

Comparative Clinical Evaluation of *Rasnadi Basti* and *Madhutailika Basti* in the Management of *Prameha* (Type 2 Diabetes Mellitus): A Randomized Controlled Study

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Abstract

Background: Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from impaired insulin secretion and insulin resistance. In Ayurveda, the clinical presentation of T2DM closely resembles *Prameha*, a disorder predominantly involving *Kapha Dosha*, *Meda Dhatu*, *Kleda*, and *Mutravaha Srotas*. Among Panchakarma procedures, Basti Karma is considered an important therapeutic intervention for correcting systemic metabolic imbalance. Classical Ayurvedic literature describes *Rasnadi Basti* and *Madhutailika Basti* as effective formulations for disorders associated with *Kapha* predominance and metabolic dysfunction; however, comparative clinical evidence regarding their efficacy in *Prameha* is limited.

Objective: To evaluate and compare the clinical efficacy of *Rasnadi Basti* and *Madhutailika Basti* as adjunctive therapies in the management of *Prameha* with special reference to Type 2 Diabetes Mellitus.

Materials and Methods: A randomized comparative clinical study was conducted on 44 patients diagnosed with Type 2 Diabetes Mellitus fulfilling the predefined eligibility criteria. Participants were randomly allocated into two equal groups (n = 22 each). Group A received *Rasnadi Basti* and Group B received *Madhutailika Basti* according to the Kala Basti schedule for ten days following Deepana-Pachana, Udvartana, and Parisheka procedures.

Clinical efficacy was assessed using subjective parameters including Prabhuta Mutrata, Mutramadhurya, Pipasa Adhikya, Kshudha Adhikya, Swedadhikya, Angagandha, Nidradhikya, Hasta-Pada-Tala Daha, and Kara-Pada Suptata. Objective assessment included fasting blood sugar (FBS), postprandial blood sugar (PP2BS), HbA1c, urine sugar, and body mass index (BMI). Quality of life was evaluated using a structured questionnaire. Appropriate parametric and non-parametric statistical tests were applied with statistical significance set at $p < 0.05$.

Results: Both treatment groups demonstrated statistically significant improvement in subjective symptoms, objective biochemical parameters, and quality-of-life scores following intervention ($p < 0.05$). No adverse events were reported during the study period.

Conclusion: Both *Rasnadi Basti* and *Madhutailika Basti* are effective adjunctive Panchakarma interventions for the management of *Prameha* (Type 2 Diabetes Mellitus). The two treatment modalities significantly improved glycemic control, clinical symptoms, metabolic parameters, and patient-reported quality of life with an excellent safety profile.

Keywords: *Prameha*, Type 2 Diabetes Mellitus, *Rasnadi Basti*, *Madhutailika Basti*, *Panchakarma*, *Basti Karma*, Glycemic Control.

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Introduction

Diabetes mellitus has become one of the most significant non-communicable diseases worldwide, posing a major challenge to healthcare systems because of its rapidly increasing prevalence, chronic progression, and debilitating complications. Type 2 Diabetes Mellitus (T2DM), accounting for nearly 90–95% of all diabetes cases, is characterized by insulin resistance, progressive pancreatic β -cell dysfunction, and chronic hyperglycemia. Persistent elevation of blood glucose contributes to microvascular complications such as diabetic nephropathy, neuropathy, and retinopathy, as well as macrovascular disorders including coronary artery disease and stroke. In addition to increased morbidity and mortality, diabetes substantially reduces quality of life and imposes a considerable economic burden on patients and healthcare systems.(1)

The International Diabetes Federation estimates that the global prevalence of diabetes continues to rise at an alarming rate, with India representing one of the

countries bearing the highest disease burden. Rapid urbanization, sedentary lifestyles, obesity, unhealthy dietary habits, psychosocial stress, and population ageing have contributed significantly to the increasing incidence of T2DM. The growing number of younger individuals developing diabetes further emphasizes the necessity for effective, economical, and holistic treatment strategies capable of addressing both glycemic control and associated metabolic dysfunction.(2)

