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Samayogavahitvam - The concept of equilibrium and homeostasis in Ayurveda

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ABSTRACT

Ayurveda is a science that gives immense importance to homeostasis among *Doshas*, *Dushyas*, *Agni* and all other entities in body. Health is attained through this equilibrium and disease by its disruption. The Western counterpart of homeostasis is also comparable to that of *Ayurveda*. This article endeavors to identify the variables influencing homeostasis in *Ayurveda* and their role in health and disease, and also addresses the *Ayurvedic* methods to maintain this equilibrium.

Key words: *Samayogavahitva*, *Samayoga*, *homeostasis*

INTRODUCTION

The scientific world today, is deeply engaged in exploring the intricacies of the mechanisms of life. The response of life towards various external factors has always been a topic of vast research globally. The homeostatic balance of the human body and its *modus operandi* in health and disease have been one among them. The knowledge of homeostasis has evolved from that of an organism to the cellular and component level.^[1]

Ayurveda, in most contexts, has adopted the pedagogy of minimalism and abstraction. It explains life, health and disease in the language of *Malas*, *Dhatu*s, and *Doshas* which are increasingly abstract and minimal in

nature. The equilibrium of these three components forms life and health, whereas the imbalance of the same leads to disease and death. This equilibrium or homeostasis (the ability to maintain a stable internal environment) is what is addressed as *Samayogavahitva* in *Ayurveda*. Various extrapolations of the same concept are possible, which can contribute in plenty to the genre of life sciences. The phenotype based (*Prakriti* based) variability in homeostatic mechanisms is one such example.

Homeostatic imbalance has also been understood as a significant cause in many of the diseases that are encountered today.^[2] The role of various factors like micro-organisms in homeostasis are also subjects of large-scale studies.^[3] Hence, the knowledge in Ayurveda about the same needs to be re-explored and compared with the current understanding of the topic.

MATERIALS AND METHODS

The Ayurvedic texts, classical and contemporary, were critically examined for metabolic indicators and pathways representing and regulating homeostatic mechanisms. The research happening in Ayurveda and Western medicine were also studied and evaluated. Keywords like '*Svasthya*', '*Arogya*', '*Bala*', '*Ojas*', were searched for. Various mentions and interpretations pertaining to the concept, features, and maintenance

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of *Samayoga*, or homeostasis were discerned. The factors influencing them were elicited. The variables were analyzed within the framework of Western understanding of homeostasis.

RESULTS

Concept of *Samayoga*

In Ayurveda texts, the term *Samayogavahitva* is first seen in *Caraka Samhita* wherein the author describes human body as the seat of soul, made of the derivatives of the five basic elements in equilibrium.^[1] The commentary by *Cakrapani* says that this equilibrium or *Samayogavahitva* is the state in which these elements are in conglomeration in appropriate amounts (*Sama, ucita*), leading to health.^[2] This holds equally good when the role of *Doshas, Dhatus* and *Malas* in the maintenance of health is explained. In this context, the word *Sama* means that the components carry out their functions properly.^[1]

Features of *Samayoga*

Samayoga of *Doshas, Dhatus* and *Malas* are understood by the features of health. Of the classic Ayurvedic texts, *Sushruta* has defined the term *Svastha* denoting healthy individual. *Svastha* is the one who has an equilibrium of *Doshas, Agni*, functioning of *Dhatus* and *Malas*, and pleasant soul, senses and mind.^[1]

Kashyapa, has elucidated the same, stating *Arogya Lingani*^[1] (symptoms of health), which are

- Desire in food/Appetite,
- Comfortable digestion of the food consumed,
- Proper evacuation of urine, faeces, and flatus,
- Lightness of body and senses,
- Pleasantness of organs,
- Proper sleep followed by comfortable waking up,
- Attainment of strength, complexion, and longevity,
- Pleasantness of mind,
- Equilibrium of *Agni*.

