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A COMPARATIVE CLINICAL STUDY TO EVALUATE THE EFFECT OF PANCHTIKTA PANCHPRASRITIKA BASTI AND NISHAKATAKADI YOGA IN MANAGEMENT OF MADHUMEHA WITH SPECIAL REFERENCE TO DIABETES MELLITUS TYPE 2

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ABSTRACT

Background: *Madhumeha* is described in *Ayurveda* under the broad category of *Prameha* and is characterized by excessive urination and metabolic disturbances. It closely resembles Type 2 Diabetes Mellitus in modern medicine. Due to sedentary lifestyle, improper dietary habits, and stress, the incidence of diabetes is increasing rapidly worldwide. *Ayurveda* offers several therapeutic modalities such as *Shodhana* and *Shamana* therapies for the management of this condition **Aim:** To compare the effect of *Panchatikta Panchprasritika Basti* along with oral *Nishakatakadi Yoga* and oral *Nishakatakadi Yoga* in the management of *Madhumeha* with special reference to diabetes mellitus type-2. **Materials and methods:** The present clinical study entitled 'A Comparative Clinical study to evaluate the effect of *Panchatikta Panchprasritika Basti* and *Nishakatakadi Yoga* in Management of *Madhumeha* with special reference to Diabetes Mellitus Type 2' was carried out on 40 patients divided into 2 groups. One group was given *Panchatikta Panchprasritika Basti* for 15 days and oral *Nishakatakadi Yoga* for 15 days and another group of patients will be given oral *Nishakatakadi Yoga* for 1 month. The "Wilcoxon matched pairs signed rank test" was used while for parametric data, "Paired t test" was used and results calculated in each group. For calculating the inter group comparison, "Mann Whitney and the Unpaired t-test" was used for

non-parametric and parametric data respectively. **Results:** Significant improvement was observed in symptoms like *Prabhuta Mutrata, Trishna, Kshudha Adhikya, and Nidra Adhikya* in both groups. Objective parameters such as Fasting Blood Sugar and Post-Prandial Blood Sugar also showed statistically significant improvement. **Conclusion:** Both treatment modalities showed beneficial effects in the management of *Madhumeha.* However, *Panchatikta Panchprasritika Basti* combined with *Nishakatakadi Yoga* showed comparatively better results.

KEYWORDS: *Madhumeha*, Diabetes Mellitus, *Panchakarma*, *Panchatikta Panchprasritika Basti*, *Nishakatakadi Yoga.*

INRODUCTION

Prameha is a disease condition in which there is excessive urination.[1] It is further classified into 20 types.[2] It is a lifestyle disorder and comes under *Kricchsadhya Vyadhi*. The chances of its occurrence are increasing due to sedentary lifestyle and consumption of *Gramya, Audaka and Aaupa* meat along with *Navannpan*.[3]

A similar condition in modern science is Diabetes mellitus. According to Indian Council of Medical Research (ICMR), India is the diabetic capital of the world. Research by ICMR shows India has 101 million diabetic and 136 million pre diabetic individuals who require preventive measure.[4]

For management of diabetes, modern medicine has oral medications which has to be taken for lifetime. The doses of oral medication often increase with time, and eventually many patients require insulin due to declining drug response. Therefore, there is a clear need to identify safe and effective approaches for the management of Diabetes Mellitus. *Ayurveda* provides valuable options in this regard. Ayurveda, being an evidence-based system aimed at both preserving health and treating disease, offers long-term benefits for patients of *Madhumeha*. Its treatment strategies are based on three classical principles: *Devavyapashraya, Yuktivyapashraya* (including *Sanshodhana, Sanshamana* and *Nidan Parivarjana*), and *Satvavajaya*.[5] In the context of *Prameha*, therapies such as *Basti* and specific yogic practices are especially emphasized. *Prameha* or *Madhumeha*, as described in Ayurvedic texts, can be correlated with modern-day Diabetes Mellitus on the basis of causative factors and clinical features. Diabetes Mellitus is a chronic metabolic disorder prevalent worldwide. It is characterized by hyperglycaemia due to an absolute or relative

deficiency of insulin. It results from a complex interplay of genetic predisposition, sedentary lifestyle, and environmental influences. Diabetes Mellitus is classified into two broad categories: Type 1 Diabetes Mellitus and Type 2 Diabetes Mellitus. Type 1 Diabetes Mellitus, formerly known as insulin-dependent diabetes.

