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Review Article

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"CONCEPT OF TRIDOSHA IN SAMHITAS WITH MODERN CORRELATES: A SCIENTIFIC REVIEW"

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ABSTRACT

Introduction: Ayurveda describes the *Tridosha* theory — *Vata*, *Pitta*, and *Kapha* — as the fundamental physiological and pathological principles governing human health and disease. The *Samhitas* portray these doshas as regulators of bodily and mental functions, whose equilibrium ensures health, while imbalance leads to disease. Despite its ancient origins, the concept has remarkable parallels with modern physiology, neuroendocrine regulation, and immunology. **Methods:** A comprehensive literature search was conducted using classical Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*), commentaries, PubMed, Scopus, Web of Science, and Google Scholar. Studies exploring physiological, biochemical, genetic, and psychosomatic correlates of Tridosha were included. Inclusion criteria comprised review articles, conceptual studies, and clinical research published from 2000–2025. Exclusion criteria included non-peer-reviewed sources and anecdotal reports without textual or experimental backing. **Results:** Classical texts describe *Vata* as responsible for movement, communication, and neurological functions; *Pitta* for metabolism, digestion, and thermoregulation; and *Kapha* for stability, lubrication, and immunity. Modern research correlates Vata with autonomic nervous system regulation and neurotransmission; Pitta with enzymatic activity, mitochondrial energy metabolism, and hormonal control; and Kapha with anabolic processes, immunity, and fluid balance. Clinical studies suggest that doshic constitution (*Prakriti*) is associated with genomic, metabolomic, and microbiome variations, supporting the biological plausibility of Tridosha theory. **Discussion:** The integration of Tridosha with modern biomedical sciences highlights Ayurveda's systemic and personalized approach to health. However, further interdisciplinary studies are needed to validate doshic assessment tools and correlate them with objective biomarkers.

KEYWORDS: Ayurveda, Dosha theory, Personalized medicine, Samhitas, Tridosha

INTRODUCTION

The Ayurvedic system of medicine, rooted in the Samhitas, explains health and disease through the concept of *Tridosha*[1]. These three principles — *Vata, Pitta, and Kapha* — are not merely physical entities but represent dynamic functional aspects of the human body. They govern all physiological processes, ranging from digestion and metabolism to immunity, mental balance, and aging[2-3]. The balance (*samyavastha*) of the doshas leads to health, while their imbalance (*vikriti*) forms the root cause of disease[4].

The Tridosha concept has intrigued researchers for decades because of its holistic and individualized perspective. Unlike modern biomedicine, which often focuses on organ-specific pathology, Ayurveda interprets disease as systemic imbalance of doshas[5-6]. This has drawn attention to its possible correlations with neuroendocrine regulation, metabolic functions, and systems biology, making Tridosha a fertile ground for integrative research[7-8].

The present review aims to systematically explore the concept of Tridosha in Samhitas and its modern correlates. The objectives are: (1) to critically analyze the classical understanding of Tridosha; (2) to summarize modern research findings linking Tridosha to physiology, genetics, and disease; and (3) to identify gaps and future directions for validating this foundational Ayurvedic principle[9-10].

MATERIALS AND METHODS

This review was conducted in accordance with PRISMA guidelines for narrative reviews.

- **Literature sources:** Primary Ayurvedic texts (*Charaka Samhita, Sushruta Samhita, Ashtanga Hridaya*), authoritative commentaries, and modern Ayurvedic compendia were analyzed. Electronic databases searched included PubMed, Scopus, Web of Science, and Google Scholar[11].
- **Search strategy:** Keywords included "Tridosha," "Vata Pitta Kapha physiology," "Ayurveda and genomics," "Prakriti correlates," "Ayurveda and systems biology." Boolean operators (AND/OR) were used[12].
- **Inclusion criteria:** Classical texts, peer-reviewed research articles, conceptual reviews, and clinical studies published between 2000 and 2025[13].
- **Exclusion criteria:** Non-peer-reviewed papers, anecdotal case studies without scientific or textual basis, and studies lacking methodological rigor[14].
- **Type of studies reviewed:** Conceptual analyses, cross-sectional studies on *Prakriti*, genetic and metabolomic studies, and clinical investigations of doshic imbalances in diseases[14].