Ayurveda describes a disease entity known as *Prameha*, whose clinical manifestations closely resemble Type 2 Diabetes Mellitus. *Prameha* is classified among the *Aṣṭa Mahāgāda* due to its chronic nature, complexity of management, and potential for severe complications.(3) Classical Ayurvedic texts describe twenty subtypes of *Prameha* based on the predominance of *Doshas*, with *Kaphaja Prameha* representing the initial stage of disease progression. If inadequately managed, the

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condition advances through Pittaja and eventually Vataja Prameha, which is considered difficult to treat. The pathogenesis of Prameha involves excessive consumption of Guru, Snigdha, Madhura, and Picchila dietary substances, lack of physical activity, excessive sleep, psychological stress, and other lifestyle factors that aggravate Kapha Dosha. These etiological factors result in Agnimandya, excessive Kleda production, vitiation of Meda Dhatu, and obstruction of various Srotas, particularly Mutravaha Srotas. Progressive derangement of Dosha-Dushya homeostasis ultimately manifests as excessive urination, turbidity of urine, increased thirst, increased appetite, fatigue, burning sensation of extremities, numbness, and other characteristic clinical features.(4) Interestingly, these pathological events exhibit remarkable similarity with the modern concepts of obesity-induced insulin resistance, dyslipidemia, chronic inflammation, and impaired glucose metabolism.

Current management of T2DM primarily includes lifestyle modification, oral hypoglycemic agents, and insulin therapy. Although these interventions effectively lower blood glucose levels, long-term treatment often fails to prevent progressive β -cell dysfunction and associated metabolic complications completely. Lifelong medication dependency, adverse drug reactions, escalating healthcare costs, and incomplete improvement in quality of life encourage exploration of complementary therapeutic approaches capable of addressing the underlying metabolic imbalance.(2)

Ayurveda emphasizes correction of the root pathophysiology rather than symptomatic management alone. Among the various therapeutic modalities described for Prameha, Basti Karma occupies a unique position because of its systemic action on Dosha equilibrium, Agni, Dhatu metabolism, and Srotas. Classical texts describe Basti not only as the principal therapy for Vata disorders but also as an effective intervention in chronic metabolic disorders owing to its ability to eliminate vitiated Doshas, normalize metabolic functions, and restore physiological homeostasis.(5)

Rasnadi Basti is a classical Niruha Basti formulation containing multiple herbal ingredients possessing

Intervention

Table 1: Treatment Protocol

	Group A	Group B
Day 1 – Day 3	<i>Deepan Pachana</i> Tab <i>shankha vati</i> 2 BD before food Tab <i>amapachak vati</i> 2 BD after food <i>Rukshana</i> <i>Udvardhana</i> with <i>yava churna</i> followed by <i>sarvang parisheka</i> with <i>dashamool kashay</i> <i>Triphala churna</i> 5 gms with <i>takra</i>	
Day 4 – Day 13	<i>Rasnadi Basti</i> ⁽⁸⁾	<i>Madhutailika Basti</i> ⁽⁹⁾

Deepana, *Pachana*, *Lekhana*, *Kapha-Medohara*, *Srotoshodhana*, and anti-inflammatory properties.(6) Collectively, these pharmacological actions are expected to improve glucose metabolism, reduce pathological Kleda, enhance insulin sensitivity, and facilitate correction of metabolic abnormalities.

Similarly, *Madhutailika Basti* is a widely practiced classical formulation consisting of *Madhu*, *Murchhita Tila Taila*, *Shatapushpa Kalka*, and *Erandamoola Kwatha*. The formulation possesses *Yogavahi*, *Deepana*, *Vatanulomana*, *Medohara*, and *Rasayana* properties, thereby improving metabolic function while supporting tissue nourishment and systemic balance.(7)

Although both formulations are routinely employed in Panchakarma practice for metabolic disorders, evidence directly comparing their clinical efficacy remains limited. Comparative evaluation of these two Basti formulations is therefore essential to establish evidence-based therapeutic recommendations for patients with Prameha.