Among *Panchakarma* procedures, *Basti* is considered the most important therapy for *Vata* disorders and metabolic disorders.

Panchatikta Panchaprasritika Basti is mentioned in *Ayurvedic* classics for disorders involving vitiation of *Dosha* and *Dhatu*.

Nishakatakadi Yoga is a classical *Ayurvedic* formulation known for its antidiabetic and metabolic regulatory properties.

Therefore, the present study was undertaken to compare the efficacy of these therapies.

AIM

To compare the effect of *Panchatikta Panchprasritika Basti* along With oral *Nishakatakadi Yoga* and oral *Nishakatakadi Yoga* in the management of *Madhumeha* with special reference to diabetes mellitus type-2.

OBJECTIVES

1. To study the effect of *Panchatika Panchprasritika Basti* and *Nishakatakadi Yoga* in management of *Madhumeha* (Diabetes Mellitus Type 2)
2. To study the effect of oral administration of *Nishakatakadi Yoga* in management of *Madhumeha* (Diabetes mellitus type 2).

MATERIALS AND METHODS

Source of collection of data Screening, selection and registration of 40 patients randomly from OPD and IPD Panchakarma Department, GACH Patna, based on inclusion and exclusion criteria. This Clinical trial was started after registration in CTRI, having registration no. CTRI/2025/05/086548 and was approved by Institutional Ethics Committee, wide Memo. No. 7/Dated 03-01-25

Criteria for selection of patients

Diagnostic Criteria

1. Diagnosis based on clinical features of *Madhumeha* (Type 2 diabetes mellitus).
2. Patients with FBS > 126 mg/dl, PPBS > 200 mg/ dl

Inclusion Criteria

1. Patient of either sex between the age group of 18-70 years.
2. Patient with FBS–in range of 126-200mg/dl
3. PPBS-in range of 200-300mg/dl
4. Patient with HbA1c between 7.0- 9.5%
5. Patient giving consent for trial and willing to participate in study.

Exclusion Criteria

1. Patient not giving the consent.
2. Patients having Type-1 Diabetes Mellitus.
3. Patient with HbA1c >9.5%
4. FBS>200 mg/dl and PPBS>300 mg/dl.
5. Patients of Type-2 diabetes mellitus who are on insulin therapy.
6. Type-2 diabetes mellitus with complications and *Madhumeha* with *Ashadhya upadrava.*
7. Patients having any serious illness like cardiovascular diseases, renal disease, hepatic disease, malignancy, any other endocrinopathies etc.
8. Patient having known hypersensitivity to known drug.
9. Patient having severe infection. 10. Pregnant and lactating mother.

Assessment Criteria: Subjective and objective criteria was assessed based on gradings as per severity of cardinal signs and symptoms of the disease.

A. Subjective Criteria

Sr No.	Parameter	Description	Grade
1.	***Prabhoota Mootrata (*Polyuria*)***	3-6 times per day, rarely at night	0
		6-9 times per day, 0-2 times per night	1
		9-12 times per day, 2-4 times per night	2
		More than 12 times per day, more than 4 times per Night	3
2.	***Trishna Adhikya (Increased thirst)***	Feeling of thirst (7-9 times/24 hours) and relieved by drinking water	0

