Review Article

International Research Journal of Ayurveda & Yoga
Vol. 5 (5),83-89, May, 2022
ISSN: 2581-785X;https:/ /irjay.com/
DOI: **10.47223/IRJAY.2022.5514**

Bheshajakaala and its Clinical Importance–A Review on the Physiological Basis

B.G. Resmi[1], Yadav Ram Chhaju[2], M. Abhilash[3]

1.PhD Scholar, Department of Kriya Sharir, National Institute of Ayurveda DU, Jaipur.
2.Associate Professor & Head of the Department Kriya Sharir, National Institute of Ayurveda DU, Jaipur Rajasthan.
3.Assistant Professor, Department of Kriya Sharir, Govt. Ayurveda College, Pariyaram, Kannur, Kerala.

Article Info

Article history:
Received on: 30-03-2022
Accepted on: 18-05-2022
Available online: 31-05-2022

Corresponding author-
B.G. Resmi, PhD Scholar,
Department of Kriya Sharir,
National Institute of Ayurveda
DU, Jaipur
Email- faribeker@gmail.com

ABSTRACT:

The concept of time of administration of drugs (*Bheshajakaala)* is an important area in Ayurveda to be focused on. Even though the different types and indications of the different *bheshajakaala* are mentioned in classics how far they are executed in management of diseases by proper analysis is to be thought of. For the proper execution of these principles, there should be clarity and proper understanding of the concepts. The Ayurveda classics have given the details regarding drug administration viz. types, description of each type, conditions in which they are to be applied etc. but there is no direct reference regarding the exact reason for choosing these particular time period in particular condition. Here, an attempt is made to explain the logic of indicating each *bheshajakaala* in different conditions for the better understanding of the concept. The descriptions integrating modern physiological principles could prove pivotal in explaining the rationale for *bheshajakaala* and thereby facilitating their judicious use in clinical practice.

Keywords: *Bheshajakaala*, *Vata*, Bioavailability, Physiology, Ayurveda drug interactions

INTRODUCTION

Ayurveda is a time-tested science having its own clear concepts with respect to health and disease. The fundamental principles of Ayurveda, etiopathology and management of diseases, posology, mode of administration of medicines, time of administration of medicines – all these have been described in detail in the respective contexts with sufficient logic behind. In this present era, it becomes essential to evaluate these concepts in the light of modern knowledge so that they can be appropriately explained in an understandable way to the modern world. Modern science is also now thinking in the way of personalized medicine where the constitution of the individuals, the habitat one lives, the seasonal and diurnal variations, the strength of the individual, the type of food one is accustomed to, timed dosage of medicine etc. have to be considered. The time of drug administration has a critical role in treatment as it influences the interaction of drug with food and can alter the outcomes.

Though all the classical texts of Ayurveda have detailed about the *bheshajakaala* or the time of administration of medicine according to different conditions, the reason for the particular indication has not been explained. It will be

more enlightening in the treatment aspect if we can understand their physiological basis. Apart from the evaluation of the disease (*rogapareeksha)*, patient (*rogipareeksha)*& the choice of treatment, there are certain factors which can modify the effect of treatment like *anupana (medium along with which medicine has to be taken), bheshajakaala* etc.

"*Bheshaja*", one among the four-fold requirements for the successful treatment as mentioned in Ayurveda classics (*chatushpaada)*,[1] has been defined as that which helps us to overcome the fear of diseases. While detailing the qualities of *bheshajakaala, Acharya Susrutha* has said that which is administered properly at proper time can only be called *bheshaja*.[2] *Kaala* is the time. In *Charaka Samhita Chikitsasthana*, it is said *kaala* are of various types depending on *dina (day), atura (patient), oushadha (medicine*) etc.[3] and this time depending on medicine (*oushadhaapekshikaala*) is what we call the *bheshajakaala*. Thus, *bheshajakaala* can be said as the suitable time for the administration of medicine to get a desired effect**.**

