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Concept of *Tridosha* and homeostasis regulation: A *Kriya Sharir* interpretation

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Abstract

Ayurveda defines health as a state of equilibrium of *Dosha, Dhatu, Mala,* and *Agni*. Among these, *TriDoshas Vata*, *Pitta*, and *Kapha* act as the primary regulators of all physiological functions. Modern physiology defines health in terms of homeostasis i.e. the maintenance of a constant internal environment. Though originating from different backgrounds, both systems focuses on balance, regulation, and adaptive mechanisms. Relevant literature was searched from PubMed, Google Scholar, and Scopus using keywords related to *TriDosha*, *Vata*, *Pitta*, *Kapha*, homeostasis, and physiology. Relevant research articles, review articles, and classical Ayurvedic texts were selected and narratively synthesized. This review explores the conceptual and functional correlation between *TriDosha* equilibrium and homeostasis by analysing classical Ayurvedic texts and modern physiological principles. *Vata* is correlated with neural and regulatory mechanisms, *Pitta* with metabolic and enzymatic activities, and *Kapha* with structural integrity and anabolic processes. Understanding *TriDosha* through the lens of homeostasis offers an integrative

framework that enhances physiological knowledge, clinical assessment, and preventive healthcare strategies.

Keywords: *TriDosha*, Homeostasis, Kriya Sharir, Ayurveda.

Introduction

Ayurveda, the ancient science of life, focuses on maintaining health rather than treating illness.[1] According to Ayurveda, Swasthya (health) is defined as the balance of *Dosha*, Dhatu, Mala, and Agni, as well as mental, sensory, and spiritual well-being [2]. *TriDosha* (*Vata*, *Pitta*, and *Kapha*) are considered the fundamental physiological principles that govern all human functions [3]. Modern medicine, on the other hand, explains health and survival using the concept of homeostasis, which is defined as the body's ability to maintain a steady internal environment despite changes in external situations [4]. This concept was first introduced by Claude Bernard and then developed by Walter Cannon.[5,6] Homeostasis in Ayurveda is referred to as Samyavastha. It represents the equilibrium of the *Dosha*s, which is crucial for maintaining health. Disruption in this balance leads to disease. Although Ayurveda and modern science use distinct terminologies and approaches, both systems emphasize the need of equilibrium to maintain a healthy body . This review aims to study and correlate *TriDosha* with homeostatic mechanisms, bridging traditional Ayurvedic physiology with modern scientific understanding. This narrative review is based on Ayurvedic texts such as Charaka Samhita, Sushruta Samhita, and Ashtanga Hridaya, modern physiology textbooks and review articles on homeostasis, neuroendocrine regulation and metabolism.

Methodology

Relevant literature was searched from PubMed, Google Scholar, and Scopus using keywords such as *TriDosha*, *Vata*, *Pitta*, *Kapha*, homeostasis, and physiology. Relevant research articles, review articles, and classical Ayurvedic texts were selected. The information was extracted and narratively synthesized to understand the relationship between *TriDosha* and physiological homeostasis.

Concept of *TriDosha*

TriDosha are functional entities and according to Ayurveda, *Vata*, *Pitta*, and *Kapha* are generated from the fundamental unit called as Panchamahabhutas i.e. *Vata* from in Vayu and Akasha Mahabhut, *Pitta* from Agni Mahabhut, and *Kapha* from Prithvi and Jala Mahabhut.[7] Similarly, the human body originates from basic cellular

units, where cells group together to form tissues, tissues organize into organs, organs integrate into systems, and collectively constitute the complete human organism [8]. Just as *TriDoshas* act as the fundamental functional principles at the systemic level, cells represent the fundamental structural and functional units at the microscopic level.

The functions of the cell may be interpreted through the lens of *TriDosha*. *Vata*, characterized by movement and regulation, may be correlated with cellular transport, exchange, and signaling processes, reflecting its Chala and Pravartaka Gunas [9]. *Pitta*, associated with transformation and metabolism, may be correlated with enzymatic reactions, cellular energy metabolism, and biochemical turnover, reflecting its *Agneya* and *Pachaka Gunas* [10]. *Kapha*, characterized by stability, structure, and storage, may be correlated with maintenance of cellular structural integrity, organization, and homeostatic stability, reflecting its Sthira, Guru, and Sneha Gunas [11].

