

PRAMEHA: AYURVEDIC PATHOGENESIS, METABOLIC CORRELATION WITH DIABETES MELLITUS, AND EVIDENCE-BASED MANAGEMENT

Dr. Kaustubh Chandrashekhar Vaidya^{*1}, Dr. Durga Gorakh Satav², Dr. Ganesh Tukaram Aher³, Dr Bhavana Sandeep Mane⁴

^{*1}BAMS, MD, Department of Kayachikitsa, Medical Officer, Seth Tarachand Hospital, Rastha Peth, Pune, Maharashtra, India. dr.kaustubhvaidya@gmail.com

²BAMS, MD, PhD (Scholar) Department of Kayachikitsa, College of Ayurved, Bharati Vidyapeeth (Deemed to be university), Pune, Maharashtra, India. drdurgasatav28@gmail.com

³BAMS, MD, Principal, Professor, Panchkarma Department, PMT Ayurved College and Hospital Loni, Ahilyanagar, Maharashtra, India.

⁴B.A.M.S, M.D. Professor, Swasthivritta Department, Pravara Rural Ayurved College and Hospital Loni bk, Ahilyanagar, Maharashtra, India. drbfgangurde@gmail.com

Corrospoding Author

Dr. Durga Gorakh Satav

BAMS, MD, PhD (Scholar) Department of Kayachikitsa, College of Ayurved, Bharati Vidyapeeth (Deemed to be university), Pune, Maharashtra, India. drdurgasatav28@gmail.com

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Abstract

Prameha is a major Ayurvedic disease complex characterized by excessive and altered urination, metabolic imbalance, and progressive involvement of Kapha, Meda, Mamsa, Kleda, Ojas and Mutravaha Srotas. Although Madhumeha is often compared with diabetes mellitus, the classical concept of Prameha is broader and includes multiple phenotypes that differ in Dosha dominance, tissue status, body habitus and prognosis. This structured review synthesizes classical Ayurvedic descriptions with contemporary evidence on type 2 diabetes, insulin resistance and selected Ayurveda-based clinical interventions. The review was developed from the supplied Prameha material, classical compendia, peer-reviewed Ayurveda studies and authoritative diabetes sources. The Ayurvedic Samprapti is dominated initially by Santarpana, Agnimandya, Kapha-Meda-Kleda excess and Srotorodha, while chronic or advanced disease may progress toward Vata aggravation, Dhatu Kshaya and Ojas depletion. Modern type 2 diabetes similarly involves insulin resistance, ectopic adiposity, beta-cell dysfunction and chronic hyperglycaemia, but these biomedical mechanisms should be treated as a clinical correlation rather than a literal translation of Ayurvedic constructs. Published clinical studies of Saptarangyadi Ghanavati, Rishyagandha, Nyagrodhadi Ghanavati, Vamana followed by Darvyadi Kwatha, and integrated Ayurveda-lifestyle programmes report improvements in symptoms and selected glycaemic outcomes; however, small samples, open-label designs, heterogeneous formulations and multicomponent interventions limit causal certainty. The most defensible contemporary approach is individualized, stage-sensitive Ayurveda used with objective glucose monitoring, pharmaceutical quality control, lifestyle correction and appropriate coordination with conventional medical care. (Sharma and Chandola, 2011b)

1. Introduction

Prameha occupies an important position in Ayurvedic medicine because it is described not as a single urinary disorder but as a systemic

metabolic syndrome involving Dosha, Dushya, Agni, Kleda, Meda, Ojas and multiple Srotas. The common features Prabhuta Mutrata and

Avila Mutrata provide a clinical axis, while the twenty classical varieties indicate substantial heterogeneity in presentation and prognosis. (Sharma and Dash, 2014)

Madhumeha is one of the Vataja forms of Prameha and is frequently correlated with diabetes mellitus because both can present with polyuria, excessive thirst, altered appetite, fatigue and progressive tissue complications. This comparison is useful for biomedical monitoring, but it should not be used to collapse all forms of Prameha into one modern diagnosis because Ayurvedic classification depends on Dosha, body habitus, tissue quality and disease stage. (Sharma and Chandola, 2011a)

Diabetes mellitus is a chronic metabolic disease characterized by persistent hyperglycaemia arising from impaired insulin secretion, impaired insulin action or both. The World Health Organization reported that about 830 million people were living with diabetes in 2022, and the adult prevalence reached approximately 14% among people aged 18 years and older. (World Health Organization, 2024)

India carries a particularly high burden of diabetes. The International Diabetes Federation estimated about 89.8 million adults aged 20–79 years with diabetes in India in 2024 and projected approximately 156.7 million by 2050, emphasizing the importance

of prevention, early detection and sustainable long-term management. (International Diabetes Federation, 2025)

Type 2 diabetes accounts for the great majority of diabetes cases and is characterized by insulin resistance accompanied by relative insulin deficiency. Excess or ectopic adiposity, hepatic glucose overproduction, impaired skeletal-muscle glucose uptake, progressive beta-cell dysfunction and altered incretin and adipokine signaling interact over time to sustain hyperglycaemia. (American Diabetes Association, 2026)

The central research value of Prameha lies in its phenotype-sensitive therapeutic logic. Ayurveda distinguishes the strong, overnourished, Kapha-Meda-dominant patient from the lean, weak or depleted patient in whom Vata and Ojas disturbance become more important, and this distinction materially changes the choice between Langhana, Shodhana, Shamana, Brimhana and Rasayana. (Sharma and Chandola, 2011b)

The objective of this article is to present a standard, evidence-grounded synthesis of Prameha covering classical classification, Nidana, Purvarupa, Samprapti, the role of Meda Dhatu and Kleda, the biomedical concepts of insulin resistance and type 2 diabetes, Ayurvedic management, clinical evidence, safety, research gaps and future directions. (Rastogi, 2018)

