



Review Article

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REVIEW ON THE CONCEPT OF SHAT KRIYAKALA

Anu P Baby ^{1*}, Jigeesh PP ²

¹ PG Scholar, Department of Panchakarma, VPSV Ayurveda College Kottakkal, Kerala, India

² Professor & Head, Department of Panchakarma, VPSV Ayurveda College Kottakkal, Kerala, India

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*Corresponding author

E-mail: anupbaby256@gmail.com

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ABSTRACT

Diagnosis in Ayurveda is not always in terms of the name of the disease but in terms of the nature or phenomenon. This phenomenon is described in terms of Samprapti of the disease in each patient, comprising Dosha, Dushya and Adhishtana components. The prime factors in the pathogenesis of the disease are Dosha and Dushya. Shat kriyakala refers to the stage of development of a pathological process in which a physician can intervene by the most accurate treatment modality and medicine, thereby halting the progression of the disease process. By intricate understanding of the process of Shat kriyakala, the disease process could be arrested, and further complications can be avoided. In the current scenario, the concept of prevention has become broad-based. The natural history of disease is one of the significant elements of epidemiology. The course of a disease takes in individual people from its pathological onset until its eventual resolution. Natural history of disease is possible to correlate pre-pathogenesis with Sanchaya, Prakopa, Prasara and pathogenesis with Sthanasamsraya, Vyakti and Bhedavastha of Shat kriyakala. Recent studies have shown that it is possible to identify certain pre-clinical stages for many diseases like Parkinson's disease, which can help in the early successful treatment. Shat kriyakala helps to arrest the disease process at the very early stage itself. Along with current technology, the need for research for validating the Shat kriyakala will benefit humankind in the long run.

Keywords: Samprapti, Dosha, Dushya, Adhishtana, Shat kriyakala, pathogenesis.

INTRODUCTION

Prevention is better than cure has always been a golden standard and underlined principle for health. Good quality, quantity and timely balanced diet, good sleep, sex and exercise, freedom from stress and extremes of emotions, attending the urges when they get manifested, making a protocol and adapting Dinacharya (Rules of daily living) and Ritucharya (Rules of seasonal living) etc. help in preventing a wide array of diseases. This is one dimension of the prevention of illness. The other dimension of prevention is 'an early diagnosis of the disease in its budding stage itself'.

Any branch of medical science which deals with preventive and curative aspects should have deep knowledge about the stages of pathogenesis. According to Ayurveda, diagnosis is not always in terms of the name of the disease but in terms of the nature of the phenomenon of the disease.

The art of understanding disease and its stages of pathogenesis was probably explained for the first time in Ayurveda in a very comprehensive way. Acharya Sushruta beautifully illustrates the stage of development of a pathological process under the nomenclature Kriyakala. These stages are called Shat kriyakala - 6 time periods for managing a disease¹.

The term Kriyakala refers to recognizing the stage of disease progression. This concept is compared chiefly with disease pathogenesis. Kriyakala comprises two words. Kriya means action or treatment. Kala means time or period. Thus, it is the time for proper step or interception in disease manifestation. The term Kriyakala is also known as Chikitsa avasara kala, denotes the stage of the necessity of treatment.¹

Importance of Shat kriyakala

- It gives us the knowledge of diagnosis, prognosis, and intervention level.
- It gives information about the time of treatment in the process of disease manifestation and prevents the establishment of disease.
- These stages give us an idea regarding the state of the disease in the body, and it guides us when to intervene and where to intervene.

Classification: Kriyakala is divided into Ritu kriyakala and Vyadhi kriyakala.

Ritu kriyakala

The natural changes occur to Dosha according to the season. The Ritu kriyakala is explained by Acharya Vagbhata, Charaka and Susruta.²⁻⁴ In Grishma Ritu, owing to the nature of Ritu and Aharadi gunas which are identical to the qualities of Vata, will result in Vatachaya. Since the season is hot, which is antagonistic to the Sita property of Vata, Prakopa of Vata does not happen. It undergoes Prakopa in Varsha and become pacified in Sarath. In Varsha Ritu, due to Amla vipaka of Jala and Aharadi guna, Pittachaya occurs. But as the season is Sita, it does not attain the Prakopa stage.

In contrast, it undergoes Prakopa in Sarath and becomes pacified in Hemantha. Similarly, in Sisira Ritu, Kapha chaya occurs due to Snigdha and Sita guna. Even though Deha and Kala favour the increase of Kapha by similar properties, it does not attain Prakopa due to its solid nature. But it attains Kopa in Vasantha and gets pacified in Grishma Ritu.² These three stages of Doshas happen

due to the influence of changes occurring in the season. If a person adopts the existing Ritu – Ritucharya (Rules of seasonal living), Doshas will be brought back to the normal stage.

