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Concept of Chronopharmacology w.s.r. *Aushadha Sevana Kala* in Ayurveda

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ABSTRACT

Chronobiology is the science which deals with the biological rhythmic phenomenon in the living system. Chronopharmacology is the branch of Chronobiology which deals with the Pharmacologic aspects of Chronobiology. In *Ayurveda*, *Aushadha Sevana Kala* is the proper time of administering the *aushadha* (medicine). The proper knowledge of *Agni* (digestive fire) and *Aushadha Sevana Kala* (time for drug administration) will help in understanding the food and drug interaction which is helpful in the proper treatment of a patient. In different *Ayurvedic* texts, *Acharyas* had defined *Aushadha Sevana Kalas* according to the biological clock for attaining the equilibrium between the *Doshas* and *Dhatu*s which ultimately leads to *swasthya* (good health). The present article is an attempt made to have a Critical Study of different *Aushadha Sevana Kala* in *Ayurveda* with special reference to Chronopharmacology.

KEYWORDS

Chronobiology, Chronopharmacology, Circadian Rhythms, Aushadha Sevana Kala, Charaka, Sushruta, Ashtanga Hrudaya, Sharangadhara



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INTRODUCTION

Chronopharmacology is the study of how the effects of drugs vary with biological rhythms and endogenous periodicities. In early 1970, the term Chronopharmacology had been recognized as a scientific domain of investigation. Chronotherapeutics refers to a treatment method in which in vivo drug availability is timed to match with biological rhythms of disease, in order to gain best therapeutic outcomes and minimum side effects. Until the 20th Century, Modern Science was not much aware of the biochemical, physiological and pathological variations of human body within 24 hour period. But the *Ayurvedic* texts had very well described the pharmacokinetics and pharmacodynamics of medicine under the umbrella of *Aushadha Sevana Kala* which is directly affected by biological rhythmic activities of the body.

The Circadian clock controls the biological rhythm of our body. Circadian rhythms are self-sustaining endogenous oscillations occurring in a period of 24 hours. The normal sleep-wake cycle is related to the circadian rhythms of human body. These rhythms are under the controlled by Suprachiasmatic nuclei (SCN) that are situated in the hypothalamus and the pineal gland. This

master clock network regulates the circadian clocks located in cells, tissues, and organ-systems. The chronopharmacologic approaches tend to reduce the side effects and to make the drug more bio-available. The approach of conventional homeostatic is replaced by the proper study of Chronopharmacology. The Chronopharmacological principle is very well applied in the therapy of Myocardial Infarction (MI), diabetes, hypercholesterolemia, bronchial asthma, arthritis, hypertension etc.

Kala (time) is unavoidable and unique, it is the specific causative factor for all type of effects¹. That is why, *Ayurveda* being the science of life, gives emphasis on the concept of *Kala* (time). The *Aushadha* (medicine) and *Kala* (time) relationship are explored by our ancient *Acharyas*. According to *Acharya Vagbhata*, *Kala* (time) fulfills the aim of administration of *Aushadha* (medicine) which is rightly stated as '*Kalo Bhaisajya Yoga Kr^t*'. In the same context, *Acharya Charaka* says that *Aushadha* (medicine) given at appropriate *Kala* (time) is more efficacious than one given at inappropriate *Kala*. The effect of a drug depends on the dosage administration time. In *Ayurveda*, it has been mentioned that the predictable variations in bodily functions during a day, season and age alters the severity of



disease symptoms, results of diagnostic tests and effects of drugs.

When to intake the *aushadha* i.e. before or after or in between the meals or at night depends upon the disease and medicine itself. The basic knowledge of the concept of *Aushadha Sevana Kala* in the day to day practice is very important to treat patients more accurately and effectively. Though *Kala* (time) has relationships with all the effects, to prove it the present study is designed to understand the chronopharmacology with special reference to *Aushadha Sevana Kala*.

AIMS AND OBJECTIVES

The present study has been undertaken with following aims and objectives.

1. To study the *Aushadha Sevana Kala* from different classical *Ayurvedic* texts.
2. To understand the concept of *Aushadha Sevana Kala* in detail.

MATERIAL AND METHODS

The classical *Ayurvedic* texts have been used as a material for this study. The important books from which various references have been collected in this study are *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Astanga Sangraha*, *Sharangadhara Samhita* and available commentaries on these *Samhitas*.