Factors influencing *Samayoga*

Homeostasis of the body is influenced by a multitude of factors. They are;

- **Ahara:** Food and food habits (time, quantity and conduct) play vital role in maintaining the equilibrium of *Doshas, Dhatus* and *Malas*.
- **Vihara:** The regimen, primarily physical activities and sleep are pivotal in influencing the metabolism, and hence the equilibrium of the body.
- **Agni:** The metabolic mechanism of the body is responsible for the appropriate formation of *Dosha-Dhatu-Malas* in quality and quantity. It is also the fulcrum of health, vitality, immunity and homeostasis.^[1]
- **Desha Kala Vayah Prakriti:** The place, time (on daily, seasonal basis), age and phenotype also influence the homeostasis and incline them towards a particular dosha.
- **Bala:** It is the final outcome of proper metabolism, represented by vitality. It is an indicator of *Samayogavahitva* too.^[1]
- **Satva:** The totality of mental status and welfare is denoted by the term. It influences all physical activities including metabolism in gross.^[1]
- If the process of homeostasis and factors affecting it were to be conceptualized pictorially, it would be as follows (Fig. 1).

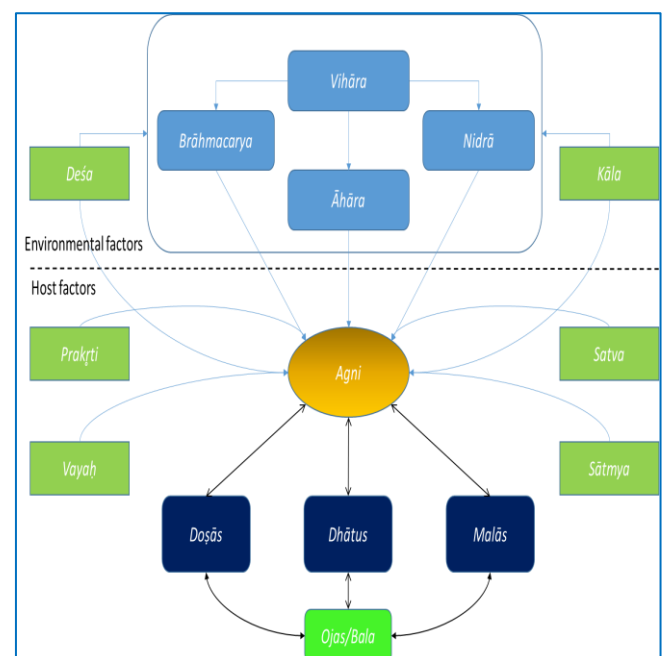


Fig.1: Homeostasis in Ayurveda

The normalcy of these factors is indispensable for homeostasis and health.

Maintenance of Samayoga

In Ayurveda, equal importance is given to the preservation of this equilibrium and its re-establishment (once lost). To preserve the homeostatic ability, daily regimen (*Dinacharya*),^[1] seasonal regimen (*Ritucharya*),^[2] proper execution of natural urges like defecation^[2] micturition, vomiting, etc., proper diet, rejuvenating therapies (*Rasayana*),^[2] aphrodisiac therapies (*Vajikarana*)^[2] are advised. When the homeostasis is impaired giving rise to multiple spectra of diseases, therapies specific to concerned diseases are adopted.

Homeostatic system and its variables - The Western view

In the purview of the Western system of medicine, the homeostatic mechanism is currently elicited on cellular and component levels. The homeostatic mechanism, at the cellular level, is responsible for various manifestations. In a nutshell, a homeostatic system basically comprises of the following variables (Table 1)^[2]

Table 1: Variables of a homeostatic system

Variable	Description
Stock (Regulated variables)	A system’s variable representing quantity (Variables maintained at stable levels by homeostatic circuits)
Flow (Controlled variables)	Variable that influences stock (Variables manipulated in order to maintain the regulated variable within desired range).
Set point	An optimal value of regulated variable; divergence from set point value activates homeostatic control mechanisms
Error value X-X’	The difference between set point and the actual value of the regulated variable
Controller	A component of the homeostatic circuit monitoring value of regulated variable