Vyadhi kriyakala - Sequential progression of a disease.

The Vyadhi kriyakala is explained in 6 stages. This is known as Shat kriyakala.¹

1. Sanchaya- Stage of accumulation
2. Prakopa- Stage of vitiation
3. Prasara- Stage of dissemination
4. Sthanasamsraya- Stage of localisation
5. Vyakti- Stage of clinical symptoms
6. Bheda-Stage of complication

It can be otherwise classified based on the criteria for treatment as

- Dosha kriyakala including Sanchaya, Prakopa and Prasara.
- Vyadhi kriyakala, including Sthana samsraya, Vyakti and Bheda.

Sanchaya - Stage of accumulation

Sanchaya means collection or putting together. In this stage, Dosha is accumulated due to various Nidana factors. When the accumulation occurs in its place and is not enough to move from its place, and if a Dosha has to move from one place to another or move from its place, it must be in Vilayana rupa, i.e., liquid state.¹ If the liquid form is not attained or the Nidana for accumulation of Dosha is insufficient to liquefy them, the Dosha stays increasing in the solid-state itself, i.e., Samhathirupa vrudhhi is Chaya.¹

Sita and Ushna are considered more potent properties as they come under Virya. That is why these two properties decide the Chaya or Kopa of Dosha.²

Table 1: Properties leading to Sanchaya

Sanchaya dosha	Properties of Dosha	Combining property
Vata	Laghu, Ruksha, Sita	Ushna
Pitta	Tikshna, Laghu, Ushna	Sita
Kapha	Snigdha, Guru, Sita	Sita

It is more interesting to note that Grishma will not increase Vata as it is hot. But as the Soumyamsa of Ahara and Oushadha get reduced and become Ruksha due to Grishma Ritu, it causes Vata chaya. Ruksha is the most crucial property of Vata, and that is why Ruksha has been referred to as the first quality while explaining Vata gunas.⁵ Similarly, Katurasa is Ushna still produce Vata kopa due to its Ruksha guna. Madhura is Sita, but it is Vata samana due to its Snigdha quality. So, there are two explanations for Vata chaya; Grishma Ritu being hot opposes the extreme vitiation of Vata. Dryness of the Grishma Ritu leading to its provocation. Hence hotness and dryness of Grishma Ritu lead to Vata chaya.⁵

The general manifestation of Sanchaya is the aversion to the similar Guna, Rasa and Vihara of the Dosha and desire to the opposite Gunas of the Dosha.¹ signs and symptoms of Sanchaya concerning the Dosha is noted in Table 2.

Table 2: Dosha & Sanchaya lakshana

Dosha	Sanchaya lakshana
Vata	Stabdhapurnakoshtatha (Stiffness and fullness in the abdomen) Agni vaishamy (Impairment in digestive power) Adho gurutwa (Heaviness of the lower part of the body)
Pitta	Pitavabhasata (Yellowish of body parts) Mandoshmata (Mild decrease in body temperature) Sadanam (Weakness of body)
Kapha	Mandoshmata (Mild decrease in body temperature) Angagourava (Heaviness in the whole body) Alasya (Lassitude) Angasada (Weakness across the entire body) Asyavairasya (Tastelessness) Mrudvagni (Mild decrease in digestive power) Sthimitam (Unsteadiness)

It is the foremost occasion for intervention. When eliminated in the Sanchaya stage, Doshas do not attain successive stages. Physiologically Chaya occurs concerning seasonal and diurnal variation. In such conditions, the Ritucharya and Dinacharya should be followed. In pathological Chaya conditions, measures like Nidana parivarjanam (Avoidance of causative factors) and Samana chikitsa (Palliative measures) are preferred.

