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OCCUPATIONAL HEALTH HAZARDS THROUGH THE LENS OF *GARA VISHA*: A CROSS-DISCIPLINARY REVIEW

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ABSTRACT

The impact of occupation in human beings is illustrated by the fact that it is not only a source of revenue but also a crucial component of personal identity. The traditional Indian medical system known as *Ayurveda* emphasizes a close connection between profession and health. Persistent exposure to industrial chemicals, cement dust, pesticides, and herbicides can act as *Kritrima Visha* (manufactured toxins), significantly affecting one or more physiological systems. Persistent health conditions can result through such exposures, especially for workers in the mining, engineering, manufacturing, and agriculture sectors. Such exposures have been exacerbated by swift industrialization and widespread chemical use, contributing to an increasing load of long-term health issues. The idea of *Gara Visha,* an intentionally created cumulative poison made by combining poisonous or non-toxic compounds that have prolonged systemic effects, is used by *Ayurveda* to describe a similar state. Evaluating *Gara Visha's* relevance in light of contemporary occupational toxicity is the primary objective of this narrative review.

Ayurveda is renowned across the world in recent years for its holistic approach to preventing ailment and promoting wellness. Conventional treatment alone may not be adequate for occupational disorders, which are frequently complex and multifaceted. By addressing the

psychosomatic aspects of illness and considering the body as a cohesive whole controlled by the harmony of the three *Dosha-Vata, Pitta,* and *Kapha, Ayurveda* provides an alternate view point. It was shown that multisystem illnesses with delayed onset, tissue depletion, metabolic abnormalities, and poor elimination, which closely resemble the pathophysiology *of Gara Visha* are developed when this state of equilibrium is upset by extended exposure to hazardous substances.

Ayurvedic management emphasizes preventive as well as curative measures, including regulation of daily and seasonal regimens, dietary modification, lifestyle modification , detoxification procedures such as *Shodhana*, anti-poison therapies (*Agada*), and rejuvenative interventions (*Rasayana*) to enhance immunity, vitality, and resistance to disease[1].

Such approaches can be beneficial in managing common occupational conditions including respiratory disorders like asthma, stress-related illnesses, hypertension, heat-related conditions, tinnitus, eye strain, frostbite, and musculoskeletal pain etc. Overall, *Ayurveda* provides a comprehensive framework for protecting worker health, enhancing resilience, and reducing the burden of occupational diseases.

Keywords: *Gara Visha*, Occupational Toxicity, Cumulative Poisoning, *Kritrima Visha, Agada*

INTRODUCTION

Occupational health hazards represent a significant global challenge, particularly in rapidly industrializing developing nations. Workers are routinely exposed to physical, chemical, biological, and psychosocial risks that may lead to both acute and long-term illnesses. Prolonged exposure to low levels of toxic substances is especially dangerous, as subtle symptoms often emerge gradually and remain unnoticed until serious damage has occurred[2].

Occupational health aims to promote and maintain the highest attainable standards of physical, mental, and social well-being among workers in all fields. It emphasizes the prevention of disease and injury, reduction of workplace risks, and the creation of safe environments by adapting work conditions to the worker and the worker to the job. Such measures are essential for ensuring healthy and productive employment[3].

Exposure to unsafe working conditions can result in occupational diseases, making prevention, protection, and timely management fundamental rights of employees. Many countries have therefore introduced labour legislation and institutional mechanisms to safeguard worker welfare. In India, the Ministry of Labour & Employment oversees policies

and programs related to labour safety and health. At the international level, the International Labour Organization and the World Health Organization advocate for maintaining optimal physical, mental, and social well-being in the workforce. Consequently, occupational health shares the fundamental goal of preventive medicine—protecting health and preventing disease before it arises[4].

Ayurveda provides an extensive understanding of toxicity in the *Agadatantra* a specialized branch one among the eight branches of *Ayurveda*[5] dealing with *Visha*, its effect on the body and its management. Science that deals with medical and legal aspects of the harmful effects of the chemicals on the human body[6]. In modern times, toxins often accumulate in the body unknowingly as a consequence of changing lifestyles and environmental exposures. Ayurveda categorizes *Visha* (poison) into various types either as 1. Natural i.e. *Sthavara* (of plant origin), *Jangama* (of animal origin), or 2. Manufactured i.e. *Garavisha* (artificially prepared poison), and *Dushivisha* (residual or cumulative toxin)[7]. Acharya Bhavaprakasha also provides an alternative classification, describing certain poisons under the category of *Kritrima Visha* (artificial toxins) from a different interpretative viewpoint[8].

