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Occurrence of Trushna as an *Upadrava* in Patients Undergoing Chemotherapy for Breast Cancer: An Observational Study

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Abstract

Background: Breast cancer is the most frequently diagnosed cancer among women worldwide. Chemotherapy remains one of the main treatment modalities but is associated with numerous adverse effects that reduce patients' quality of life. Ayurveda describes *Trushna* as an important *Upadrava* (complication) associated with various disease conditions. Exploring chemotherapy-induced toxicities through Ayurvedic principles may facilitate integrative supportive care. **Objective:** To evaluate the occurrence of *Trushna* as an *Upadrava*

among breast cancer patients undergoing chemotherapy and to correlate chemotherapy-induced toxicities with Ayurvedic symptomatology. **Materials and Methods:** An analytical cross-sectional observational study was conducted among 50 breast cancer patients receiving first-line neoadjuvant or adjuvant TEC chemotherapy (Docetaxel/Paclitaxel, Epirubicin, and Cyclophosphamide) between January and June 2025 at Dr. D. Y. Patil Hospital, Nerul, Navi Mumbai. Patients aged 25–70 years who had completed at least one chemotherapy cycle were included. Symptom

assessment was performed using the Memorial Symptom Assessment Scale (MSAS). Data were collected on the 7th and 21st day following chemotherapy. **Results:** The mean age of participants was 50 ± 8.28 years. Most participants were married (90%) and had children (84%). Haematological toxicity occurred in 37.7% of patients, whereas 94% experienced non-haematological toxicity. The most prevalent symptoms included numbness (98%), neutropenia/cachexia/early menopause (98%), appetite loss and altered taste (96%), cognitive dysfunction (96%), peripheral neuropathy (94%), chemotherapy-induced nausea and vomiting (94%), xerostomia (94%), stomatitis with dry mouth (92%), malaise (92%), diarrhoea (56%), throat pain with difficulty speaking (56%), delirium (46%), and syncope/altered consciousness (32%). These symptoms demonstrated close similarity with Ayurvedic descriptions of Trushna and its associated Upadrasas. **Conclusion:** Chemotherapy-induced adverse effects exhibit substantial overlap with the Ayurvedic concept of Trushna Upadrava. Understanding these manifestations from an Ayurvedic perspective may provide a scientific basis for developing integrative supportive interventions aimed at improving

quality of life among breast cancer patients receiving chemotherapy.

Keywords: Breast cancer, Chemotherapy, Trushna, Upadrava, Ayurveda, MSAS, Supportive care

1. Introduction:

Breast cancer is the most common malignancy among women worldwide and remains one of the leading causes of cancer-related mortality. Globally, approximately one in eight women develops breast cancer during her lifetime, while the lifetime risk of death is approximately one in thirty-five women. Improvements in early diagnosis and multimodality treatment have significantly increased survival rates, making management of treatment-related adverse effects an important aspect of comprehensive cancer care.¹

Chemotherapy forms an essential component of breast cancer management, particularly in neoadjuvant and adjuvant settings. Although chemotherapy improves disease-free survival and overall survival, cytotoxic drugs also damage rapidly dividing normal tissues including oral mucosa, gastrointestinal epithelium, bone marrow and hair follicles, resulting in multiple adverse effects such as nausea, vomiting, mucositis, xerostomia, fatigue, neuropathy and haematological

toxicities.² These complications frequently impair patients' quality of life and may necessitate treatment delays or dose reductions.

Modern supportive medications reduce the severity of many chemotherapy-related toxicities but often fail to provide complete symptomatic relief. Consequently, many cancer patients seek complementary therapies, including Ayurveda, to improve symptom control and quality of life. A cross-sectional study published in the *British Journal of Cancer* reported that a substantial proportion of patients receiving chemotherapy simultaneously use herbal medicines.³ Major cancer centres including Tata Memorial Hospital and Memorial Sloan Kettering Cancer Center have also incorporated integrative medicine services into supportive oncology care.

Ayurveda describes *Trushna* as an important *Upadrava* occurring secondary to various disease processes. Classical descriptions of *Trushna* include excessive thirst associated with dryness of the mouth, palate, throat and tongue, weakness, burning sensation, fatigue and altered consciousness, many of which resemble chemotherapy-induced toxicities.⁴⁻⁶ However, these chemotherapy-induced manifestations have not yet been

systematically interpreted according to Ayurvedic principles.

Therefore, the present study aimed to evaluate the occurrence of *Trushna* as an *Upadrava* among breast cancer patients undergoing chemotherapy and to compare chemotherapy-induced toxicities with Ayurvedic symptomatology.

2. Materials and Methods:

2.1 Study Design

An exploratory observational study was conducted between January 2025 and June 2025 at the Chemotherapy Day Care Unit of Dr. D. Y. Patil Hospital, Nerul.

2.2 Study Population

Fifty female breast cancer patients receiving first-line neoadjuvant or adjuvant chemotherapy with the TEC regimen (Docetaxel/Paclitaxel, Epirubicin and Cyclophosphamide) were enrolled.

2.2.1 Inclusion Criteria

- 1) Female patients aged 25–70 years.
- 2) Histologically confirmed breast cancer.
- 3) Receiving neoadjuvant or adjuvant TEC chemotherapy.
- 4) Completion of at least one chemotherapy cycle.
- 5) Patients receiving routine supportive medications.
- 6) Controlled diabetes mellitus, hypertension or thyroid disorders.

2.2.2 Exclusion Criteria

Patients unwilling to participate or unable to complete the questionnaire were excluded.

2.3 Sample Size

A convenience sample of 50 eligible patients attending the chemotherapy day-care unit during the study period was included.

