

# The Relevance of Agadtantra in Addressing Cancer from Chemical Exposures: An Ayurvedic Toxicological Perspective

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## Abstract:

Lifestyle disorders are chronic conditions primarily caused by unhealthy habits and prolonged environmental exposure. Among them, cancer is a leading global health concern and is increasingly linked to modern lifestyle practices. In 2020, India ranked third in global cancer incidence, underlining the urgency of addressing modifiable risk factors, particularly those related to chemical exposure.

**Objective:** This article explores the role of chemical exposure from diet, cosmetics, and environment in the etiology of cancer and presents the perspective of Agadtantra-the branch of Ayurveda dealing with toxicology-in understanding and managing such conditions.

**Methods:** A review of classical Ayurvedic texts was conducted to examine concepts like **Viṣa** (toxin) and **Doṣṭiviṣa** (latent toxins), alongside a synthesis of modern literature on carcinogens found in food additives, packaging materials, cosmetic products, and environmental pollutants. Conceptual parallels were drawn to highlight the relevance of Ayurvedic principles in addressing these exposures.

**Results:** Carcinogenesis mirrors the Ayurvedic concept of Doṣṭiviṣa, characterized by slow accumulation and delayed manifestation of symptoms. Chemical additives in processed foods, preservatives, and cosmetic compounds like parabens and phthalates contribute significantly to cancer risk. Environmental exposure to toxins is largely unavoidable in modern life. Ayurvedic interventions such as Śodhana (detoxification), Agada (anti-toxic formulations), Ghrta (medicated ghee), and Suvarṇa Kalpa (gold-based Rasāyana) may help detoxify the body, enhance immunity, and restore cellular health.

**Conclusion:** Agadtantra offers a holistic and preventive approach to managing lifestyle-related cancers by addressing underlying toxic exposures through time-tested Ayurvedic principles.

**Keywords :** Cancer, Chemical exposure, Agadtantra , lifestyle disorders, Detoxification, Integrative oncology.

## Introduction:

Lifestyle disorders are the diseases primarily resulting from the manner in which persons live their life. These diseases are associated with factors diet, physical activity, mental stress, addictions, and environment, etc. They are the chronic diseases resulting from combination of physiological, genetic, environmental and behavioral factors. Cancer is one of the significant diseases caused due to lifestyle. The burden of cancer is increasing day by day affecting the different socio-economic and geographies of the India. In 2020, the Global Cancer Observatory (GLOBOCAN) estimated, there were 19.3 million incident cancer cases in the world<sup>(1)</sup>. India was on third position after China and the United States of America<sup>(2)</sup>. Considering the increasing burden of cancer, it is necessary to discover the latent causes of cancer in the current lifestyle.

*Agadtantra* is a branch of Ayurveda which focuses on the study and management of *Viṣa* i.e., poisons or toxic substances. In Agadtantra carcinogens are referred as *Viṣa*. Hence, cancer can be considered as a disease caused due to accumulation of *Viṣa* to which humans are exposed in current lifestyle. Exposure of various chemical through diet, cosmetics and environment is very common. Many

chemicals from these sources are associated with causation of cancer.

**AIM :** To review the role of *Agadtantra* in cancer linked to chemical exposure

## Objectives :

1. To collect literary aspect of *Agadtantra* and cancer
2. To analyze the cancer-causing chemicals present in the diet, cosmetics, and environment.
3. To explain the role of *Agadtantra* in cancer linked to chemical exposure

## Materials & Methods :

**Materials :** The data for this review article is collected from –  
Classical Ayurvedic texts  
Relevant research articles  
Relevant Websites

**Methodology :** Literary Analysis – Conceptual study of *Agadtantra* principles in relation with chemical exposure linked Cancer

## Conceptual Study :

Concept of cancer, carcinogens and carcinogenesis in

**Agadtantra –**

Cancer is a disease in which abnormal cells grow uncontrollably in the body. Carcinogens are the substances that can cause cancer. They can be physical, biological or chemical agents. The process by which normal cells are transformed into cancer cells is called as carcinogenesis. It involves mutations (DNA damage) and epigenetic modifications in gene expression. The duration of time someone lives after a cancer diagnosis varies greatly depending on the type and stage of cancer, the individual's overall health, and the treatment. *Agadtantra* describes types of *Visha* (poison) as a *Kritrim* (artificial) and *Akritrim* (natural) *Visha*.<sup>(3)</sup> *Kritrim Visha* is further divided into *Gara Visha* and *Dooshi Visha*. *Garavisha* is an artificially prepared poison.<sup>(4)</sup> It is a combination of poisonous or non-poisonous

substances that causes chronic toxicity. It can cause long-term health problems rather than immediate death.<sup>(4)</sup> *Dooshivisha* is state of low-grade or low-potency poisons that remains in body for long term in latent phase.<sup>(5)</sup>