Plant	Effector component of the homeostatic circuit activated by the Controller to change the value of regulated variable
Controller gain	A characteristic of Controllers that determines the amount of signal produced in response to given error value X-X’
Gain tuning of Controller	A method to optimize Controller performance

DISCUSSION

Ayurveda presents homeostasis or *Samayogavahitva* in the language of *Agni*, which regulates *Dosha*, which in turn regulate *Dhatus* and *Malas*. *Doshas* also exert their influence on *Agni*. The outcome of proper biotransformation, *Bala* or *Ojas*, is the indicator of proper homeostasis (*Samayoga*). It is similar to health where the *Doshas*, *Dhatus* and *Malas* function properly. But the ‘proper’ is different for different individuals. For example, two people of the same age group and height need not have the same appetite or bowel habits, when healthy. Hence the term *Sama* needs to be explored logically. The baseline of normalcy in an individual is laid by his *Prakriti*. Hence, *Sama* shall more aptly be considered as the state where the physiology of individual lies within the range of normalcy allowed by his *Prakriti*. This must be the reason why a set of scholars opine that there are two sets of *Doshas* in the human body, *Prakrita* and *Vaikrita*. *Prakrita Doshas* are responsible for the formation of *Prakriti*, they originate along with the body. They play significant role in the formation of the *Vaikritadoshas* which vary in physiology and pathology. A derangement in the *Prakrita Doshas* happen when the individual nears death.^[2]

In management of *Samayoga*, the *Ayurvedic* method is primarily

- addressing symptoms (only if the symptom is severe and requires immediate intervention),
- correcting metabolism (*Agni*) and^[2]
- restoring optimal biotransformation, which would result in correction of deranged homeostasis (represented by restoration of *Bala* and *Ojas*). The

corrected homeostatic ability itself can arrest the pathogenesis and cure the disease.^[3]

When *Ayurvedic* variables of *Samayogavahitva* or homeostasis are analyzed using the Western framework, they show similarity with the following components.

Table 2: Ayurvedic counterparts of homeostatic variables

Variable	Ayurvedic counterpart
Stock (Regulated variables)	<i>Dhatus</i> (maintained at optimum level)
Flow (Controlled variables)	<i>Malas</i> (expelled or retained in order to maintain the <i>dhatus</i>)
Set point	Normalcy-range set by one's <i>Prakriti</i> . It decides the extent of 'Sama' in terms of <i>Dosha-Dhatu-Malas</i> .
Error value $ X-X' $	The extent of deviation from <i>Prakriti</i> .
Controller	<i>Agni</i> , which regulates the formation of <i>Dosha-Dhatu-Malas</i> .
Plant	<i>Doshas</i> , that are formed in <i>Avasthapaka</i> , from the food and regimen, on transformation by <i>Agni</i> . <i>Doshas</i> form the 'plant' component due to its ability of vitiate (<i>Dushanat</i>), and initiate (<i>Arambhakatva</i>).
Controller gain	Mainly influenced by Food, Physical Activities, and Sleep
Gain tuning of Controller	Daily, Seasonal regimen, Urge regulation, Rejuvenation, Aphrodisiac therapy, disease specific intervention.

CONCLUSION

The knowledge in *Ayurveda* has been enunciated in such a way that it is ready-to-use for mediocre students in practice, and they shall be innovated by the intelligent ones and implemented in multiple domains. The emerging of branches like *Ayurgenomics* are indicative of the footsteps *Ayurveda* can make in the field of healthcare, especially preventive, predictive and precision medicine. The wisdom within it has to be unfurled, appropriated (to the contemporary times via research), and globally disseminated (through quality publication).

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