Accordingly, the present randomized controlled clinical study was undertaken to compare the efficacy of *Rasnadi Basti* and *Madhutailika Basti* as adjunctive therapies in patients with Prameha (Type 2 Diabetes Mellitus) by assessing changes in subjective symptoms, biochemical parameters, anthropometric indices, and quality-of-life outcomes.

Materials and Methods

Ethical Approval: PU/PIA/IEC/11/2025/473 (Date: 03/02/2025)

CTRI: CTRI/2025/03/0882770

Sources of data: 44 patients diagnosed with diabetes mellitus and fulfilling the inclusion criteria were selected by computer-generated simple randomization method from OPD and IPD of Parul Ayurved Hospital, Limda, Vadodara. These patients were divided into two groups, Group A and Group B, each comprising 22 individuals.

Group A received *Rasnadi basti* while Group B received *Madhutailika basti* following the *kala basti krama* (pattern)

	<i>Madhu</i> - 140 ml <i>Saindhav</i> - 12 gms <i>Sneha</i> - <i>murchita tila taila</i> 100 ml <i>Kalka</i> - 30 gms paste of <i>Madanaphala</i> , <i>Sugandhaval</i> , <i>Yashtimadhu</i> , <i>Pippali</i> , <i>Priyangu</i> , <i>Satahva</i> , <i>Rasanjana</i> , <i>Sveta Vacha</i> , <i>Vidanga</i> , <i>Kalinga</i> , <i>Patha</i> , <i>Musta</i> .	<i>Madhu</i> - 150 ml <i>Saindhav</i> - 12 gms <i>Sneha</i> - 150 ml <i>murchita tila taila</i> <i>Kalka</i> - 30 gms of <i>shatapushpa paste</i> <i>Kashay</i> - 200 ml of <i>erandmool decoction</i> .
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<i>Kashay - 200 ml decoction of Rasna, Eranda, Guduchi, Nimba, Patola, Patha, Katuki, Kirata, Vidanga, Daruharidra, Saptaparna, Usira, Devadaru, Aragvadha, Mushakakarni, Dasamula, Musta, Trayamana, Sighru, Triphala</i>	<i>Avapa - 100 ml gomutra</i>
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Diagnostic criteria

Patients were selected according to the criteria of American Diabetes Association (ADA) – Glycated Hemoglobin (A1C) Test: 6.5% or > 6.5%, Fasting Plasma Glucose Level: ≥ 126 mg/dL (7.0 mmol/L), Post prandial plasma glucose level: ≥ 200 mg/dl (11.1 mmol/L)

Inclusion criteria

Subjects of 18 to 70 years of age group, exhibiting symptoms according to classics - Prabhuta Mutrata (Polyuria), Mutramadhurya (Increased Sugar in Urine),

Assessment criteria

Subjective Parameters

Table 3: Scoring pattern of assessment criteria(10)

Prabhuta Mutrata	3 – 5 times per day, no rarely at night	0
	6 – 8 times per day, 1 – 2 times per night	1
	9 – 11 times per day, 3 – 4 times per night	2
	> 11 times per day, > 4 times per night	3
Mutramadhurya	Absence of	0

<i>Anuvasan basti = 70 ml murchita tila taila</i>

Table 2: Basti Pattern

<i>Kala basti krama</i>										
	D a y 4	D a y 5	D a y 6	D a y 7	D a y 8	D a y 9	D a y 10	D a y 11	D a y 12	D a y 13
<i>Ba</i>	-	N	N	N	N	N	N	-	-	-
<i>sti</i>	A B	A B	A B	A B	A B	A B	A B	A B	A B	A B

Where Ab = Anuvasan basti, and NB = Niruha basti

Pipasadhikya (Increased Thirst), Kshudha-Adhikya (Increased Appetite), Swedadhikya (Perspiration), Angagandha (Bad odour), Nidradhikya (Increased Sleep), Hasta-Pada-Tala Daha (Burning in sole and palms), Kara-Pada Suptata (Tingling sensation and numbness) were selected.