2.4 Ethical Considerations

The study was conducted according to the ethical principles outlined in the Declaration of Helsinki (Edinburgh revision, 2000). Institutional ethical approval was obtained prior to commencement of the study. Written informed consent was obtained from all participants, and confidentiality and anonymity were maintained throughout the study.

2.5 Study Instrument

Symptoms were assessed using the Memorial Symptom Assessment Scale (MSAS), a validated questionnaire comprising 32 symptoms. Twenty-four symptoms are assessed for severity, frequency and distress, while eight symptoms are evaluated for severity and distress.

2.6 Data Collection Procedure

Eligible patients were informed about the study in their native language and written informed consent was obtained. Baseline demographic and clinical information was recorded. Participants were educated

regarding completion of the MSAS questionnaire. Symptom assessment was performed on the 7th and 21st day following each chemotherapy cycle through hospital visits or telephonic interviews.

2.7 Data Analysis:

Data were entered into Microsoft Excel and analyzed using appropriate statistical software. Continuous variables were summarized using mean and standard deviation, whereas categorical variables were expressed as frequencies and percentages. Descriptive statistics were used to evaluate the occurrence of chemotherapy-induced toxicities and their correlation with Ayurvedic descriptions of Trushna Upadrava. Statistical significance was considered at $p < 0.05$.

3. Results:

The study included 50 female breast cancer patients with a mean age of 50 ± 8.28 years (range: 31–64 years). Most participants were married (90%) and had children (84%).

Among the study population, 37.7% developed haematological toxicities, predominantly neutropenia, whereas 94% experienced one or more non-haematological toxicities including peripheral neuropathy, diarrhoea and vomiting. Approximately 23.6% of patients required emergency department visits due to chemotherapy-

related toxicity, and those admitted remained hospitalized for an average of five days.

The most frequently reported chemotherapy-induced symptoms included numbness (98%), neutropenia, cachexia and early menopause (98%), appetite loss and altered taste (96%), cognitive impairment or "chemo-brain" (96%), peripheral neuropathy with burning sensation (94%), chemotherapy-induced nausea and vomiting (94%), xerostomia (94%), stomatitis with oral dryness (92%), malaise (92%), chemotherapy-induced diarrhoea (56%), difficulty in speaking with throat pain (56%), delirium (46%), and altered consciousness/syncope (32%).

These clinical manifestations demonstrated considerable overlap with Ayurvedic descriptions of Trushna *Upadrava*, including *Mukhashosha* (dry mouth), *Talu-Oshta-Kantha-Jihva Karkashyata* (dryness of palate, lips, throat and tongue), *Santapa* (burning sensation), *Badhiryata* (numbness), *Aruchi* (loss of appetite), *Saada* (fatigue), *Bhrama* (giddiness/confusion), *Pralapa* (delirium) and *Chittanasha* (loss of consciousness).

4. Discussion:

The present observational study demonstrated that chemotherapy-induced toxicities in breast cancer patients closely

resemble the Ayurvedic concept of Trushna as an *Upadrava*. Nearly all patients experienced multiple non-haematological adverse effects, particularly xerostomia, oral dryness, nausea, vomiting, fatigue, altered taste and neurological symptoms.

Chemotherapeutic agents act by damaging rapidly proliferating cells, affecting not only malignant cells but also normal tissues such as oral mucosa, gastrointestinal epithelium and bone marrow. These pathological changes result in dehydration, electrolyte imbalance, mucosal injury and inflammatory responses that clinically manifest as excessive thirst, dryness and fatigue. Similar symptom complexes are described in Ayurveda under *Trushna Upadrava*.

The high prevalence of xerostomia (94%) and stomatitis (92%) observed in this study is particularly noteworthy, as classical Ayurvedic texts describe dryness of the mouth, palate, throat and tongue as cardinal manifestations of Trushna. Likewise, appetite loss, altered taste and nausea correspond with *Aruchi* and *Jihva*-related manifestations described in *Charaka Samhita*.

Neurological manifestations including peripheral neuropathy, cognitive dysfunction and numbness were also highly prevalent. These findings may reflect systemic Vata aggravation secondary to chemotherapy-induced tissue depletion, while the associated burning sensation and dehydration suggest concomitant *Pitta Dosha* involvement. Such observations support interpreting chemotherapy-induced toxicities through Ayurvedic principles.

Modern supportive medications reduce the incidence of severe chemotherapy complications; however, many patients

continue to experience persistent symptoms that significantly affect quality of life. Previous studies have demonstrated widespread use of complementary and herbal medicines among oncology patients, highlighting the increasing demand for integrative supportive care. The present findings provide preliminary evidence supporting the conceptual applicability of Ayurvedic Trushna *Upadrava* in understanding chemotherapy-induced symptom complexes.

The major limitation of this study is its cross-sectional observational design with a relatively small sample size and absence of longitudinal follow-up or intervention. Future multicentric studies with larger populations and validated Ayurvedic assessment tools are warranted to establish stronger clinical correlations and evaluate Ayurvedic therapeutic interventions for chemotherapy-induced Trushna.

5. Conclusion:

Chemotherapy-induced adverse effects among breast cancer patients exhibit considerable similarity with the Ayurvedic concept of Trushna as an *Upadrava*. Symptoms such as xerostomia, oral dryness, fatigue, nausea, altered taste, burning sensation and neurological manifestations closely correspond to classical Ayurvedic descriptions. These findings support the need for systematic Ayurvedic assessment of chemotherapy-induced toxicities and provide a rationale for future integrative clinical research evaluating Ayurvedic supportive therapies to improve quality of life in breast cancer patients undergoing chemotherapy.

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