		Feeling of moderate thirst (>9-11 times/24 hours) and relieved by drinking water	1
		Feeling of excess thirst (11-13 times/24 hours) and not relieved by drinking water	2
		Feeling of thirst (>13 times/24 hours) not relieved by drinking water	3
3.	***Swedadhikya (Perspiration)***	Sweating after heavy work and fast movement or in hot weather	0
		Profuse sweating after moderate work and movement	1
		Sweating after little work and movement (stepping ladder etc)	2
		Profuse sweating after little work and movement	3
		Sweating even at rest or in cold weather	4
4.	***Kshudadhikya (Appetite)***	Regular usual	0
		Slightly increased (1-2 meals)	1
		Moderately increased (3-4 meals)	2
		Markedly increased (5-6 meals)	3
5.	***Nidradhikya (Increased sleep)***	Normal sleep, 6-8 hours/24 hrs	0
		Sleep up to 8 hours/ 24 hours with *Angagaurava*	1
		Sleep up to 8 hours/ 24 hours with *Angagaurava* and *Jrimbha*	2
		Sleep up to 10 hours/ 24 hours with *Tandra*	3
		Sleep up to >10 hours/ 24 hours with *Tandra* and *Klama*	4
6	***Angagandha (Bad odour)***	No odour	0
		Bad odour but not offensive	1
		Strong odour but can be lessened by use of deodorants or perfumes	2
		Very strong odour even after using fragrances (use of deodorants or perfumes)	3
7	***Kara-Pada -tala Daha (*Burning Sensation of both palms and feet*)***	No *Daha*	0
		Kara-Pada-tala Daha, occasionally	1
		Kara-Pada-tala Daha, continuous but not severe	2
		Kara-Pada-tala Daha, continuous and severe	3
7	***Kara-Pada -tala Supti (*Numbness of both palms and feet*)***	No *supti*	0
		Kara-Pada-tala Supti, occasionally	1
		Kara-Pada-tala Supti, continuous but not severe	2
		Kara-Pada-tala Supti, continuous and severe	3

b. Objective Criteria

1. Fasting Blood Sugar (FBS)

2. Post Prandial Blood sugar (PPBS)

Study design: Open label, Randomized, two arm, Comparative Clinical Trial.

Administration of Drug

Group 'A'– Patient will be given the treatment with *Panchtikta panchaprasritika Basti* for 15 days and oral *Nishakatakadi Yoga* for 15 days

Group 'B'– Patient will be given oral *Nishakatakadi Yoga* for 1 month

Follow up – On 8th, 16th, 24th, 32nd day

RESULTS AND DISCUSSION

This comparative randomized parallel group study is of 40 patients out of which 36 patients completed the treatment and 2 patients were dropout from Group A and 2 patients were dropout from Group B. In Group A, observation was done on 20 patients and assessment of results were drawn on 18 patients who were subjected to *Panchtikta Panchaprasritika Basti* for 15 days and oral *Nishakatakadi Yoga* for 15 days. In Group B, observation was done on 20 patients and assessment of results were drawn on 18 patients who were given oral *Nishakatakadi Yoga* for 15 days.

Table 1: Distribution of patients by age.

RANGE OF AGE	GROUP A	GROUP B	TOTAL	%
21-30	0	1	1	2.5
31-40	3	6	9	22.5
41-50	4	5	9	22.5
51-60	8	5	13	32.5
61-70	5	3	8	20
TOTAL	20	20	40	100

The above table shows that in the present study

The age group 51-60 accounted max i.e. 32.5% of all patients, followed by age group 31-40 and 41-50 which were 22.5% each. 20% of patients were between ages of 61-70 while 2.5% were 21-30.

Table 2: SEX WISE DISTRIBUTION.

Gender	Group A	Group B	Total	%
Male	8	9	17	42.5
Female	12	11	23	57.5
Total	20	20	40	100

In this study majority of patient ware female i.e. 57.5%, while remaining 42.5% were male. Female predominance can be seen in this observation.

Table 3: Occupation wise distribution.

