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REVIEW ARTICLE

Deha Prakriti and Metabolic Health: An Ayurvedic Perspective

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Abstract

Metabolic disorders, including obesity, dyslipidaemia, insulin resistance and type 2 diabetes, account for a substantial and rising share of global morbidity, and their prevention is only partly addressed by population-level strategies. Ayurveda classifies individuals according to Deha Prakriti, a constitution determined at conception by the relative predominance of the three Doshas, and proposes that this constitution shapes digestion, tissue metabolism and disease susceptibility. This review examines, critically and without overstatement, whether Prakriti can contribute to the understanding of metabolic health, the individualisation of prevention and contemporary lifestyle medicine. Classical descriptions of Prakriti in the Charaka Samhita are outlined and distinguished from acquired pathological states. Possible physiological correlates are considered through Agni, Dhatu metabolism and Meda Dhatu, and compared cautiously with contemporary constructs such as metabolic phenotype and inflammatory tone. Observational hospital-based studies have reported associations between Prakriti and cardiovascular risk factors, insulin resistance and type 2 diabetes, but these are predominantly cross-sectional, small, and based on heterogeneous assessment methods. Genomics, transcriptomics and microbiome research have generated testable hypotheses; replication remains limited, and the reliability of available Prakriti assessment tools is under critical scrutiny. Prakriti offers a structured framework for individualised assessment and lifestyle counselling, but it is not currently validated as a metabolic biomarker. Its scientific value will depend on standardised phenotyping, longitudinal cohorts and prospective stratified trials that test constitutional classification against conventional risk assessment.

Keywords: Prakriti; Deha Prakriti; Ayurveda; metabolic health; metabolic syndrome; personalized medicine; Agni; Ayurgenomics

Introduction

Diabetes and related metabolic disorders now dominate the global non-communicable disease burden. The World Health Organization estimates that the number of people living with diabetes rose from about 200 million in 1990 to 830 million in 2022, with 14% of adults aged 18 years and older affected in 2022 against 7% in 1990; more than 95% of cases are type 2 diabetes, and in 2021 diabetes was the direct cause of 1.6 million deaths.¹ The eleventh edition of the IDF Diabetes Atlas estimates 589 million adults aged 20–79 years living with diabetes in 2024, roughly one in nine adults, and projects 853 million by 2050² earlier projections for the same age band anticipated a rise in prevalence from 10.5% in 2021 to 12.2% by 2045.³ The increase is steepest in low- and middle-income countries.^{1,3}

Aggregate figures conceal substantial individual variation. Two people of similar age, adiposity and diet may diverge markedly in glucose tolerance, lipid profile and inflammatory tone, and conventional risk factors explain only part of that divergence. Stratified prevention — matching the intensity and content of advice to

individual susceptibility — has therefore become a central theme in preventive medicine, and it requires traits that are measurable, stable and clinically actionable.

Ayurveda addresses the same problem through *Deha Prakriti*, the constitutional disposition determined at conception by the relative predominance of *Vata*, *Pitta* and *Kapha*.^{4,5} *Prakriti* is treated as a stable trait that shapes physique, digestive capacity, thermal tolerance, sleep, activity and behaviour, and therefore the individual response to diet and regimen. Framed as a trait rather than a transient state, it invites comparison with contemporary phenotypic stratification for prevention.⁴ That comparison, however, is only as sound as the measurement on which it rests, and appraisal of *Prakriti* assessment has recently become considerably more stringent.⁶

This review examines what *Prakriti* can and cannot contribute to the understanding of metabolic health. Classical formulation, clinical observation, mechanistic hypothesis and established biomedical knowledge are

treated as distinct strata, because conflating them has been a recurring weakness of the literature.