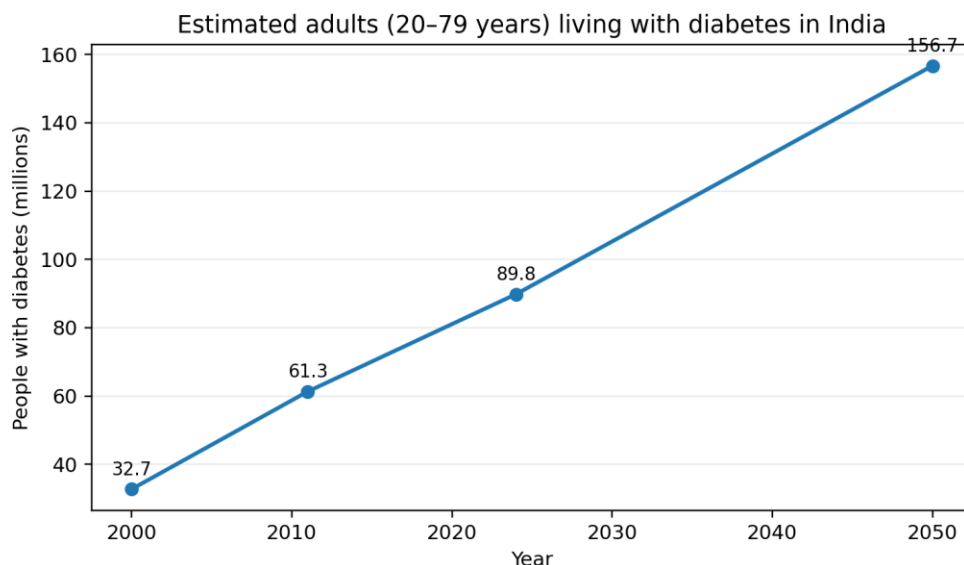


Figure 1. Diabetes burden in India using IDF 2025 country estimates and projections.

2. Materials and Methods

This article was prepared as a structured narrative review rather than as a newly conducted clinical trial. The supplied Prameha review material was used as the primary Ayurvedic evidence base, and its classical framework, study descriptions and numerical outcomes were retained only where they could be clearly attributed to identifiable sources. (Sharma and Chandola, 2011b)

The classical evidence base included the Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya, Madhava Nidana, Bhavaprakasha and later therapeutic compilations dealing with Prameha, together with official Ayurvedic formulary and pharmacopoeial principles relevant to medicine identity and quality. (Government of India, 2003)

Contemporary biomedical context was added from authoritative diabetes sources and peer-reviewed clinical literature, with emphasis on insulin resistance, disease burden, diagnostic monitoring and complications.

Ayurveda-focused clinical reports were included when the formulation or procedure, sample characteristics and clinical or biochemical outcomes were sufficiently described to permit cautious interpretation. (Yadav and Bhatt, 2021)

Because the selected Ayurvedic studies differed substantially in diagnosis, formulation composition, co-interventions, treatment duration and outcome reporting, the data were not pooled statistically. Numerical graphs in this article reproduce or calculate values directly from published group means and are presented descriptively rather than as meta-analytic estimates. (Singh et al., 2012)

3. Ayurvedic Concept and Classification of Prameha

Classical Ayurveda describes twenty types of Prameha: ten Kaphaja, six Pittaja and four Vataja. The distribution itself suggests a progression from a state of relative excess and metabolic congestion toward increasingly difficult Pitta- and Vata-associated disease

states, with Madhumeha placed among the Vataja forms. (Tripathi, 2017)

Category	Types	Dominant features	General prognosis	Therapeutic emphasis
Kaphaja Prameha	10	Kapha, Meda, Mamsa, Kleda excess; heaviness and turbidity	Relatively more manageable when recent	Langhana, Rukshana, Deepana-Pachana; selected Vamana and Kashaya-Tikta Shamana
Pittaja Prameha	6	Pitta/Rakta involvement; heat, burning and discoloration	More difficult than Kaphaja	Careful Virechana where indicated; Pitta-protective Tikta-Kashaya approach
Vataja Prameha	4	Vata aggravation, Dhatu Kshaya and Ojas involvement	Classically difficult or Yasya/Asadhya depending on chronicity	Mridu Shamana, Brimhana, Snehana and Rasayana; avoid excessive depletion
Sahaja tendency	Variable	Constitutional or familial susceptibility	Often chronic	Long-term individualized support and surveillance
Apathyanimittaja tendency	Variable	Dietary excess, inactivity and Kapha-Meda accumulation	Potentially modifiable early	Strict Pathya, exercise, weight correction and stage-appropriate therapy

Table 1. Classical classification and therapeutic implications of Prameha.

Sahaja Prameha is generally discussed in relation to constitutional or familial predisposition, whereas Apathyanimittaja disease is strongly linked with repeated unwholesome diet and behaviour. This distinction resembles, at a broad clinical level, the difference between inherited susceptibility and acquired lifestyle-related metabolic risk, although the two knowledge systems should not be treated as identical. (Roy et al., 1993)

4. Nidana: Dietary and Lifestyle Drivers

The dominant classical causative pattern is Santarpana. Repeated intake of Guru, Snigdha, Madhura and Picchila foods, excessive sweet preparations, frequent heavy meals, day sleep, prolonged sitting and inadequate physical activity promote Kapha, Meda and Kleda accumulation and impair the normal

movement of metabolic products. (Mishra, 2016)

This lifestyle pattern has clear clinical relevance in the modern era because physical inactivity, excess energy intake and adiposity contribute strongly to insulin resistance and type 2 diabetes risk. The biomedical pathway is not equivalent to the Ayurvedic concept of Kapha or Meda, but both frameworks recognize the importance of sustained overnutrition and insufficient energy expenditure. (American Diabetes Association, 2026)

