

**CRITICAL ANALYSIS OF SHAD KRIYA KALA IN CANCER W.S.R
TO METASTASIS****Dr. Madhava Diggavi*¹ and Dr. Nazhat Parveen²**

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ABSTRACT

The term Kriyakala refers to the stage of a diseases progress. It helps to determine the imbalance in Doshas. kriya kala word comprises of Kriya and Kala, where Kriya means the choice to treatment (ahara, vihara, aushada) used to improve the disturbance in Doshas, dhatu & agni and Kala refers to the stage of progress of a disease. Sushruta^[4], has described the concept of Kriyakala in Varnaprashnadhyaya, 21st chapter in sutra sthana. Abnormal interactions between genotype and environmental factors vitiate the Doshas and impair immunity, which can lead to genetic mutations, neoplastic cell growth and cancer. Moreover, the interaction between vitiated Doshas and Dhatus, jatara agni, dhatu agnimandata manifests as cancers. Agni mandata of particular dhatus and bhuta agni leads to cancer of that particular dhatus. Shat kriyakala (six stages of progress of a disease), on the other

hand, provides a framework to assess the cancer and its pathogenesis in different stages. According to Ayurvedic concepts, all cancer therapies treat the affected tissues by eliminating vitiated Doshas, rejuvenating Dhatus and restoring immunity in cancer patients. The present review describes the six stages of Shat kriyakala in detail which comes hand in hand with pathogenesis of cancer. This traditional knowledge can be utilized with modern technologies to detect predisposition for cancer or diagnose cancer in its early stages.

KEYWORDS: Medicine, Ayurvedic; Shatkriyakala; Tumors, Malignant, Neoplasm.

INTRODUCTION

Cancer is most deadliest diseases of the 20th century and spreading further with continuance and increasing incidence in the 21st century.^[1] Cancer is second only to coronary artery disease as being the most common cause of death all over the world. The disease Arbuda was mentioned during the Vedic period. In Atharvaveda there is reference of Arbuda and its management. Acharya Charaka, Sushruta, Vagbhatta have clearly mentioned its Hetu, Lakshana and Anekvidha Upkrama of Arbuda. Etymological Derivation of Arbuda^[5]: "Arbuda" is constituted of the root word "Arbb" and suffixed by verb "Udeti". The meaning of the "Arbb" is to kill, to hurt or to go towards and the meanings of the verb, "Udeti" is to elevate or to rise."Arbuda is derived as "Arma Bundeti", meaning which is perceived very fast "Sighraapyati". The derivation of the word arbuda generally means the disease which spreads very abruptly. It fits clearly to metastasis of cancer. Acharya Sushruta has described Arbuda as "The Doshas having vitiated in any part of the body and afflicting the Mamsa, and produce a swelling, which is circular, fixed, slightly painful, big in size, broad based, slowly growing and does not suppurate."^[6] Which are clearly signs and symptoms of cancer. Acharya Charaka has described Arbuda as a complication of Vata-Rakta. Acharya Madhava^[14] while describing Arbuda opines that the vitiated Dosha afflict the Mamsa and Rakta both to produce a swelling. The disease begins in the form of Shotha (swelling) and with the span of time gets converted to Arbuda.

SIMILARITY BETWEEN ARBUDA AND CANCER: Many diseases can be correlated with Cancer but Arbuda is a parallel disease for it. The signs and symptoms of Arbuda can be correlated with modern science.^[16]

Gatra pradeshe kavachita: Anywhere in the body or any tissue may be damaged. Cancer can occur at any area.

Mamsamabhi pradushyam: Predominantly it is a disease of the Mamsa that is damage of the muscular connective and epithelial tissues.

Vrutam sthiram: The growth is round and stony hard.

Manda rujam: Pain is not present except in final stage i.e in malignant tumors.

Mahantam: It spreads with deep route. Lymphatic and blood are routes

Chira vrudhi: It is chronic in nature and gradual in progress.