LITERATURE REVIEW

The following *Ayurvedic* texts have elaborated the concept of *Aushadha sevana kala*.

1. *Charaka Samhita Chikitsa Sthana – Yoni vyapat chikitsa Adhyaya*¹.
2. *Sushruta Samhita Uttara Tantra – Swasthavritta Adhyaya*³.
3. *Astanga Hridaya Sutrasthana – Doshopkramaniya Adhyaya*⁴.
4. *Astanga Sangraha Sutrasthana – Doshopkramaniya Adhyaya*⁵.
5. *Sarangadhara Samhita Purvakhanda – Bhaishajyakhyanakam adhyaya*⁶.

The total number of *Aushadha Sevana Kala* are different according to different *Ayurvedic* texts [Table 1]. The importance of *Aushadha Sevana Kala* in disease management has been classified as below as follows.

1. *Abhakta /Niranna kala (Empty stomach)*⁷.

It is the specific *Kala (time)* in which *Bheshaja* is administered on empty stomach [Table 1,2].

Indications:

- Patient with good digestive fire (*Pradipta Agni Avastha*)
- Patients having a good strength (*Balwan Rogi*) and with *Balavan Vyadhi*.
- Administered as *Rasayana*.
- *Kapha Vikaras (Kaphaja disease)*



- *Pitta / KaphaVruddhi* (increase) and for intake of *Vamana-Virechana Aushadhi*.

Contraindications:

- Children (*Bala*), Pregnancy (*Garbhini*), Female (*Stree*) patient
- *Depletion of Dosha and Dhatu* (*Doshakshaya, Dhaturkshaya*).

Action of *Bheshaja*

Ayurvedic scholars adopt this *bheshaja kala* because the potency of medicine and interaction between *Aushadha* and digestive fire (*Agni*) is not hindered by food. *Hemadri* suggests that *Aushadha* should be given once the consumed food is digested and after digestion of *aushadha*, food is given. According to *Indu*, *Aushadha* should be given on empty stomach, but two hours after sunrise because in this *kala*, *Amashaya* and *Strotasas* are devoid of *Kapha*[Table 3,4].

2. *Pragbhakta/ Bhuktadau* (Before Meal)⁷

Pragbhakta means before meals. In this specific *Aushadha kala*, *Hemadri* suggests taking *Aushadhi* immediately followed by food[Table 1].

Indications

- *Apanavayu Vikruti*
- Diseases of lower(*Adha*) body (*Kaya*) diseases (*Vikaras*)
- *Mutravaha-Malavaha-Shukravaha Strotasas*,

- *Pakvashayagata Vyadhi*,
- *Arsha, and Gudabhransha*.
- *Meda vikruti*(fat).

3. *Madhyabhakta* (In between meals)⁷

In this *Aushadha sevana Kala*, the *Bheshaja* is administered in between the meal. According to *Chakrapani* and *Indu*, the half portion of the food is taken initially, followed by *Aushadha* administration, and again followed by the remaining portion of food[Table 2,3,4].

Indications

- *Samanavayu Vikruti*.
- *Mandagni*
- *Koshthagatavyadhi*, *Pakvashayagata Vyadhi*, *Shula*, *Gulma*, *Grahani*.
- *Paittika Vikaras* (disease), and
- *Strotorossdhanashak*.

Action of *Bheshaja*

The food restricts the *Urdhwagati* and *Adhahgati* of *Aushadha* and hence it is forced to act locally. Therefore helps to cure *Sthanik Doshas* as *Samana Vayu* and *Pachaka Pitta* are both situated in the *Koshtha*.

4. *Pashchadbhakta/ Adhobhakta* (after Lunch & Dinner)⁵

In this *kala*, *Bheshaja* is administered after meals (after lunch and Dinner). According to *Cakrapani* *Pashchadbhakta kala* is for both morning and evening time after meals. *Hemadri* and *Indu*, further added



that *Bheshaja* is to be administered immediately after meals [Table 2,3,4].

