

## CRITICAL APPRAISAL OF SHADKRIYAKALA IN CONTEXT OF CARCINOGENESIS

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## ABSTRACT

Enumerable hypothesis have been put forward with positive evidences regarding the pathogenesis of cancer but still many processes are poorly understood. At present, in the modern oncology the damage of the genetic apparatus of the cell is considered to be the primary cause of cancer, and the pathogenesis of cancer is seen as a process of transformation of a normal cell into a tumor cell, as evidenced by deep fundamental research of the pathogenesis of cancer, which is held exclusively at the cellular, molecular and genetic levels of the organism.<sup>[1,2]</sup> According to the Ayurvedic concept of pathogenesis of cancer Sushruta has given emphasis on the pathogenesis of a disease under the nomenclature of *Shadkriyakala* namely; *Sanchya, Prakopa, Prasara, Sthansanshrya, Vyakti* and *Bheda*,<sup>[3]</sup> Modern science believes that the process of carcinogenesis starts nearly 10-15 years earlier than the presentation of disease,<sup>[4]</sup> which solidifies the concept of *Shadkriyakala* postulated by Sushruta. The article reviews the principles of *shadvidhkriyakaal* and great resemblance with modern theories of carcinogenesis.

**KEYWORDS:** Pathogenesis, cancer, Cancer Staging, *Shadkriyakala*.

## INTRODUCTION

From the careful study of concept of *Shadkriyakala* it is seen that the phenomenon of disease has been conceived as a 'process' which moves in consecutive steps of stages of evolutive development. The importance of the scheme of *kriyakaal* in early diagnosis and for adopting preventive and curative measures can be appreciated better by taking into consideration some of the recent trends in modern medicine relating to the pathogenesis of disease, it may be noted in advance, particularly in case of cancer, that except for different nomenclatures, the general outlook of the disease bears a striking familial resemblance to ancient Ayurvedic scheme of *kriyakaal*.

Proper knowledge regarding the natural history of pathogenesis (*samprapti*) of disease is very necessary to treat (*samprapti vighatan*) the same. The concept of *Shadkriyakala* describes the mode and stages of the development of disease. The term *kriyakaal* literally means time of action. *Kriyakaal*, therefore, means the recognition of the stage of disease and the resort to appropriate measures *aushadh, ahaar* and *charya* with a view to eliminate and correct the *doshik* disturbances. A good understanding of it is very essential for the recognition of the process of the carcinogenesis even in its very early inceptive stage – the *chayavastha* so that early steps may be taken to arrest the further development. Screening and early detection in case of cancer implies the same concept of Sushruta i.e. if the

doshas are left unremedied they may gain strength and intensity in the course of their development.<sup>[5]</sup> It is very beneficial to stage a disease especially cancer not only from diagnosis point of view but planning of treatment depends on it, the role and current status of staging of cancer is undergoing continuous analysis. The American Joint Committee on Cancer Staging (AJCC),<sup>[6]</sup> however, has described goal of staging as a means of defining natural history of disease. Additional goals include the ability to judge therapeutic results between various centers as well as a means of defining patients' prognosis.

## MATERIAL AND METHODS

Ayurvedic treatises Charak Samhita, Sushrut Samhita, and Madhavnidana have been explored for comparison of symptoms in different stages of vitiation of doshas. Shuruta has elaborately defined the symptoms usually present in the patients in different stages of diseases which are then interpreted and analyzed in context to carcinogenesis including modern concepts

## RESULTS

Staging of the Cancer	Symptoms			
	Charak	Sushruta	Madhav.	Modern
1.Sanchayavastha	Anorexia, Lethargy, Oedema, Urticaria, Heavyness in body and symptoms of <i>santarpanajanya vyadhi</i> (Ch.chi23/6-7)	Heavyness in abdomen, pallor, hypothermia, lethargy, (Su.Su.21/18)	Same as Sushrut	carcinogens start stimulating the cell at gene level. <sup>[7,8,9,10,11]</sup>
2.Prakopavastha	Anaemia, weakness, (ch. Chi.12)	Pricking pain in abdomen, excessive thirst, Burning, Lack of appetite, giddiness. , (Su.Su.21/27)	”	such carcinogen interacts with the cell and start vitiating particular <i>doshas</i> at the cellular level affecting the whole body. <sup>[13]</sup>
3. prasaravastha	Increased kapha dosha vitiated Mamsa dhatu. (Ch.chi23/6-7)	Movement of Doshas from their seat to all over the body, Flatulance, Indigestion, Bodyache, vomittingetc., (Su.Su.21/28)	”	stimulation and alternation at genetic level in two previous stages may lead to mutagenic changes leading to vitiating of various chemical and enzymatic factors and releasing these in the body system. <sup>[14]</sup>
4. Sthansansharayavastha	Any part of the body may be affected. (Ch.chi23/6-7)	Purvaroopapradurbhava (Su.Su.21/33)	”	Modern concept suggest the involvement of specific sites are due to particular cell or enzymatic receptors <sup>[15]</sup>
5.Vyaktivastha	Rogotpatti.	Rogotpatti, Apache, Granthi, Arbuda, (Su.Su.21/27)	”	After this there is clinical manifestation of the fully developed carcinoma with characteristic symptomatology depending on the part/organ involved and type of carcinoma.
6. Bhedavastha	As described in Nasarbuda: dydpnoea, Epistaxis, Haematemasis etc. complications starts metastasis. (Ch.Chi.26/116)	Complications of the diseases, (Su.Su.21/27)	”	Due to negligence at this stage and persistence of factors, there is extensive damage leading to local invasion and metastasis as a result of occurrence of secondaries in distant organs.