Apakam: It is non-suppurative. Only in super added malignant complicative infections

Mamshrochhayam: Tumor is formed by unnecessary and uncontrolled abnormal proliferation of tissue.

MODERN REVIEW

Metastatic tumor^[17] can send cells into other tissues in the body, which may be distant from the original tumor. The original tumor is called the "primary tumor." Its cells, which travel through the body, can begin the formation of new tumors in other organs. These new tumors are referred to as "secondary tumors." The cancerous cells travel through the blood (circulatory system) or lymphatic system to form secondary tumors. The lymphatic system is a series of small vessels that collect waste from cells, carrying it into larger vessels, and finally into lymph nodes. Lymph fluid eventually drains into the bloodstream. Cancer is named after the part of the body where it originated. When cancer spreads, it keeps this same name. For example, if kidney cancer spreads to the lungs, it is still kidney cancer, not lung cancer. (The lung cancer would be an example of a secondary tumor.) Staging is the process of determining whether cancer has spread and, if so, how far. There is more than one system used for staging cancer, and the definition of each stage will depend on the type of cancer. Cancer is not just one disease but rather a group of diseases, all of which cause cells in the body to change and grow out of control. Cancers are classified either according to the kind of tissue from which they originate, or according to the location in the body where they first developed. In addition, some cancers are of mixed types. Usually cancer gets diagnosed at the later stages when it has under went multiple METASTASIS. This means that the cancer cells can travel far from original tumor site and form a new tumor when they settle and grow in different part of the body which can be studied with detailed shad KRIYA kala.

CONCEPT OF KRIYA KALA

The concept of shad KRIYA kala^[2] suits more to pathology of tumor than pathogenesis of common disease itself. Arbuda is tridoshaja vyadhi and the causative factors of cancer are innumerable which causes tridosha, dhatu, agni, mala vitiation. As described in Sushruta Samhita^[3], the Kaphakaraahara viharas, such as Guru and Snigdha foods, worsen Kapha and affect the Jatharagni of the body, which results in Mandagni (the hypo-functioning of digestion and metabolism). This leads to improper digestion of food and formation of autotoxins, which mix with biological factors and affect the body tissues, altering their qualities. Probable causative factors that vitiates tridoshas, jataragni are correlated here with modern oncogenic causative factors.

VATA AGGRAVATING FACTORS – Mutations (90-95%), excessive mental stress, strain, freezer items, soft drinks, cigarette smoking, shoka, bhaya, raga, sheeta ruksha ahara, viruddha ahara etc.

PITTA AGGRAVATING FACTORS-- excessive intake of amla, lavan, katu ahara, food containing lead, MSG, fried and spicy foods, krodha, more caffeinated drinks, UV irradiation, Mobile phone radiation, physical agents like asbestos, Cobalt etc, Hormones like oestrogen, progesterone etc.

KAPHA AGGRAVATING FACTORS- Virus (HPV, HIV, EPSTEIN BARR Viruses, Kaposi's sarcoma, herpes virus, Hepatitis A and C, parasites), Obesity, diabetic patients.

1) SANCHAYA IN GENERAL - Sanchaya, the first stage of Kriyakala, describes the collection or accumulation of Doshas^[7] due to various causative factors mentioned above. In this stage, Doshas are accumulated but do not leave their own place. The symptoms in Sanchaya stage are due to increased Doshas, but not due to any disease. The etiology of sanchaya is due to swabhava, Prajnaparadha, Astamendriyarthasamyoga, seasonal changes, day-night changes, and changes in food and regimen. These are also ultimate reason for genetic mutation. All these causative factors leads to vitiation of tridoshas and dhatu agni, bhuta agni and jataragni manda. Agni present in each and every cell is responsible for digestion and normal metabolic function of cell, agni mandata due to above reasons causes vitiation of vata and improper nutrition of all the uttara uttara dhatus(dhatu kshaya). The VIBHU VATA is Amara. It leads to vitiation of other doshas and dhatus.

