)	Result
FBS	210 mg/ dL	95 mg/ dL	Reduced
PPBS	300 mg/dL	140 mg/dL	Reduced
HbA1C	12.5	6.5	Reduced

RESULTS:

The patient's lab values over the period of 9 months treatment are shown in Table 4.

Table 4: Represents 3months average of lab results.

SYMPTOMS	1ST MONTH (May)	3RD MONTH (August)	6TH MONTH (November)	9TH MONTH (February)
FBS	210 mg/ dL	155 mg/dL	115 mg/dL	95 mg/dL
PPBS	300 mg/dL	245 mg/dL	185 mg/dL	140 mg/dL
HbA1C	12.5	11.0	8.5	6.5

DISCUSSION:

In the management of post-COVID Diabetes Mellitus, where metabolic imbalance and systemic inflammation play pivotal roles, Ayurvedic interventions offer a holistic approach through their *Rasayana* (rejuvenative), *Dosha-balancing*, and anti-hyperglycemia properties. Several classical formulations show promising roles both as preventive and therapeutic agents in the post-viral diabetic state.

Nishakatakadi Kashayam is a decoction predominantly composed of herbs with *Kashaya* (astringent) and *Tikta* (bitter) *Rasa*, with *Laghu* (light) and *Ruksha* (dry) *Gunas*. These properties aid in reducing *Kapha* and *Meda Dhatu* (fat tissue) and correcting impaired metabolism. The formulation exhibits *Vatakapha-hara* action due to its *Sheeta* and *Ushna Veerya*, and *Madhura* and *Katu Vipaka*, which synergistically help in regulating glycemic levels and support pancreatic function[3]. Its known hypoglycemic activity adds to its therapeutic utility in managing elevated blood glucose levels following COVID-19.

Vasantakusumakara Rasa, a classical herbo-mineral preparation, is widely revered for its *Rasayana* property, particularly for endocrine rejuvenation. It plays a crucial role in restoring pancreatic beta-cell function and enhancing endogenous insulin secretion[5,8]. This makes it especially valuable in cases of new-onset diabetes where beta-cell stress and dysfunction are prominent post-COVID sequelae. Its systemic strengthening properties further aid in counteracting fatigue and debility common in post-COVID conditions.

Chandraprabha Vati offers a comprehensive approach to metabolic disorders through its *Rasayana*, Balya (strength-promoting), and *Tridosha-Shamaka* (balancing all three doshas) properties. Its complex composition involves *Katu*, *Tikta*, *Kashaya*, and *Madhura Rasa*, *Ushna Veerya*, and *Laghu*, *Tikshna*, *Ruksha Gunas* that exhibit *Chedana* and *Lekhana* actions on *Kapha* and *Meda dhatus*[6]. These attributes make it effective in addressing insulin resistance and fat metabolism, which are key in the pathology of *Madhumeha* (diabetes) post-COVID.

Shilajith in tablet form, well-documented in classical and modern literature, plays a dual role as a *Rasayana* and an *anti-glycemic* agent. It acts on a cellular level to prevent degeneration of pancreatic islet cells by scavenging cytotoxic free radicals. By protecting beta-cell integrity and improving glucose utilization, it becomes a cornerstone in long-term glycemic control, especially relevant in post-viral syndromes with oxidative stress and inflammation.

Nisha Amalaki Choornam, a combination of *Haridra (Curcuma longa)* and *Amalaki (Emblica officinalis)*, exhibits potent *anti-diabetic* activity. It pacifies *Vata-Kapha* doshas, which are commonly involved in the etiology of Madhumeha[7,9]. The formulation supports pancreatic function, enhances insulin sensitivity, and acts as a daily supplement for metabolic correction and immune support in post-COVID recovery.

Collectively, these formulations address the multi-factorial etiology of post-COVID diabetes, including *Agni Dushti* (metabolic derangement), *Ojakshaya* (immune depletion), oxidative stress, and impaired endocrine function. Integrating these Ayurvedic interventions with modern management protocols can offer a safe, effective, and holistic approach in mitigating the long-term metabolic aftermath of COVID-19.

Shodhana in the management of *Sthula Pramehi* includes a series of purificatory measures such as **selective internal oleation**, **mild fomentation**, and procedures like **therapeutic emesis (*Vamana*)**, **purgation (*Virechana*)**, and **medicated decoction enemas (*Basti*)**[11]. Prior to initiating internal or external oleation, it is essential to administer ***Rookshana* (desiccating or drying therapy)**, particularly in obese patients. Among the *Rookshana* procedures, ***Udwarthana* (dry powder massage)** is considered highly effective in managing *Prameha*. To induce ***Langhana*** (depletion or reduction of excessive *Kapha* and *Meda*), practices like ***Upavasa*** (controlled fasting) and consumption of ***Rookshahara*** (fat-free or drying diet) are recommended. Therapeutic strategies described for *Medoroga* (morbid obesity) can be effectively adapted for the treatment of **Type 2 Diabetes Mellitus**, especially where obesity is a contributing factor.The dietary regimen should include **heavy (*Guru*) but low-nutrient** foods, preferably rich in indigestible fibers such as cellulose, which aid in promoting satiety while limiting caloric intake. ***Abhyanga*** plays an important role by pacifying ***Vata Dosha*** and enhancing **sensory perception** of the skin. While light dietary measures support ***Langhana***, ***Rookshana*** can further be reinforced through external interventions such as ***Seka*** (medicated pouring), **exposure to air and sunlight (*Vatatapa Seva*)**, and **regular physical exercise (*Vyayama*)**. Collectively, these therapies function synergistically to promote *Langhana*, thereby contributing to the effective management of *Prameha* and its associated complications[12,13]. Probable mode of action is represented in Table 5.