Ayurveda also recognizes that chronic disease can ultimately present with tissue depletion rather than simple excess. A lean, fatigued patient with dryness, weakness, neuropathic complaints and loss of strength cannot be managed by indiscriminate fasting or strong purification merely because hyperglycaemia is present. (Sharma and Chandola, 2011b)

Nidana Parivarjana therefore forms the first therapeutic step. The practical objective is to remove the repeated causes maintaining Kapha-Meda-Kleda disturbance while preserving nutrition, hydration and strength appropriate to the patient's constitution and stage of disease. (Tripathi, 2017)

5. Samprapti and the Role of Meda Dhatu

Agnimandya is central to the Ayurvedic explanation of Prameha because impaired

digestion and tissue-level transformation permit abnormal accumulation of metabolic material. Kapha and Meda become excessive or qualitatively abnormal, Kleda increases, and channels responsible for distribution and elimination become functionally obstructed. (Sharma and Dash, 2014)

Meda Dhatu in Prameha should not be reduced to body fat alone. The classical concept includes tissue quantity, quality, metabolic processing and its relationship with Kapha, Kleda, Mamsa and the movement of Vata, so an apparently obese patient may still have poor tissue nutrition and impaired metabolic function. (Sharma and Chandola, 2011a)

The Avarana pathway explains a state in which Kapha-Meda accumulation obstructs Vata and disturbs normal movement and utilization, whereas the Dhatu-Kshaya pathway emphasizes progressive tissue depletion and Ojas loss. These two patterns may coexist over the course of chronic disease and help explain why therapeutic requirements can shift substantially with time. (Sharma and Chandola, 2011b)

Mutravaha Srotas becomes an important route of manifestation, giving rise to excessive or altered urine, while systemic features such as thirst, appetite change, fatigue, sweating, sensory symptoms and progressive complications reflect the wider metabolic disorder. (Tripathi, 2014)

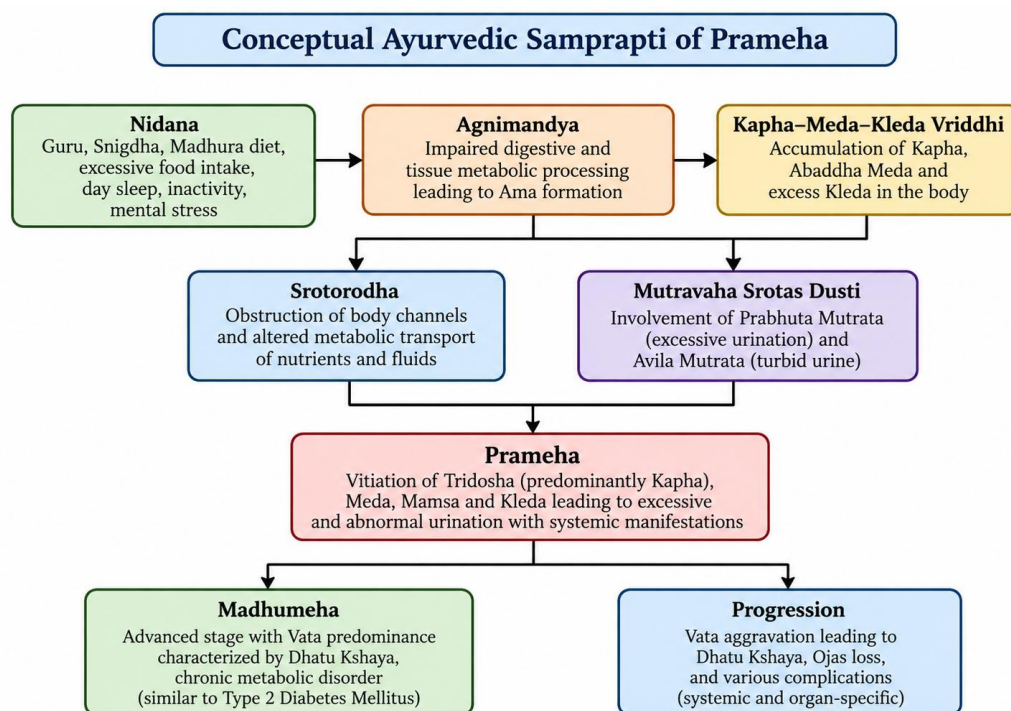


Figure 2. Conceptual Ayurvedic Samprapti of Prameha synthesized from classical descriptions.

6. Purvarupa, Rupa and Clinical Assessment

Classical Purvarupa include excessive sweating, body odour, heaviness, drowsiness, matting of hair, sweetness in the mouth,

altered sensation or burning in the hands and feet, and changes in urine that attract insects. These prodromal descriptions are clinically useful as an early-risk framework, although they are not substitutes for modern laboratory screening. (Tripathi, 2014)

Ayurvedic feature	Meaning	Biomedical clinical correlation (not equivalence)
Prabhuta Mutrata	Excessive urination	Polyuria; may accompany hyperglycaemia or other disorders
Avila Mutrata	Turbid/altered urine	Urine quality change; requires urinalysis if clinically indicated
Trishnadhikya/Pipasa	Excessive thirst	Polydipsia
Kshudhadhikya	Excessive appetite	Polyphagia in uncontrolled diabetes
Daurbalya/Alasya	Weakness and lethargy	Fatigue; non-specific but common in metabolic disease
Kara-pada supti/daha	Numbness or burning in extremities	May resemble neuropathic symptoms; needs formal evaluation

Atisweda	Excessive sweating	May reflect autonomic/metabolic factors; non-specific
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Table 2. Selected Prameha features and cautious modern clinical correlations.