OCCUPATION	GROUP A	GROUP B	TOTAL	%
Housewife	10	10	20	50
Teacher	1	2	3	7.5
Farmer	2	0	2	5
Service	4	1	5	12.5
Business	2	1	3	7.5
Vendor	1	1	2	5
Pharmacist	0	1	1	2.5
Advocate	0	1	1	2.5
Unemployed	0	3	3	7.5

In the view of occupation of patient, it was observed that, out of 40 registered patients, 50% were housewife, 12.5 % were service, 7.5% each were teachers, businessman and unemployed, 5% each were farmer and vendor and 2.5% each were pharmacist and advocate.

Table 4: *Mala pravriti* (bowel habit) wise distribution.

Mala Pravriti	Group A	Group B	Total	%
Regular	15	7	22	55
Irregular	5	13	18	45
Total	20	20	40	100

Above table revels that, more than half 55% patient had regular bowel movement while the other 45% had irregular bowel movement.

Table 5: Chronicity wise distribution.

Chronicity	Group A	Group B	Total	%
≤ 1 year	10	7	17	42.5
1-5 years	9	8	17	42.5
6-10 years	0	3	3	7.5
≥10 years	1	2	3	7.5
Total	20	20	40	100

The majority of patient, 42.5% each had diabetes mellitus for less than and year and from 1-5 years and 7.5 % each 6-10 year and more than 10 years.

Other observational findings

Table 6: *Nidan* wise distribution.

Nidana	Group A	Group B	Total	%
Asyasukham	13	14	27	67.5
Swapnasukham	13	10	23	57.5
Atidadhi sevan	9	8	17	42.5
Gramya Anupa Mamsa Sevana	16	17	33	82.5
Ati Madhur Guru Aahar	14	10	24	60
Alasya	12	14	26	65
Avyayam	15	13	28	70

As *Nidana* was evaluated majority of patient 82.5% took *Gramya, Anupa Mamsa Sevana*, followed by *Avyayam* 70%, 67.5% had *Asyasukham*, 65% had *Alasya*, 60% of them took *Ati Madhur Guru Aahar*, 57.5% had history of *Swapanasukham* and 42.5% had *Atidadhi Sevana.*

Table 7: Effect of *Panchatikta Panchaprasritika Basti and Nishakatakadi Yoga* on Subjective Parameters.

Variable	N (No. of patients)	Mean		% of Relief	W value	'p'value
		BT	AT			
Prabhoot Mootrata	18	1.778	0.7778	56.24	-153.0	<0.0001
Trishnaadhikya	13	1.111	0.1667	85	-83.00	0.0020
Swdadhikya	12	1.167	0.1667	85.68	-66.00	0.0010
Kshudhadhikya	11	1.444	0.7778	46.17	-45.00	0.0039
Ati Nidra	13	1.278	0.5000	60.86	-66.00	0.0010
Angagandha	11	0.5000	0.1111	77.78	-28.00	0.0156
Karpadatala Daha	12	1.333	0.5000	62.5	-66.00	0.0010
Karpadatala Suptata	10	0.8333	0.2222	73.33	-45.00	0.0039

In Group A, post *Panchtikta Panchaprasritika Basti* for 15 days and oral *Nishakatakadi Yoga* for 15 days there was 56.24% improvement found in *Prabhoot Mootrata,* 85% improvement seen in *Trishnaadhikya,* 85.6% improvement found in *Swdadhikya, 46.17* % was seen in *Kshudhadhikya*, 60.86% improvement was seen in *Ati Nidra*, 77.78% improvement found in *Angagandha,* 62.5 % relief seen in *Karpadatala Daha and* 73.33% improvement found in *Karpadatala Suptata* after the treatment.

Table 8: Effect of oral *Nishakatakadi Yoga* on Subjective Parameters.