METHODOLOGY

All the major classical texts of Ayurveda were referred for the descriptions regarding the concerned subjects. Charaka Samhita Chikitsasthana, Susuruta Samhita Uttara Tantra, Ashtanga Samgraha Sootrasthana, Ashtanga Hrudaya Sootrasthana and Sarngadhara Samhita Poorvakhanda along with their commentaries specifically emphasizing on the topic *bheshajakaala* have been studied. Modern physiology textbooks discussing the topics of gastrointestinal physiology, food and drug interactions, bioavailability etc were also referred. Several scientific online databases were also searched to avail the articles on *bheshajakaala* and principles of modern physiology in relation with digestion and absorption. *Bheshajakaala*, Ayurveda drug interaction, food-drug interaction, bioavailability etc were the keywords used for searching. The purpose of the study is to explore the possible physiological principles behind the indication of different therapeutic times in the classical texts of Ayurveda. This better understanding of the principles give a rationale in choosing the time of administration of medicines which can augment the expected results of treatment.

Bioavailability

When a drug is taken, its digestion, absorption and metabolism depend on its bioavailability. Bioavailability is the fraction of administered medicine available in systemic circulation.[4] The bioavailability of a drug is largely influenced by the food intake. The drug disintegration, drug dissolution, drug transit through gastrointestinal tract and metabolic transformation of drugs are also interfered by the food. Depending on the type of food, this interaction may vary. Some foods may augment the drug action whereas some others may hamper with the drug action. Iron containing drugs are better assimilated in presence of citrous foods whereas tea, coffee and dairy products hamper the iron absorption.[5] Thus, the foods taken along with drugs have short term as well as long term effects on the systemic bioavailability of drugs by influencing the absorptive and biotransformation processes.[6] Among the factors which can alter the bioavailability of a drug like physical properties, formulation, gastric emptying etc. only those essential to understand the possible physiological principles behind each *bheshajakaala* are dealt here.

Significance of *annakaala*

The bioavailability of a drug will be altered by food and fluid intake, rate and extent of absorption, pre-systemic metabolism and systemic drug clearance. Hence *bheshajakaala* is said in relation with *annakaala***.** Different food interactions and food-drug interactions in the light of gastrointestinal physiological events can be used to explain these complicate mechanisms of assimilation of food and medicine into the body and then to the target cells.

Significance of *bheshajakaala*

The prime difference of ayurveda medicines with respect to modern drugs is that in Ayurveda, either whole of a drug/plant product(s) or formulation is given which has to undergo the process of digestion, absorption, assimilation etc. just like food we take; unlike modern medicine oral drugs, which mostly will be an extract or chemical constituent or alkaloid that can directly go to the stage of absorption and assimilation. Therefore, the administration of ayurveda drugs has to be done keeping in mind the phases and processes of digestion. For instance, the modern drug absorption is increased when the gastric emptying occurs at a faster rate as there is no need for the drug to be digested. But an ayurveda drug should first be digested properly, hence slow gastric emptying will enhance the absorption from intestine. Though drug and food can alter the bioavailability of a drug, their temporal relation also plays the decisive role in the rate of absorption. Hence every time a medicine is administered, along with food and drug, time of administration should also be considered.

Physiological significance

When a drug is administered; there will be changes in circulation, secretion and motility in GIT, altogether

having a significant impact on the rate of absorption. The key factor which the physician has to bear in mind is "the rate of absorption is in inverse relation with that of stomach emptying", i.e., as the gastric emptying is delayed, the time for absorption from intestine is increased.[7] The site of absorption of the drug again depends on the constituents as lipid, protein, or carbohydrate in content.

The different opinions of the eminent Ayurveda scholars on the time of administration of medicine as mentioned in classics are given in table number 1.[8-12] The different *bheshajakaala* mentioned by various *Acharya* can be included in the 11 *aushadha kaala* of *Ashtanga Samgraha* and how the drug is to be administered in each type of *bheshaja kaala* and the different conditions in which they are to be applied are given in table 2.[13]