Prakopa - Stage of vitiation

When Doshas are in Chayavastha, if Nidana still follows, Dosha lands at Prakopavastha. Dosha is a state of readiness to move from its place that means Dosha increases in its quantity and is ready to move from its place or to another place but not moving.¹ It is commented that Prakopa stage of Vagbhata includes Prakopa, Prasara, Sthana samsraya, Vyakti and Bheda stages of Shat kriyakala.²

Table 3: Properties leading to Prakopa²

Prakopa dosha	Properties of Dosha	Combining property
Vata	Laghu, Ruksha, Sita	Sita
Pitta	Tikshna, Laghu, Ushna	Ushna
Kapha	Snigdha, Guru, Sita	Ushna

Table 4: Dosha & Prakopa lakshana¹

Dosha	Prakopa lakshana
Vata	Koshta toda sancharana (Pain and movement of Vata in Mahasrotas) Karsyam (Emaciation), Karshnyam (Blackish discolouration)
Pitta	Amlika (Sour eructation) Pipasa (Excessive thirst) Paridaha (Burning sensation all over the body) Trishna (Increased thirst), Sveda (Increased sweat), Dhumaka (Feeling of hot fumes coming out from stomach), Pitavinmutra (Yellowish urine and stool), Vitbheda/Atisara (Diarrhea)
Kapha	Annadvesha (Aversion to food) Hrudytokleda (Excessive salivation in mouth) Avipaka (Dyspepsia), Sleshmapraseka (Nausea), Mukhamaduryam (Sweetness of mouth)

Types of Prakopa

Chaya purvaka prakopa - is a typical Prakopa wherein the Doshas undergo Chayavastha and gradually progress to the stage of Prakopa.^{6,7} It is also considered as Katinyabhava.⁸

Physiologically Chayapurvaka prakopa occur concerning the Ritu. In Grishma Ritu, Vata chaya will emerge and lead to Kopa in Varsha. In the same way, Pitta - Kapha, Chaya and Prakopa will occur. Apart from this, pathological aggravation of Dosha may also occur. For example, getting Tamaka svasa on the consumption of more Madhura, guru and Sitala ahara in which Samhatha rupa vrudhhi and Prakopa has happened.

Achaya purvaka prakopa - The Doshas jump directly to the Prakopa stage without passing through the Chayavastha.^{6,7} This is considered as Unabhava of Dosha.⁸

Physiologically Achaya purvaka prakopa happened in the conditions like indulging heavy exercise, anger, and day sleep directly causes Vata kopa, Pitta kopa and Kapha kopa, respectively.¹ Pathologically, one example is the Tamaka svasa vega develops on inhaling dust particles or smoke without increasing Samhatha rupa Kapha.

Based on the reason, the Dosha kopa is divided into two.⁷

Apathyaja is an outcome of Apathya food habits of the previous season, i.e., Chayapurvaka. Due to the Apathya ahara vihara, the Doshas accumulate, leading to Samhatharupa vrudhhi attaining Katinyabhava prakopa.

Pathyaja is the Prakopa of Doshas by wholesome food for the previous Ritu. Whereas in Svabhavika prakopa though taking Pathyaja ahara vihara, Dosha will get aggravation. This condition is Unabhava dosha, i.e., irrespective of ahara vihara.

Treatment

These Doshas are in the liquid state can be removed from the site through the proximal route. In Chayapurvaka prakopa - Sodhana measures and in Achaya purvaka prakopa - Samana measures are employed.⁷

Prasara - Stage of dissemination

If Nidana continues, Dosha moves from one place to another. The aggravated Doshas spread in whole or half or a part of the body. The factor responsible for this spread is Vayu.¹ Aggravated Doshas leave their original place and spread to the other parts of the body with the help of Vayu. Vata is Rajabhuyishta, and the Chala guna is an essential key factor for carrying out the Prasaravastha.¹ The phenomenon of Koshta gati and Sakha gati occurs in Prasara avastha. Signs and symptoms of Prasara are shown in Table 5.

Table 5: Dosha & Prasara lakshana

Dosha	Prasara lakshana
Vata	Vayorvimargagamana (Vata moves to different places other than its place) Atopa (Flatulence and gurgling)
Pitta	Osha (Localised burning sensation) Chosha (Sucking type of pain) Paridaha (Burning sensation all over the body) Dhumayana (Feeling of hot fumes coming out from stomach)
Kapha	Arochaka (Anorexia) Avipaka (Dyspepsia) Chardi (Vomiting) Angasada (Lassitude)

Types of Prasara

Doshas move to different parts of the body with the help of Vayu, either alone or in combinations. It is of 15 types.¹

1. Vata prasara
2. Pitta prasara
3. Kapha prasara
4. Rakta prasara
5. Vata pitta prasara
6. Vata kapha prasara
7. Vata rakta prasara
8. Pitta kapha prasara
9. Pitta rakta prasara
10. Kapha rakta prasara
11. Vata pitta rakta prasara
12. Pitta kapha rakta prasara
13. Vata pitta kapha prasara
14. Vata kapha rakta prasara
15. Vata pitta kapha rakta prasara

Treatment

Hetu linga chikitsa and Sthanika dosha chikitsa are advocated in this stage. For example, Vata spreads to Pitta sthana – Pittahara chikitsa like Mrudu virechana is employed.