Health is preserved when these *Dosha*s are in *Samyavastha* (balance), whereas imbalance *Vaishamya* (imbalance) leads to illness [12]. *Dosha*s are regulatory forces that respond to both internal and external stimuli such as *Aahar* (diet),*Vihar* (lifestyle), *Kaal* (climate), *Vaya* (age), and *Mansik Awastha* (mental state). This adaptive nature of the *TriDoshas* closely matches how the body maintains and regulates its normal functions.

Among *TriDoshas* ,*Vata Dosha* is considered the most important in the *TriDoshas* because of its critical role in regulating, coordinating, and initiating all physiological actions in the body.[13] According to Ayurveda, *Vata* is the primary motive factor responsible for movement, communication, and control, without it, *Pitta* and *Kapha* are functionally inactive. Aacharya Charaka highlights this dominance by stating it as"*Tandra-yantradharaha*", suggesting that *Vata* dominates all bodily functions and maintains regular *Sharira Kriya* [14]. From a modern physiological point, *Vata* can be associated with the body's regulatory and control systems, including the neurological system, neuromuscular coordination, autonomic regulation, and transport mechanisms that maintain homeostasis. *Vata*'s numerous roles are explained through its five subtypes- *Prana, Udana, Samana, Vyana,* and *Apana,* each with a specific place and function

Pitta Dosha is responsible for transformation and metabolism in the human body. According to Ayurveda, *Pitta* is the systemic

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indicator of Agni and is responsible for digestion, metabolism, thermogenesis (metabolic heat production involved in heat temperature regulation), vision, intelligence, and complexion [15]. Aacharya Sushrut clearly compares *Pitta* with Agni, emphasizing its important role in supporting life[16]. *Pitta*'s physiological functions are explained by its five subtypes, *Pachaka*, *Ranjaka, Sadhaka, Alochaka,* and *Bhrajaka* [17].

Kapha Dosha provides structure and stability in the body, and it is essential for sustaining proper physiological activities by giving *Sthiratwa* (stability), *Kledan* (lubrication), *Puran* (healing property), Bala (strength), and Upachaya (growth). According to modern physiological theory, *Kapha* can be associated with anabolic processes, immunological control, and fluid and structural maintenance.[18] Similar to *Vata* and *Pitta Dosha*, *Kapha Dosha* also have five types- *Kledaka, Avalambaka, Bodhaka, Tarpaka,* and *Shleshaka* .[19]

Concept of Homeostasis in Modern Physiology

In modern physiology, homeostasis refers to the body's ability to maintain a steady internal environment, which is necessary for good cellular and systemic function. It includes regulating critical parameters such as body temperature, blood glucose levels, pH, electrolyte balance, blood pressure, and oxygen concentration. This regulation is accomplished through a coordinated procedure in which specialized sensors identify deviations from normal values, control centers such as the brain and endocrine glands integrate and process this data, and effectors act to restore balance, primarily through feedback mechanisms (negative and positive feedback mechanism)[20]. Homeostasis is primarily controlled by the neurological, endocrine, and immunological systems, as well as renal and respiratory regulation. It represents a equilibrium in which constant modifications are made in response to internal and external changes.[21]

TriDosha and homeostatic regulation -

Homeostasis consists of various physiological parameters and regulatory mechanisms like body temperature, pH balance etc., that maintain internal balance, and can be functionally correlated with the actions of *Vata*, *Pitta*, and *Kapha*.