SANCHAYA IN CANCER

Cancer is an primary disorder of vata, that originates due to catabolic crisis between vata and kapha. Genes are basically made up of vata. so here the catabolic crisis between vata and kapha can leads to genetic mutations. which can be taken for genetic mutation. VATA further causes the promotion of oncogenes and inhibition of tumor suppressor genes. So basically in sanchaya avastha, due to vibhu vata vitiation, the other doshas, dhatus and agni gets vitiated causing favorable environment for genetic mutation. Sanchaya may also represent the level of oxidative stress, which damages the cell structure and its functions leading to somatic mutations and neoplastic transformation of the cells.

2) PRAKOPA IN GENERAL - In Prakopa (vitiation) stage, the accumulation stage (sanchaya) has persisted for a long time and the causative factors have been continuously present. This stage occurs while the Dosha^[8] are ready to move from their svasthana to anyasthana. On the basis of this observation, it is assumed that the Prakopa stage is developed due to continuous intake of improper Ahara, Vihara and Aushadha. The Dosha vriddhi occurs in a liquid state at its own place which is of two types, i.e., Chayapurvaka and Achayapurvaka Prakopa. Chayapurvaka describes reaching Prakopa after passing through Sanchaya, whereas Achayapurvaka Prakopa is characterized by reaching Prakopa without prior accumulation.

PRAKOPA IN CANCER

Achayapurvaka occurs more in metastatic condition where here patients will be not having any signs and symptoms of primary cancer but gets diagnosed when there is multiple metastasis later. patient with primary cancer on chemotherapy will be having secondary metastasis as a side effect of chemotherapy drugs. As the sloka quotes "kopastu unmarga gamita" can be studied with metastasis pathophysiology. After the sanchaya avastha, if patient is exposed to carcinogens, further mutation takes place in the same area and also other secondary areas. Leading to further stronger DNA mutation, genomic amplification, transcription in prakopa stage.

3) PRASARA IN GENERAL

Prasara is a stage of spreading. In Prakopa stage, the Doshas, which have remained in place so far, become ready to move.^[10] Now, in Prasara stage, the Doshas overflow and spread or move to other areas or organs of the body. Metastasis, where the cells break away from main tumor cells by vata and enter into blood stream (raktavaha srotas) and lymphatic system (rasavaha srotas) can be taken for prasara avastha.

Vata Dosha is the major culprit in moving the Pitta, Kapha, Dhatus and Malas to other places. Thus, it appears that the Vata is a key factor that mediates the Prasara stage in the cancer manifestation process. In this stage, the vitiated Doshas continuously spread outside of their normal sites.

PRASARA IN CANCER

The VIBHU VATA takes the neoplastic cells to the different parts of the body through blood, lymphatic, transcoelomic etc routes and gets lodge into the place where there is khavaigunyat and grow at that particular site and called by the name of primary site.

Eg – if the primary breast cancer caused metastasis in liver then it is Known as secondary breast cancer metastasized in liver.

4) STHANA SAMSRAYA IN GENERAL

Sthanasamsraya or the settlement of Doshas at a particular place occurs when vitiated Doshas are circulating and settle in areas of Srotavaigunya.^[10] These weak or defective sites may have tissue depletion or certain disturbances in their normal surface. Furthermore, a specific causative factor may have an affinity towards particular channels or tissues, which leads to a defective site and the manifestation of a disease.

EG- Asbestos has a affinity to get lodge in lungs and causes lung cancer with prolonged exposure. The localization of Doshas at sites in the abdomen produces disorders related to the stomach and urinary bladder, GIT tumors. When the Doshas are localized in the skin, muscle, or blood, the condition may lead to skin diseases like leprosy, skin cancer. Whereas localization in the fatty tissues of the body causes cysts, palpable tumors and goiter.^[11] It suggests that a particular disease is produced by the localization of Dosha at a particular site of the body.