Variable	N (No. of patients)	Mean		% Relief	W value	'p'value
		BT	AT			
Prabhoot Mootrata	18	1.500	0.7222	51.86	-91.00	0.0002
Trishnaadhikya	13	1.333	0.4444	66.68	-91.00	0.0002
Swdadhikya	13	1.389	0.5556	59.99	-91.00	0.0002
Kshudhadhikya	12	1.833	1.333	27.277	-45.00	0.0039

Ati Nidra	14	1.222	0.5556	54.55	-66.00	0.0010
Angagandha	9	0.6111	0.2222	63.63	-28.00	0.0156
Karpadatala Daha	6	0.6111	0.2778	54.49	-21.00	0.0312
Karpadatala Suptata	8	0.6667	0.2222	66.65	-28.00	0.0156

In Group B, oral *Nishakatakadi Yoga* for 30 days there was 51.86% improvement found in *Prabhoot Mootrata*, 66.68% improvement seen in *Trishnaadhikya*, 59.99% improvement found in *Swdadhikya*, 27.27 % was seen in *Kshudhadhikya*, 54.55% improvement was seen in *Ati Nidra*, 63.63% improvement found in *Angagandha*, 54.49 % relief seen in *Karpadatala Daha and* 66.65% improvement found in *Karpadatala Suptata* after the treatment.

Table 9: Inter-group comparison of Subjective variable.

Chief complaints (Variable)	**Group**	**N (No. of patients)**	**Mean**	**'U' value**	**'p'value**	**S**
Prabhoot Mootrata	A	18	1.000	128	0.1490	ns
	B	18	0.7778			
Trishnaadhikya	A	13	1.056	142.5	0.6416	ns
	B	13	0.8889			
Swedadhikya	A	12	1.000	156.5	0.9497	ns
	B	13	0.8333			
Kshudhadhikya	A	11	0.6667	145	0.6361	ns
	B	12	0.4444			
Ati Nidra	A	13	0.6667	154	0.8928	ns
	B	14	0.6667			
Angagandha	A	11	0.3889	156.5	>0.9999	ns
	B	9	0.3889			
Karpadatala Daha	A	12	0.8333	108	0.0722	ns
	B	6	0.3333			
Karpadatala Suptata	A	10	0.6111	133.5	0.3893	ns
	B	8	0.3889			

On intergroup comparison – "the 'p' value for all subjective variables is >0.05, which is statically non- significant. This shows there is no statistical difference in efficacy of both treatments on each symptom".

Effect of Therapy on Objective Parameter in Group A

The initial mean score for FBS was 167.1 ± 8.120 which decreased to 130 ± 38.56 after treatment with a relief of 22%, the initial mean score for PP was 238.2 ± 7.682 which decreased to 220.2 ± 22.78 after treatment with a relief of 7.58%, the initial mean score for Hb was 13.32 ± 1.824 which increased to 13.36 ± 1.231 after treatment with a relief of 0.29%, the initial mean score for ESR was 28.50 ± 18.86 which decreased to 23.89 ± 13.35 after treatment with a relief of 16.17%, the initial mean score for AST was 26.32 ± 12.21

which decreased to 26.08 ± 7.321 after treatment with a relief of 0.90%, the initial mean score for ALT was 30.42 ± 27.69 which decreased to 29.36 ± 16.38 after treatment with a relief of 3.47%, the initial mean score for S. Creatinine was 0.8028 ± 0.1591 which decreased to 0.7717 ± 0.1454 after treatment with a relief of 3.87%, and the initial mean score for Urea was 21.66 ± 6.087 which increased to 22.12 ± 4.946 after treatment with a relief of 2.13%.