Gara Visha, one of the synthetic poisons, is defined as a hazardous mixture of occasionally apparent compounds that progressively upsets the body's equilibrium. The symptoms of *Gara Visha* appear after a prolonged build-up in the body, in contrast to acute poisoning. Chronic illness states result from its disruption of tissue function, metabolism, and digestion. The manner that cumulative occupational toxicity is currently conceptualized is quite comparable to this description.

Reanalysing classic frameworks like *Gara Visha* may provide important insights for management and prevention given the growing prevalence of occupational diseases.

MATERIALS AND METHODS

The present study was designed as a conceptual narrative review to explore occupational health hazards from the *Ayurvedic* perspective of *Gara Visha*. Relevant data were collected from classical *Ayurvedic* texts, including *Charaka Samhita, Sushruta Samhita,* and *Ashtanga Hridaya,* along with standard textbooks of Agadatantra and related disciplines. Contemporary information was obtained from modern toxicology and occupational health literature, peer-reviewed journals, and authentic academic websites. Literature describing occupational exposure to chemical, physical, biological, and psychosocial hazards, as well as chronic or cumulative toxicity, was included for analysis. A qualitative comparative method

was adopted to identify similarities between the clinical features, pathogenesis, and progression of occupational toxicity and the classical descriptions of *Gara Visha*, particularly regarding delayed onset, multisystem involvement, and cumulative effects on body tissues. As the study was based exclusively on published sources and classical references, no human or animal subjects were involved, and ethical approval was not required.

1. Nature of Occupational Toxic Exposure

Occupational toxicity arises from repeated exposure to harmful agents in the workplace. The primary routes of exposure include inhalation, dermal absorption, and ingestion.

Major toxic agents include:

Heavy Metals

Mercury, lead, arsenic, cadmium, and chromium are widely used in industrial processes. Chronic exposure can cause neurological impairment, renal dysfunction, haematological disorders, and malignancies.

Organic Chemicals

Solvents, hydrocarbons, pesticides, and organophosphates are common in agriculture and manufacturing sectors. These compounds may disrupt neurotransmission, respiratory function, and endocrine balance.

Physical Hazards

Extreme temperatures, radiation, vibration, and noise contribute to systemic stress and organ damage.

Biological Hazards

Healthcare workers and agricultural labourers are at risk of infections, allergens, and toxin-producing organisms.

Occupational hazards in the health sector[9]

Hazard Type	Short Description	Key Examples / Outcomes
1. Infectious risks	Exposure to communicable diseases at work	TB, Hepatitis B/C, HIV, flu, COVID-like illnesses
2. Patient handling hazards	Injury from lifting or moving patients improperly	Back pain, muscle strain, spinal injury

3. Chemical hazards	Contact with harmful medical chemicals	Disinfectants, drugs, mercury, latex allergy
4. Radiation hazards	Exposure to medical radiation sources	X-rays, radioactive materials, UV, lasers
5. Psychosocial stressors	Work pressures affecting mental health	Burnout, fatigue, stress, emotional strain
6. Workplace violence	Abuse or assault during duty	Physical, verbal, or sexual harassment
7. Environmental discomfort	Unfavourable physical conditions	Excess heat/cold, high noise levels
8. Accidental injuries	Injuries from workplace incidents	Falls, electric shock, fire, vehicle crashes
9. Sanitation & environmental risks	Poor hygiene and unsafe surroundings	Unsafe water, medical waste exposure, infection risk

3. Characteristics of *Gara Visha*

Gara Visha is a distinctive concept in Ayurveda categorized under artificial poisons (*Kritrima Visha*). It is formed by combining two or more substances, whether toxic or non-toxic, which subsequently produce harmful effects on the body. Unlike acute poisons, *Gara Visha* acts slowly because these substances are metabolized gradually, leading to delayed and cumulative toxicity.

According to classical interpretation by Chakrapani (commentator of Charaka Samhita), *Gara Visha* can be classified into two types:

1. ***Gara*** — Formed by the combination of two or more non-poisonous substances that acquire toxic properties after mixing.
2. ***Kritrima Visha*** **(Artificial poison)** — Produced by combining two or more inherently poisonous substances, resulting in a potent artificial toxin. Thus, both categories represent artificially prepared poisons characterized by delayed onset and cumulative adverse effects on body tissues.

2. Clinical Manifestations

Ayurvedic scriptures depict *Gara Visha* as[10]:

- Artificial poison produced through combining substances

- Cumulative and slow-acting
- Tricky to identify in its early phases
- Holds the ability to influence all tissues (*dhatus*).
- Inducing systemic chronic illness

Signs and Symptoms of *Gara Visha*[11]

The clinical features of *Gara Visha* develop after ingestion as the toxic substances gradually disturb normal physiological functions and weaken body tissues. The presentation is typically chronic and systemic in nature. The commonly observed manifestations include:

- Pallor with marked physical weakness
- Diminished appetite
- Increased heart rate
- Swelling of the extremities
- Features of *Grahani* (digestive and absorptive dysfunction)
- Symptoms resembling *Rajayakshma* (chronic wasting condition)
- Development of *Gulma* (abdominal lump or distension)
- Progressive depletion of body tissues (*Dhatu-kshaya*)
- Fever (*Jwara*)

Together, these signs indicate cumulative toxic effects consistent with *Garavisha* poisoning.