Targeting *panchavata (Five types of vayu as mentioned in Ayurveda classics)*

The concept of *bheshajakaala* has been evolved emphasizing the vitiation of *panchavata*. This is mainly because of the supremacy of *Vataroga (diseases due to vitiated humor, Vata)* over the others as far as number and prevalence are concerned. Also, for any disease to manifest, the movement of *pitta* and *kapha dosha* from their respective seat and localization in a different site occur only with the help of *vatadosha,*[14] As per Ayurveda, *vata, pitta* and *kapha* are the three basic humors *(dosha)* present in the body.[15] These humors are further narrated as five types.[16] The five divisions of *Vata dosha* are *Pranavata, Udanavata, Vyana vata, Samana vata* & *Apana vata*. When the divisions of *vata dosha* as described in classics are thoroughly studied, their functions can be attributed generally as follows,[17,18]

***Apanavata*:** all the functions of lower lumbar and sacral segments helping in defecation, micturition, parturition etc. can be said as that of *apana*.

***Samanavata*:** the extrinsic ANS in the gut and the intrinsic ENS controlling the peristalsis and secretomotor activity can be said as that of *samanavata*.

***Vyanavata*:** most of the ANS including sympathetic and parasympathetic, helping in the voluntary activities and vital involuntary activities including energy metabolism at cellular level can be attributed to *vyana*.

***Udanavata*:** the reticular formation from pons, cervical upto T6 innervating the muscles aiding in articulation, respiration etc. can be said as that of *udana*.

***Pranavata*:** the reticular formation from brainstem to medulla with higher brain centres helping in deglutition, belching, respiration etc.

Possible physiological principles behind each *bheshajakaala*:

1. ***Abhaktha*:** Here drug is given in empty stomach. A better definition is given by *Hemadri* as, in *abhakta* medicine is administered after the digestion of ingested food and after the digestion of medicine, food is to be given.[19] It corresponds to the cephalic phase of gastric secretion which occurs even without food in stomach. Such secretions will be rich in enzymes and HCl. Here it is indicated in conditions where ANS, ENS and higher controlling centres are intact. The problem will be with secretory mechanism. To stimulate the secretory mechanism, highly potent medicines are needed which in turn requires highly acidic gastric juice to digest them which are present in the cephalic phase. To withstand all these processes within the body, the patient should have adequate strength. Hence, indicated in *balavaan* (strong persons) and obviously contraindicated in *sukumara* (tender persons).
2. ***Pragbhaktha*:** Here drug is given prior to food. The administered drug reaches the stomach first and will be emptied to the intestine at a faster rate, will be digested and absorbed more easily and will directly stimulate the parasympathetic system. This *bheshajakaala* is indicated in *apanavaigunya (*vitiation of *apanavayu)*. So, in conditions like constipation, the drugs given as *pragbhaktha* will directly stimulate the gastrocolic reflex, which help in mass peristalsis resulting in normal defecation. Likewise, the action in other conditions like urinary retention etc. can also be explained. In obese patients where thinning therapy is the aim (*kriseekarana)*, motility is targeted rather than absorption. When motility increases, absorption decreases; hence in obese, those medicines which increase the motility are to be administered as *pragbhaktha*.
3. ***Madhyabhaktha***: Here drug is given in between food. So, the drug will be emptied slowly to intestine increasing the degradation in lower pH of stomach. It augments the activity of gastric juice, bile and pancreatic juice which together keep the digestive functions of GIT intact. This *bheshajakaala* is indicated in *samanavaigunya (derangement of samanavata)*. Hence in conditions like indigestion, medicines are to be administered along with food (as *sabhakta)* targeting the correction of enzymatic activity. In *samanavaigunya*, *Agni* will be hampered which in turn affects *pitta*. Therefore, in *pittajavyadhi* (diseases of *pitta* vitiation) also this *kaala* is to be opted.
4. ***Adhobhaktha*:** in this *bheshajakaala* drug is given after food. Here the initial portion of food will be emptied to

intestine and the latter undigested food and administered drug will be retained in the stomach and will be emptied to intestine only by next housekeeper phase of the fasted cycle. This ensures maximum absorption from intestine**.** It is Indicated in *vyanavaigunya* (vitiation of *Vyanavayu*) after morning meal and *udanavaigunya (*vitiation of *Udanavayu)* after evening meal. This can be explained as follows:

To make avail the medicinal effects for whole day long in order to perform all the functions mentioned under *vyanavata*, it might be suggested as *adhobhaktha*. We know morning meal is much important when compared to evening meal as it provides more nourishment and helps to perform all those vital functions which are the same as that said under *vyana*. In conditions like P.E.M., continuous intake of nutrient deficient food leads to *vyanavaigunya* inactivating the metabolizing enzymes at tissue level. To correct this administration of drugs as *adhobhaktha* preferably after morning meal is suggested.

