



Review Article

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CHRONOBIOLOGICAL SIGNIFICANCE OF *KALA* IN AYURVEDA AND ITS THERAPEUTIC UTILITY

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Abstract

According to Ayurveda, *Kala* is considered to be one of the four main principles that influence the various stages of birth, growth, decay and death of all living things, as well as the principle of *Parinama*. Ayurveda recognizes that all things in the universe will undergo changes due to the passage of time as dictated by specific laws of change. Ayurveda categorizes time as either *Kshanadikala* or *Vyadhyavasthakala*. Researchers suggested strong correlations between effects of circadian rhythms on *Dosha* preponderance. In general, *Kapha* predominance occurs during the construction or repair of body tissues whereas *Pitta* predominance occurs during metabolic and enzymatic activity and formation of *Vata* dominant processes. Thus *Dosha* vitiation or disease occurrence greatly affected by *Kala*. Considering this fact Ayurveda suggested concepts of *Dinacharya* and *Ritucharya* to establish preventive health care practices. *Kala* is essential to determining the prognosis of a sickness and implementing correct therapeutic measures accordingly. Similarly *Oushadhasevana Kalas* is very essential to acquire maximum therapeutic benefits of medicines. *Kala* is therefore inextricably linked to human life in both Ayurvedic preventive and therapeutic contexts.

Key-Words: *Kala, Dosha, Chronobiology, Circadian Rhythm, Chronotherapeutic*

Introduction

Circadian rhythm is defined as a biological cycle that regulates the majority of critical physiological functions such as sleep, secretion of hormones, metabolism and feeling of hungry, etc. This biological rhythm is primarily determined by the suprachiasmatic nucleus with input from environmental stimuli such as light, darkness and etc. Each of the three *Doshas* affects bodily processes at different times of day; *Kapha* predominates early morning hours; *Pitta* predominates at-midday; and *Vata* predominates late evening demonstrating the ability for body functions to connect and have similar rhythms and cycles with nature. In addition, Ayurveda places a great deal of emphasis on the role of *Kala* in deciding one's health, resulting in the definition of disease, progress of an illness and how best to treat it [1-4].

New discoveries in the field of chronopharmacology and chronotherapeutics have shown that both efficacy and safety of medicines occur differently depending on when the medicine is taken. Drug responsiveness is also influenced by biological timing; thus consideration of circadian synchronization during treatment is very important. Ayurvedic chronotherapy, especially as it relates to the *Aushadha Sevana Kala* principle can be correlated with the contemporary chronobiological science. It is believed that seasonal fluctuations, the time of day, and the digestive condition all affect the dominance of *Doshas* and physiological processes. Therefore this time related variation affects prevalence of disease and their treatment [4-6].

Role of *Kala* in Physiological Health:

Classical Ayurvedic literature states that *Kala* governs all aspects of our physiological health from digestion, metabolism and regeneration of tissues. The construction of our three *Doshas* is cyclical & synonymous with these same temporalities on a daily, seasonal and ageing basis. In addition to daily shifts, each of the three *Doshas* also builds up in a cycle over the course of the seasons *Kapha* builds up in winter; *Pitta* builds up during the rainy season and *Vata* during summer. The time based cycles demonstrate why *Dinacharya* and *Ritucharya* are critical preventive measures for maintaining balance between the three *Doshas* and ensuring optimal health.

Similarly, Ayurveda recognizes that the aging process is structured & timed in a cyclical manner with respect to an individual's age. It also explains why there are more cases

of respiratory illness in children, metabolic illnesses in adults and degenerative diseases in the elderly. Thus, Ayurveda sees the aging process and the progression of illness as time regulated biologically based processes [5-7].

***Kala* and offspring**

In the process of development from the moment of conception, the concept of *Kala* has a significant role in developing *Prakriti*, *Ayu* and overall development. In order for conception to occur successfully, the four factors required for conception; *Ritu*, *Kshetra*, *Ambu* and *Beeja* must all occur in a proper sequence based upon the timing factors. For this reason, conception can only occur when the timing or time factor coincides correctly with the three remaining factors [6-8].