4. Correlation between Occupational Toxicity and *Gara Visha*

Parameter	**Occupational Toxicity**	***Gara Visha***
Chronic exposure	Present	Present
Delayed symptoms	Present	Present
Multisystem involvement	Present	Present
Cumulative nature	Present	Present
Metabolic disturbance	Present	Present

Ayurvedic Management (*Gara Visha Chikitsa*)

As described in *Charaka Samhita*[12]

- *Hridaya Shodhana* (Cardio-protective purification)

  Induction of therapeutic emesis (*Vamana Karma*).

  Performed using *Tamra Choorna* combined with honey.

- *Suvarna Prashana*

  Administration of *Swarna Bhasma* with honey following purification.

  Aims to enhance strength, immunity, and vitality.

- *Agadapana* (Anti-poison therapy)

  Use of specific antidotal formulations such as *Nagadanti Agada.*

  Helps neutralize remaining toxic material.

As described in *Ashtanga Hridaya*[13]

- *Vamana Karma*

  Primary cleansing procedure to eliminate accumulated poison.

- *Sharkara-Suvarnadi Leha*

  A rejuvenating *Leha* prepared with gold powder, honey, and sugar acts as a potent medicine, helping to pacify severe toxic effects produced by various poisonous formulations.

- *Moorva-Guduchyadi Choorna*

  A preparation made from *Murva, Giloy, Tagara, Pippali, Patoli, Chavya, Chitraka, Musta*, and *Vayvidanga* is recommended. It should be taken along with warm water, *Mastu* (thin buttermilk), or *Kanji* (a sour fermented drink) to enhance its effectiveness in alleviating fever.

- *Patavataadi Hima*

  A cooling therapeutic preparation aimed at calming aggravated *Doshas* and restoring systemic stability is prepared from pigeon meat, *Shati (Kachur),* and *Pushkarmoola.* Water boiled with these ingredients and consumed after cooling

helps alleviate fever, excessive thirst, pain, cough, asthma, and related febrile conditions.

Rejuvenation Therapy (*Rasayana*)

These interventions restore tissue integrity, immunity, and vitality.

Supportive Care

Dietary regulation, lifestyle modification, and strengthening therapies enhance recovery and prevent recurrence.

DISCUSSION

The review highlights a strong conceptual overlap between modern occupational toxicity and the *Ayurvedic* concept of *Gara Visha*, both describing cumulative harmful effects caused by prolonged exposure to toxic agents with delayed onset and multisystem involvement. Workplace hazards such as chemicals, heavy metals, pesticides, radiation, and stress can gradually impair metabolism, damage tissues, and produce chronic disorders. *Ayurveda* explains this process through imbalance of *Tridoshas*, weakened *Agni*, and vitiation of *Dhatus*, while modern science attributes it to mechanisms like oxidative stress, inflammation, and impaired detoxification.

Current occupational health practices mainly focus on exposure control and symptomatic management, whereas *Ayurveda* proposes a holistic approach including detoxification (*Shodhana*), antidotal therapy (*Agada*), rejuvenation (*Rasayana*), and lifestyle regulation to restore balance. Integrating these traditional measures with modern safety strategies may provide a more comprehensive framework for managing chronic toxic exposure. However, further scientific validation is necessary to confirm their effectiveness and ensure safe application in contemporary practice.

CONCLUSION

Occupational toxicity represents a growing global health challenge, particularly in industries where workers face prolonged exposure to hazardous substances. The *Ayurvedic* concept of *Gara Visha* provides a valuable traditional framework for understanding cumulative poisoning characterized by gradual onset, widespread systemic involvement, and progressive tissue damage. The parallels between classical descriptions of artificial toxins

and modern occupational exposures underscore the continued relevance of *Ayurvedic* toxicology in addressing contemporary health issues.

Ayurveda outlines a multidimensional strategy encompassing preventive care, detoxification, antidote therapy, rejuvenation, and lifestyle regulation aimed at restoring physiological equilibrium and enhancing resistance to disease. When combined with modern industrial safety practices and regulatory measures, these principles may contribute to better prevention, timely intervention, and improved long-term health outcomes for workers. Future interdisciplinary research integrating classical *Ayurvedic* knowledge with modern scientific methodology is essential to validate these concepts and develop evidence-based approaches for occupational health management.

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