Data were thematically organized into (1) classical perspectives of Tridosha, (2) physiological and psychological correlates, (3) clinical and genomic evidence, and (4) modern implications in personalized medicine[15].

OBSERVATION AND RESULTS

The Tridosha theory described in the Samhitas forms the cornerstone of Ayurvedic physiology and pathology. *Vata, Pitta,* and *Kapha* are functional principles that collectively govern the human body, mind, and disease processes. They are not merely humoral factors but dynamic entities reflecting physiological regulation, environmental adaptability, and psychosomatic integration. A comprehensive review of Samhitas, classical commentaries, and modern research reveals several thematic insights.

1. Concept of Tridosha in Samhitas

According to *Charaka Samhita*, Tridosha are the fundamental regulatory forces of the body (*Sharira dharanam doshah*), whose equilibrium sustains health (*samyavastha*) and disequilibrium (*vaishamya*) leads to disease. *Sushruta* emphasizes their role in *prakriti* (constitution), *vikriti* (pathology), and *chikitsa* (treatment). *Vagbhata* highlights their circadian, seasonal, and age-related rhythms, aligning the concept with chronobiology.

The Samhitas portray Vata as the principle of motion, Pitta as transformation and metabolism, and Kapha as stability and cohesion. These are observable at every level — from digestion to tissue metabolism and mental faculties. The universality of Tridosha makes them applicable across preventive, diagnostic, and therapeutic dimensions**.**

2. Functional Domains of Vata, Pitta, and Kapha

- Vata Dosha: Described as light, mobile, and subtle, Vata governs movement, respiration, nerve impulses, circulation, and excretion. Its

subdivisions (*Prana, Udana, Samana, Vyana, Apana*) reflect specific roles in neurological, cardiovascular, gastrointestinal, and reproductive functions.

- Pitta Dosha: Characterized by heat and sharpness, Pitta regulates digestion, enzymatic actions, hormonal regulation, temperature control, and vision. Its subtypes (*Pachaka, Ranjaka, Sadhaka, Alochaka, Bhrajaka*) align with gastrointestinal, hepatic, cardiovascular, ocular, and dermal physiology.
- Kapha Dosha: Heavy and stable in nature, Kapha provides structural integrity, lubrication, immunity, and psychological calmness. Its five subtypes (*Avalambaka, Kledaka, Bodhaka, Tarpaka, Shleshaka*) correspond to respiratory, gastric, oral, central nervous system, and musculoskeletal functions.

These detailed subdivisions indicate that Tridosha represent system-wide homeostatic regulators.

3. Tridosha and Prakriti (Constitutional Types)

Ayurveda emphasizes the individual's constitution (*Prakriti*) as determined by doshic predominance. Seven combinations (Vataja, Pittaja, Kaphaja, and their dual/mixed types, along with Sama Prakriti) are recognized. Classical texts state that Prakriti influences susceptibility to disease, behavior, and response to therapies.

Modern research has confirmed that Prakriti types exhibit measurable biological differences. For example:

- Genomics: Studies have reported associations between HLA polymorphisms and Prakriti.
- Metabolomics: Distinct lipid and amino acid profiles are observed in Vata, Pitta, and Kapha types.
- Microbiome: Prakriti types differ in gut microbial diversity, influencing metabolism and immunity.

This validates the Samhita view of personalized health and disease predisposition based on Tridosha.