Kala* and *Prakriti

Prakriti is *Kalanupatini*, which refers to the concept of how the time and its cycles influence the physical body and the physiological traits of an individual. The *Tridoshas* are under constant influence from the properties of *Kala* and exhibit a dynamic cycle of increase and decrease at different times of the day. *Vata*, *Kapha* and *Pitta* are all in different states of predominance throughout life: *Vata* predominates towards the end of life, the evening and nighttime hours; *Kapha* predominates during childhood, the morning and first part of the evening; and, *Pitta* predominates during adulthood, the midday hour and the end of the night. This demonstrates how much the physiological events that take place in the human body are affected by the timing of those events in accord with the biological rhythms of *Doshas*, and how much their timing guides daily activities and the ageing process. Thus, when planning diet and lifestyle, it is important to do so according to the natural fluctuations of the *Doshas* to support physiological balance [7-9].

***Kala*; Disease Diagnosis and Treatment**

In the clinical practice the concept of *Kala* is a pivotal component in diagnosis, prognosis and treatment planning. Disease is classified into two categories: *Kalaja* and *Akalaja*, reflecting the role of time on the manifestation and course of the disease process. Chronic diseases are frequently viewed as having resulted from a prolonged state of *Dosha* imbalance and/or delaying treatment intervention, indicating the significance of timely diagnosis and treatment. The most obvious application of the concept of *Kala* in therapy is

through *Aushadha Sevana Kala*, signifying that the efficacy and safety of medications vary depending on the time administered, a tenet of Ayurveda that parallels modern theories of chronopharmacology.

Timing of medicines based on *Dosha* predominance and the overall physiological state of the individual contributes to optimal absorption, maximal potency, and minimal adverse effects as depicted in **Table 1**. Similarly, in order to achieve optimal therapeutic efficacy, treatments like *Raktamokshana*, *Nasya* and *Snehana* require appropriate timing [6-9].

Table 1: Role of Kala in Optimal Detoxification Therapy

<i>Dosha</i> Predominance	Recommended <i>Panchakarma</i>	<i>Ritu Kala</i>	Purpose
<i>Kapha Dosha</i>	<i>Vamana</i>	<i>Vasanta Ritu</i>	Eliminates accumulated <i>Kapha</i> and prevents <i>Kapha</i> -related disorders.
<i>Pitta Dosha</i>	<i>Virechana</i>	<i>Sharad Ritu</i>	Expels aggravated <i>Pitta</i> and helps to manage <i>Pitta</i> -dominant diseases.
<i>Vata Dosha</i>	<i>Basti</i>	<i>Varsha Ritu</i>	Balances aggravated <i>Vata</i> and considered most effective therapy for <i>Vata</i> disorders.

Ayurveda places great emphasis on the timely treatment of diseases through the administration of therapies and medicines at the proper time, as the timing of treatment has a significant impact on whether even good treatments will work. Treatments that are given at the wrong time may not work or may even cause more harm, regardless of the quality of the treatment. It is possible to stop the progression of many diseases and improve the effectiveness of treatment if an intervention is performed at early stages. Therefore, from disease identification (*Nidana*) through treatment (*Chikitsa*), the timing of each intervention (*Kala*) is a critical component in the treatment of disease.

The importance of timing is especially critical in procedures such as *Panchakarma*, where there are specific time frames and seasonal guidelines for how long each procedure should take. If treatments are not performed according to the established guidelines (*Heena Yoga*), are performed for too long (*Ati Yoga*), or are performed incorrectly (*Mithya Yoga*), there can be many complications. Prognosis is also influenced heavily by time, as acute disease is usually much more treatable than chronic disease. Conditions such as disease with

the imbalance of the *Dosha*, *Dushya*, and *Ritu* factors are usually much easier to treat when treated at the appropriate time. Time of medication administration very crucial factor therefore, medications will only have the desired benefits if administered at the right moment. Additionally, *Kala* has a direct impact on the potency of both formulations and raw medicines [8-10].

Aushadha Sevana Kala

The time of drug administration, or *Aushadha Sevana Kala*, is highly important in Ayurveda since it has a major impact on the effectiveness, absorption, distribution and therapeutic action of medications. Different timing (**Figure 1**) for giving medications according to the patient's condition, *Doshic* predominance, digestive status, and disease pathology are described in classical Ayurvedic texts.