In *udana*, as it resides in *uras* (thoracic region), the normal vitiation of *kapha* in the initial period of night and the *seetatwa* (coldness) of the night may aggravate it. So, in conditions like pharyngitis, laryngitis etc., in order to keep the benefits of medicines all through the night, medicines are advocated as *adhobhaktha* in the evening. After food as there is increase in *kapha*, in *slaishmikavyadhi* (diseases due to vitiated *kapha*) also it is indicated.

5. ***Antharabhaktha****:* In this *bheshajakaala*, after morning meal gets digested drugs are given at afternoon, then evening meal and likewise at night also. It corresponds to the inter-digestive period where a little gastric juice will be produced which is of non-oxyntic type.[20] Hence indicated in *abala* (weak persons), *vrudha* (old age) etc. as their *oushadha* will be *mridu* (less intense) which require only less potent digestive juice.Another indication is *vyanavaigunya* as maximum absorption is to be ensured here by prolonging the digestion of medicine. In *antharabhaktha*, ample time is available for digestion and absorption. So, drugs with higher diffusion coefficient are a choice in *vyanavaigunya* as it may be dissolved slowly, released gradually over time with longer duration of action**.**
6. **& 7. *Sagrasa* & *Grasanthara* indicated in *pranavaigunya*.**

As *pranavata* helps in *annapravesana* (entry of food to GIT), it has a major role in deglutition reflex. When affected it causes conditions like dysphagia, achalasia cardia etc. so when drug is given as *sagrasa*, i.e., with every morsel it will stimulate such reflexes helping in swallowing.

In *grasanthara*, after every morsel drug is given, it is indicated in *hridroga* (cardiac ailments) etc. Apart from mere cardiac diseases, GERD, vomiting etc. can be included under *hridroga*. In such cases, food itself is the stimulus and to suppress such stimuli medicine is given after every morsel.

8. *Muhurmuhu*: frequent administration of medicine is indicated in *swasa* (respiratory ailments), *kasa* (cough), *chardi* (vomiting) like conditions. Either allergic or *kapha* predominant conditions are said here. The mediators of allergy such as histamines will be released continuously into the blood stream. In order to maintain the bioavailability and plasma concentration of drugs which suppress their release in an optimum level, frequent administration is recommended.

9. *Nisi*: also called as *naisam* by *Hemadri*, is indicated in *jatroordhwagata vyadhi* (diseases affecting region above neck). It has been proven that absorption is much better in lying posture when compared to standing posture because the rate of gastric emptying is less in lying posture when compared to sitting, standing etc. thereby giving enough time for digestion. The slow emptying also ensures maximal absorption from intestine. Hence in conditions which require rest, repair, increased circulation etc. can be given as *nisi*.

10. *Sabhaktha*: It applies the same principle as that of *madhyabhaktha.*

11. *Samudga*: Here combined principle of *pragbhaktha* and *adhobhaktha* is applied.

DISCUSSION

A drug given at different *bheshajakaala* may have different results. If we consider the administration of *Rajanyadi Choorna*[21] in children, the effect of the medicine varies according to the time of administration. When given as *Prakbhaktha*, it acts as laxative in constipation. When the same medicine is given as *Madhyabhaktha*/*sabhaktha*/*sagrasa*, it kindles digestion (*deepana*) and best suitable in indigestion. In *Adhobhaktha* (morning), it provides *bala*, *varna* etc. and effective in nutritional deficiency. When given as *Adhobhaktha* (evening), it corrects *udana vata* and hence beneficial in lower respiratory tract infection.

In allergic conditions including *swasa*, *kasa* (allergic asthma, allergic bronchitis) etc. *Muhurmuhu* is the choice of administration. In *jatroordhwagata vyadhi* as in allergic rhinitis, administration of drug at *Nisi* is the best choice.

