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ENVIRONMENTAL AND LIFESTYLE TOXINS IN THE MODERN ERA : AN INTEGRATIVE PERSPECTIVE OF SWASTHAVRITTA AND AGADTANTRA

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Abstract:
The reason behind increasing prevalence of chronic diseases in the modern era is Environmental and lifestyle toxins. The continuous exposure to toxic substances through air, water, soil, food, and daily living contributes to its toxicity. The rapid industrialization, urbanization, environmental pollution, and unhealthy lifestyle practices contributes to toxicity features like neurological, endocrine, respiratory, cardiovascular, and immune disorders. In ayurveda the concept of dushivisha, Janapadodhvansa can better understand through environmental toxicity perspective. The two branches of ayurveda namely Agadtantra and Swasthavritta can offer holistic care in such cases. An integrative application of these principles provides a sustainable framework for reducing toxic burden, enhancing immunity, and maintaining health in the modern era. In present paper the contribution of these two brackens of ayurveda in management and prevention of environmental and lifestyle toxins will be discussed.

Keywords: Environmental toxins; Lifestyle toxins; Ayurveda; Agadtantra; Swasthavritta; Dushivisha

Introduction:

The environment includes both living and non-living things, as well as things that are made of matter and those that aren't. It always has an effect on people's health. It can be divided into three main groups: physical, biological, and social. These include air, water, soil, housing, waste, radiation, microorganisms, plants and animals, customs, culture, work, and ways of living. When these parts are not working together, it hurts people's health. In the current world, things like pollution of air, water, and soil, bad housing conditions, and the existence of disease vectors are still big public health problems.

Rapid industrialisation, urbanisation, deforestation, and heavy use of synthetic chemicals have made environmental toxicity a major global issue. It is the negative physiological and biochemical impacts that happen when someone is exposed to toxic substances in the air, water, food, or soil for a short or long time. Heavy metals, industrial chemicals, pesticides, and air pollutants are some of the most

dangerous substances. They build up in the body and damage important organs like the brain, liver, kidneys, and endocrine system.

Environmental and lifestyle toxins can cause a wide range of health problems, including neurological, developmental, endocrine, and reproductive abnormalities, as well as respiratory, cardiovascular, immunological, and malignant diseases. These consequences occur via processes including oxidative stress, inflammation, DNA damage, mitochondrial malfunction, and hormonal disturbance.

The concept of dushivisha, chronic exposure as Dūṣīviṣa, and population-level afflictions as Janapadodhvansa best suits to concept of environmental and lifestyle toxins. In such chronic conditions Ayurveda offers a holistic framework through ayurveda, providing integrative and preventive approaches. It is important to apply both preventive and integrative strategies in order to avoid or reduce these exposures. Ayurveda provides a comprehensive approach Agadtantra i.e toxicology and Swasthavritta the branch which deals with prevention of disease. By emphasizing health maintenance, lifestyle regulation, detoxification, and immune enhancement, Ayurveda provides a helpful preventive strategy for dealing with environmental and lifestyle pollutants in the modern era.

Aims and objectives

1. To identify and understand environmental and lifestyle toxins prevalent in the modern era
2. To interpret Environmental And lifestyle toxins exposures through Ayurvedic concepts in the

perspective of Agadtantra.

3. To evaluate the role of Swasthavritta in the prevention of environmental and lifestyle toxins
4. To highlight the integrative perspective of Swasthavritta and Agadtantra in environmental and lifestyle toxins

Discussion

Environmental And lifestyle toxins there ayurvedic perspective

Environment refers to the totality of a person's living and non-living, material and non-material surroundings. For descriptive purposes, it is classified into three components: physical, biological, and social. The physical environment includes air, water, soil, housing, waste, and radiation; the biological environment comprises plant and animal life, including bacteria, viruses, insects, rodents, and animals; while the social environment encompasses customs, culture, habits, occupation, income, and religion. Disturbance in any of these components adversely affects human health. Environmental factors such as air, water, and soil pollution, poor housing conditions, and the presence of animal reservoirs and insect vectors of disease continue to pose serious threats to human health

Environmental toxicity, in modern biomedical science, refers to the adverse physiological and biochemical effects resulting from acute or prolonged exposure to harmful substances present in the environment. Modern toxicology defines environmental toxicity as adverse health outcomes arising from exposure to natural or synthetic toxicants in air, water, food, or soil[4].