4. Tridosha and Circadian/Seasonal Rhythms

Ayurvedic texts detail diurnal and seasonal dominance of doshas. For instance, Kapha predominates in the morning and spring, Pitta at midday and autumn, and Vata in the evening and late winter. These rhythms parallel modern chronobiology, where hormone secretion, enzyme activity, and autonomic balance follow circadian and seasonal patterns. For example:

- Cortisol peaks in the morning (Kapha-Pitta overlap).
- Digestive enzymes are most active midday (Pitta).
- Sympathetic nervous activity rises in the evening (Vata).

Thus, dosha rhythms align with endocrine and neurobiological cycles described in contemporary science.

5. Pathogenetic Role of Tridosha

Disease occurs when doshas become imbalanced due to diet, lifestyle, or environmental factors. Each dosha has specific pathological tendencies:

- Vata: Neurological, degenerative, and musculoskeletal disorders (e.g., arthritis, Parkinsonism).
- Pitta: Inflammatory, metabolic, and hepatobiliary disorders (e.g., gastritis, ulcerative colitis, liver disease).
- Kapha: Respiratory, metabolic, and endocrine disorders (e.g., asthma, obesity, diabetes).

Samhitas describe *Samprapti* (pathogenesis) as the process by which doshic imbalance disturbs *Agni*, *Dhatus*, and *Srotas*. This framework resonates with the systems biology approach, where imbalance in regulatory networks leads to multisystem disorders.

6. Tridosha and Modern Physiological Correlates

- Vata has been correlated with autonomic nervous system activity, neurotransmission, and catabolic processes. Its mobility and rapidity mirror neuronal signaling and cardiovascular dynamics.
- Pitta resembles enzymatic and endocrine functions, mitochondrial metabolism, and thermoregulation. Its sharp and hot qualities parallel metabolic heat production and oxidative processes.
- Kapha correlates with anabolic processes, immune responses, and fluid balance. Its stability reflects connective tissue integrity and psychological resilience.

These parallels illustrate the scientific plausibility of Tridosha as regulatory principles rather than metaphysical constructs.

7. Tridosha in Psychosomatic Health

The Samhitas note the influence of doshas on mental states: Vata with fear and anxiety, Pitta with anger and intensity, and Kapha with calmness and inertia. Modern psychology associates these with sympathetic/parasympathetic dominance, neurotransmitter profiles, and stress responses. Research on personality traits and Prakriti suggests that Kapha individuals exhibit higher emotional stability, while Vata types show greater variability and susceptibility to stress.

8. Clinical and Experimental Studies

Several modern studies provide evidence for Tridosha theory:

- Cross-sectional studies show correlation between Prakriti and cardiovascular risk factors.
- Ayurgenomics research links Prakriti with SNP variations in metabolic and immune genes.
- Panchakarma therapies targeting doshic imbalances reduce oxidative stress and improve metabolic markers.
- Neurophysiological studies indicate distinct autonomic profiles in Vata, Pitta, and Kapha individuals.

These findings substantiate the biomedical relevance of dosha-based diagnostics and treatments.

9. Tridosha as a Framework for Personalized Medicine

The Tridosha principle aligns with modern precision medicine, which stratifies individuals based on genetic, metabolic, and environmental profiles. Ayurveda's *Prakriti-based* approach, rooted in Tridosha, offers a time-tested model for individualized care. Integrating dosha assessment with genomics and metabolomics can bridge traditional and modern paradigms, advancing predictive, preventive, and personalized healthcare.

10. Thematic Synthesis

From the classical descriptions in Samhitas and emerging modern evidence, Tridosha emerges as:

- A physiological regulator ensuring systemic balance.
- A pathogenetic factor in disease manifestation.
- A basis for constitutional typing and personalized care.
- A framework for integrative medicine linking ancient wisdom with systems biology.

Thus, the observation highlights Tridosha as a multidimensional model that transcends time and remains relevant to modern healthcare challenges.