Effect of Therapy on Objective Parameter in Group B

The initial mean score for FBS was 159.3 ± 24.83 which decreased to144.6 ±19.64 after treatment with a relief of 9.2%, the initial mean score for PP was 230.8 ± 25.39 which decreased to 219.1 ± 22.57 after treatment with a relief of 5.10%, the initial mean score for Hb was 12.99 ± 1.148 which increased to 13.03 ± 1.330 after treatment with a relief of 0.25%, the initial mean score for ESR was 28.00 ± 16.52 which decreased to 26.50 ± 13.87 after treatment with a relief of 5.35%, the initial mean score for AST was 23.18 ± 7.909 which decreased to 22.45 ± 6.543 after treatment with a relief of 3.14%, the initial mean score for ALT was 21.51 ± 10.38 which decreased to 20.71 ± 7.985 after treatment with a relief of 3.75%, the initial mean score for S. Creatinine was 0.6978 ± 0.1357 which decreased to 0.6867 ± 0.1249 after treatment with a relief of 1.59%, and the initial mean score for Urea was 33.06 ± 8.249 which increased to 31.61 ± 7.694 after treatment with a relief of 4.36%.

Table 10: Intergroup Comparison of Objective Variables.

Variable	Gp	Mean	SD±	SEM±	't'	'p'
FBS	A	49.06	21.08	4.968	5.473	<0.0001
	B	18.11	11.45	2.699		
PP	A	23.72	10.89	2.567	0.7965	0.4313
	B	20.33	14.40	3.394		
Hb	A	0.9389	0.8521	0.2008	2.453	0.0194
	B	0.4222	0.2691	0.06343		
ESR	A	6.167	8.431	1.987	1.245	0.2216
	B	3.611	2.173	0.5122		
AST	A	4.639	8.243	1.943	0.2748	0.7851
	B	4.073	2.929	0.6904		
ALT	A	9.452	18.51	4.362	1.237	0.2245
	B	3.989	2.897	0.6828		
S.Creatinine	A	0.1311	0.09548	0.02250	2.846	0.0074
	B	0.06000	0.04602	0.01085		
Urea	A	5.011	4.328	1.020	2.383	0.0229
	B	2.244	2.351	0.5540		

The table reveals that on inter group comparison, we observed Highly Significant result in FBS (p≤0.0001). The p- value for Hb, Creatinine is p≤0.01 (Highly Significant). So, there

was highly significant difference in efficacy of both treatments. The p- value for Hb, S.urea is p≤0.05 (Significant). So, there was significant difference in efficacy of both treatments. On intergroup comparison – "the 'p' value for PP, ESR, AST, ALT is >0.05, which is statically non- significant. This shows there is no statistical difference in efficacy of both treatments on these objective variables.

DISCUSSION

Madhumeha is a variant of *Vataja Prameha*, a disorder characterized by the excretion of a substantial volume of turbid urine.[6] According to *Acharya Charaka*, "*Bahudrava Shleshma Doshavisesha*," indicating that *Bahudrava Kapha* is particularly predominant among the *Tridosha* in the context of *Prameha*. The *Dushya* involved in this condition include "*Meda, Mamsa, Kleda, Shukra, Shonita, Vasa, Majja, Lasika, Rasa, and Oja*," which are also associated with *Kapha Vargiya*.[7] *Acharya Sushruta* has noted that "*Madhumeha* is the consequence of untreated Prameha.[8]" The term "*Madhumehi Madhusamsam*" describes *Madhumeha* as a disorder where the individual excretes urine resembling honey in appearance.[9]

In modern medical science, *Madhumeha* is referred to as diabetes mellitus (DM), characterized by elevated plasma blood glucose levels.[10] According to the International Diabetes Federation (IDF), "there are three main types of diabetes: Type 1 Diabetes, Type 2 Diabetes, and Gestational Diabetes.[11]" Type 2 Diabetes Mellitus (T2DM) is the most prevalent form, resulting from the body's cells' inability to respond fully to insulin, accounting for approximately 90% of all diabetes cases.[12]

In 2019, "463 million adults (20-79 years) had diabetes; by 2045, this figure is projected to rise to 700 million.[13]" In most countries, the incidence of type 2 diabetes is increasing. Adults with diabetes constituted 79 percent of the population in low- and middle-income countries. This trend indicates that despite the development of new medications and therapeutic interventions for DM, the prevalence of the disease is escalating at an alarming rate.