Pitta spreads to Kapha sthana – Kaphahara chikitsa is employed. For example, Vamana in Amlapitta.

Kapha spreads to Vata sthana – Vata anulomana chikitsa is employed.

Sthanasamsraya - Stage of localization

Continuation of causative factors in the stage of Prasara will take Doshas to the stage of Sthanasamsraya. While vitiated Doshas are in Prasara, wherever Srotovaigunya (Obstruction to the body's channels) present, they settle there. This Srotovaigunya leads to Dosha dushya Sammurchana, and in this stage, all the Purvarupa of disease appears.¹

Table 6: Sthanasamsraya rogas

Organ	Diseases
Udara	Gulma, vidradhi, udara roga, agni vikara, vibandha, anaha, vishuchika, atisara, pravahika, vilambika.
Bastigata	Prameha, asmari, mutraghata, mutra dosha.
Medragata	Niruddha prakasa, upadamsa, suka dosha.
Gudagata	Bhagandara, arsa.
Vrushnagata	Vrudhhi roga
Urdhvajatrugata	Manifests Urdhvajatrugata vikara.
Tvak, Mamsa, Sonitagata	Kshudra roga, kushta, visarpa.
Medagata	Granthi, apaci, arbuda, galaganda, alaji.
Asthisagata	Asthi vidradhi
Padagata	Slipada, Vata sonita, Vata kantaka.
Sarvangagata	Jvara

Treatment

The treatment is purely according to the symptoms and the location.¹ If it can identify the disease at this level, it is possible to prevent the virility of the illness and complications arising out of it. So, observation of Purvarupa serves as a vital clue in diagnosing the actual disease and deciding the treatment. For

example: In Vatika jvara at the Purvarupa stage itself, if in Nirama, Svacca ghritapana is indicated. In Pittika jvara, Mrudu virechana and Kaphaja jvara, Vamana is indicated in Purvarupa stage.⁹

Vyakti - Stage of clinical symptoms

The continuation of Nidana in the stage of Sthanasamsraya leads Dosha to the Vyakti stage. It represents the complete-blown picture of the disease. Here the doshic predominance, the involved Dushya and the involvement of Srotas will reveal the Samprapti krama.

Treatment

According to the diagnosis, the treatment is planned to heal the disease.

Bheda - Stage of complication

The disease course may either end in relief or progress to attain chronicity, giving origin to some other disorders and finally may lead to death. It is an indication of a bad prognosis. More care should be taken as a secondary disease or complication arises in this stage. For example, long course of fever leading to Atisara.¹⁰

Natural history of the disease - current theory

The goals of medicine are to promote health, preserve health, restore health when it is impaired and minimise suffering and distress. These goals are embodied in the word 'prevention'. Successful prevention depends upon knowledge of causation and the dynamics of transmission. The disease occurs from a compound interaction among men, agents and the environment. It indicates how the disease evolves from the pre-pathogenesis phase to its termination as recovery, disability or death, without treatment or prevention. The term natural history of disease is the key concept of epidemiology.¹¹

It has 2 phases

Pre-pathogenesis phase: start when the condition favoring a disease is present, but the agent has not entered the body.¹¹

Pathogenesis phase: begin with the entry of organism characterized by the presence of clinical or subclinical symptoms and decides the fate of disease outcome.¹¹

The current theory of prevention has become broad-based. It has become customary to define prevention in terms of 4 levels.¹¹

1. Primordial
2. Primary
3. Secondary
4. Tertiary levels of prevention.

At each level, the aim of prevention is different.

Primordial prevention – A new concept is receiving particular attention in preventing chronic diseases. This is a prevention of the emergence or development of risk factors in population groups in which they have not yet appeared.¹¹

Primary prevention can be defined as action taken before the onset of the disease, which removes the possibility that an infection will ever occur. It signifies intervention in the pre-pathogenesis phase of a disease.¹¹

Secondary prevention can be defined as an action that halts the progress of the disease at its incipient stage and prevents complications.¹¹

Tertiary prevention - When the disease process has advanced beyond its early stages, it is still possible to accomplish it by tertiary prevention. It reduces the impact of complications or limits impairment and disabilities.¹¹