**Carcinogens in diet :** According to *Agadtantra Garavisha* is *Ahar Samprukta* which means mixed with food.<sup>(6)</sup> Also, Acharya Vagbhata refers Viruddha Ahara (Incompatible food) as a *Garovisha*. *Garavisha* is *Alapa Veerya* (low potency) *Visha*.<sup>(7)</sup> This can be correlated to the substances present in the food which are responsible for chronic toxicity or delayed harmful effects on health. At present, the diet contents numerous harmful substances leading to various diseases including cancer. The food additives, preservatives, and packing material are the major culprits of cancer. Table 1

**Table1: Food additives stimulating carcinogenicity of other carcinogenic agents at high doses.**

Sr. No.	Food additives	Cancer type	Cancer causing compounds
1	Sodium Saccharin	Bladder carcinoma	N-(4-(5-nitro-2-furyl)-2-thiazolyl)formamide or N-butyl-N-(4-hydroxybutyl) nitrosamine
2	Carrageenan	Colon carcinoma	Azoxymethane or methylnitrosourea
3	Sorbitan monolaurate	Skin tumor Stomach adenocarcinoma, sarcoma	N-methyl-N'-nitro-N-nitrosoguanidine
4	Ascorbic acid	Urinary bladder carcinoma	N-butyl-N-(4-hydroxybutyl) nitrosamine
5	Sodium erythorbate	Urinary bladder carcinoma	N-butyl-N-(4-hydroxybutyl) nitrosamine
6	Sodium ascorbate	Forestomach and urinary bladder carcinomas	Butylated hydroxyanisole
7	Propyl gallate	Forestomach carcinoma	Sodium nitrate

Additives and the type of Cancer caused and the specific compounds in presence of which cancer is caused<sup>(8)</sup>.

Use of artificial preservatives has been increased to preserve freshness of food for longer duration. But these preservatives can cause harmful effect on human health. Sodium nitrite and sodium benzoate are commonly used food preservatives which forms carcinogenic substances when they reacts certain compounds. Preservatives like Hexamethylene Tetramine, Butylated Hydroxyanisole (BHA) and Butylated Hydroxytoluene (BHT) can cause cancer<sup>(9)</sup>.

Currently food packing material is creating concern regarding food safety. News paper is widely used for food packing. News-paper ink is associated with the cancer. Commonly used packing material Bisphenol A (BPA) has been linked to prostate cancer<sup>(10)</sup>.

**Cosmetics and Cancer:** Different cosmetics and personal care products has become an integral part of human life. Heavy metals, parabens, silica, and ethoxylated compounds present in cosmetics are with potential carcinogenic effect<sup>(11)</sup>.

**Environmental toxicants and Cancer:**

Pollutants coming in contact from air, soil and water are unavoidable. Chemicals present in these sources can induce oxidative stress and DNA damage and can lead to cancer.

**Agadtantra and cancer management :** If we consider carcinogens as a *Garavisha* and carcinogenesis as a *Dooshivisha*, we can use various *Agada* (anti-toxic) formulations in management of cancer. As described in *Dooshivisha*, *Shodhana* (detoxification) can play important role in cancer management. *Dooshivishari Agada* can be used<sup>(12)</sup>. *Ghritha* and *Suvarna Prayoga* described in *Garavisha* can be useful<sup>(13)</sup>.

**Discussion:** The convergence of ancient Ayurvedic wisdom and modern biomedical evidence provides a rich, multidimensional perspective in understanding the etiology of cancer. This integrative approach, drawing from both traditional health systems and contemporary science, not only strengthens our understanding of carcinogenesis but also offers insights into preventive strategies that are both culturally relevant and scientifically grounded.

## 1. Dietary Practices and Processed Foods: A Shared Concern

Ayurvedic texts such as the *Aṣṭāṅghrdayam* and *Caraka Saṃhitā* place significant emphasis on the quality, freshness, and mode of preparation of food. These classical sources caution against the consumption of stale (*pūti*), over-processed, or chemically altered foods, warning that such practices lead to the formation of *āma* - a toxic, undigested metabolic byproduct considered a root cause of many chronic diseases, including *arbuda* (tumor-like conditions)<sup>(3,4,6,7)</sup>.