CONCLUSION

Bheshajakaala widens the spectrum of application of medicine. It can be very well understood from the above facts that "*bheshajakaala*" is said in our classics to judiciously advocate medicines. Practically, the administration of medicines for the given indications preferably in the specified *kaala* may give better results. In short, apt medicine in apt medium at apt time gives the maximum result.

Acknowledgements- Nil
Conflict of Interest – None
Source of Finance & Support – Nil

ORCID

B.G. Resmi https://orcid.org/
0000-0002-0416-2352

REFERENCES

1. Murthy RS, Vagbhata, Ashtanga Samgraha, Vol I Sutrasthana Ch.2 Ver.21, Varanasi: Chaukhambha Orientalia, 6th edition:2002.pp.27
2. Shastri AD, Susruta, Susruta Samhita, Sootrastana 34/23, Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2019.pp.167
3. Shastri P, Agnivesa, Charaka samhita of Acharya Charaka, Dridhabala krit, Chikitsasthana Ch.30 Ver.296; Varanasi: Chaukhambha Viswabharati, Reprint 2002.pp.880
4. Available from:https://en.wikipedia.org/wiki/Bioavailability
5. Cadman B, Foods and meal plan for iron deficiency, Medical News Today, July 7 2021 available on https://www.medicalnewstoday.com/articles/322336
6. Melander A. Influence of Food on the Bioavailability of Drugs. *Clin Pharmacokinet* **3, 1978,** 337–351. https://doi.org/10.2165/00003088-197803050-00001
7. K Sembulingam, Essentials of Medical Physiology, 8th edition, chapter 41,2009.pp. no.284
8. Acharya YT, Agnivesa, Charaka samhita of Acharya Charaka Dridhabala krit, edited, Chikitsasthana Ch.30 Ver.297; Varanasi: Chaukhambha Surbharatri prakashan, 2021.pp. 646
9. Acharya YT, Susruta, Sushruta Samhita, Uttartantra, Ch.64 Ver. 64, Varanasi: Chaukhambha Surbharatri prakashan; 2019.pp.813.
10. Tripathi B, Vagbhata, Ashtanga Hrudayam, Sootrasthana Ch.13 Ver.37-41, Varanasi: Chaukhambha Sanskrit Pratishthan, 2009.pp.190
11. Gupta A, Vagbhata, Ashtanga Samgraha, Vol.1 Sutrasthana Ch.23 Ver.12, publisher Krishna Das Academy, 2002.pp.181
12. Tripathi B, Sarngadharacharya, Sarngadhara Samhita, Poorvakhanda Chapter 2 verse 2, Varanasi: Chaukhambha Subhratri Prakashan, 2009.pp.18
13. Tripathi RD, Vriddha Vagbhata, Ashtang Sangraha, Sutrasthana Ch.23 Ver.12-22 Varanasi: Chaukhambha Sanskrit Pratishtan 2009.pp. 428-430
14. Tripathi B, Sarngadharacharya, Sarngadhara Samhita, Poorvakhanda Chapter 5 verse 2, Varanasi: Chaukhambha Subhratri Prakashan, 2009.pp.42
15. Murthy RS, Vagbhata, Ashtanga Samgraha, Vol I Sutrasthana Ch.19/ Ver.1, Varanasi: Chaukhambha Orientalia, 6th edition:2002.pp.349
16. Murthy RS, Vagbhata, Ashtanga Samgraha, Vol I Sutrasthana Ch.20 Ver.2, Varanasi: Chaukhambha Orientalia, 6th edition:2002.pp.368
17. Sastri VVS, Tridosha Theory, Published by Department of Publications, Arya Vaidya Sala, Kottakkal, 5th edition 2009.pp.89
18. Abhilash M, Lakshmi V, Aavaranam. 2nd ed. Kottakkal: Arya vaidya sala Publication Division; 2016. Pp.13- 22.
19. Shastri HS, Hemadri, Ayurveda Rasayana, Commentary on Ashtanga Hrudaya of Vagbhata,Paradakara Bhishagacharya, Sootrasthana Ch.13 Ver.37, Varanasi: Chaukhambha Subharatri Prakashan 2009.pp.218
20. Guyton and Hall, Textbook of Medical Physiology, 3rd South Asia edition, Section VI, Chapter 67.2009.pp.442
21. Shastri HS, Vagbhata, Ashtanga Hrudaya, Paradakara Bhishagacharya, Uttarasthana 2/38-40, Chaukhambha Subharatri Prakashan, 2009.pp.783