**Staging of Cancer****Sanchya: Stage of Accumulation**

It means accumulation of stagnation of *Doshas* in their own places. In the process of carcinogenesis, when

different types of carcinogens start stimulating the cell at gene level.<sup>[7,8,9,10,11]</sup> and this stage could be correlated with *Sanchyavastha* of disease. Apart from genetic stimulation of cell, accumulation of toxins into particular

group of cells leading to mild dysplasia may also be considered as *Sanchyavastha* of this disease.

The person may feel heaviness in a particular part of body along with special liking to contradictory type of foods, which may contribute to one of the factors responsible for production of particular variety of *Arbuda*.<sup>[12]</sup>

#### Prakopa: Stage of Excitation

It is started to be the condition in which the *doshas* having increased and accumulated in their own places, being excited by appropriate causes, spreads over to parts other than its own.

Further, in the process of carcinogenesis, such carcinogen interacts with the cell and start vitiating particular *doshas* at the cellular level affecting the whole body.<sup>[13]</sup>

This stage when carefully studied in relation to disease *Arbuda* will give an additional symptomatology of a slow rate swelling to the area where some heaviness was felt previously. Again the patient will have experience of general body symptoms.

#### Prasara: Stage of Spread

The previously excited *doshas* is started to spread over and extend to other parts, organs and structures of the body.

Again if provocative factors i.e. carcinogens are still allowed to continue the stimulation at the molecular and cellular level may provoke to organ of macroscopic level along with the appearance of various *doshik* symptomatological conditions. In other words the stimulation and alternation at genetic level in two previous stages may lead to mutagenic changes leading to vitiating of various chemical and enzymatic factors and releasing these in the body system.<sup>[14]</sup>

Patient may feel heaviness of demonstrable swelling with little pain of feeling of discomfort. Premalignant lesions may also be considered as evidence of *prasaravastha* of this disease.

#### Sthanasanshrya: Stage of Localization

In this stage the excited *doshas*, having extended to other parts of body, becomes localized and it marks the beginning of specific diseases pertaining to those structures.

At this stage of process of carcinogenesis, the promoting agents (*doshas*) act on affected dormant cells of particular organ or organ-system and alter them at particular site resulting in the development of cancer.<sup>[15]</sup> Such stage is nomenclatured as *sthanasanshrya* and process as *Dosha-Dushya sammurchhana* and the affected receptor cells as *Kha-vaigunya* leading to obstruction of vitiating of particular srotas. This, in fact,

represents the prodromal phase of disease i.e. *purvaroop* manifest fully in this stage.

Modern concept suggest the involvement of specific sites are due to particular cell or enzymatic receptors which is almost in accordance with the concept of *khavaigunya* as mentioned above.

#### Vyakti: Stage of Manifestation

This stage may be started as the clinical manifestation of fully developed disease as a result of *Dosha Dushya Sammurchhana* and it is represented by its characteristic symptomatology.

*Sanchyavastha* of the *doshas* lead to the initiation of the process of carcinogenesis, the excited (*prakupit*) *doshas* affect the cell leading to promotion of the process which is *prakopavastha* in which various enzymatic factors are released into body system and macroscopic changes become evident. Then carcinogenesis progresses to the affected receptor cell/organ/part of the body leading to *Dosh Dushya Sammurchhana* which is *prasaravastha*. After this there is clinical manifestation of the fully developed carcinoma with characteristic symptomatology depending on the part/organ involved and type of carcinoma. Due to negligence at this stage and persistence of factors, there is extensive damage leading to local invasion and metastasis as a result of occurrence of secondaries in distant organs.

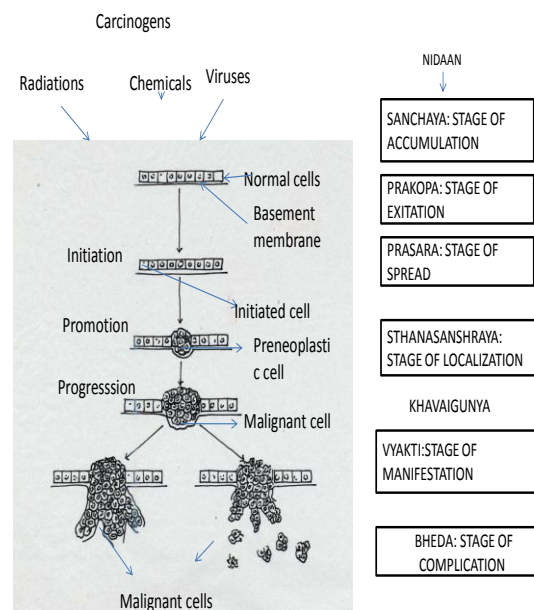


Fig:1 Process of carcinogenesis in Terms of Shad Krivakal

#### CONCLUSION

Thus the importance of recognizing this stage lies not only in its being a valuable aid in prognosis but also in the fact that when disease reaches at the last stages, it may metastasize to other important organs of the body like liver, kidneys, lungs, bone, brain etc And may act as predisposing factor for some other presentation. That's

why Sushruta has said that an attempt should be made to study the disease process at its very incipient i.e. *sanchya* stage where from it can be averted without much difficulty.

In nut shell, the concept of *Shadkriyakala* can be concluded that if the careful observation and institution of proper treatment at a proper time is made then the disease process can both be concluded as well as cured.

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