

**ROLE OF AGADA W.R.T. SIDE EFFECTS OF CHEMOTHERAPY****Dr. Heena Kaushik<sup>1\*</sup>, Dr. Madhusudan Parmar<sup>2</sup>**<sup>1</sup>Assistant Professor, National College of Ayurveda and Hospital, Barwala, Hissar.<sup>2</sup>BAMS, IAS&R, SKAU, Kurukshetra, MHA, DCRUST, Sonipat.**\*Corresponding Author: Dr. Heena Kaushik**

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**ABSTRACT**

The incidence of cancer is on the rise in India. In recent decades, significant progress in diagnostic techniques and cancer treatments has led to higher survival rates for cancer patients. Chemotherapy is use of cytotoxic chemicals used in the treatment different types of cancer and it often causes side effects. Being aware of potential side effects from chemotherapy is crucial for preventing and managing them effectively. The side effects of chemotherapy may vary from person to person which may depend on the type of cancer, location, drug, dose, and general health of an individual. Chemotherapy is cytotoxic systemic medication. It can be used as a treatment for many different cancers. Chemotherapy targets and destroys cells that are dividing into two new cells, affecting both cancerous and healthy cells that are actively progressing through the cell cycle. Active cells are those that are growing and dividing as part of the normal cell cycle. Since cancer cells generally proliferate more rapidly than healthy cells, chemotherapy can more readily target them. However, side effects occur when chemotherapy also harms healthy cells, potentially leading to issues such as hair loss, nausea, and vomiting. Fortunately, there are now many more medications available to manage these side effects than in the past. Though chemotherapy is cytotoxic but can also show its toxic effects in form of side effects like fever, nausea, vomiting, lethargy, oedema etc. in the body. In this review we will discuss regarding various *Agada* which can be used to combat and minimize the side effects of chemotherapy used in cancer treatment.

**KEYWORDS:** *Agad*, *Ayurveda*, Cancer, Chemotherapy, Cytotoxic, Side Effects.**INTRODUCTION**

Chemotherapy is a successful therapy for various types of cancer, but it often comes with adverse effects, similar to other cancer treatments. Why do side effects occur with chemotherapy? Chemotherapy targets cells that are actively growing and dividing, which is part of the natural cell cycle. Since cancer cells, like healthy cells, are also active and undergo this cycle, they are affected by chemotherapy. Cancer cells often grow faster than healthy cells, making chemotherapy more effective. However, chemotherapy will also destroy some normal cells. These include cells in your blood, mouth, digestive tract, and hair follicles. Cancer is a significant disease and a leading cause of death globally, resulting in widespread suffering and substantial economic losses through worldwide.<sup>[1]</sup> There were 20 million cancer cases and 9.7 million deaths due to cancer worldwide in the year 2022.<sup>[2]</sup> As a result, research is being conducted worldwide to prevent cancer and develop non-toxic

therapeutic agents, including those based on Ayurvedic herbal medicines. Despite significant advancements in cancer diagnostics and treatments over the past few decades, which have improved survival rates, there is growing attention<sup>[4]</sup> in the long-term effects of these treatments on the quality of life of cancer survivors. change the sentence without changing the meaning and with zero plagrism Late complications of these therapies also include pharyngitis, esophagitis, laryngitis, persistent dysphagia, fatigue, hepatotoxicity, infertility and cognitive deficits.<sup>[5]</sup>

**ANOREXIA (*Arochak*)** - Almost 80% of cancer patients experience anorexia-cachexia syndrome in the advanced stages of their illness, and this condition is often exacerbated by chemotherapy.<sup>[6]</sup> Anorexia is the most frequent side effect of chemotherapy, and it is linked to weight loss, fatigue, and decreased appetite.

These factors contribute to lower chances of a favorable outcome and reduced survival.<sup>[7]</sup>

**NAUSEA AND VOMITING (*Chardi*)** - These are the most frequently observed issues during chemoradiotherapy. Despite the use of anti-emetic medications, 70% of patients continue to experience persistent symptoms.<sup>[8]</sup>

**ANEMIA (*Panduta*)** - Anemia is a prevalent issue among cancer patients undergoing chemotherapy. It considerably impacts quality of life and is a major reason for blood transfusions in these patients.<sup>[9]</sup>

**DIARRHOEA (*Atisara*)** – Diarrhea affects 50% to 80% of patients undergoing chemotherapy, contributing to a diminished quality of life and lower effectiveness of the treatment output.<sup>[10]</sup>

**CONSTIPATION (*Vibandha*)** - Constipation is another significant issue for patients undergoing treatment with certain chemotherapeutic agents, such as cisplatin.<sup>[11]</sup>

**COGNITIVE DEFICITS (*Medha, Smriti*)** - Research indicates that about 61% of patients undergoing chemotherapy experience declines in cognitive functions such as learning, attention, and processing speed, along with difficulties in areas like executive function, memory, psychomotor speed, and attention.<sup>[12]</sup>