Body temperature is mainly regulated by *Pitta Dosha*, by it's *Ushna Guna* (metabolic heat). *Vata Dosha (Vyan Vayu)* helps in

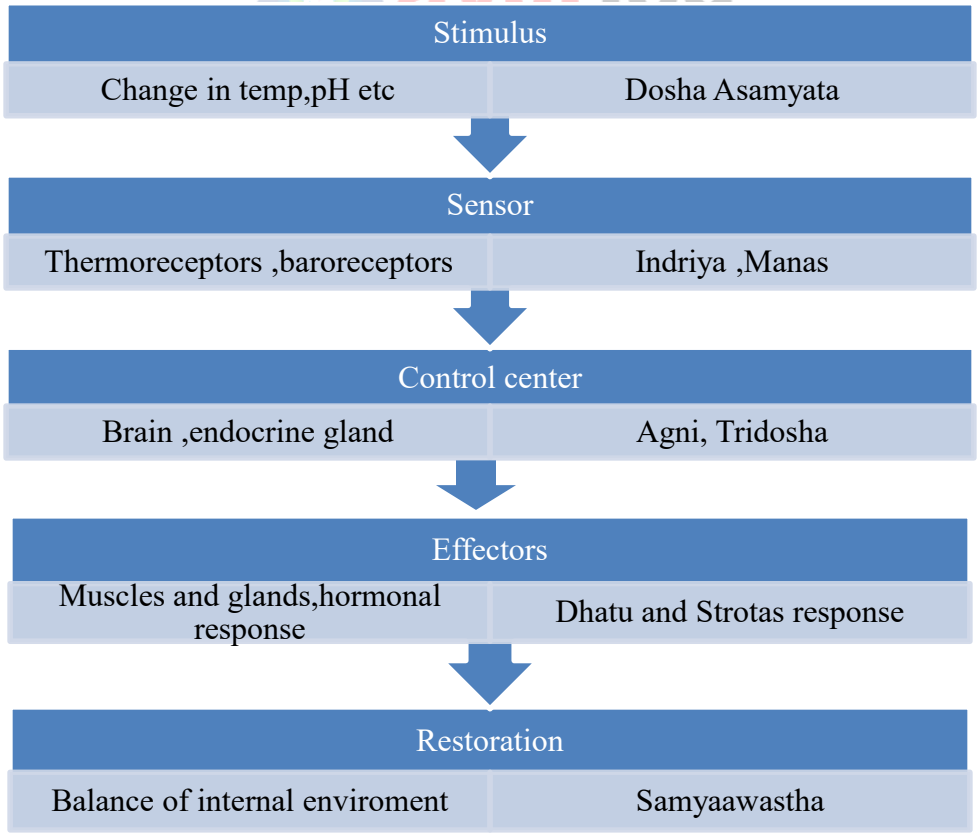
circulation and distribution of heat, while *Kapha Dosha* provides cooling and stability. Imbalance of *Pitta* causes *Jwar* (fever), *Kapha* lowers heat(hypothermia). pH (acid–base balance) is governed primarily by *Pitta Dosha* due to its acidic and metabolic nature. *Kapha Dosha* acts as a buffer because of its *Sheeta* and *Snigdha* Guna, while *Vata Dosha* helps in transport and elimination. *Pitta* aggravation may leads to acidic nature in blood (acidosis) and *Kapha* to alkalinity. Blood glucose level is regulated mainly by *Kapha Dosha*, which controls storage and nourishment. *Pitta Dosha* aids digestion and utilization through *Agni*, and *Vata Dosha* mobilizes stored glucose. *Kapha* imbalance may leads to disease like *Prameha*. Blood pressure and circulation are controlled mainly by *Vata Dosha*, especially Vyana Vayu [22]. *Pitta Dosha* maintains blood quality with the help of *Ranjak Pitta*, while *Kapha Dosha* provides vessel stability. Excess *Pitta* can lead to hypertension, and excess *Kapha* can lead to vascular obstruction. Fluid and osmotic balance is maintained mainly by *Kapha Dosha* due to its Jala dominance. *Vata Dosha* governs fluid movement, and *Pitta Dosha* regulates thirst and metabolism. Electrolyte balance is primarily governed by *Vata Dosha*, which controls ionic movement and nerve conduction. *Kapha Dosha* maintains tissue stability, and *Pitta Dosha* supports cellular metabolism. Blood gases (O_2 and CO_2) are regulated mainly by Prana *Vata*, which controls respiration. *Pitta Dosha* helps in cellular oxygen utilization, and *Kapha Dosha* maintains lung structure. Vitiated *Vata* causes *dyspnea*, *Kapha* congestion, and *Pitta* inflammation. Excretion of waste products is regulated primarily by Apana *Vata*, which governs elimination. *Pitta Dosha* forms metabolic wastes, and *Kapha Dosha* maintains lubrication of excretory channels.