Table 5: Shows Mode of Action of procedures:

SI.NO	PROCEDURE	MODE OF ACTION

1.	*Udvartanam*	*The Kapha-Meda Vilayana* property *is present in the Udvartana* process. *The medications used in Udvartana* increase *this Meda Vilayana* property *as a result of their Katu Tikta Rasa, Ushna Veerya Laghu Ruksha, and Tikshna Guna characteristics.Triphala, and Kolakulathadhi Choornam all have Kashaya Rasa* acts *that are Katu, Tikta, and Kashaya Rasa* acts, which are used to treat *Kapha, Krimighna, and Kandughna. Ushna Veerya* helps in *Srotoshuddhi* and lowers *Kledatva. Bhrajakapitta / Twachagni* (local temperature increases) in the skin digests the medications that are applied and rubbed onto it. Its *Ushna-Veerya* enter *Rasa Dhatu* remove the obstruction in the *Rasa* and *Swedavaha Srotas, its Gunas* and *Vipaka, Veerya* spreads all over the body. The process of *Udvartana* enhances the *Twakgata Agni/Bhrajakapitta,* which in turn improves the functions of the *Uttarottara Dhatvagni* functions. By increasing the *Medo Dhatvagni*, the *Dhatupaka* process is improved, resulting in a reduction in the amount of accumulated *Vikrita Medo Dhatu*[14,16].
2.	*Snehapanam*	The circulating free fatty acids in the blood may be reduced by *Snehapanam*, along with insulin resistance at the cellular level. Due to its *Sheeta* (cooling) and *Kleda Shoshana* (fluid-absorbing) properties, *Guggulutiktaka Ghrita* has the potential to mitigate the *Ushna* (heat-inducing) and *Tikshna Guna* (intense properties) that are linked to *Pitta Dosha*. Furthermore, when treating *Pitta Kopa* (aggravation of Pitta), it helps to reestablish the equilibrium of *Dravarupa Pitta Vriddhi* (excessive Pitta) and maintain *Kledasamaavastha* (proper fluid balance). Perform reduction in peripheral resistance, Beta cell dysfunction, prevent further deposition of *Meda* (fat tissue) and bring normalcy in receptor function. By ensuring the normal functioning of *Saadhaka Pitta* and the preservation of *Ojas*, this balanced strategy can help prevent hyperglycemia from getting worse[14].The drug *Guggulutiktaka Ghrita* effects may be brought about by restoring pancreatic cells, lowering glucose absorption in the intestines, boosting cellular glucose absorption, preventing the progression of advanced glycated end-products, raising liver glycogen and glucokinase activity, and having antioxidant properties[15].
3.	Vamanam	Vamana Karma is an important Shodhana therapy in the management of ***Prameha***, particularly in ***Kapha-Meda***

		predominant conditions. It helps eliminate the morbid *Kapha Dosha*, which plays a key role in the pathogenesis of diabetes.In this treatment, *Madhanaphala* ***Yoga*** is used as the emetic formulation due to its safety and efficacy. Proper ***Purvakarma*** such as ***Snehapana*** and ***Swedana*** are performed beforehand. *Vamana* helps in reducing ***Kleda***, ***Medo Dushti***, and enhances ***Agni***, thereby improving metabolic functions. The procedure is followed by ***Samsarjana Krama*** to restore digestive strength.
4.	Bhaspa Swedam	*Bhaspa Sweda* (steam sudation) is effectively utilized in the management of Diabetes Mellitus (*Prameha*) as part of the *Purvakarma* in Panchakarma. It helps in reducing ***Kleda*** and ***Medo Dushti***, which are significant pathological factors in diabetes. By inducing perspiration, it promotes the elimination of excessive moisture and liquefies morbid doshas, particularly *Kapha* and *Meda*. *Bhaspa Sweda* also enhances ***Agni*** (digestive/metabolic fire), improves circulation, and facilitates detoxification by clearing *Srotarodha* (channel obstruction). It is typically administered following ***Abhyanga*** with *Kapha-Medo hara* oils and is either used as preparation for Vamana or as a standalone therapy in milder cases of diabetes.

CONCLUSION:

The emergence of new-onset Diabetes Mellitus as a post-COVID-19 complication underscores the long-term metabolic impact of the pandemic. The increased incidence, particularly among individuals with moderate to severe COVID-19, highlights the need for sustained monitoring and early intervention strategies in the post-infection phase. While the exact mechanisms remain multi factorial including beta-cell dysfunction, steroid-induced hyperglycemia, and heightened systemic inflammation the risk is significant and calls for integrative approaches to management. Ayurveda offers time-tested formulations that address not only the symptomatic control of blood glucose but also the root causes, such as *dosha* imbalance, oxidative stress, and immune depletion. Incorporating Ayurvedic interventions alongside conventional care can offer a comprehensive, individualized, and sustainable solution to post-COVID diabetes. Further research and clinical validation will help strengthen the role of Ayurveda in managing such emerging metabolic challenges in both urban and rural populations.

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