Objective assessment is essential whenever a patient with suspected Prameha also meets criteria for prediabetes or diabetes. Fasting glucose, post-prandial glucose, HbA1c, renal status, lipid profile, blood pressure, body composition and screening for neuropathic, retinal and cardiovascular complications provide measurable safety and outcome information that cannot be replaced by symptom scoring alone. (American Diabetes Association, 2026)

7. Biomedical Correlation: Insulin Resistance and Type 2 Diabetes

Insulin resistance refers to reduced biological responsiveness to insulin in key target tissues, particularly skeletal muscle, liver and adipose tissue. The pancreas initially compensates by increasing insulin secretion, but progressive beta-cell dysfunction eventually prevents adequate compensation and sustained hyperglycaemia develops. (American Diabetes Association, 2026)

Visceral adiposity contributes to insulin resistance through increased free-fatty-acid

flux, altered adipokines, low-grade inflammation and ectopic lipid deposition in liver and muscle. These processes provide a biomedical framework for understanding why central obesity and sedentary behaviour are major risk factors for type 2 diabetes. (American Diabetes Association, 2026)

Chronic hyperglycaemia damages vascular and neural tissues and is associated with retinopathy, nephropathy, neuropathy, cardiovascular disease and lower-limb complications. The WHO emphasizes that timely diagnosis, healthy diet, physical activity, appropriate medicines and complication screening can prevent or delay adverse outcomes. (World Health Organization, 2024)

The similarities between insulin resistance and the Kapha-Meda-Kleda/Srotorodha pattern are conceptually useful but should remain analogical. Ayurvedic categories describe a distinct diagnostic system and cannot be validated merely by assigning a one-to-one biomedical molecule or pathway to each classical term. (Sharma and Chandola, 2011a)

Simplified biomedical progression of type 2 diabetes

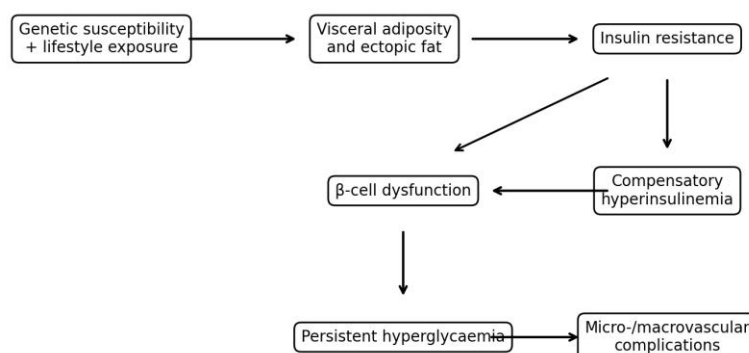


Figure 3. Simplified biomedical progression of type 2 diabetes.

8. Ayurvedic Management Principles

8.1 Stage-sensitive treatment

Ayurvedic management begins with Rogi-Roga Pariksha and does not prescribe the same therapy for every patient labelled as diabetic. Dosha dominance, Meda status, Agni, Ama, Bala, body build, chronicity, complications and current medicines should be assessed before selecting reduction, purification, palliative or restorative strategies. (Sharma and Chandola, 2011b)

In a strong, obese, Kapha-Meda-dominant patient, Langhana, Rukshana and Deepana-

Pachana may be used to prepare for selected Shodhana. Vamana is traditionally chosen when Kapha predominance and patient fitness are appropriate, whereas Virechana may be considered under a different Dosha pattern and clinical indication. (Sharma and Dash, 2014)

In a lean, weak or chronically depleted patient, aggressive reduction can be harmful. The therapeutic emphasis shifts toward gentle Shamana, Snehana, appropriate nourishment and Rasayana while maintaining glucose monitoring and management of acute or chronic complications. (Sharma and Chandola, 2011b)

8.2 Shamana formulations and single drugs

Intervention	Therapeutic logic	Evidence context
Nishamalaki	Haridra + Amalaki; Kapha-Meda-Kleda regulation with Rasayana support	Early/moderate Prameha under supervision
Saptarangyadi Ghanavati	Kashaya-Tikta dominant, Pramehaghna/Medohara intent	Studied with Pathya and walking
Nyagrodhadi Ghanavati	Astringent/cooling Shamana approach	Symptom-oriented management; studied alone and

		after Virechana
Darvyadi Kwatha	Classical decoction after selected Vamana	Studied in prediabetes/Prameha
Rishyagandha (Withania coagulans)	Single-drug Shamana approach	Small clinical study; not generalizable to all preparations
Silajatu + Mamajjaka	Naimittika Rasayana-oriented strategy	Chronic metabolic disease with tissue support
Mamajjaka + Amalaki + Guduchi	Integrated public-health Ayurveda protocol	Used with lifestyle modification and Yoga

Table 3. Representative Ayurvedic interventions discussed in Prameha literature.

The therapeutic reputation of an Ayurvedic medicine should not be separated from dose, dosage form, processing, Anupana, pharmaceutical quality and patient phenotype. A formulation that is useful in Kapha-Meda dominance may be inappropriate in a depleted patient, and products carrying the same traditional name can differ materially in manufacturing quality. (Government of India, 2003)

9. Pathya, Exercise and Lifestyle Regulation

Pathya is an active component of Prameha management rather than a secondary recommendation. Classical diets generally emphasize appropriate use of Yava, Mudga, old grains, selected bitter or astringent vegetables and lighter meals while avoiding repeated excess of sweets, highly unctuous foods, overeating and day sleep. (Mishra, 2016)

Regular walking and physical activity are repeatedly recommended in Apathyanimittaja Prameha because inactivity sustains Kapha-Meda accumulation. Modern diabetes prevention likewise supports regular physical activity, healthy dietary patterns and weight management to prevent or delay type 2 diabetes in high-risk individuals. (World Health Organization, 2024)