Exclusion criteria

Subjects with complications like diabetic coma, diabetic gangrene, carbuncles, Ischemic Heart Disease, Insulin dependent Diabetes Mellitus (IDDM), and those who were not willing to clinical trial were excluded

a	Glucose in urine	
	Traces of Glucose in urine	1
	+ Glucose in urine	2
	++ Glucose in urine	3
	+++ Glucose in urine	4
	++++ Glucose in urine	5
Pipasadhikya	Feeling of thirst (7 – 9 times/24	0

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	hours) & relieved by drinking water		<i>Swedadhikya</i>	Sweating after heavy work and fast movement or in hot weather	0
	Feeling of moderate thirst (>9 - 11 times/24 hours) & relieved by drinking water	1		Profuse sweating after moderate work and movement	1
	Feeling of excess thirst (>11 - 13 times/24 hours) not relieved by drinking water	2		Sweating after little work and movement (stepping ladder etc.)	2
	Feeling of sever thirst (>13 times) not relieved by drinking water	3		Profuse sweating after little work and movement	3
<i>Kshudha-Adhikya</i>	As usual / routine	0	<i>Angagandha</i>	Sweating even at rest or in cold weather	4
	Slightly increased (1 meal extra with routine diet)	1		No odour	0
	Moderately increased (2 meals extra with routine diet)	2		Bad odour but not offensive	1
	Markedly increased (3 meals extra with routine diet)	3		Strong odour but can be lessened by use of deodorants or perfumes	2

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	Very strong odour even after using fragrances (use of deodorants or perfumes)	3
Nidradhikya	Normal & sound sleep for 6 – 8 hrs. /24 hrs. with feeling of lightness and relaxation in the body & mind	0
	Sleep >8 -9 hrs. /24 hrs. with slight heaviness in the body.	1
	Sleep >9 - 10 hrs. /24 hrs. with heaviness in the body associated with <i>Jrimbha</i>	2
	Sleep >10 hrs. /24 hrs. with heaviness in the body associated with <i>Jrimbha</i> & <i>Tandra</i>	3
Hasta-Pada-	No Daha	0

Tala Daha	Hasta - Pada-Tala Daha found occasionally, mild, bearable	1
	Hasta - Pada-Tala Daha continuous but bearable & not severe	2
	Hasta - Pada-Tala-Daha continuous and severe & unbearable	3
Kara-Pada Suptata	No suptata	0
	Kara-Pada Suptata incontinuos	1
	Kara-Pada Suptata continuous but bearable & not severe	2
	Kara-Pada Suptata continuous and severe & Unbearable	3

Objective Parameters

Fasting blood sugar level (FBS)

Post prandial blood sugar level (PP2BS)

HbA1c

Investigation

- Blood Sugar Level

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Fasting Plasma Glucose Level: ≥ 126 mg/dL (7.0 mmol/L)

Post prandial plasma glucose level: ≥ 200 mg/dl (11.1 mmol/L)

- HbA1c: 6.5% or $> 6.5\%$
- Urine Routine/Micro
- ECG

Observations

Both groups showed broadly similar demographic characteristics. Participants were predominantly male (51.00% in Group A; 59.09% in Group B) and aged 51–60 years (59.09%; 50.00%), with the majority being

Hindu (90.91%; 95.45%), married (100% in both groups), and from rural areas (63.64%; 54.55%). Primary education (50.00%; 36.36%) and middle-class socioeconomic status (40.91%; 36.36%) were predominant. Housewives (31.82%) predominated in Group A, while field workers (40.91%) predominated in Group B. A vegetarian diet (90.91%; 72.73%) and moderate appetite (63.64%; 77.27%) were common in both groups. Regular exercise was reported by 40.91% of Group A and 50.00% of Group B. A history of diabetes mellitus alone (81.82%; 77.27%) was predominant in both groups