Shat kriyakala versus prevention

Sequential progression of disease from etiological factors to the complication is described under Vyadhi kriyakala. The natural history of illness and Shat kriyakala can be correlated with each other (Table 7). In Kriyakala, there are six stages of progression of diseases viz. Sanchaya, Prakopa, Prasara, Sthanasamsraya, Vyakti and Bheda and there are two stages of disease progression in the natural history of disease viz. Pre-pathogenesis and pathogenesis. It is possible to correlate the stage of pre-pathogenesis with Sanchaya, Prakopa, Prasara as the intensity of disease in these stages and pre pathogenesis phase of the disease's natural history are minimal. The pathogenesis phase comprises Sthanasamsraya, Vyakti and Bheda. The intensity of disease is more and disease is fully established in these stages. There are four stages of prevention, viz. Primordial – prevent the development of risk factors, Primary – manage the risk factors and prevent the onset of disease, Secondary – early diagnosis and prompt treatment and Tertiary - reduce complication and disability. The disease in its Sanchaya stage needs primordial prevention, using the measures that inhibit the emergence of environmental, economic, social and behavioural conditions. Primary prevention is beneficial in Prakopa and Prasara stages; it reduces disease incidence by protecting the health by personal and community efforts such as enhancing nutritional status, providing immunisation and eliminating environmental risks. Secondary prevention consists of measures for early detection and prompt intervention to control disease and minimise disability which is advisable in the stage of Sthanasamsraya. In tertiary prevention, measures are intended to soften the impact of long-term disease and disability, minimise suffering, and maximise potential years of useful life.¹² As far as Shat kriyakala is concerned, it is beneficial in Vyakti and Bheda stage.

Table 7: Natural history of disease and Shat kriyakala

Pre-pathogenesis		Pathogenesis	
Sanchayavastha	Primordial prevention	Sthanasamsraya	Secondary prevention
Prakopa	Primary prevention	Vyakti	Tertiary prevention
Prasara	Primary prevention	Bheda	Tertiary prevention

The clinical course of Parkinson's disease concerning Shatkriyakala

The purpose of understanding a disease process is ultimately for its appropriate management. The current medical approach is for the disease manifestation and its complications. But very recently, the concept of disease stage-specific interventions has been put forward, which is expected to maximise the benefit of modifying the course of the disease. An article published by Michaela E. Johnson et al. proposed a new model for Parkinson's Disease (PD) pathogenesis in which three phases of PD have been mentioned. There are no distinct boundaries for these phases, and they represent a continuum along the disease course. They are triggers, facilitators and aggravators. Triggers like viral infections, microbiome perturbation initiate disease pathogenesis

during prodromal PD. Potential outcomes of triggering events include long-term gut dysfunction. Facilitators like this gut inflammation spread pathology significantly to impact the central nervous system (CNS). This results in the onset of PD motor symptoms; at this point, aggravators (like neuroinflammation) continue to increase cell loss and neuropathology, causing worsening symptoms and enabling the emergence of new symptoms. The study concluded that medical interventions need to be disease-stage specific and personalised to maximise the chances of modifying the course of the disease.¹³

The hallmark of Parkinson's disease is the presence of Lewy bodies composed of alpha-synuclein aggregates in the CNS. But it is interesting to notice that earlier presence of alpha-synuclein outside CNS has been demonstrated in the gut, which is more prevalent in PD, leading to early symptoms.¹⁴ This synucleinopathy may be transmitted from the gut to the brain via the vagus nerve. The initial occurrence of the pathological hallmark is at one site. When manifested, it appears at a different site, the concept of which is like that of Dosha increasing at Koshta first, spreading to the whole body and locating at another site to manifest. It is also concluded that targeting pre-motor intestinal stages of PD for therapeutic intervention may hold the potential to slow or halt the progression of the disease and also found that proper bowel habits, lifestyle modifications, and dietary habits delay or prevent the progress of the disease.¹⁵

Some similar observations are

- Recent discoveries implicate the lung as a possible extra-articular mucosal site for initiating rheumatoid arthritis-associated immunity.¹⁶
- Gut inflammation observed in Ankylosing Spondylitis and psoriatic patients seem to be not only an epiphenomenon of the ongoing systemic inflammation but also represent the base camp in which inflammatory cells are activated and from whom they shuttle.¹⁷

The above findings show that the pathology of diseases starts in one site, progresses and manifests in another site.

CONCLUSION

The concept of Shat kriyakala helps the physician understand the manifestation and diagnosis of disease and also to provide cost and time-effective management for the patients. The validation of the Shat kriyakala model with the help of modern science could be a remarkable achievement in medicine.

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