Exercise must be individualized when the patient has advanced neuropathy, cardiovascular disease, severe weakness, dehydration or unstable glucose. The Ayurvedic principle of Bala-based prescription and the biomedical principle of complication-sensitive exercise planning converge on the need for graded rather than indiscriminate activity. (American Diabetes Association, 2026)

10. Clinical Evidence for Ayurvedic Interventions

The available Ayurveda literature is clinically interesting but methodologically heterogeneous. Most studies are small, several are open-label, and many combine medicines with Pathya, walking, Yoga or Shodhana, so the observed outcome belongs to a treatment package rather than to a single isolated ingredient. (Sharma et al., 2019)

10.1 Saptarangyadi Ghanavati

In a study of Saptarangyadi Ghanavati, 67 participants completed treatment. Newly detected patients showed fasting glucose reduction from 177.90 to 156.94 mg/dL and post-prandial glucose reduction from 242.00 to 185.70 mg/dL, while chronic uncontrolled patients also showed improvement while

continuing existing conventional medicines. (Singh et al., 2012)

Classical symptom relief in the newly detected group included 69% improvement in Prabhuta Mutrata, 82.3% in Avila Mutrata, 63% in Pipasadhikya, 56% in Kshudhadhikya

and 67% in Pindikodveshtana. Because diet and walking were prescribed simultaneously, the results should be interpreted as evidence for an integrated protocol rather than proof of tablet-only efficacy. (Singh et al., 2012)

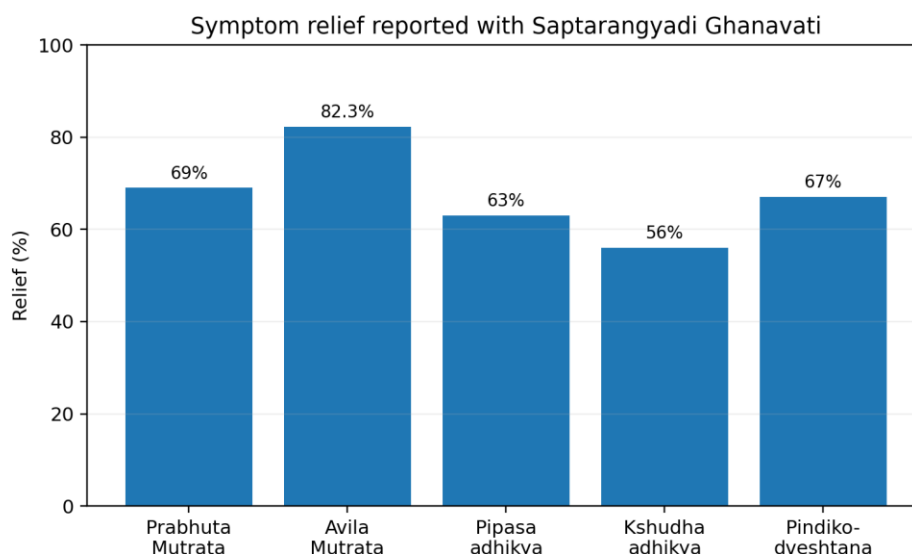


Figure 4. Published symptom relief with Saptarangyadi Ghanavati in newly detected Prameha.

10.2 Rishyagandha (*Withania coagulans*)

A small clinical study using Rishyagandha at 10 g/day reported reduction in fasting glucose from 131.50 to 122.35 mg/dL and post-prandial glucose from 207.53 to 180.29 mg/dL, together with improvement in polyuria, excessive appetite, weakness and burning or tingling symptoms. The study supports a possible therapeutic role but is not sufficient to establish standardized efficacy across different extracts or doses. (Upadhyay and Gupta, 2011)

10.3 Nyagrodhadi Ghanavati and prior Shodhana

Nyagrodhadi Ghanavati produced substantial relief in classical symptoms including Prabhuta Mutrata, Trishnadhikya, Daurbalya and Kara-pada-supti, but the

Shamana-only arm showed little fasting-glucose improvement and no clear post-prandial benefit. This finding shows why symptom scores and biochemical outcomes should be reported separately. (Kumari et al., 2010)

The group receiving Virechana followed by Nyagrodhadi showed a larger proportion of marked global improvement than the Shamana-only group, supporting the classical hypothesis that appropriate prior purification may improve response in selected fit patients. The result does not justify routine Virechana for every person with diabetes. (Kumari et al., 2010)

10.4 Vamana followed by Darvyadi Kwatha

A single-arm study in 20 participants with prediabetes/Prameha reported a reduction in

mean HbA1c from 6.25% to 5.63%, fasting glucose from 120.05 to 93.31 mg/dL and post-prandial glucose from 165.26 to 112.84 mg/dL

by the 120-day assessment after Vamana followed by Darvyadi Kwatha. (Yadav and Bhatted, 2021)

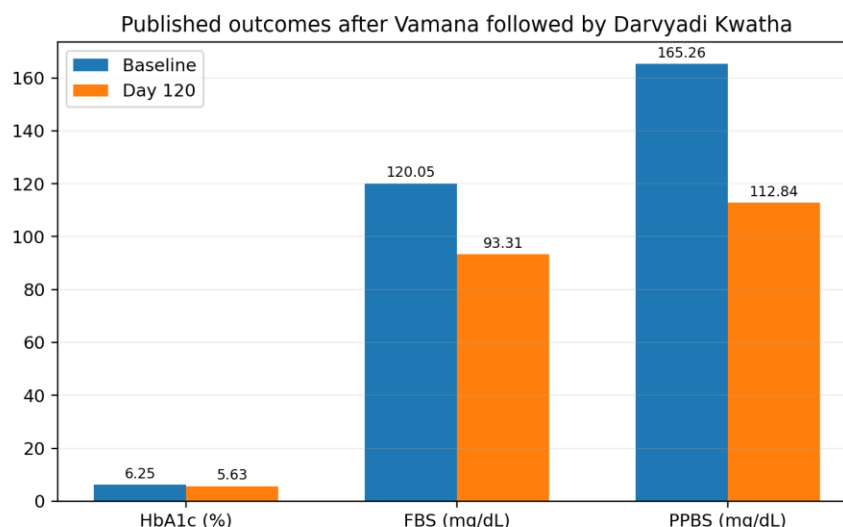


Figure 5. Baseline and day-120 outcomes reported after Vamana followed by Darvyadi Kwatha.