Indications

- In *Vyana vayu vikruti*, *Bheshaja* is administered after lunch.
- In *Udana vayu vikruti*, *Bheshaja* is administered after dinner.
- *Vyanavayujanya vikruti* - *Jvara*, *Shopha*, *Napunsakata* (debility), *Udasinta* (depression), bodyache, tingling, numbness, *Kushtha*, *Visarpa*.
- *Udanavayujanya vikruti* - *Gala vikar*, *Aruchi*, *Chhardi*, *Pinasa*, *Galaganda*, *Urdhvajatrugata Vyadhi*, *Karshya*, *Ura Sthangata Kasa* – *Shwasagata Vyadhi*

Action of *Bheshaja*

- After lunch- stimulation of *Vyana Vayu*. It is considered as *Ura – Urdhva jatrugata, Bala* (strength) *Vruddhikara* (increase) *Aushadha Sevana kala, Kapha Dosha Janya Vyadhi, Pushti* (strength) *janya Aushadhi Sevana – Sarvottam Kala*.
- After dinner- stimulation of *Udana Vayu*. It is considered as *Udanavayu* causes the *Urdhvagati* of *Bheshaja*, it strengthens the upper part of body (*urdhwanga*), especially the sense organs.

5. *Muhurmuhu* (frequently administered)⁵

In this *Aushadha Sevana Kala*, *Aushadha* is administered frequently regardless of

Bhukta or *Abuktavastha* is *Muhurmuhu Kala* [Table 3,4,5]. Except *Chakrapani*, all authors opinion that *Aushadha* should be given irrespective of meals [Table 2].

Indications

- *Pranavahastrogotata Vyadhi-- Shvasa, Kasa, Hikka*
- *Udakavahastrogotata Vyadhi – Pipasa Vikara*.
- *Annavahastrogotata Vyadhi -- Chhardi, Vishbadha*.

Action of *Bheshaja*:-

- In this *Aushadha Sevana kala* the medicine is administered in *Atyayika* (Emergency life-threatening) diseases which need immediate therapeutic intervention.
- Sublingual absorption provides faster relief and High concentration of drug provides more bio-availability which treats the vitiated *doshas* in their *Sanchaya & Vegavastha*.

6. *Samudga* (Before food and after food)⁴

Samudga means before and after food. Food taken should be *Laghu* (light).

Indications

- In *Hikka, Kampa, Aakshepaka and Adha* (lower) *kaya* (body) *vikara* (disease),
- In *Vyana, Apana, and Udana Vayu Vikruti*.



- In *Vataja Prameha* and *Shukradosha*.

Action of *Bheshaja*

Aushadha is administered at the time immediately before and after meals. All commentators are unanimous about *Samudga Kala* i.e. *Aushadha* to be given before and after meals. *Indu and Hemadri* specify that *Aushadha* should be consumed immediately in relation to food [Table 2,3,4].

7. *Sabhakta* (mixed with food)⁴

Sabhakta kala means *Aushadha* is given mixed with food. All the commentators agree that *Aushadha* should be consumed along with food but *Indu* opines that *Aushadha* is processed or cooked or it is given along with the food [Table 3,4].

Indications

- It is indicated in *SukumaraVyakti*, *Bala* (Child),
- In *Aruchikara* (unpalatable) *Aushadha*.
- In *Sarvangata* (whole body) *Vikara*.

Action of *Bheshaja*

The drug mixes with *Rasadhatu* & then spreads all over the body through *Urdhva-Adha* and *Tiryak Gati*. Therefore useful in *Sarvangasamshrita vyadhis*.

8. *Sagrassa* (with each and every morsel of food)⁴

Sagrassa Aushadha kala means *aushadha* is given with each and every morsel of food. All authors have same opinion regarding this *kala*.

Indications

- It is indicated in *Prana Vayu Dushtijanya Vikara* (Respiratory diseases like *Pinasa, Ardita, trusha, Shvasa*).
- In *Hrudroga*,
- Indicated as *Dipana-* to stimulate *agni*,
- *Bheshaja- Vajikarana Bheshaja* (*Churna, Leha, Deepana Dravya, Vati, Guti*)

Action of *Bheshaja*

In normalcy, *Pranavayu* regulates the intake of food. In *Grasa Kala*, *Bheshaja* stimulates the *Pranavayu*. So the *Indriyaprasadana* & *Chittaprasadana* takes place. This enhances the *Vrishya Prabhava* of the *Vrishya Dravyas* [Table 2,3,4].

9. *Grasantara* (in between two morsel of food)⁶

In *Grasantara Aushadha sevana kala* means *bheshaja* is administered in between two morsels of food.

Indications

- It is indicated in *Prana Vayu janya Vikara* (*Pinasa, Ardita, Trusha, Shwasa*)
- In *Hrudroga*².
- *Prana Vayu Prakopavastha*.



- Indicated for *Vamana dravya*.
- Indicated for *Kasaghna dhuma*³.