How to cite this article: Resmi B.G, Chhaju YR, M Abhilash "*Bheshajakaala* And Its Clinical Importance – A Review On The Physiological Basis" IRJAY.[online]2022;5(5);83-89.
Available from: https://irjay.com
DOI link- https://doi.org/10.47223/IRJAY.2022.5514

Table 1: Types Of *Bheshajakaaala* According To Different Ayurveda Classics

S.No	***Charak Samhita***[8]	***Susruta Samhita***[9]	***Ashtang Hridaya***[10]	***Ashtang Sangraha***[11]	***Sharangadhar Samhita***[12]
1	*Nirannam*	*Abhakta*	*Abhakta*	*Abhakta*	*Suryodaya (pratah)*
2	*Bhuktadau (pratah kaal)*	*Pragbhakta*	*Pragbhakta*	*Pragbhakta*	*Pragbhakta*
	Bhuktadau (sayam kaal)	*Madhya Bhakta*	*Madhya Bhakta*	*Madhya Bhakta*	
3	*Bhukta Madhya*	*Madhya Bhakta*	*Madhya Bhakta*	*Madhya Bhakta*	
4	*Bhukta paschat*	*Adhobhakta*	*Adhobhakta*	*Adhobhakta*	*Adhobhakta*
5		*Antarabhakta*		*Antarabhakta*	
6	*Bhakta sayuktam*	*Sabhakta*	*Sabhakta*	*Sabhakta*	
7	*Samudga*	*Samudga*	*Samudga*	*Samudga*	
8	*Muhurmuhu*	*Muhurmuhu*	*Muhurmuhu*	*Muhurmuhu*	*Muhurmuhu*
9	*Grase*	*Grase bhakta*	*Grase Sagraasa*	*Grase Sagraasa*	
10	*Grasantara bhakti*	*Grasantara bhakta*	*Grasantara bhakta*	*Grasantara bhakta*	
11			*Nishi*	*Nishi*	*Nishi*
Total no.	10	10	10	11	5

Table 2: The Indications Of Different *Bheshajakaala* As Mentioned In Ashtanga Sangraha[13]

S.No	Ashtang Sangraha	Time of drug administration	*Vayu* involved	Health conditions
1	*Abhakta*	*Medicine alone*		*Only in strong persons*
2	*Pragbhakta*	*Before food*	*Apana Vayu*	*To strengthen lower part of body, to cure diseases in lower part of body, in leaning therapy*
3	*Madhya Bhakta*	*In between food*	*Samana Vayu*	*Gastrointsestinal/abdominal diseases, Pittaja diseases*
4	*Adhobhakta*	*After food*	*Vyana Vata* *Udana Vata*	*To strengthen upper part of body, to cure diseases in upper part of body, in stoutening therapy, in kaphaja diseases*
5	*Sabhakta*	*Along with food*		*Children, in tender and delicate*

				persons, who has aversion to medicines, anorexia, whole body diseases
6	*Antarabhakta*	*After digestion of Morning food – medicine at noon – after its digestion food in evening – after its digestion medicine at night- after drug digestion food in morning*	*Vyana vayu*	*Strong digestive capacity*
7	*Samudga*	*Before and after food*		*Hiccups, tremors, convulsions, diseases of upper and lower parts of body*
8	*Muhurmuhu*	*Frequently Independent of food intake*		*Respiratory ailments, cough, hiccups, thirst, vomiting, diseases caused by toxins*
9	*Grasa Sagrasa*	*With every morsel*	*Prana Vayu*	*To kindle digestion, aphrodisiac*
10	*Grasantara bhakta*	*In between morsels*	*Prana Vayu*	*Hridroga (cardiac ailments), vomiting,*
11	*Nishi*	*At night*		*In diseases above neck*