These results are promising but require cautious interpretation because the study was small and uncontrolled, and Vamana is a specialized procedure requiring classical fitness assessment, trained supervision and appropriate preparatory and post-procedure care. (Yadav and Bhatted, 2021)

with lifestyle modification and Yoga demonstrated the feasibility of delivering Ayurveda-centred care within an integrated prevention and control programme. The multicomponent design reflects real-world practice but prevents attribution of benefit to a single herb. (Sharma et al., 2019)

10.5 Integrated Ayurveda-lifestyle programmes

A multicentric public-health project combining Mamajjaka, Amalaki and Guduchi

Study	Intervention	Design	Main reported finding
Upadhyay & Gupta, 2011	Rishyagandha	Small clinical study	FBS 131.50→122.35; PPBS 207.53→180.29 mg/dL; symptom improvement
Singh et al., 2012	Saptarangyadi Ghanavati Pathya/walking	67 completers	Approx. 12% FBS and 24% PPBS reduction in newly detected group; broad symptom relief
Kumari et al., 2010	Nyagrodhadi	34 completers	Large symptom relief;

	Virechana		limited glucose response with Shamana alone; better global response after Virechana
Sharma et al., 2019	Mamajjaka + Amalaki + Guduchi + lifestyle + Yoga	Multicentric pragmatic project	Feasibility and clinically useful change under integrated AYUSH model
Yadav & Bhatted, 2021	Vamana + Darvyadi Kwatha	n=20	HbA1c 6.25→5.63%; FBS 120.05→93.31; PPBS 165.26→112.84 mg/dL
Thomas, 2023	Individualized Ayurveda	Single case	Large HbA1c decline reported; hypothesis-generating only

Table 4. Selected clinical evidence relevant to Prameha/Madhumeha.

11. Integrative Interpretation: Meda Dhatu and Insulin Resistance

The Meda-centered presentation of Prameha is clinically compatible with the observation that visceral adiposity frequently accompanies insulin resistance, but the two are not synonyms. Meda Dhatu includes qualitative tissue metabolism and its relationship with other Dushya, whereas insulin resistance is a measurable reduction in insulin responsiveness at specific tissues. (American Diabetes Association, 2026)

The Ayurvedic concept of Srotorodha can serve as a useful systems-level metaphor for impaired distribution and utilization, yet it should not be presented as a proven microscopic mechanism of insulin signaling. Scientific integration is strongest when correlations generate testable hypotheses rather than when traditional terms are artificially assigned to modern molecules. (Sharma and Chandola, 2011a)

Similarly, Agni can be discussed as a classical regulator of digestion and tissue transformation but should not be equated with a single enzyme, mitochondrial pathway or basal metabolic rate. Preserving the conceptual integrity of both systems makes interdisciplinary research more rigorous and avoids false equivalence. (Rastogi, 2018)

12. Complications, Safety and Clinical Monitoring

Persistent hyperglycaemia increases the risk of cardiovascular disease, kidney disease, retinopathy, neuropathy and lower-limb complications, so any integrative Prameha programme should include routine biomedical surveillance and timely referral. Ayurvedic symptom improvement should not be assumed to mean that glycaemic or vascular risk has normalized. (World Health Organization, 2024)

Ayurvedic medicines should be sourced from reliable manufacturers and used with

attention to identity, contamination, adulteration, dose, renal or hepatic status and possible interactions with existing glucose-lowering medicines. Classical herbo-mineral products require particularly careful quality assurance and qualified supervision. (Government of India, 2003)

Patients already receiving insulin or oral glucose-lowering medication should not discontinue treatment abruptly on the basis of an Ayurvedic prescription or a single improved glucose reading. Dose adjustment requires serial monitoring and coordination with the treating clinician because combined treatment can increase the risk of hypoglycaemia. (American Diabetes Association, 2026)

Shodhana procedures should not be generalized as routine detoxification. Vamana and Virechana require assessment of strength, age, season, comorbidities, hydration, cardiovascular status and the capacity to complete preparatory and post-procedure regimens safely. (Yadav and Bhatted, 2021)

13. Research Gaps and Future Directions

The principal limitation of the existing Prameha clinical literature is methodological heterogeneity. Diagnostic criteria, formulations, co-interventions, dose, treatment duration and outcome measures vary considerably, making direct comparison and pooled effect estimates unreliable. (Sharma et al., 2019)

Future trials should report authenticated plant material, manufacturing standards, batch testing, exact dose, dosage form, Anupana, adherence and adverse events. Studies should also document the Ayurvedic phenotype, including Dosha-Dushya status, body habitus,

Agni, Bala and chronicity, so that individualization becomes analyzable rather than anecdotal. (Government of India, 2003)

A core outcome set for Prameha research could combine classical symptoms such as Prabhuta Mutrata, Avila Mutrata, Trishnadhikya, Kshudhahdhikya and Daurbalya with fasting glucose, post-prandial glucose, HbA1c, body composition, blood pressure, lipid indices, renal markers, quality of life and safety outcomes. (Rastogi et al., 2023)