Concept of *Deha Prakriti* in Ayurveda

Charaka places *Prakriti* among the entities to be examined when judging a patient's strength and the severity of disease, embedding constitutional appraisal within clinical reasoning rather than apart from it.⁵ In the eighth chapter of the *Vimana Sthana*, physical constitution is traced to the state of the reproductive elements (*Shukra* and *Shonita*), the time of conception and condition of the uterus, the diet and regimen followed by the mother during pregnancy, and the predominance of the *Mahabhutas*. Whichever *Dosha* predominates in these determinants accompanies the foetus, so that individuals are born *Sleshmala*, *Pittala*, *Vatala*, of mixed constitution (*Samsrshtha*), or in a state of equilibrium (*Samadhātu*).⁵

Kapha-predominant individuals are described as unctuous, smooth, firm, dense, slow, stable, heavy and cold, with a correspondingly sturdy physical disposition; *Pitta*-predominant individuals as hot, sharp, fluid and pungent, of moderate build and brisk digestion; and *Vata*-predominant individuals as dry, light, mobile, rough and cold, of lean build with variable appetite and activity.⁵ Psychological characteristics are described alongside somatic ones. Constitution is thus presented as an account of an organism's tendencies as a whole, not of a single measurable variable.

Two clarifications matter. First, *Prakriti* is a constitutive tendency, whereas *Vikriti* denotes the current acquired deviation from it; the same constitution can present very different clinical pictures according to diet, season, age and conduct, and clinical reasoning depends on reading one against the other. The classical literature also recognises mixed and balanced constitutions, so reducing *Prakriti* to three exclusive categories misrepresents it.⁵ Second, the texts specify no measurement instrument, scoring convention or reliability requirement. Modern investigators have produced 64 distinct assessment tools across 94 studies, most without adequate psychometric validation.⁶; the consequences are mentioned later on.

Prakriti and Physiological Metabolic Regulation

Ayurvedic physiology locates digestive and metabolic competence in *Agni*, described at the level of the

gastrointestinal tract (*Jatharagni*), the tissues (*Dhatvagni*) and elemental transformation (*Bhutagni*).⁷ Impaired *Agni* produces *Ama*, incompletely transformed material that is held to obstruct the *Srotas* and to underlie both local and systemic disease. Constitution is linked to this capacity dispositionally: *Kapha* constitutions are described as having slower, heavier digestion, and *Pitta* constitutions as having intense digestion.^{5,7} *Agni* is an integrative functional concept rather than a synonym for any enzyme, hormone or signalling pathway, and equating it with, for example, basal metabolic rate or insulin sensitivity would import unwarranted precision. Its analytical value lies in directing attention to inter-individual variation in metabolic capacity, which can then be restated as a testable hypothesis.

The *Dhatu* framework describes seven tissues maintained by sequential transformation, among which *Meda Dhatu* (adipose tissue) occupies a pivotal position. *Charaka*'s account of *Prameha* identifies vitiated *Kapha* and *Meda* as the basis of pathogenesis, describes excessive loose fat, muscle and body fluids as contributory, and distinguishes the obese patient (*Sthula Pramehi*) from the lean one.⁸ This is a clinical observation rather than a mechanism, but a substantive one: adiposity, constitutional tendency and disordered metabolism are brought within a single account of failed tissue transformation.

Contemporary data offer partial, provisional support for the proposition that *Prakriti* marks physiologically meaningful differences. Prasher and colleagues compared whole-genome expression profiles and biochemical parameters among individuals at the extremes of *Prakriti* and reported group-level differences at both levels, describing the work as exploratory.⁹ An association between *Prakriti* and CYP2C19 genotype distribution has also been reported, with slow-metaboliser genotypes more frequent among *Kapha*-predominant participants, again presented as preliminary evidence.¹⁰ Such observations indicate that constitutional categories may correlate with measurable biological variation; they do not establish correspondence between any *Dosha* and a specific pathway.

Gut microbial ecology has been examined as a bridging phenotype. In a genetically homogeneous rural

population in western India, 135 healthy individuals classified into extreme *Prakriti* groups showed broadly similar community structure but differentially abundant taxa; *Prevotella copri* was enriched in *Kapha*-predominant women, whereas *Bacteroides vulgatus* and *Eubacterium rectale* were enriched in *Vata*-predominant women.¹¹ Studies of gut, oral and skin microbiomes have reported a small number of highly abundant taxa across constitutional types¹², and a comparative analysis of the *Prakriti* and *Sasang* systems described functional-level similarities between constitutionally analogous classes.¹³ Several implicated taxa are butyrate producers, which is mechanistically interesting given the role of short-chain fatty acids in energy and inflammatory regulation. Nevertheless, samples were small, dietary and geographical confounding was incompletely controlled, and independent replication is lacking; these remain hypotheses rather than findings.

