

# Traditional medicine-based therapies for cancer management

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## ABSTRACT

In traditional Sri Lankan medicine, “*Pilika*” is the main term used to denote cancer. But the terms “*Gadu*”, “*Arbuda*”, “*Mas vana*” are also other names for cancer used in the literature. In Indian Ayurveda concepts, cancer is resemblance with entities of *Arbuda* and *Granthi*. Systems of Traditional Medicine approaches are needed to further explore in cancer management to minimize the gap between modern understanding and traditional concepts. Hence a brief review on some of the important features used in Ayurveda and traditional Sri Lankan medicine was given to understand the principles behind cancer management. Further attempt

was made in this review to discuss about the etiopathogenesis of cancer described in Ayurveda and traditional systems of medicine in Sri Lanka.

**Key words:** Cancer, Ayurveda, Traditional Sri Lankan Medicine

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## INTRODUCTION

Cancer is one of the most dreaded diseases of the 20<sup>th</sup> century and spreading further with continuance and increasing incidence in 21<sup>st</sup> century. Cancer in Sri Lanka is steadily on the rise. The country's cancer incidence rate has doubled since the eighties, according to the latest data (2006) compiled by the Sri Lankan National Cancer Control Programme (NCCP). Statistics indicate that the number of cases and mortality rates from cancer have gone up since 1985. The increase in incidence was higher for females at 79 percent in 2006. According to the World Health Organization (WHO), Sri Lanka ranks the highest in non-communicable diseases in Southeast Asia<sup>1</sup>.

Ayurveda and traditional Sri Lankan medicine has served in the curative and preventive aspects of cancer since the ancient time. Among the specializations in traditional medicine, “*Gedi-Vana-Pilika*” (Oncology) has been a specialization practiced for many generations. Earliest written evidence of treating Cancer by Sri Lankan physicians can be found as early as 1680 BC in records of JoãoRibeiro<sup>2</sup>. Since 1879, some books written in Sri Lanka on traditional medicine are abundant in herb-mineral drugs for cancer. Even today, some indigenous practitioners treat various types of cancer effectively in those who seek traditional treatments at earlier stages of the disease.

Medicinal herbs and their derivative phyto-compounds are being increasingly recognized as useful complementary treatments for cancer. A large volume of clinical studies has reported the beneficial effects of herbal medicines on the survival, immune modulation, and quality of life of cancer patients, when these herbal medicines are used in combination with conventional therapeutics<sup>3</sup>. Recently, a greater emphasis has been given towards the research on traditional medicine that deals with cancer management.

## AYURVEDA CONCEPT OF CANCER

Well known Ayurveda classics *Charakaand Sushruta Samhita* describe cancer as inflammatory or non-inflammatory swelling and mention them as either *Granthi* (minor neoplasm) or *Arbuda* (major neoplasm). In benign neoplasm raised from one of body humors (functional systems) *Vataja*, *Pittaja* or *Kaphaja* or combination of two of the body humors which are out of control and is not too harmful because the body is still trying to coordinate among these systems. Malignant tumors (raised from *Tridosaja*) are harmful because all the three body humors lose coordination and damage the tissues resulting endpoint of death<sup>4,5</sup>.

## AYURVEDA CLASSIFICATION OF CANCER

Group I: Diseases that can be named as clear malignancy, which includes *Arbudaand Granthi*, e.g. *Mamsarbuda* (melanoma) and *Raktarbuda* (leukaemia), *Mukharbuda* (oral cancer).

Group II: Diseases that can be considered as cancer, such as incurable ulcers with e.g. *tridosajulmas* (abdominal tumors like carcinomas of the stomach and liver or lymphomas).

Group III: Diseases with the possibility of malignancy, e.g. *Visarpa* (erysipelas), *asadhya kamala* (incurable jaundice) and *nadivrana* (sinusitis)<sup>6,7</sup>

## CLASSIFICATION OF CANCER ACCORDING TO SRI LANKAN TRADITIONAL MEDICINE

In Sri Lankan traditional medicine (TSM), “*Pilika*” is the main term used to denote cancer. But the terms “*Gadu*”, “*Arbuda*”, “*Mas vana*”, etc. are also used in texts. Some of the terms used in Sri Lankan texts on cancer are given in the following table (Table 1)<sup>8,9</sup>.