Environmental toxicity has emerged as a major global health concern, driven by rapid industrialization, urbanization, deforestation, and extensive use of synthetic chemicals in agriculture and manufacturing sectors[2.] Major environmental toxicants include heavy metals such as lead, mercury, cadmium, and arsenic; industrial chemicals like polychlorinated biphenyls (PCBs), bisphenol A (BPA), and dioxins; pesticides such as organochlorines and organophosphates; and air pollutants including PM2.5, nitrogen dioxide (NO_2), and ozone[3]

Among these, heavy metals enter the human body through contaminated drinking water, industrial effluents, polluted air, and food grown in contaminated soil and can accumulate in in vital organs such as the brain, liver, and kidneys, leading to neurological deficits, renal dysfunction, developmental delays, and anemia[3.] Industrial chemicals like PCBs, BPA, dioxins etc can significantly contribute to environmental toxicity by disturbing endocrine system hence disturbing reproductive health. Also, the pesticides like organochlorines, organophosphates inhibit cholinesterase enzymes, resulting in

neuromuscular dysfunction, respiratory failure in severe cases, birth defects, and cognitive impairment[3.]

Air pollutants including fine particulate matter (PM2.5 and PM10), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and ozone primarily enter the body through inhalation, causing respiratory illnesses, exacerbation of asthma, reduced lung function, and increased cardiovascular risk. These environmental toxins cause oxidative stress, inflammation, DNA damage, and mitochondrial dysfunction. And generate reactive oxygen species (ROS), leading to cellular damage of lipids, proteins, and DNA, also interfere with enzymatic activity, or induce immune dysregulation, thereby contributing to autoimmune diseases and cancer. Certain food preservatives may also undergo chemical transformation into carcinogenic compounds[3.]

The multifactorial nature and long-term impact of environmental and lifestyle toxins necessitate integrative approaches to health care. Traditional systems of medicine such as Ayurveda emphasize holistic detoxification, regulation of diet and lifestyle, and maintenance of environmental harmony to reduce toxic burden and prevent chronic disease.

Ayurvedic Perspective of Environmental Toxicity

According to Ayurveda, the concept of environmental toxicity closely correlates with Dushivisha. Dushivisha is described as a poison of animal, plant, or chemical origin that is remains partially retained in a body. Dūṣīviṣa persists within the body for prolonged periods, sometimes for several years[5.]

These toxins accumulate gradually in the body in sub-lethal doses, remain latent, and do not manifest immediately. They become aggravated under specific triggering factors such as Ahita Ahara (unwholesome diet), Ativyayama (excessive exertion), psychological stress, or seasonal variations, leading to the manifestation of clinical features of Dushivisha[6].The Poorvarupa (prodromal symptoms) of Dushivisha include excessive sleep, heaviness of the body, frequent yawning, laxity of joints, horripilation, and generalized body ache[7.]

The Lakshana of Dushivisha include looseness of stools (diarrhoea), discoloration of the complexion, foul body odor, bad taste in the mouth, excessive thirst, epileptic episodes, vomiting, lassitude, confused speech, and features of Dusyodara (ascites). The effects of Dushivisha are known to worsen on cloudy days and with exposure to cold winds. Acharya Charaka further explains that Dushivisha vitiates Rakta Dhatu, leading to dermatological manifestations such as Arunshika (eczema), Kitibha (psoriasis), and Kotha (urticaria). Gradually, it vitiates all Doshas and may result in death if untreated [8,9]Another important Ayurvedic concept that parallels environmental toxicity is Janpadodhvansa. Janpada refers to a population, and diseases that affects large population leading to destruction of an entire community or region is named as janpadodhvansa Rogas. Acharya Charakacharya mass diseases arise due to the vitiation of common environmental factors, namely Vayu (air), Jala (water), Desha (land), and Kala (season) are janpadodhvansa Rogas[10]. Charakacharya further explains the characteristics of Samanya Vayu (normal air), Vikruta Vayu (polluted air), and Vishadushita Vayu (poisoned air). The Poorvarupa of Janpadodhvansa include abnormal conditions of celestial bodies such as stars, planets, the sun and moon, along with disturbances in air, fire, and the environment, leading to derangement of seasonal patterns [10]