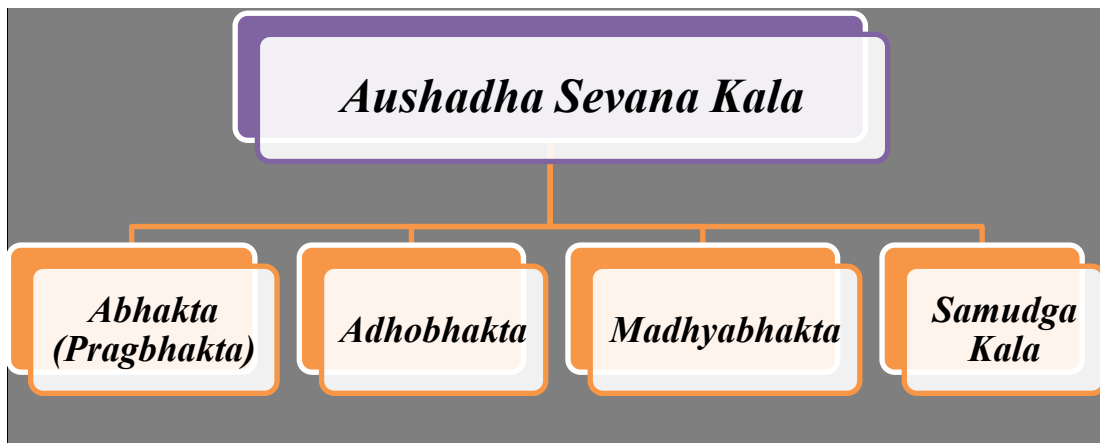


Figure 1: Various timing of drug administration according to Ayurveda

As mentioned above *Abhakta (Pragbhakta)* is the practice of giving medication on an empty stomach, typically in the early morning. It is especially helpful for illnesses needing strong therapeutic action, systemic cleansing, and *Vata* disorders. *Adhobhakta*, which entails taking medication right after meals, is advised for conditions affecting the stomach as well as *Kapha* issues. *Madhyabhakta*, which involves taking medication in the middle of a meal, is said to be the best way to treat *Pitta* disorders. *Samudga Kala* means giving medication both before and after meals, is especially helpful for ailments including weakness, hiccups, vomiting, and *Vata* disruptions [5-7].

***Kala* as Preventive Aspects:**

Kala can be sub-divided into two major categories i.e. *Nityaga Kala* and *Avasthika Kala*. For prevention of illness the purpose of having *Ahara* and *Vihara* in a timely fashion

with relation to *Samvatsara* and with *Ritu* and other temporal classifications is very important and provides a clear indication of how to stay healthy. A *Samvatsara* is divided into two *Ayanas*; *Uttarayana* and *Dakshinayana*. These two *Ayanas* are further divided into six *Ritus* and the understanding of the *Ritu* provides the framework to understand *Jagathika Kala*. Ayurveda provides specific *Ahara* and *Vihara* regimens for each of the *Shadritu* in order to balance *Dosha* and support health.

The concept of *Vega* also highlights the significance of time. *Adharaneeya Vegas* must be evacuated promptly because prolonged suppression might result in a number of illnesses. *Dharaneeya Vegas*, or suppressible desires, on the other hand, should always be properly restrained. In order to maintain *Swasthya*, *Acharya* emphasized the significance of adhering to *Dinacharya*, *Ratricharya* and *Ritucharya* [8-10].

Conclusion

Kala is the only entity that is constantly and irreversibly changing, so it is considered to be the governing force of the processes of life and death. Accurate time management is very important to ensure the correct diagnosis, treatment schedule, drug administration, emergency and overall clinical efficiency. People have often neglected to acknowledge the influence of time on their bodies and minds. Failing to take into consideration the biological rhythms and natural cycles of the body can slowly lead to the development of physical, physiological, and psychological disorders. Disturbances in sleep patterns, irregular eating patterns, stress and poor lifestyle habits can all affect the body's natural rhythms and therefore impact the overall health and well-being of an individual. Ayurveda advocates that physicians must consider *Kala* while diagnosing or treating someone. Ayurveda customizes treatment based on biological rhythms to restore balance and improve clinical outcomes, much like contemporary chronotherapy, which synchronizes treatment schedules with circadian rhythms to promote therapeutic efficacy and reduce side effects.

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