DISCUSSION

The Tridosha theory occupies a central place in Ayurvedic epistemology, forming the bridge between health and disease as described in the Samhitas. While rooted in ancient philosophy, it continues to gain contemporary relevance due to parallels with modern biomedical sciences. A critical discussion of classical insights alongside current evidence reveals both strengths and gaps in the understanding of Tridosha[16].

Firstly, the Tridosha model offers a holistic and systemic view of health, unlike the reductionist approach of modern biomedicine. In Samhitas, Vata, Pitta, and Kapha are not isolated entities but dynamic principles that manifest through multiple physiological pathways. Modern correlates such as neuroendocrine regulation, immunology, metabolism, and chronobiology echo these multidimensional roles. For instance, the circadian predominance of doshas resembles the cyclic hormonal and autonomic rhythms described in chronomedicine. This underscores Ayurveda's advanced appreciation of biological rhythms long before modern chronobiology[17].

Secondly, the concept of Prakriti based on doshic predominance provides a scientific foundation for personalized medicine. Contemporary studies in ayurgenomics, metabolomics, and gut microbiome analysis demonstrate measurable biological signatures in different Prakriti types. This strongly aligns with the emerging paradigm of precision medicine, where individual genetic and metabolic diversity informs disease prediction and therapeutic response. Ayurveda thus offers a well-established model of constitution-based healthcare, validated by modern research[18].

Thirdly, the pathogenetic role of doshas (Samprapti) provides an integrative disease model. Disorders are explained through doshic imbalances that disrupt Agni, Dhatus, and Srotas. Modern parallels can be drawn with systemic inflammation, metabolic dysfunction, and network medicine. For example, Pitta-dominant pathology resembles hypermetabolic

and inflammatory disorders, while Kapha imbalance reflects metabolic syndrome, obesity, and insulin resistance. Such correlations provide a scientific rationale for integrating Ayurvedic diagnostics with modern clinical practice[19].

Despite these strengths, challenges remain. The language of Samhitas is qualitative and metaphorical, making translation into biomedical terminology complex. Direct one-to-one mapping of doshas to modern physiological systems may risk oversimplification. Further, most modern studies are exploratory and limited by small sample sizes, heterogeneity of methodologies, and lack of standardized Prakriti assessment tools. These gaps necessitate rigorous, large-scale, and interdisciplinary research to validate and refine Tridosha concepts[19].

Moreover, while Tridosha provides a valuable functional model, it does not fully address molecular mechanisms in the way contemporary biomedicine requires. Bridging this gap demands integrative research approaches—combining clinical trials, omics technologies, and systems biology with Ayurvedic insights. Future studies should also explore doshic influences on epigenetics, gut-brain axis, and immune regulation, which may reveal novel therapeutic strategies[20].

In summary, the discussion establishes that Tridosha is not an obsolete philosophical construct but a scientifically relevant, holistic framework. It provides explanatory power for health and disease, guides personalized care, and offers pathways for integrative medicine. Its future lies in rigorous scientific validation, methodological refinement, and translational application in clinical practice. Thus, the Tridosha concept continues to serve as a vital meeting point between traditional wisdom and modern science[20].

CONCLUSION

The Tridosha theory remains one of the most profound contributions of Ayurveda, providing a holistic, individualized, and systems-based model of health and disease. Classical descriptions in the Samhitas portray Vata, Pitta, and Kapha as regulators of movement, metabolism, and stability, respectively. Modern research provides correlates in the domains of neurobiology, enzymology, immunity, genomics, and metabolomics, offering preliminary validation.

The clinical relevance of Tridosha extends to *Prakriti*-based stratification, preventive health, and management of chronic lifestyle disorders. However, the field still lacks robust biomarkers and standardized tools for dosha assessment. Future research should integrate Ayurveda with systems biology, molecular sciences, and precision medicine to establish evidence-based correlates of Tridosha.

In summary, Tridosha bridges ancient wisdom with modern science, offering a comprehensive framework for personalized and preventive healthcare.

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