Longer follow-up is needed to determine whether observed benefits are sustained and whether integrated Ayurveda affects clinically important endpoints such as progression from prediabetes to diabetes, medication burden, neuropathy, kidney disease or cardiovascular risk. Short-term symptom improvement alone cannot answer these questions. (Yadav and Bhatted, 2021)

Mechanistic research may examine whether standardized Ayurvedic interventions influence insulin sensitivity, adipokines, inflammatory mediators, gut microbiota or beta-cell function, but such work should be hypothesis-driven and should avoid claiming that a biomarker is the direct modern equivalent of a Dosha or Dhatu. (Sharma and Chandola, 2011a)

14. Discussion

The classical Prameha model is notable for combining dietary excess, physical inactivity, body habitus, tissue metabolism, urinary change and disease progression within one clinical framework. This systems-oriented view gives particular importance to early correction of lifestyle and to differentiating a state of metabolic accumulation from one of

chronic depletion. (Sharma and Chandola, 2011a)

Modern type 2 diabetes research independently demonstrates that lifestyle, adiposity, insulin resistance and progressive beta-cell dysfunction interact over years before overt complications become established. The overlap in clinical emphasis makes Prameha a productive field for integrative research, even though the underlying theoretical languages remain distinct. (American Diabetes Association, 2026)

The clinical studies reviewed here provide a consistent signal that integrated Ayurveda can improve classical symptoms and, in some settings, fasting glucose, post-prandial glucose or HbA1c. The strongest responses often occur when medicines are combined with Pathya, exercise, Yoga or appropriately selected Shodhana, which is consistent with the Ayurvedic view that Prameha is maintained by an entire behavioural-metabolic network. (Singh et al., 2012)

At the same time, the evidence does not support replacing standard diabetes surveillance with symptom-based assessment or assuming that every traditional formulation is an effective antidiabetic drug. The small sample sizes and multicomponent protocols mean that efficacy, comparative effectiveness and long-term safety remain uncertain. (Sharma et al., 2019)

The most responsible contemporary model is therefore complementary and individualized: preserve the diagnostic richness of Ayurveda, apply pharmaceutical quality standards, correct diet and activity, monitor objective glycaemic and complication markers, and coordinate treatment when

conventional medicines are already required. (World Health Organization, 2024)

15. Practical Integrative Assessment and Follow-up Framework

A clinically responsible Prameha assessment should record both Ayurvedic and biomedical variables at baseline. Ayurvedic documentation can include Dosha dominance, Sthula or Krisha body habitus, Agni, Ama, Bala, relevant Dushya, Prabhuta Mutrata, Avila Mutrata, thirst, appetite, fatigue, sweating and sensory complaints, while biomedical assessment should establish glucose status and screen for major complications. This dual documentation allows the traditional treatment logic and measurable metabolic risk to be followed without forcing one framework to substitute for the other. (Rastogi et al., 2023)

For patients with established diabetes, HbA1c provides a medium-term measure of glycaemic exposure, while fasting and post-prandial glucose can help identify daily patterns and treatment response. Blood pressure, renal function, urine albumin assessment, lipid profile, weight or waist measures and foot or neuropathy screening provide additional information relevant to long-term safety. (American Diabetes Association, 2026)

Ayurvedic follow-up should not be limited to a binary label of improvement. Changes in urinary frequency, urine quality, thirst, hunger, energy, sleep, bowel pattern, exercise tolerance and sensory symptoms can be documented using reproducible ordinal scores, while any change in Agni, Bala or signs of excessive Rukshata should inform dose and

treatment intensity. (Sharma and Chandola, 2011b)

Medication reconciliation is essential at every visit because patients may be receiving metformin, sulfonylureas, insulin or other glucose-lowering agents alongside Ayurvedic medicines. When glucose values decline, the possibility of hypoglycaemia must be considered before attributing fatigue, sweating or weakness to Dosha change alone. (American Diabetes Association, 2026)

A practical research model is to define the Ayurvedic phenotype before treatment, standardize the intervention sufficiently for reproducibility, retain clinically necessary conventional care, and pre-specify both classical and biomedical outcomes. Such a design can test whether phenotype-matched Ayurveda adds benefit while preserving patient safety and methodological clarity. (Sharma et al., 2019)

Domain	Baseline assessment	Follow-up measure	Reason for inclusion
Ayurvedic phenotype	Dosha, Dushya, Agni, Ama, Bala, Sthula/Krishna status	Same variables at each major review	Tests whether treatment remains matched to changing Samprapti
Classical symptoms	Prabhuta Mutrata, Avila Mutrata, Trishna, Kshudha, Daurbalya, sensory features	Standardized symptom scores	Captures patient-centered Ayurvedic response
Glycaemic status	FBS, PPBS and HbA1c as clinically appropriate	Repeat according to diabetes status and treatment changes	Provides objective metabolic response and safety
Cardiorenal risk	BP, lipids, creatinine/eGFR, urine albumin where indicated	Periodic risk-based monitoring	Detects complications not apparent from symptom relief
Medication safety	All prescribed, OTC and traditional products	Reconcile at every visit	Reduces interaction, duplication and hypoglycaemia risk
Lifestyle adherence	Diet, activity, sleep and day-sleep pattern	Adherence diary or structured interview	Separates medicine effect from lifestyle co-intervention

Table 5. Suggested integrated assessment framework for clinical practice and future Prameha research.