### What causes cancer?

According to traditional systems of medicine texts consider incorrect lifestyle, unhealthy foods, poor hygiene and bad habits results in the derangement of main humors in body (*Doshas*), which leads to the manifestation of tumors (references). Cancer in each person differs according to the person's exposure to pathogens and *Prakruthi* (genetic constitutions) which make each of them to react differently. According to ancient texts, the following are the main factors responsible for the vitiation of *Doshas* which may be the causative factor/s in developing a cancer stage<sup>10</sup>.

a. *Vatavitiates* causes - excessive intake of bitter, pungent, astringent, dry foods and stressful conditions.

**Table 1: Classification of cancer in traditional Sri Lankan medicine with modern equivalent.**

Term used in traditional medicine	Modern equivalent
<i>SanniPilika / Isa Pilika</i>	Brain tumors
<i>UdaraPilika</i>	Gastrointestinal cancers
<i>Pith Pilika</i>	Hepatobiliary cancer
<i>Katha vandavanakusapilika</i>	Uterine cancer
<i>UgureGadu</i>	Esophageal cancer
<i>Etapalagadu</i>	Osteosarcoma / Chondrosarcoma
<i>AsthiPilika</i>	Bone cancer of spine
<i>Kandamalagadu</i>	Thyroid cancer
<i>PramehaPilika</i>	Prostate cancer / Bladder Cancer
<i>HakuPilika</i>	Cancers of oral cavity
<i>Jihvaarbuda</i>	Cancer of tongue
<i>Lochanaarbuda</i>	Leukemia
<i>Dumas vana</i>	Ulcerative cancers
<i>Kustarbuda</i>	Melanoma and other skin cancers

- b. *Pittavitiates* causes - excessive intake of sour, salty, fried foods and excessive anger.
- c. *Kaphavitiates* causes- excessive intake of sweet, oily food and sedentary nature.
- d. *Raktavitiates* causes - excessive intake of acid or alkali containing foods, fried and roasted foods, alcoholic beverages, excessive anger or severe emotional upset, sunbathing or working under scorching sun or near fire and hot conditions, etc. are some other causes
- e. *Mamsavitiates* causes- excessive use of exudative foods like meat ad some dairy products. Behaviours leading to exudation like sleeping during the day and overeating are some of the causes for pathogens invading the fatty tissues.
- f. *Medovitiates* causes - excessive intake of oily foods, sweets, alcohol and sedentary life.

## How does cancer occur?

In Ayurveda free energy of food oxidation is correlated with *Agni* (metabolic energy) and it can be correlated to enzyme and hormones pathways of metabolism. Gastrointestinal tract (GIT) secretions is considered as constituents of *Jatharagni* (Metabolic transform actions based on alimentary system). Further actions of metabolic pathways in tissues and cells can be correlated as *Dhatvagni* (metabolic transform actions based on tissue level) and *Bhutagni* (chemical actions based on gene level). In *Bhutagni* level, gene expressions and protein synthesis can occur. According to influence of *Vata* and *Kapha* Doshas on *Agni* there may be occurrence of wrong messages at the gene level. According to Ayurveda, it can be correlated with "*Pravrudha Ama concept*" (cancer occurring messages and proliferation) at cellular level. Etiological factors responsible for impairment of *Agni* leads to formation of *Ama* (Free radicals). Constitution of *Ama* and its *Gun*as (properties) may be causative factor of most diseases in human. Formation of *Ama* at different levels and its' pathogenicity at *Dhatu* (tissues) and *Dhatvagni* levels leads to precipitation of various pathological conditions. In cancer the decreased state of *Dhatvagni* (deranged metabolism) will result in excessive tissue growth. According to Ayurveda concepts, cancer originates due to a metabolic crisis, i.e. aggravation of *vata* forces and suppression of *Kapha* forces, both interacting with one another resulting in proliferation<sup>10</sup>. However, the abnormal cancerous growth at a specific organ (*Ekadesavridhi*) is managed by compensation from other parts of the body (*Anyasthaniyakshaya*), e.g. body weight loss (cachexia)<sup>11,12</sup>. Literature in *Sushruta Samhithaha* proposed six stages in the pathogenesis of all diseases<sup>4, 11</sup>. These stages are used in cancer drug development process as drug targets (Figure 1).