Discussion of trial Drug

Ayurveda encompasses two primary therapeutic approaches, namely *Sodhana* and *Shamana Chikitsa*. In consideration of the etiopathogenesis of *Madhumeha*, the principal therapeutic strategy involves the elimination of *Kleda*. *Acharya Charaka* has previously advocated for

Vasti Karma, as it rectifies the vitiation of *Vata,* thereby stabilizing its normal functions, and counteracts the vitiated *Kapha, Kleda,* and *Meda* through the use of specific pharmacological agents. Consequently, a specially formulated medicated enema was prescribed in this case. The treatment protocol primarily focuses on *Kledaharana,* which facilitates the disruption of the pathogenesis of diabetes in these patients. The probable mechanisms of action of all interventions are delineated as follows:

Panchatikta Panchaprishritika Niruha Basti—*Panchatikta Panchaprashritika Basti* is specifically recommended for *Prameha* in *Charaka Samhita,* particularly in *Kaphaja Prameha,* which is characterized as an *Abhishyanda Pradhana* disease. *Prameha* is an ideal indication for the application of this type of *Kledahara* and *Shodhana Vasti*. It is also a condition with significant *Dushya Sangraha* involved in its *Samprapti* (pathogenesis). All constituents of this *Basti* possess *Tikta Rasatmak, Katu Vipaki*, and *Ushna Viryatmak* properties, thus exhibiting *Deepan Pachan, Anulomak,* and *Krumighna* characteristics.

- *Patol:* It is a *Dushta Kaphanashaka Dravya* and is beneficial in *Agnimandya* and *Yakritvikar*. It dilates the openings of minute channels associated with *Pakwashaya* and expels *Dosha* in the form of loose motion, hence it should be employed in *Prameha Vikar* for the excretion of *Kleda.*
- *Nimba*: It digests and absorbs *Drava, Kapha,* and *Kleda* present in various *Dhatus* through its *Tikta* and *Ruksha Gunas* and regulates *Bahumutrata.*
- *Bhunimba: Bhunimba* is advantageous in *Yakrit Pleeha Vikar, Vibandha*, and *Agnimandya.*
- *Rasna*: It is *Vatakaphagna* in nature, thus acting in *Prameha.*
- *Saptaparna:* It is beneficial in liver debility as a liver stimulant due to its *Tikta Rasa*. Given its *Tikta Rasa*, it liquefies *Kapha* and facilitates its elimination.
- *Sarshpa Kalka*: It is utilized in the Vasti due to its *Kapha Vataghna, Deepan*, and *Krimighna* properties.
- *Saindhava* (Rock Salt) - *Saindhava* is characterized by properties such as *Vishyandi, Sukshma, Tikshna, Ushna*, and *Vatghna*, which facilitate the evacuation of the bladder and rectum. Additionally, *Saindhava* neutralizes the *Picchila, Bahula*, and *Kashaya* properties of *Madhu,* contributing to the formation of a homogeneous mixture. The application of rock salt is also beneficial in correcting electrolyte imbalances.
- *Madhu* (Honey) - Honey possesses a prebiotic index of 6.89, attributed to its oligosaccharide content, which promotes the growth of a healthy microbial flora. Fructose and glucose, the primary carbohydrates in honey, share the same molecular formula but

differ in structural formula. Fructose aids in reducing hyperglycemia and obesity in affected individuals.

- *Go Ghrita* - Due to its lipid-soluble nature, *Vasti Dravyas* mixed with *ghee* are efficiently absorbed into the rectum, which is richly supplied with blood and lymph.