Action of *Bheshaja*

Normal *Pranavayu* regulates the intake of food⁴. In *Grasantara Kala*, *Bheshaja* stimulates the *Pranavayu*. So the *Indriyaprasadana* & *Chittaprasadana* takes place. This enhances the *Vrishya Prabhava* of the *Vrishya Dravyas*[Table 2,3,4].

10. *Nisha* (Before sleep)⁵

Nisha aushadha sevana Kala means medicine is administered after digestion of food consumed. *Indu* specifically defines the *Nisha Kala* as the time after the evening meal has digested and 3 hours have been passed. *Sharangadhara* has mentioned it is an *Anannavastha*[Table 4,5].

Indications

- It is indicated in *Urdhvajatrugata Vikara* (disease),
- Indicated for *Vamana, Dhumapana*.

Action of *Bheshaja*

The purpose of this *kala* is for *Anulomana* and *Brimhana*. In this *kala*, *Bheshaja* specifically acts on *Urdhvajatrugata* parts. The *Bheshaja* gives *Chiraparinamana prabhava* (long lasting action) of the *Shamana Aushadhi* as no food intake occurs until the next morning.

11. *Antarbhakta* (after digestion of meal in noon)⁴

In this *Bheshaja kala*, *Aushadha* is to be intaken in *Madhyanha*, when the previous consumed food is digested and after *Aushadha* is metabolised, again food is to be taken in the evening[Table 1].

Indications

- It is indicated in *Diptagni Vikara* (diseases) and
- In *Vyana Vata Dosha Janya Vikara* (disease).

Action of *Bheshaja*

Due to *madhyanha* i.e. *Pittakala*, *Agni* is in a stimulated condition. So *Bheshaja* is properly metabolized in this *kala*. In this *kala Aushadha* shows *Hrudya, Pathya, Deepana* and *Manobalakara* effect [Table 3,4].

Table 1 Types of *Aushadha Sevan Kalas* as per different *Samhitas*

S.No.	<i>Charaka</i> ⁷	<i>Sushruta</i> ⁸	<i>Ashtanga Sangraha</i> ⁹	<i>Ashtanga Hrudaya</i> ¹⁰	<i>Sharangadhara Samhita</i> ¹¹
1	<i>Pratah Niranna</i>	<i>Abhakta</i>	<i>Abhakta</i>	<i>Abhakta</i>	<i>Suryodayajatah</i>
2	<i>Bhuktadau</i>	<i>Pragbhakta</i>	<i>Pragbhakta</i>	<i>Pragbhakta</i>	<i>Divasabhojane</i>
3	<i>Bhuktamadhye</i>	<i>Madhyabhakta</i>	<i>Madhyabhakta</i>	<i>Madhyabhakta</i>	<i>Sayambhojane</i>
4	<i>Bhuktapaschat</i>	<i>Adhobhakta</i>	<i>Adhobhakta</i>	<i>pashchadbhakta</i>	<i>Muhurmuhu</i>
5	<i>Bhaktasanyukta</i>	<i>Sabhakta</i>	<i>Samabhakta</i>	<i>Sabhakta</i>	<i>Nishi</i>



6	Muhurmuhu	Muhurmuhu	Muhurmuhu	Muhurmuhu
7	Samudga	Samudga	Samudga	Samudga
8	Grasa	Grasa	Sagrasa	Sagrasa
9	Grasantara	Grasantara	Grasantara	Grasantara
10	Laghupathya annayukta	Antarabhakta	Nishi	Nishi
11		Antarabhakta		

Table 2 Aushadha Sevana Kala according to Charak Samhita¹

S. No.	Aushadha Sevana Kala	Indications
1	Pratah Niranna	Balwanarugna Durbalarugna
2	Bhuktadau	Apana vayu vikruti
3	Bhuktamadhya	Samana vikruti
4	Bhuktapaschat – Pratah	Vyana vayu vikruti
5	Bhuktapaschat – Sayam	Udana vayu vikruti
6	Bhaktasanyukta	Aruchi
7	Muhurmuhu	Shwasa-Kasa- Pipasa
8	Samudga	Hikka
9	Sagrasa	Prana vayu vikruti
10	Grasantara	Prana vayu vikruti