Deha Prakriti and Metabolic Health

Classical Ayurvedic accounts of metabolic disease centre on *Sthaulya* and *Prameha*. *Prameha* is classified into twenty types — ten *Kaphaja*, six *Pittaja* and four *Vataja* — with the *Vataja* group, which includes *Madhumeha*, regarded as the most serious.^{7,8} *Kaphaja* types are associated with copious, turbid or sweetish urine without marked wasting; *Pittaja* types with heat, burning and coloured urine; and *Vataja* types with dryness, pain and emaciation. *Sthaulya*, the obese state, arises from excess *Meda* and *Mamsa* and is described as reducing vitality and predisposing to complications.⁷ Adiposity is thus embedded in the Ayurvedic pathogenesis of metabolic disease rather than treated as an incidental risk factor.

Equating *Prameha* with diabetes mellitus is nonetheless too crude. *Prameha* is a broader category of disordered urinary character and volume, and only its *Vataja* subset, particularly *Madhumeha*, approaches the modern entity; even that comparison is imperfect, since the classical classification rests on doshic pattern, chronicity and clinical course rather than on glucose measurement.

Empirical studies of *Prakriti* and metabolic risk are predominantly cross-sectional and hospital-based. Mahalle and colleagues assessed constitutional type together with conventional cardiovascular risk factors, inflammatory markers and insulin resistance in patients undergoing coronary angiography, reporting differences across *Prakriti* groups; the authors described the work as

among the first of its kind in an angiographically characterised population.¹⁴ The study was single-centre and modest in size, and constitutional assessment had no external reference standard, so causal inference is not possible. Gupta and colleagues reported an association between *Kaphaja* and *Kapha-Pittaja* constitutions and type 2 diabetes, examined alongside the MTHFR C677T allele.¹⁵ while another study used anthropometric and biochemical variation across *Prakriti* types to construct a clinical prediction model for diabetes.¹⁶ These results are compatible with the hypothesis that constitution co-aggregates with susceptibility; they do not show that constitution predicts incident disease.

Prospective evidence is only beginning to accrue. A cross-sectional study in the South Andaman district of India is examining the prevalence of metabolic syndrome and non-communicable disease risk factors and their relationship with *Prakriti* and socioeconomic status, and had enrolled just over half of a planned 1000 participants at the time of reporting.¹⁷ Until such cohort's report, the association between constitutional type and metabolic syndrome remains suggested rather than demonstrated.

Four strata of knowledge should be kept distinct. In classical Ayurvedic understanding, *Prakriti* predisposes to *Sthaulya* and *Prameha* through the interaction of *Dosha*, *Agni*, *Meda Dhatu* and *Srotas* — an internally coherent system of reasoning that has not been measured as such. In clinical observation, several cross-sectional studies report higher metabolic risk markers among *Kapha*-predominant individuals, with inconsistent adjustment for confounders. In mechanistic hypothesis, constitutional differences in substrate handling, inflammatory tone or microbial ecology are proposed as mediators, supported by fragmentary omics data. In established biomedical evidence, adiposity, insulin resistance, dyslipidaemia and hyperglycaemia are causally implicated in type 2 diabetes and cardiovascular disease, with well-defined preventive targets.¹ *Prakriti* has not yet entered this fourth stratum.

Prakriti-Based Diet and Lifestyle Personalization

Ayurvedic dietetics is organised around *Ahara*: the qualities of foods, their taste (*Rasa*), potency (*Virya*) and post-digestive effect (*Vipaka*), and the principle that opposite qualities pacify an aggravated *Dosha*. Warm, unctuous and nourishing foods are indicated for *Vata*;

cooling, non-pungent foods for *Pitta*; light, dry, warm and pungent foods for *Kapha*, with *Pathya* and *Apathya* lists governing combinations, timing and quantity. The same logic extends to *Dinacharya* (daily regimen), *Ritucharya* (seasonal regimen), *Nidra* (sleep), *Vyayama* (physical activity) and the regulation of mental states, so that *Prakriti* organises an entire lifestyle prescription rather than a dietary rulebook alone.