Nishakatakaadi Kwath - In *Nishakatakaadi Kwath*, the majority of the constituents exhibit *Kashaya, Tikata Rasa, Laghu,* and *Ruksha guna. Prameha*, caused by *Kapha Vata Medo Dushti*, is alleviated by the *Vata-Kaphahara* properties *of Nishakatakaadi Kwath*, attributed to its *Sheeta, Ushna Veerya*, and *Madhura, Katu Vipaka*. The *Rasa* and *Vipaka* of these drugs assist in mitigating *Prameha.*

1. The *Ayurvedic* Mechanism (*Samprapti Vighatana) Kapha-Medohara*: The formulation exerts a "scraping" (*Lekhana*) effect, clearing obstructions caused by excess fat and phlegm in the body's channels (*Srotas).*

***Pramehahara*:** The ingredients possess *Kashaya* (astringent) and *Tikta* (bitter) tastes, which directly counteract the sweetness (*Madhurya*) of elevated blood sugar levels.

***Chakshushya* Properties:** Ingredients such as *Kataka* (Clearing Nut) help prevent long-term complications of diabetes, particularly diabetic retinopathy.

2. Modern Pharmacological Mechanisms

A. Pancreatic Beta-Cell Protection: Antioxidants in *Curcuma longa* (*Nisha*) *and Emblica officinalis (Amalaki)* reduce oxidative stress in the pancreas, thereby protecting remaining beta-cells from apoptosis (cell death) and potentially stimulating the regeneration of insulin-secreting cells.

B. Insulin Sensitization: *Salacia reticulata*/*Ekanayakam* act as insulin sensitizers, enhancing the body's cellular response to existing insulin and reducing "insulin resistance."

C. Alpha-Glucosidase Inhibition: *Nishakatakadi Yoga* contains compounds that inhibit enzymes in the small intestine, slowing the breakdown of carbohydrates into glucose and preventing "post-meal" blood sugar spikes.

D. Hypolipidemic Effect: Diabetes is often accompanied by high cholesterol levels. This formulation aids in lowering LDL (bad cholesterol) and triglycerides, thereby reducing the risk of diabetic cardiovascular complications.

CONCLUSION

The present comparative clinical study was conducted to assess the efficacy of *Panchatikta Panchaprasritika Basti* in conjunction with oral *Nishakatakadi Yoga*, as well as oral *Nishakatakadi Yoga* alone, in the management of *Madhumeha*, with a particular focus on Type 2 Diabetes Mellitus. The study involved 40 registered patients, of whom 36 completed the trial. Based on the observations, statistical analysis, and clinical outcomes, the following **conclusions can be drawn**

1. Both treatment modalities demonstrated statistically significant improvement in subjective parameters such as *Prabhuta Mutrata* (polyuria), *Trishna Adhikya* (excessive thirst), *Kshudadhikya*, *Kara-Pada Daha*, *Kara-Pada Supti*, and other associated symptoms of *Madhumeha.*
2. Significant improvement was also observed in objective parameters, including Fasting Blood Sugar (FBS), Postprandial Blood Sugar (PPBS), and other relevant biochemical markers in both groups.
3. The group treated with *Panchatikta Panchaprasritika Basti* in addition to *Nishakatakadi Yoga* exhibited comparatively better improvement than the group treated with *Nishakatakadi Yoga* alone, suggesting that the addition of *Basti* therapy enhances therapeutic efficacy.
4. The results support the Ayurvedic concept that *Madhumeha*, being a *Vata-pradhana Tridoshaja Vyadhi* with *Meda* predominance, responds effectively to *Basti* therapy, which is considered the optimal treatment for *Vata* disorders. The *Tikta* and *Kleda shoshaka* properties of the drugs used aid in correcting *Medo-dushti*, reducing *Kleda*, and restoring *Agni* balance. 5. No significant adverse effects were observed during the study period, indicating that both therapies are safe and well-tolerated when administered under proper supervision.
5. The combined approach of *Shodhana (Basti*) and *Shamana* (oral medication) appears more effective, beneficial in achieving better glycaemic control and symptomatic relief compared to Shamana therapy alone.

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