**SKIN TOXICITY (*Twak Vikara*)** - Skin-related adverse effects are prevalent with newer antitumor medications. Up to 34% of patients on multikinase inhibitors, up to 90% on selective tyrosine kinase inhibitors (such as EGFR or mutant BRAF inhibitors), and up to 68% on immunotherapeutic agents (like CTLA4 inhibitors) experience these issues. Common cutaneous side effects include seborrhea, epidermal atrophy, dry skin (xerosis cutis), itching, dry eczema, and increased susceptibility to skin fissures, particularly on the fingers, toes, and heels.<sup>[13]</sup>

**HEPATOTOXICITY (*Yakrit Vikara*)** - Many chemotherapeutic agents are known to be hepatotoxic and frequently cause liver damage in patients. In Ayurveda, liver abnormalities are referred to as Yakrittodar, which is linked to symptoms such as fatigue, loss of appetite, constipation, nausea, vomiting, excessive thirst, weight loss, mild fever, altered taste, abdominal bloating, indigestion, visible veins on the abdomen, fainting, shortness of breath, and cough.<sup>[15]</sup> Due to the limited efficacy of most chemo-protective agents in fully managing these side effects, complementary and alternative medicines have recently gained increased attention from researchers and medical professionals. This review seeks to offer a detailed management protocol for the aforementioned chemotherapy side effects based on Ayurveda, the ancient system of traditional medicine practiced in the Indian subcontinent since 5000 BC.<sup>[16]</sup>

Though chemotherapy is cytotoxic but can also show its toxic effects in form of side effects like fever, nausea, vomiting, lethargy, oedema etc. in the body. In this review we will discuss regarding various *Agada* which can be used to combat and minimize the side effects of chemotherapy used in cancer treatment.

***Gandhahasti agada*** - This collyrium also treats various conditions including all types of fever, choleric diarrhea, indigestion, fainting, insanity (*unmada*), epilepsy (*apasmara*), anemia, and unconsciousness. Applying its paste can address skin issues such as *kitibha* (a skin disease), *kushtha* (chronic skin conditions including leprosy), *shvitra* (leucoderma), and *vicharchika* (eczema) etc.<sup>[17]</sup>

***Mahagandhahastinama agada*** - It addresses *vishama jwara*, indigestion, *dadru*, *kandu*, choleric diarrhea, and *pama*. For *anaddha* (obstruction or constipation), the paste of this remedy should be applied around the anus.<sup>[18]</sup>

***Rushabhakadi agada*** - Administered as a *peya* (a thin rice gruel), it alleviates conditions such as *shwasa* (respiratory issues) and fever etc.<sup>[19]</sup>

***Hingvadi yoga***- Consuming a mixture of *hingu* (*Ferula foetida*) and *krishna* (*Piper longum*) with honey and sugar, or the juice of *kapittha* (*Feronia limonia*) and *saindhava* (rock salt) combined with honey and sugar, can treat fever, hiccups, shortness of breath, and cough resulting from poisoning.<sup>[20]</sup>

**Treatment of vomiting** - Consuming a linctus made from the seed-pulp of *kola* (*Zizyphus jujube*), *anjana* (*rasanjana*), *laja* (roasted rice grains), *utpala* (*Nymphaea stellata*), honey, and ghee (clarified butter) can alleviate vomiting.<sup>[21]</sup>

## DISCUSSION

As depicted above, incidence of cancer is on the rise in India. In recent decades, significant progress in diagnostic methods and cancer treatments has led to improved survival rates for cancer patients. Chemotherapy is use of cytotoxic chemicals used in the treatment different types of cancer and it often causes side effects. As we know that Chemotherapy targets and destroys cells that are actively dividing into two new cells. Both cancerous and healthy cells are part of this active process, leading to various side effects. These can be acute (arising within a few weeks of treatment), intermediate, or delayed (developing months or years later). Notable side effects include nausea, vomiting, diarrhea, mucositis, hair loss, and constipation. Long-term complications may encompass pharyngitis, esophagitis, laryngitis, ongoing difficulty swallowing, fatigue, liver damage, infertility, and cognitive impairments. Today, there are more medications available to manage these side effects than in the past. In this review we will discuss regarding various *Agada*

which can be used to combat and minimize the side effects of chemotherapy used in cancer.

Preclinical studies demonstrate a narrow therapeutic window for different *Agadas* to relieve side effects of chemotherapy used in cancer. Studies are being conducted globally to prevent cancer or develop nontoxic therapeutic agents which include those using *ayurvedic* herbal medications. Additional research required to support the evidence that different *Agadas* to relieve side effects of chemotherapy.

## CONCLUSION

This manuscript addresses a critical aspect of chemotherapy-induced side effects in cancer patients. It thoroughly examines the major and prevalent side effects and presents *ayurvedic* interventions based on an extensive review of both ancient Vedic literature and contemporary scientific evidence. This work aims to assist clinicians and cancer patients in managing severe chemotherapy-related side effects using *ayurvedic* treatments. Some *Agadas* like *Gandhahasti agada*, *Mahagandhahastinama agada*, *Rushabhakadi agada* etc. which can be used to combat and minimize the side effects of chemotherapy used in cancer treatment. These *ayurveda Agadas* based solutions may act as an important adjuvant to chemotherapy and enhance the quality of life of cancer patients. Future studies should scientifically test these recommendations for various side effects induced by conventional management of cancer.

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