Observation on Subjective Criteria

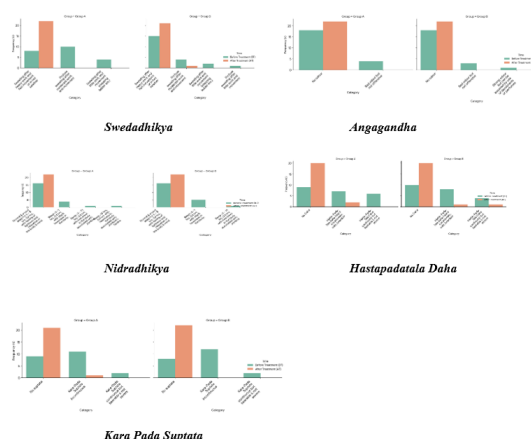


Chart 1: Observation on Subjective Criteria

overall improvement in the assessed subjective parameters.

Observation on Objective criteria

The objective parameters demonstrated an overall improvement following treatment in both groups. BMI decreased from 27.83 to 26.50 in Group A and from 28.14 to 27.77 in Group B. FBS showed a reduction in mean values from 123.08 to 99.87 in Group A and from 126.08 to 106.91 in Group B. Similarly, mean PP2BS decreased from 190.02 to 133.76 in Group A and from 179.32 to 136.96 in Group B. HbA1c also declined from 8.09 to 6.16 in Group A and from 7.64 to 6.91 in Group B. Regarding urine sugar, absence of glucose increased from 50.00% to 95.45% in Group A and from 63.64% to 81.82% in Group B after treatment, indicating an overall improvement in the assessed objective parameters in both groups.

Overall, the subjective parameters showed improvement following treatment in both groups. Prabhuta Mutrata improved, with 90.91% of participants in both groups achieving normal urinary frequency after treatment. Mutramadhurya showed increased absence of urinary glucose to 90.91% in Group A and 86.36% in Group B. Pipasa Adhikya and also showed normalization, with 100% of Group A and 90.91% of Group B achieving the milder thirst category and 100% of participants in both groups reporting routine appetite after treatment. Improvement was also observed in Swedadhikya and Angagandha, with Kshudha Adhikya normalization in 100% of Group A and 95.45% and 100% of Group B, respectively. Nidradhikya normalized in all participants in both groups. Hastapadatala Daha was absent in 90.91% of participants in both groups, while absence of Kara-Pada Suptata was observed in 95.45% of Group A and 100% of Group B after treatment, indicating an

Results

Table 4: Within-Group Analysis of subjective parameters before and after treatment (Wilcoxon Signed-Rank Test)

Outcome Measure	Group	Before Treatment Mean (SD)	After Treatment Mean (SD)	Z value	P value
Prabhuta Mutrata (Polyuria)	A	1.36 (0.58)	0.09 (0.29)	-4.315	$< .001^*$
	B	1.27 (0.46)	0.09 (0.29)	-4.400	$< .001^*$
Mutramadhurya	A	1.18 (1.50)	0.73 (1.16)	-2.961	$.003^*$

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(Glycosuria)	B	0.09 (0.29)	0.27 (0.70)	- 2.4 28	.01 5*
Pipasa Adhikya (Increased Thirst)	A	1.18 (0.59)	1.09 (0.68)	- 4.0 99	< .00 1*
	B	0.00 (0.00)	0.09 (0.29)	- 3.9 47	< .00 1*
Kshudha Adhikya	A	0.55 (0.67)	0.55 (0.80)	- 2.9 72	.00 3*
	B	0.00 (0.00)	0.00 (0.00)	- 2.8 07	.00 5*
Swedadhikya	A	0.82 (0.73)	0.50 (0.86)	- 3.4 48	< .00 1*
	B	0.00 (0.00)	0.05 (0.21)	- 2.4 56	.01 4*
Angagandha	A	0.18 (0.39)	0.00 (0.00)	- 2.0 00	.04 6*

Both Group A and Group B showed statistically significant improvement in the majority of symptoms after treatment. Specifically, all nine symptoms showed significant improvement in Group A (all $p < .05$). In **Table 5: Between-Group Comparison of subjective parameters before and after treatment (Mann-Whitney U Test)**