Several of these targets overlap with contemporary lifestyle medicine. The World Health Organization identifies a healthy diet, regular physical activity, weight maintenance and avoidance of tobacco as the principal means of preventing or delaying type 2 diabetes¹, and sleep duration, psychological stress and sedentary time are recognised modifiers of metabolic risk. Ayurvedic counselling addresses each of these domains, which makes constitution-based advice a potentially useful vehicle for preventive messages among populations that consult Ayurvedic practitioners.

Congruence, however, is not efficacy. Randomised comparisons of *Prakriti*-matched dietary or lifestyle advice against conventional advice using metabolic endpoints are scarce, and reported outcomes are largely behavioural, symptomatic or surrogate rather than glycaemic. It is plausible that advice framed within a familiar constitutional idiom improves adherence, and this is a testable proposition; but any metabolic benefit would depend on the substance of the advice, much of which — meal regularity, whole foods, moderation, physical activity — is not constitution-specific. *Prakriti*-based personalisation is therefore best regarded as a clinical heuristic for assessment and counselling, used in harmony with established preventive guidance¹, rather than as a validated intervention.

Contemporary Evidence and Ayurgenomics

Ayurgenomics denotes the systematic attempt to relate constitutional types to genomic, transcriptomic and, more recently, epigenetic and metabolic variation. Early work compared whole-genome expression with biochemical parameters across the extremes of *Prakriti* and reported differences at both levels.⁹ A study of extreme constitution types in a high-altitude setting found variants at *EGLN1*, a central component of hypoxia sensing, associated with high-altitude adaptation and unevenly distributed across constitutional groups.¹⁸ The largest study of its kind screened 3,416 healthy men aged

20–30 years, selected 262 with the highest dominance of a single *Dosha* for genome-wide single-nucleotide polymorphism analysis, and reported 52 variants of nominal significance, including a non-synonymous PGM1 variant associated with the *Pitta* phenotype.¹⁹

These results are often cited as demonstrating that *Prakriti* has a genetic basis, an inference weaker than it may appear. The analysis compared selected extremes rather than the mixed constitutions common in practice; no participant represented a pure single *Prakriti*; replication cohorts were absent; and the authors themselves cautioned that some signals could be artefacts of population stratification.¹⁹ Reviewers of the field have accordingly treated genomic correlates as provisional²⁰, and later appraisals continue to describe *Prakriti*-based translation as promising but immature.^{21,22} Constitutional classification may also track ancestry, geography or social factors rather than biology alone, which complicates interpretation of any association.

Biomarkers closer to metabolic function — inflammatory markers, insulin resistance indices, lipidomic and metabolomic profiles, and microbial composition — are more directly relevant to the present question than genotype, and the studies discussed earlier^{10,11,14} are best read as hypothesis-generating work in this direction rather than as demonstrations of constitutional biology.

Methodological Limitations and Research Gaps

Measurement is the critical constraint. A 2025 critical review of 64 *Prakriti* assessment tools reported across 94 studies found that most had not undergone dimensionality testing, test–retest reliability assessment or contextual validation, and few had been tested outside the populations in which they were developed, producing a high risk of developer bias; test–retest reliability had been examined for only two of twenty validated tools, and predictive and discriminant validity were rarely evaluated.⁶ If a construct cannot be reproduced by independent assessors using different instruments, associations with metabolic variables are difficult to interpret, because misclassification attenuates or distorts true relationships.