Ayurveda the ancient Indian Science or Knowledge of life, focuses on " Swasthasya Swasthya Rakshanam" means maintenance of health of healthy person and "Aturashya Vikar Prasamanam" is treating diseased person. Ayurveda recognizes toxins under the term Visha, it dedicates an entire branch—Agad Tantra—to the study and management of toxins, poisons, and their antidotes.

Integrative perspective of swasthavritta in Environmental And lifestyle toxins

The term Swasthavritta is derived from three words—Swa (self), Stha (established), and Vritta (conduct). Swasthavritta is a branch of Ayurveda that deals with the maintenance and promotion of health through the regulation of daily and seasonal routines (Dinacharya and Ritucharya), along with appropriate Ahara (diet) and Vihara (lifestyle) practices by bringing the vitiated dosha's to normalcy

Dinacharya (daily regimen) and **Ritucharya (seasonal regimen)** play a vital role in maintaining physiological equilibrium. Dinacharya includes adequate sleep, balanced nutrition, and regular physical activity, hence protecting the individual from lifestyle-related disorders and promoting overall well-being[11.] Ritucharya emphasizes adaptation of diet and lifestyle in accordance with seasonal variations. Such adjustments strengthen immunity and reduce susceptibility to disease by maintaining harmony between the body and the external environment[12.] Together, Dinacharya and Ritucharya support Agni, prevent the formation of Ama, and fortify Ojas, thus reducing susceptibility to cumulative environmental toxins.

Dincharya includes Waking up early on Brahma Muhurta (one and a half hours before sunrise) as this phase is dominated by Vata Dosha, which facilitates easy evacuation of bowels. optimal for meditation and mental clarity[13.] Timely evacuation of bowel indicates good health and its suppression can cause many diseases. Personal hygiene prevents microbial contamination. Dental hygiene is emphasized, with classical texts recommending the use of herbal twigs such as Vat, Vijaysara, Jati, Karavira, Arjuna, Nimba, and Karanja for cleaning teeth[14.] oral cleansing practices like tongue cleansing stimulates the digestive system and enhances Agni. Gandusha and Kaval strengthen gums, improve taste perception, remove oral odor, and promote appetite [15.]

Ahara and Vihara (Diet and Lifestyle): Ayurvedic dietary and lifestyle principles emphasize purity, moderation, and adaptability, which serve as natural defenses against environmental insults. Consumption of Satmya (compatible), Shuddha (clean), and Rasayana (rejuvenative) foods enhances Ojas, strengthens tissues, and minimizes toxin accumulation by optimizing digestion, absorption, and metabolism. The intake of Sattvik foods, which are fresh, wholesome, and nourishing are advised which helps to prevent metabolic disorders like obesity and diabetes[16.] Diet should include all six Rasas—sweet, sour, salty, bitter, pungent, and astringent—in appropriate sequence during meals. Madhur (Sweet) rasa food like fruits is advisable to be consumed in the beginning of meal, food with Amla (sour) and Lavana (salty) rasa in the middle and Katu (bitter), Tikta (astringent) and Kashaya (pungent) foods should be taken at the end of the meal. Avoidance of Viruddha Ahara (incompatible food combinations) and mindful eating habits are essential for maintaining digestive health and preventing toxin formation. Viruddha Ahara like milk with fish, salt and milk, hot honey etc needs to be avoided.

Vyayama that is Exercise and Physical Activity has to be followed. In the quest for better health, engaging in regular physical activity became a vital theme for many. It was widely advised that such exercise not only bolstered cardiovascular health but also played a significant role in weight management[17].