Table 3 Aushadhi Sevana Kala according to Sushruta Samhita³

Sr.No	AushadhaSevana Kala	Indications
1	Abhakta	Sukumar, bala, vridhha
2	Pragbhakta	Bala, vridhha, sukumar
3	Madhyabhakta	Koshtha gatvyadhi
4	Adhobhakta	Urdhva sharigata vyadhi Balya
5	Sabhakta	Mano balvardhaka, deepana
6	Antarabhakta	-----
7	Muhurmuhu	Hikka, shwasa, kasa, vaman
8	Samudga	Urdhvagami and adhogami dosha
9	Grasa	Vajikarana
10	Grasantara	Mandagni

Table 4 Aushadhi Sevana Kala according to Ashtang Sangraha²

Sr. No.	Aushadha Sevana Kala	Indications
1	Abhakta	Swastha purusha (Healthy person)
2	Pragbhakta	Apanavikruti, Sthoulyata
3	Madhyabhakta	Samanavikruti, koshtagataroga, Pittajaroga
4	Adhobhakta	Urdhvajatrugataroga
5	Samabhakta	Sarvagavyadhi
6	Antarabhakta	Vyanavyadhi
7	Muhurmuhu	Hikkashwasa, kasa, trusha, chhardi, Vishaktata.
8	Samudga	Hikka, kampa, aakshepa Urdhwa / Adhaparshwa vyadhi
9	Sagrasa	Prana vayu vikruti vajikarana
10	Grasantara	Pranavayu vikruti, hrudroga
11	Nishi	Urdhva jatru gata vyadhi, vaman, dhumapana

Table 5 Aushadhi Sevana Kala according to Sarangadhara Samhita⁶

Sr. No.	AushadhaSevana Kala	Indications
1	Suryodayajatah	Pitta / kaphajavyadhi, Virechana Vamana Lekhana



2	<i>Divasabhojane a) BhojanaPurva b) Sagrasa c) Bhojana Madhya d) Bhojana Pashchat</i>	<i>Apana vikruti Aruchi Samana vikruti Vyana vikruti</i>
3	<i>Sayambhojane a) Grasantare/Grase b) Bhojanapashchat</i>	<i>Udana vikruti Pranavayu vikruti</i>
4	<i>Muhurmuhu</i>	<i>Urdhvajatrugata roga</i>
5	<i>Nishi</i>	<i>Sarvaga vyadhi</i>

DISCUSSION

Vaidyas largely accepted the nomenclature described by *Acharya Charaka*. The ancient texts of *Ayurveda* have described 10 types of *Aushadha Sevana Kalas* (time). The texts differ about the nomenclature of *Aushadha Sevana Kalas* (time) [Table 1]. In *Niranna Kala* the *aushadha* is administered in empty stomach. *Agni* and *Aushadha* interaction is unobstructed because of absence of food. *Agni* (digestive fire) should be *Pradipta* (increased) for this *Kala*. Although *Aacharya Charaka* and *Vagbhata* told the more number of *Bheshaja Sevana Kala*, but they can be incorporated in *Bheshaj Sevana Kala* told by *Aacharya Sharangdhara*. *Abhakta*, *Pragbhakta* and *Bhaktadau* can be included in *Suryodayajataha*. *Madhyabhakta*, *Adhobhakta* (after morning meal), *Antarabhakta*, *Samudga* (before and after morning meal) can be included in *Divasa Bhojane*. *Adhobhakta* (after evening meal), *Samudga* (before and after evening meal), *Grasa*, *Grasantara* can be included in *Saayam Bhojana*. [Table 5]

CONCLUSION

Aushadha Sevana Kala is said to be the specific time for drug administration. *Aushadha Sevana Kalas* were widely accepted by the *Ayurvedic* Scholars for being its importance in *shodhana* and *samana chikitsa*. The ten *Aushadha sevana kala* of *Charak*, *Sushruta* and *Ashtanga Hrdaya* and eleven of *Ashtanga Sangraha* are well incorporated into five *Aushadha Sevana Kala* of *Sharangadhara*. In *Ayurveda*, *Aushadha Sevana Kalas* are described in relation to food only and the route of administration to is specified to oral route. The specific *Kala*(time) for *Aushadhi* (drug) *sevana* (administration) is very important as it has direct impact on treatment success. The drug release in body and its specific action on specific *dosha* or disease conditions vary with the Circadian variation of *dosha* and disease symptoms. Chronopharmacology and Chronotherapeutics has emerged an important area for research for medical fraternity as its correct knowledge helps *Vaidya* to treat patient more effectively. Hence the success of treatment always depends upon the time of drug administration.



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