Symptom	Before Treatment (BT)			After Treatment (AT)			Sig.
	U	Z	p	U	Z	p	
Prabhuta Mutrata (Polyuria)	22 8	- 0.4 14	.6 79	2 4 2	0.0 00	.10 00	ns
Mutramadhurya (Glycosuria)	20 0	- 1.1 11	.2 67	2 2 8	- 0.5 97	.55 1	ns

	B	0.23 (0.53)	0.00 (0.00)	- 1.8 90	.05 9
Nidradhikya	A	0.41 (0.80)	0.32 (0.57)	- 2.2 64	.02 4*
	B	0.00 (0.00)	0.00 (0.00)	- 2.3 33	.02 0*
Hastapada Tala Daha	A	0.86 (0.83)	0.09 (0.29)	- 3.1 53	.00 2*
	B	0.73 (0.77)	0.14 (0.47)	- 3.1 27	.00 2*
Karapada Suptata	A	0.68 (0.65)	0.05 (0.21)	- 3.2 76	.00 1*
	B	0.73 (0.63)	0.00 (0.00)	- 3.5 57	< .00 1*

Group B, eight out of nine symptoms showed significant improvement; for Angagandha, the improvement was statistically significant in Group A ($p = 0.046$), whereas it was not significant in Group B ($p = 0.059$).

Pipasa Adhikya (Increased Thirst)	22 6	- 0.4 28	.6 69	2 2 0	- 1.4 31	.15 2	ns
Kshudha Adhikya (Increased Appetite)	23 3	- 0.2 40	.8 11	2 4 2	0.0 00	.10 00	ns
Swedadhikya (Perspiration)	17 4	- 1.7 60	.0 78	2 3 1	- 1.0 00	.31 7	ns
Angagandha (Body Odour)	24 0	- 0.0 70	.9 44	2 4 2	0.0 00	.10 00	ns

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Nidradhikya (Increased Sleep)	23 8.5	- 0.1 05	.9 16	2 4 2	0.0 00	.10 00	ns
HastaPadatala (Burning in Palms/Soles)	22 1	- 0.5 29	.5 97	2 4 1	- 0.0 47	.96 2	ns

The Mann-Whitney U Test revealed no statistically significant difference between Group A and Group B on any of the nine symptoms, either at baseline or after treatment (all $p > .05$). This finding indicates that both

Table 6: Within-group comparison of objective outcome measures before and after treatment (Paired t-test)

Outcome Measure	Group	Before Treatment (Mean $\pm$ SD)	After Treatment (Mean $\pm$ SD)	Mean Difference $\pm$ SD	t value	P value
BMI	A	27.83 $\pm$ 4.74	26.50 $\pm$ 4.47	1.33 $\pm$ 0.73	8.600	< .001 ***
	B	28.14 $\pm$ 1.86	27.77 $\pm$ 1.97	0.36 $\pm$ 0.49	3.64	0.002 **
Fasting Blood Sugar	A	123.08 $\pm$ 25.92	99.87 $\pm$ 17.99	23.20 $\pm$ 14.66	7.425	< .001 ***

Both groups demonstrated statistically significant improvements in all four objective parameters from baseline to follow-up, including BMI ($p < 0.001$ in Group A; $p = 0.002$ in Group B), FBS ($p < 0.001$ in both

Kara Pada	23	-	.7	2	-	.31	ns
Suptata	2	0.2	93	3	1.0	7	
(Numbness in Hands/Feet)		63		1	00		

BT = before treatment; AT = after treatment; U = Mann-Whitney U statistic; Z = standardised test statistic; ns = not significant. Grouping variable: Group (1 = Group A, 2 = Group B). * $p < .05$.

treatment groups were comparable at the start of the study and responded similarly to their respective interventions