1. *Sanchaya*: early stages of localized neoplastic changes.
2. *Prakopa*: transformation of primary growths into metastatic tumors.
3. *Prasara*: metastasis.
4. *Sthanasamsraya*: complete metastasis and secondary growth.
5. *Vyakti*: clinical signs and symptoms are expressed.
6. *Bheda*: the stage where differentiation of growth occurs.

## CANCER THERAPY IN TSM

Ayurveda therapy based on knowledge of disease within its own framework through an individualized and holistic treatment approaches. Basically, the therapeutic approach of TSM can be divided into four main categories as follows.

1. *Roganidana-Nivarana Chikitsa* (preventive and health maintenance)
2. *Rogamula Nashana Chikitsa* (immune/gene modulating treatments)

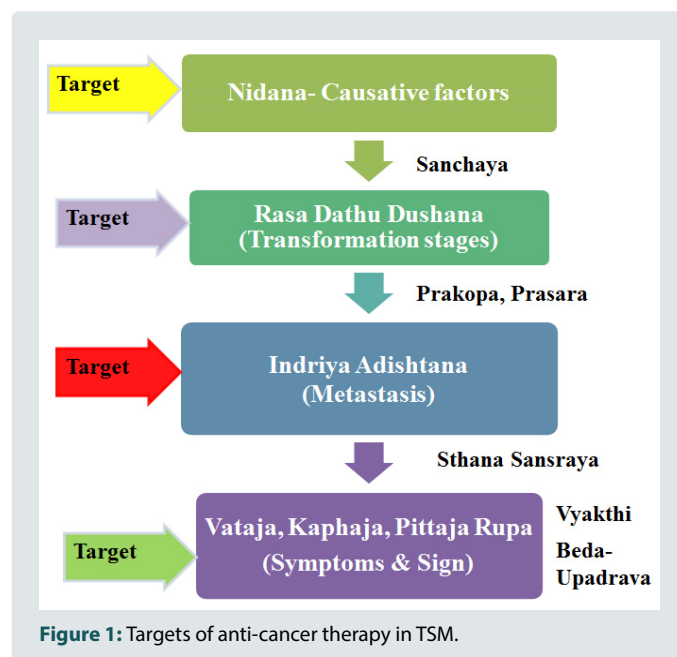


Figure 1: Targets of anti-cancer therapy in TSM.

3. *Rasayana Chikitsa* (immune enhancing treatments)
4. *Manasa Pradhana Chikitsa* (spiritual approach)

## Treatment modalities for cancer

With effective integration of "omics," *Prakriti*-based medicine can play a vital role in this changing scenario of global health wisdom as Ayurveda and TSM offers its modalities by way of *Ahara* (diet), *Vihara* (lifestyle) and *Aushadhi* (medication) which are the three pillars of *Prakriti*-based medicine making it a holistic science<sup>12,13</sup>.

Ayurveda and TSM emphasize the treatment of disease in a highly individualized manner as it believes that every individual is unique having different constitution. Therefore, pattern of treatment regimens should be directed towards personalized medical system. This is independent of racial, ethnic, or geographical considerations and may provide appropriate treatment plan. Similarly, these traditional systems classified the drugs according to the *Rasapanchaka* (Ayurvedic pharmacology), which states that the drug action is ascribed to certain attributes present in the drug namely *Rasa* (taste), *Guna* (property), *Virya* (potency), *Vipaka* (Post digestive taste) and *Prabhava* (specific potency) while in modern pharmacology the drug action is attributed to the chemical structure of a molecule<sup>12,13</sup>. The *Rasapanchaka* modality can deliver treatment as it takes into consideration the *Prakriti* of the person as well as the pharmacodynamics and pharmacokinetic properties of a drug, unlike a modern treatment that elicits varied response from person to person having same drug for the same disease. Explored results seem to support the understanding connectivity of phenotypic features (*Prakriti*) connected with genotype as personalized medicine with given maximum efficiency and safety for a particular disorder<sup>13</sup>.