Sadvritta includes Ethical and Moral Conduct. It guides an individual about do's and don'ts giving importance of ethical and moral conduct. This includes mental well-being, offering various techniques to manage stress by yoga pranayama etc. leading one towards a more balanced and peaceful mind[18].

Shodhana: Shodhana therapies, especially Vamana, Virechana, and Nasya, offer holistic detoxification by cleansing different systems of the body. Shodhana includes. Vamana which Eliminates toxins from the body through mouth as emesis. Virechana is elimination of toxins through adhomarga. Nasya i.e nasal drops to Clears toxins lodged in head and neck channels, useful for airborne and inhaled pollutants. Basti i.e Medicated Enemas which removes Vata-mediated toxins. These procedures align with modalities aimed at mobilizing and excreting pollutants via bile, feces, sweat, and mucosal secretions.

Rasayana Chikitsa: Rasayana herbs like Amalaki, Ashwagandha, and Shatavariare used to rebuild tissue strength, enhance immunity, balance hormones, and support systemic resilience. These herbs often exhibit adaptogenic and antioxidant effects beneficial in recovery from chronic toxin exposure[19.]

Shamana: Formulations: Tamra Bhasma, when used in controlled therapeutic doses, it supports heavy-metal detox. Gandhaka Rasayana, Chyawanprash, Abhrak Bhasma: Known to enhance immune function and counter systemic oxidative stress[20.]

Integrative perspective of Agad tantra in Environmental And lifestyle toxins

The word Gada means poison or any other substance which is very harmful to shareer and Tantra is the science. Hence Agadtantra is a branch of Ayurveda dealing with poison, its diagnosis, signs and symptoms, and management. Agadtantra plays a crucial role in Identifying and understanding various poisons and their effects. The explaination of environmental and lifestyle toxins needs to be considered as Visha. Vishaas a substance that causes harm to the body when ingested, inhaled, injected, or absorbed[21.]

Classical Ayurvedic literature categorizes toxins into various forms including Sthavara Visha (plant-origin), Jangama Visha (animal-origin), Dushi Visha (latent toxins), and Garavisha (artificially combined toxins), offering a comprehensive toxicological understanding that aligns closely with modern environmental toxicity[22] It covers all aspects of toxicology including Sarpavisha(animal poisons), Vriksha Visha(plant toxins), Dhatu Visha(metallic and mineral toxins), and Dushi Visha(chronic, low-dose toxins)[23.] Clinical Features of Dushi Visha are Indigestion, Aversion of food, Anorexia, Eruption of circular patches, Stupor, Loss of essential constituents of the body, Vomiting, Diarrhea, Discoloration of skin and Others Complications like Burning sensation, Hiccough, Edema, Heart diseases etc are explained

Acharya Sushruta has described that, if a person suffering from Dushivisha then the first line of treatment should be Swedana Karma followed by Vaman & Virechana Karma according to dosha predominance. After purification (Shodhan) of the body, the anti-toxic drugs (Agadpaan) like Dushivishari Agad mix with honey should be consumed daily by the affected person. Acharya Charaka has specifically mentioned that if Dushivisha is present in Rakta dhatu (Blood) should be treated with Raktamokshana (Bloodletting) by Shira (Viens)[24]. Dushivishari Agad is a compound Herbo-mineral preparation which is explained in the context of Dushivisha. Ingredients of Agad are Pippali, Pippalimula Jatamamsi Dhyamaka Lodhra Twak Ela Suvarchika Katunnatum Kusta Yastimadhu Rakhtachandana Gairika. [25]

The Vishaghna dravyas explained in ayurvedic classics like Guduchi, Haridra, Neem, and Triphalaha etc act as hepatoprotective, antioxidant, immunomodulatory which support their use in detoxification from environmental pollutants like arsenic, lead, and mercury. Ayurvedic herbs like turmeric, ashwagandha, and amla, proves beneficial. These potent herbs work harmoniously to regulate blood sugar levels, improve heart health, and diminish oxidative stress, contributing to a holistic approach to health[26.]

In water pollution Reports indicate 1.4 million child fatalities from diarrhoea.