This framework also clarifies the interpretation of treatment success. A fall in

HbA1c without improvement in fatigue or function may still require broader care, while

marked symptomatic relief with persistent hyperglycaemia should not be described as metabolic control. Concordance between patient-reported improvement, Ayurvedic assessment and objective laboratory outcomes provides the strongest basis for judging a clinically meaningful response. (Kumari et al., 2010)

16. Conclusion

Prameha is a complex Ayurvedic metabolic disease framework in which Kapha, Meda, Kleda, Agni, Srotas and Ojas change across stages of illness. Madhumeha can be clinically correlated with diabetes mellitus, particularly in chronic hyperglycaemic presentations, but the Ayurvedic category remains broader than a one-to-one biomedical diagnosis. Evidence from small Ayurveda clinical studies suggests potential benefit from Saptarangyadi Ghanavati, Rishyagandha, Nyagrodhadi Ghanavati, Vamana followed by Darvyadi Kwatha and integrated medicine-lifestyle programmes, especially when therapy is individualized and accompanied by Pathya. The quality of evidence remains limited by small samples, inconsistent standardization and heterogeneous designs. Future work should combine rigorous Ayurvedic phenotyping with modern metabolic outcomes and long-term safety assessment, while avoiding unsupported claims of cure or replacement of necessary diabetes care. (Sharma and Chandola, 2011b)

References

1. American Diabetes Association. Standards of Care in Diabetes—2026: Diagnosis and Classification of Diabetes. Diabetes Care. 2026;49(Suppl 1).
2. Government of India, Ministry of Health and Family Welfare. The Ayurvedic Formulary of India. Part I. New Delhi: Government of India; 2003.
3. International Diabetes Federation. IDF Diabetes Atlas. 11th ed. Brussels: International Diabetes Federation; 2025.
4. Kumari J, Mehta CS, Shukla VD, Dave AR, Shingala TM. A comparative clinical study of Nyagrodhadi Ghanavati and Virechana Karma in the management of Madhumeha. AYU. 2010;31(3):300–304. doi:10.4103/0974-8520.77152.
5. Madhavakara. Madhava Nidana. Tripathi B, editor. Prameha Nidana. Varanasi: Chaukhambha Surbharati Prakashan; 2014.
6. Bhavamishra. Bhavaprakasha. Mishra BS, editor. Madhyama Khanda: Prameha Rogadhikara. Varanasi: Chaukhambha Sanskrit Bhawan; 2016.
7. Rastogi S. Linking Prameha etiology with diabetes mellitus: inferences from a matched case-control study. AYU. 2018;39(3):139–145. doi:10.4103/ayu.AYU_106_18.
8. Rastogi S, Singh N, Gutch M, Bhattacharya A. Prameha Purvarupa as diabetes risk predictor: trends from a retrospective cohort study of newly diagnosed type 2 diabetes patients. J Ayurveda Integr Med. 2023;14(1):100671. doi:10.1016/j.jaim.2022.100671.
9. Roy CK, Ojha JK, Bajpai HS. A review of the history of Prameha and diabetes mellitus. Anc Sci Life. 1993;12(3–4):394–398.
10. Sharma H, Chandola HM. Prameha in Ayurveda: correlation with obesity, metabolic syndrome, and diabetes mellitus. Part 1: etiology, classification, and pathogenesis. J Altern Complement Med.

- 2011;17(6):491–496.
doi:10.1089/acm.2010.0396.
11. Sharma H, Chandola HM. Prameha in Ayurveda: correlation with obesity, metabolic syndrome, and diabetes mellitus. Part 2: management of Prameha. *J Altern Complement Med.* 2011;17(7):589–599. doi:10.1089/acm.2010.0397.
 12. Sharma R, Shahi VK, Khanduri S, Goyal A, Chaudhary S, Rana RK, et al. Effect of Ayurveda intervention, lifestyle modification and Yoga in prediabetic and type 2 diabetes under the NPCDCS-AYUSH integration project. *AYU.* 2019;40(1):8–15. doi:10.4103/ayu.AYU_105_19.
 13. Sharma RK, Dash B, editors. *Charaka Samhita. Nidana Sthana 4 and Chikitsa Sthana 6: Prameha Nidana and Chikitsa.* Varanasi: Chowkhamba Sanskrit Series Office; 2014.
 14. Singh KS, Chandola HM, Kaur M, Ravishankar B. Evaluation of Saptarangyadi Ghanavati in the management of Apathyanimittaja Prameha with special reference to type 2 diabetes mellitus. *AYU.* 2012;33(3):368–373. doi:10.4103/0974-8520.108825.
 15. Sushruta. *Sushruta Samhita.* Sharma PV, editor. Nidana Sthana 6 and Chikitsa Sthana 11–13: Prameha. Varanasi: Chaukhambha Visvabharati; 2013.
 16. Thomas V. Ayurveda approach in the treatment of type 2 diabetes mellitus: a case report. *J Ayurveda Integr Med.* 2023;14(4):100744. doi:10.1016/j.jaim.2023.100744.
 17. Tripathi B, editor. *Ashtanga Hridaya. Nidana Sthana 10 and Chikitsa Sthana 12: Prameha.* Delhi: Chaukhamba Sanskrit Pratishthan; 2017.
 18. Upadhyay BN, Gupta V. A clinical study on the effect of Rishyagandha (*Withania coagulans*) in the management of Prameha (type II diabetes mellitus). *AYU.* 2011;32(4):507–511. doi:10.4103/0974-8520.96124.
 19. World Health Organization. Diabetes fact sheet. Geneva: WHO; 2024.
 20. Yadav U, Bhatt SK. Efficacy of Vamana Karma followed by Darvyadi Kwatha in the management of prediabetes (Prameha): a single-arm clinical trial. *AYU.* 2021;42(1):30–34.
 21. Yadav U, Bhatt SK. A comparative analysis of Vamana and Shamana Chikitsa in prediabetes management: a randomized clinical trial. *J Ayurveda Integr Med.* 2023;14(5):100764. doi:10.1016/j.jaim.2023.100764.