Postprandial 2-Hour Blood Sugar	B	126.08 $\pm$ 26.52	106.91 $\pm$ 18.92	19.16 $\pm$ 14.52	6.190	< .001 ***
	A	2.27 $\pm$ 0.88	1.80 $\pm$ 0.86	56.26 $\pm$ 47.70	3.500	0.004
HbA1c	B	2.67 $\pm$ 0.49	2.07 $\pm$ 0.80	42.35 $\pm$ 24.79	4.583	< 0.001
	A	8.09 $\pm$ 2.01	6.16 $\pm$ 1.69	1.93 $\pm$ 1.93	4.690	< .001 ***
	B	7.64 $\pm$ 1.68	6.91 $\pm$ 1.38	0.72 $\pm$ 0.48	7.019	< .001 ***
	A					

groups), PP2BS ($p < 0.001$ in both groups), and HbA1c ($p < 0.001$ in both groups). Overall, the findings indicate statistically significant improvement in all assessed objective parameters following treatment in both groups.

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Table 7: Between-Group Comparison objective outcome measures at Baseline and Follow-up (Independent-Samples t-Test)

Measure	Group A Mean ± SD	Group B Mean ± SD	Mean Difference	95% CI	F	t	df	p
BMI	27.83	28.14	-0.3	(-2.4, 1.8)	1.846	-0.278	42	0.782
Base line	± 4.74	± 1.86	02	9, 1.89)				
BMI	26.50	27.77	-1.2	(-3.3, 0.8)	1.267	-1.222	42	0.229
Foll ow-up	± 4.47	± 1.97	73	8, 0.83)				
FBS	123.08	126.08	-3.0	(-18.96, 12.95)	0.016	-0.380	42	0.706
Base line	± 25.92	± 26.52	01	96, 12.95)				

Both Group A and Group B were comparable at baseline and follow-up, with no statistically significant differences observed between the groups for any objective parameter (all $p > 0.05$). The absence of The present study demonstrated statistically significant improvement in most of the subjective parameters associated with Prameha in both treatment groups. Significant reductions in Prabhuta Mutrata, Mutramadhurya, Pipasa Adhikya, Kshudha Adhikya, Swedadhikya, Nidradhikya, Hasta-Pada-Tala Daha and Kara-Pada Suptata were observed following treatment, indicating improvement in the major clinical manifestations of the disease. The improvement in Prabhuta Mutrata may be related to better regulation of Kleda and Mutravaha Srotas, while the reduction in Pipasa and Kshudha Adhikya may reflect improvement in the underlying metabolic disturbance. Similarly, improvement in Swedadhikya, Nidradhikya and Hasta-Pada-Tala Daha suggests a broader improvement in the systemic manifestations associated with Prameha. For Angagandha, a statistically significant improvement was observed in Group A, whereas the change in Group B did not reach statistical significance. Overall, the findings suggest that both Basti regimens provided

FBS	99.87	106.91	-7.042	(-18.41, 4.32)	0.001	-1.265	42	0.213
Foll ow-up	± 17.99	± 18.92						
PP2	190.02	179.32	10.705	(-24.00, 45.41)	3.164	0.623	42	0.537
BS – Base line	± 67.92	± 43.49						
PP2	133.76	136.96	-3.205	(-22.37, 15.96)	0.140	-0.337	42	0.737
BS – Foll ow-up	± 31.01	± 31.98						
HbA 1c – Base line	8.09 ± 2.01	7.64 ± 1.68	0.455	(-0.67, 1.58)	0.408	0.813	42	0.421
HbA 1c – Foll ow-up	6.16 ± 1.69	6.91 ± 1.38	-0.750	(-1.69, 0.19)	0.262	-1.614	42	0.114

significant between-group differences suggests that the two treatments were comparably effective in managing these metabolic parameters.

Discussion

substantial symptomatic relief, although the magnitude of response varied across individual symptoms.

The significant reduction in BMI in both groups, with a comparatively greater reduction in Group A, may be attributed to the Lekhana, Medohara and Kapha-Vata Shamaka properties of Rasnadi Basti. These actions may contribute to reduction of excessive Meda, correction of Srotorodha and improvement of metabolic function. Madhutailika Basti, owing to its Snigdha, Brimhana and Vatahara properties, may exert a relatively milder effect on body weight and BMI.