Empirical reliability studies reinforce the concern. Assessment of pulse, tongue and constitutional diagnosis produced agreement that was at best moderate and uneven across domains²³; a nested diagnostic study

within a randomised controlled trial found low to poor inter-rater agreement among experienced physicians for central classifications including *Prakriti* and *Agni*²⁴; and pilot validation of a prototype analysis tool reported significant inter-rater correlation for the *Vata* and *Pitta* constructs but weaker performance otherwise.²⁵ Studies also differ in the thresholds used to define constitutional dominance, one genomic analysis requiring more than 60% predominance of a single *Dosha*¹⁹, so that the same individual may be classified differently in different settings.

Design limitations compound measurement error. The clinical literature is dominated by cross-sectional, single-centre convenience samples, several restricted to men or to particular regions, with incomplete accounting for diet, activity, socioeconomic position and medication. A further conceptual problem deserves emphasis: the classical description of *Kapha* includes heaviness, density and slowness, so *Kapha* predominance may partly encode body build. An association between *Kapha Prakriti* and adiposity-related risk factors may therefore be partly tautological, and only carefully adjusted or prospective designs can separate the two. The field is also exposed to reification — treating *Dosha* as a substance to be measured and classical categories as equivalents of modern diagnoses.

The corresponding gaps are an absent consensus operational definition; no standard protocol combining textual criteria with modern instruments; few longitudinal cohorts with repeated constitutional and metabolic phenotyping; little external validation of omics findings; minimal data in children, older adults and non-Indian populations; scarce evidence that constitution-directed advice alters outcomes; and probable under-reporting of null results.

Future Directions

Standardisation of assessment is the first requirement. Tool development should follow explicit psychometric procedure: item generation from classical criteria, item reduction, exploratory and confirmatory factor analysis, dimensionality testing, internal consistency, test–retest reliability, and inter-rater agreement estimated by blinded assessors, followed by cross-cultural validation and testing by assessors who did not develop the instrument.⁶ Measurable correlates may be incorporated

alongside textual criteria, provided they enrich rather than replace the construct.

Longitudinal multicentre cohorts are needed to establish whether constitutional classification adds information beyond conventional risk models. Participants should be classified at baseline using a validated instrument and followed for incident dysglycaemia, dyslipidaemia, central adiposity and cardiovascular events, with constitutional status re-examined periodically to determine how much of the construct is stable and how much is acquired.

Mechanistic studies should be pre-registered and adequately powered, examining metabolomic, lipidomic and cytokine profiles, epigenetic marks and transcriptomic signatures in well-classified, diet-controlled groups, with multi-omics integration and replication in independent samples. Machine learning may assist in pattern detection but cannot substitute for external validation. Pragmatic randomised trials should then compare constitution-stratified counselling with usual care, using metabolic endpoints and adherence as co-primary outcomes, together with cost-effectiveness analysis, since stratification adds complexity to preventive services.

Should these steps yield a reproducible, biologically anchored phenotype, *Prakriti* could occupy a legitimate place in integrative preventive medicine — a low-cost, culturally congruent framework that prompts attention to individual variation — complementing rather than competing with established risk assessment, which will remain inaccessible to much of the world's population for the foreseeable future.

Conclusion

Deha Prakriti is a coherent classical construct describing stable inter-individual differences that Ayurvedic practice has long used to individualise diet, activity and therapy. Its underlying logic — that people differ systematically in how they process food and maintain tissue integrity — runs parallel to the direction of contemporary preventive medicine, and the classical accounts of *Sthaulya* and *Prameha* place adiposity at the centre of metabolic disorder.

The evidence nevertheless falls short of establishing *Prakriti* as a determinant or predictor of metabolic disease. Cross-sectional associations are suggestive but confounded and inconsistent; genomic and microbiome

findings are preliminary, largely unreplicated and derived from small, selected samples; and the assessment instruments on which such results depend have unresolved problems of reliability and validity. Neither dismissal nor promotion is warranted; disciplined investigation is.

Prakriti represents a potentially useful framework for individualised health assessment and a plausible vehicle for culturally grounded lifestyle counselling, but stronger methodological and clinical evidence — standardised classification, prospective cohorts and stratified intervention trials — is required before definitive biomedical conclusions can be drawn. Until then it is best understood as a hypothesis-rich clinical tradition rather than a validated metabolic biomarker.

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Conflicts of Interest

There are no conflicts of interest.

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