STHANA SAMSHRAYA IN CANCER

All the etiological factors may not be causative for a disease; every tissue of the body may requires its own etiological factor related to particular involved Doshas and Dushyas (body tissues, i.e., Rasa, Rakta, Mamsa, Meda, Asthi, Majja and Shukra). For example- like HPV virus can cause cervical and breast cancer only, a particular pathogen has a specific affinity towards a particular tissue, where it causes a disease. In such conditions, the union of Doshas/ Dushyas at a particular site is called Sthanasamsraya. vata takes the cells to the different parts of body to the place where there is khavaigunyat. eg- The primary lungs cancer which is vata kapha sthana gets metastasis into brain(pranavata sthana), bone(ashraya for vata). The primary prostate cancer which is vata sthana gets metastasis into bones(ashraya for vata). The primary colon and rectal cancer which is vata sthana gets metastasis into lungs (prana vata sthana). The primary bladder cancer which is vata stana spreads to bones (aashraya for vata)

and lungs (pranavata sthana). Uterus(vata sthana) spreads to bones(ashraya for vata), lungs(vata sthana). The primary pancreas cancer which is pitta sthana spreads to liver (pitta sthana). The primary stomach cancer sthana for pitta spreads to liver(pitta sthana). The primary lungs cancer sthana for vata kapha spreads to adrenal glands (kapha sthana)

5) VYAKTA AVASTHA IN GENERAL- If the causative factors present in Sthanasamshraya further continues, Dosha enters into Vyakti stage, in which all the symptoms of a cancer as well metastatic cancer appear.^[12] In many conditions the symptoms of primary cancer is not seen, but when it undergoes into stage of metastasis, the metastasized secondary cancer symptoms are seen in vyakta stage.

VYAKTA AVASTHA IN CANCER

In other words, during vyakta stage, all symptoms appear on the surface of a cancer site or as a systemic symptom. Hence, Vyakti is the stage where a cancer manifests itself completely. The symptoms that appear at this stage are used by medical professionals to examine and diagnose the cancer, which helps in developing a treatment plan. It helps to plan chemotherapeutic regimen required on the basis of stage of genetic mutation, site, symptoms.

6) BHEDA AVASTHA IN CANCER- Bedha is the final stage where the progression of a cancer reaches an end. Complications with the cancer will be seen^[13], and finally may lead to death. In this stage, the cancer is usually seen with its oncological emergencies like neutropenic sepsis, tumor lysis syndrome, quads equine syndrome etc leading to decreased survival rate.

CONCLUSION

The use of Ayurvedic treatment rather than the targeted therapies for destruction of the tumors is beneficial to the improvement of the metabolic defects and restoration of normal tissue functions and increase QOL of patients. The holistic approach of Ayurveda could become an essential component for cancer treatment by using immunotherapy. Moreover, Ayurveda gives insight on the condition of Doshas at each stage and can be used to track a disease by measuring Vata, which could be controlled if it falls outside of normal levels. According to Ayurveda, Kapha, Vata Dosha and Ama Visa, agnimandya appear to be the main morbid factors for cancer. It appears that Vata is a key factor for the Prasara stage in the cancer manifestation process, which can be only diagnosed with the help of clinical involvement. However, if Doshas are at the first stage, a simple line of treatment can prevent

the condition from progressing to the next stage in the manifestation of cancer. Ayurveda also has indirect approaches to the treatment of cancers because therapies aim to eliminate vitiated Doshas, rejuvenate body functions and restore immunity. This is similar to modern clinical approaches which use immunotherapy and cancer vaccines. Ayurvedic treatment regimens are largely designed to restore the body's natural defense mechanisms and self-healing powers. Ayurvedic therapies are used to promote long-term recovery from a disease by strengthening and rejuvenating major body systems. It is obvious that if a disease is diagnosed in a holistic manner, its treatment is also holistic. Moreover, although manifestation and complication are the only phases recognized by modern medical science to diagnose or treat cancer, the multi-stage approach taken by Ayurveda provides a lot of information about pathogenesis, diagnosis and treatment of a cancer in its early stages under the concept of Shatkriyakala. This wonderful concept is applicable but not yet validated scientifically. Hence, the validation of the Shatkriyakala model, with the help of modern sciences, could be a great achievement in the field of medicine.

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