A significant reduction in FBS, PP2BS and HbA1c was observed in both groups, indicating improvement in glycaemic control. The reduction in FBS and HbA1c was numerically greater in Group A, whereas improvement in PP2BS was also observed in both groups. The effect of Rasnadi Basti may be understood through its Deepana-Pachana, Amapachana, Lekhana and Medohara actions, which may help address Agnimandya, Ama and Meda Dushti, considered important components in the pathogenesis of Prameha.

Comparative Clinical Evaluation of Rasnadi Basti and Madhutilika Basti in the Management of Prameha (Type 2 Diabetes Mellitus): A Randomized Controlled Study

From an Ayurvedic perspective, the pathogenesis of Prameha involves Kapha Dosha, Meda, Kleda, Agnimandya and subsequent Srotorodha, with progressive involvement of Vata in chronic disease. Both Basti formulations may therefore act at multiple stages of the disease process. Rasnadi Basti, with its Kapha-Vata Shamaka, Lekhana, Medohara and Deepana-Pachana properties, may be particularly beneficial in patients with Meda and Kapha predominance, whereas Madhutilika Basti, with its Vatahara, Snigdha and Brimhana attributes, may support metabolic correction while maintaining tissue nourishment.

Although both groups demonstrated statistically significant improvement in the assessed subjective and objective parameters, the between-group analysis did not reveal statistically significant differences in the objective parameters ($p > 0.05$). Thus, both Rasnadi Basti and Madhutilika Basti produced comparable therapeutic outcomes in the present study. Although greater numerical reductions were observed with Rasnadi Basti in certain parameters, particularly BMI, FBS and HbA1c, these differences were not statistically significant and therefore do not establish superiority of one intervention over the other. The comparable efficacy may be attributed to the ability of both formulations to address important components of Prameha pathogenesis through their effects on Dosha, Agni, Meda and Srotas, although their pharmacological attributes differ.

Conclusion

In the present randomized comparative clinical study, Both groups showed statistically significant improvement in major subjective parameters, including Prabhuta Mutrata, Mutramadhurya, Pipasa Adhikya, Kshudha Adhikya, Swedadhikya, Nidradhikya, Hasta-Pada-Tala Daha and Kara-Pada Suptata. Significant improvement was also observed in BMI, FBS, PP2BS, HbA1c and urine sugar, along with improvement in quality of life, indicating beneficial effects on clinical and metabolic parameters.

The therapeutic effects of both Basti formulations may be attributed to their actions on Agni, Ama, Kleda, Meda, Dosha and Srotas. Although greater numerical improvement was observed with Rasnadi Basti in some parameters, the between-group differences were not statistically significant, indicating comparable efficacy of both interventions. Basti administration was well tolerated, with attainment of Samyak Basti Lakshana and no significant Ayoga or Atiyoga (complications). Thus, both Rasnadi Basti and Madhutilika Basti may be considered effective and safe therapeutic modalities for Prameha, with selection guided by the individual patient's Dosha, Dushya, Agni, Meda and clinical status.

Ethics Approval and Consent to Participate

The study protocol was approved by the Institutional Ethics Committee of Parul Institute of Ayurved, Parul University (IEC Approval No. PU/PIA/IEC/11/2025/473, dated 03 February 2025). The trial was prospectively registered with the Clinical Trials Registry-India (CTRI No. CTRI/2025/03/0882770). Written informed consent was obtained from all participants before enrolment.

Consent for Publication

Not applicable.

Availability of Data and Materials

The datasets generated and analysed during the current study are available from the corresponding author upon reasonable request.

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

Author 1: Conceptualized and designed the study, conducted the clinical trial, collected and analysed the data, interpreted the results, and prepared the manuscript.

Author 2: Provided supervision, contributed to the study design and interpretation of findings, critically reviewed and revised the manuscript for intellectual content, and approved the final manuscript for publication.

All authors have read and approved the final manuscript.

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