This traditional viewpoint finds striking resonance in modern studies that have identified various **chemical preservatives and food additives** as potential carcinogens. Research shows that substances such as **butylated hydroxyanisole (BHA)**, **nitrites/nitrites**, and **artificial colorants** not only alter cellular redox states but also initiate and promote carcinogenic pathways<sup>(8)</sup>. Further highlight that chronic exposure to these additives can cause oxidative stress, disrupt DNA integrity, and impair immune surveillance, thereby increasing cancer risk<sup>(9)</sup>. These findings validate Ayurvedic dietary recommendations that favor natural, minimally processed, and seasonal foods.

## 2. Environmental Toxins as Viṣa: Ancient Concepts in Modern Context

A particularly prescient concept in Ayurveda is “**viṣa**”, or poison. Classical Ayurvedic texts categorize *viṣa* as both naturally occurring (e.g., snake venom) and artificially introduced or accumulated through environmental exposure, improper food storage, or toxic substances in consumer products<sup>(6,12)</sup>. These descriptions mirror the modern scientific understanding of environmental toxins, such as endocrine-disrupting chemicals (EDCs), which include Bisphenol-A (BPA) and parabens, as significant contributors to cancer development, demonstrated that BPA, widely present in plastic packaging materials, can leach into food and beverages, especially under heat or long storage. BPA mimics estrogen, interferes with hormone signaling, and is associated with breast, prostate, and other hormone-sensitive cancers<sup>(10)</sup>. Similarly, parabens and phthalates found in cosmetics and personal care products have shown estrogenic activity and genotoxic effects. Identification of these compounds as potential carcinogens due to their pervasive use and ability to disrupt cellular homeostasis<sup>(11)</sup>.

Thus, the Ayurvedic notion of chronic *viṣa* exposure as a disease catalyst is increasingly being supported by toxicological and epidemiological studies in modern science. This convergence points toward the necessity of minimizing environmental and dietary exposure to synthetic chemicals as a preventive health strategy.

**3. Individualized Approaches:** Ayurveda and Precision Prevention: Another area of convergence lies in Ayurveda's emphasis on individualized healthcare, where interventions are tailored based on the patient's unique constitution (*prakṛti*), digestive capacity (*agni*), age, season, and emotional state. This aligns with the modern concept of precision prevention in oncology, which aims to customize preventive strategies based on genetic, epigenetic, environmental, and lifestyle risk factors<sup>(1)</sup>.

For example, individuals with genetic polymorphisms in detoxification enzymes (e.g., GSTs, NATs) may be more

susceptible to environmental carcinogens. Similarly, in Ayurveda, individuals with kapha-dominant constitutions are considered more prone to sluggish metabolism and accumulation of toxins, making them theoretically more vulnerable to tumor formation<sup>(3,4)</sup>. The ancient approach of *svabhāva-parīkṣā* (examination of innate nature) has modern parallels in biomarker-based risk stratification.

The Ayurvedic stress on preventive daily regimens (*dinacharyā*), seasonal adjustments (*ṛtucaryā*), and mindful living also aligns with behavioral interventions now recognized in cancer prevention guidelines. These include maintaining a healthy diet, reducing stress, physical activity, and minimizing toxin exposure.

## 4. Biochemical Homeostasis and Doṣa Balance

Finally, Ayurveda's conceptual framework of *doṣa* balance—the dynamic equilibrium of *vāta*, *pitta*, and *kapha*—can be metaphorically mapped onto the modern understanding of biochemical and cellular homeostasis. In both systems, disease is understood to arise from internal dysregulation and imbalance.

Cancer, in modern pathology, is increasingly seen as a result of disrupted homeostasis involving oxidative stress, mitochondrial dysfunction, immune evasion, and chronic inflammation. Similarly, in Ayurveda, *arbuda* is thought to originate when *doṣic* disturbances remain unresolved and accumulate in vulnerable tissues (*dhātu-sāra-bhūmi*), resulting in uncontrolled tissue growth<sup>(6,7,12)</sup>.

Importantly, Ayurveda's treatment paradigms—such as detoxification (*śodhana*), herbal rejuvenation (*rasāyana*), and lifestyle correction—are designed to restore this equilibrium, and such interventions are being increasingly explored in integrative oncology as adjuncts to conventional treatment<sup>(13)</sup>.

**Conclusion :** Agadtantra is traditionally focused on poisoning, but its principles are applied in cancer management to handle chronic toxicity, immune compromise, and cellular imbalance to enhance patient's quality of life.

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