Following are the treatment strategies in Ayurveda and TSM<sup>10</sup>.

1. Purification process (*Sodhana Chikitsa*)

Vitiated toxins are eliminated (*Ama*) by performing detoxifying purification treatments (*Panchakarma Chikitsa*).

2. *Samana Chikitsa*

It pacifies main humors (*Dosha*) and gradually relieves the disease.

3. *Rasayana Prayoga* (immunotherapy)

4. *Dhatwagni Chikitsa* (correction of metabolic defects)
5. *Vyadhipratyanika Chikitsa* (specific anti-cancerous drugs)
6. *Lakshanika Chikitsa* (symptomatic treatment)
7. Surgical cancer management

According to study, the cauterization with alkalis and acids and other surgical procedure can be performed with herbal and mineral medicines. *Arbuda* should be excised completely from its deep root seat and cauterization should be done to destroy any of the remaining cell particles.

8. *Manasa Pradhana Chikitsa* (spiritual approach and Yoga)

### Use of herbal medicine as adjuvants in conventional anti-cancer therapies

Numerous herbal medicines are being used in combination with chemotherapy or radiotherapy to improve the efficacy of cancer therapy and reduce side effects and complications throughout the world. According to studies, herbal medication in general was applied as a combination therapy with the conventional chemotherapy to increase the therapeutic benefit and quality of life as well as to decrease the side effects or complications. Recent studies based on epidemiological modeling have demonstrated interesting patterns suggesting that herbal treatment may improve prognosis in cancer patients when used as an adjuvant therapy<sup>3</sup>. These herbal drugs also assist in the induction of cytokines and stimulation/activation of antigen-presenting cells in the tumor or tissue microenvironment and leading to induce the apoptosis of the cancer cells. Most of TSM based therapies are used as poly-herbal preparations. These preparations have their own synergistic actions and multi molecular target properties. This multi target approach leads to cease the cascade reactions of cancer cell signaling and communications. Following is an example for poly-herbal preparation used in basic cancer therapies with multi target herbal compounds (Example 1).

Example 1:

*Nawarathne Kalka*<sup>14</sup> mixed with the Phanta(tea) of:

*Amu Inguru* (*Zingiber officinale*)

*Velmee* (*Glycyrrhiza glabra*)

*Koththamalli* (*Coriandumsativum*)

*Gammiris* (*Piper nigrum*)

*Sudulunu* (*Allium sativum*)

### Yoga and cancer

Ayurveda emphasizes the importance of the body-mind communication network. By demonstrating the effects of emotions on cellular immunity and other mechanisms, the science of psychoneuroimmunology has set out a potential physiologic

basis for cancer cell progression. Yoga can be a useful body-mind communication method to help relieve some symptoms of chronic diseases such as cancer, arthritis, and heart disease and can lead to increased relaxation and physical fitness. It may enhance quality of life. Some cancer treatment centers even offer yoga in addition to standard medical treatment in the world. Preliminary evidence indicates that yoga may help to improve anxiety, depression, and emotional distress, and relieve stress in people with cancer<sup>15</sup>.

“A healthy person is he whose humors (*Doshas*) and metabolic state (*Agni*) are in equilibrium, whose functional activities of the tissues (*Dhathus*) and excretory products (*Malas*) are in balance, and the soul (*Athma*), senses (*Indriya*) and mind (*Manas*) feel well” (Su. Su. 15/41)<sup>4</sup>.

As a conclusion these traditional medicine approaches should further assessed by scientific based research modalities not impairing the concepts behind their treatment protocols. Further we need to conduct vigilant clinical trials based on their conceptual approaches with parallel to the current coherent drug development process.

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