Feedback mechanisms can also be understood through Ayurvedic concepts like - Negative feedback mechanism example-When Agni is strong, hunger increases and food intake occurs, which in turn satisfies Agni and prevents further intensification. Conversely, when Agni is weak, reduced hunger limits intake, preventing overload-this maintains metabolic balance. Positive feedback mechanism example-Increased *Kapha Dosha* causes heaviness, mucus accumulation, and obstruction of channels (*Srotorodha*). Obstructed channels further promote *Kapha* accumulation, resulting in conditions like obesity, diabetes (*Prameha*), or sinus congestion-again a reinforcing cycle.[23]

Comparison of Components of Homeostasis with Ayurveda

In modern physiology, homeostasis is maintained through three basic components, receptors, control centers, and effectors, which together regulate internal balance through feedback mechanisms.[24] Ayurveda, explains regulation of the body through the functional coordination of *TriDosha*, Agni, Strotas, and Dhatu, which collectively maintain equilibrium. The receptor or sensing component of homeostasis can be correlated with Indriya or Manas, which perceive internal and external changes and initiate adaptive responses as shown in Fig 1. The control center is functionally comparable to Agni and *TriDosha* balance. The effector component resembles to the actions of *Dosha* at the level of Dhatu and *Strotas*, producing appropriate physiological responses to restore the *Samyaawastha* (healthy state of body).

Figure 1. Comparison of homeostatic mechanisms in modern physiology and Ayurveda, illustrating the functional relationship between the respective regulatory components



Discussion

The present review focuses on the conceptual and functional similarities between the Ayurvedic *TriDosha* theory and the modern physiological concept of homeostasis. Although Ayurveda and modern science have different approaches, both systems place a strong emphasis on maintaining internal balance as the foundation of health. Homeostasis is a equilibrium that is maintained by constant modifications to physiological systems such as temperature, metabolism, fluid balance, and neural-hormonal regulation. *TriDoshas* (*Vata*, *Pitta*, and *Kapha*) are functional principles that keep this balance. In Ayurveda, health (*Swastha*) is defined as the balance of *Dosha*s, Dhatus, Agni, and Malas, basically homeostasis. Ayurveda explains this balance as the dynamic balance of *Vata*, *Pitta*, and *Kapha*, but modern physiology depicts it as coordinated regulation processes involving neuronal, endocrine, immunological, and metabolic systems. *Vata Dosha* serves as the major regulatory and coordinating principle, closely resembling the neurological and autonomic systems that control communication, movement, and adaptive reactions. Its five subcategories manage respiration, circulation, digestion, excretion, and neuromuscular coordination, similar to integrated homeostatic control systems in modern physiology.

Pitta Dosha denotes transformation and metabolism, which includes enzymatic activity, endocrine regulation, thermoregulation, and cell metabolism. *Pitta*'s expression of Agni is consistent with the understanding of metabolic rate and energy balance. *Pitta* function is essential for efficient digestion, food assimilation, and cognitive clarity. *Kapha Dosha* promotes structure, stability, sustenance, and immunity by supporting anabolic processes, tissue integrity, mucosal protection, and immunological defence systems. It balances *Vata*'s active character and *Pitta*'s transformational role. All three *Dosha*s function simultaneously, just as the neurological, endocrine, and immunological systems do in modern biology. Overall, this integrative research reveals that *TriDosha* functions similarly to homeostasis.

Conclusion-

TriDosha and homeostasis are two complementary concepts that describe the maintenance of internal equilibrium. *Vata*, *Pitta*, and *Kapha* act as regulating principles, similar to modern homeostatic systems that

govern the stability in body .Understanding *TriDosha* through the lens of homeostasis makes an important link between Ayurveda and modern physiology. Further study can improve the scientific understanding and practical use of Ayurvedic physiological principles in modern medicine.

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