500000 malaria deaths 860000 child deaths due to malnutrition, 280000 drowning fatalities. 5 million individuals can avoid significant disability from lymphatic filariasis and 5 million from trachoma. Pollutant like Detergents, insecticide, herbicide, lubricants, petroleum hydrocarbons, fuel (gasoline, diesel, fuel oil), volatile organic compounds, chlorinated solvents, nitrates, phosphate-fertilizer, heavy metals, Garbage, Thermal pollutants can cause water pollution and patient presents with anaemia, vomiting, loss of appetite, liver and kidney damage, and hepatitis, diarrhoea, GIT disorders, typhoid, CNS diseases, carcinogenicity, skin problems, lead poisoning, SARS Large-scale water purification[27, 28]

As per ayurveda, drinking water will be contaminated by decomposed dead bodies of aquatic animals, decomposed aquatic plant, unexposed to the sun, moon, air, micro-organism, mixed with rainwater[29.]

To purify the poisoned water, drugs like Dhava, Ashwakarna, Asana, Paribhadra, Patala, Nirgundi, Mokshaka, Amalatas, Somavalka should be collected and burnt. The cold ashes should be then cast into the poisoned water, it will make the water pure (nonpoisonous) or a handful (1 Anjali = 160 gm) of this ash should be put into the pot containing drinking water to be used when needed[30]. Some of the tools that can purify water explained in ayurvedic classics like Impregnation of Kataka, Gomeda, Bisagranthi, Shaivala moola, Vastra, Mukta and Mani

Heated red hot iron balls immersed in water. Put Parnimula and tubers of lotus plants into the water. Water stored in copper containers overnight and consumed the next day is believed to impart 'health benefits. Chandrakanta mani, when exudates in water it removes harmful bacteria, insects, worms, and poison. Hanshodaka: In Sharada ritu (autumn season) water which is exposed to sun rays during the day time and to the moon's rays at night is the 'best' quality water. [31,32]

Land also may get polluted by Human activities like mechanisation, urbanisation, pesticides, leisure, prosperity, garbage disposal, and military presence. The health impact of landfills includes cancers, skin ailments, respiratory disorders, birth defects, liver-kidney-lung disease, and the spread of diseases by mice, rodents, flies, and birds. The poisoned surface should be purified by sprinkling it over with a solution of drugs mentioned in table 5 along with wine (Suraa) or with (an adequate quantity of) black clay dissolved in the water Or sprinkling with a decoction of drugs like Ananta, Sarpagandha

The role of Agadtantra in environmental and lifestyle toxins can be summaries as Identifying various types of poisons from natural and artificial source, Diagnosis of various types of poisoning, developing various therapeutic strategies for their management, treating Environmental pollution, Holistic approach towards Drug Addiction, avoid viruddha ahara etc can be followed.[33]

Integrative approach to swasthvritta and agad tantra.

By integrating preventive lifestyle measures, herbal antidotes, purification therapies, and rejuvenative care, Swasthavritta and Agadtantra together provide a comprehensive strategy for managing environmental and lifestyle-related toxic exposure. This approach closely aligns with modern environmental health principles that emphasize reduction of toxic load, enhancement of excretory mechanisms, strengthening of immune defenses, and restoration of metabolic balance. Ayurveda emphasizes lifestyle-based prevention through daily and seasonal regimens, dietary regulation, and ethical conduct, which help reduce continuous exposure and accumulation of toxins, thereby addressing toxicity at its root[34.]

Daily practices advocated in Swasthavritta such as Abhyanga (oil massage), Pranayama, regulated sleep, and simple detoxifying dietary measures correspond with modern recommendations aimed at reducing oxidative stress and improving lymphatic, hepatic, and biliary function[35.] The use of antioxidant like Tinospora cordifolia and Curcuma longa offers benefits by scavenging reactive oxygen species and facilitating the binding and elimination of heavy metals and environmental pollutants [36]

Panchakarma therapies like Vamana, Virechana, Nasya, and Basti helps for systematic detoxification which can be compared to modern detoxification interventions such as chelation therapy, colon cleansing, and nasal lavage etc which eliminating accumulated toxins out of body. Following detoxification, Rasayana Chikitsa plays a crucial role in long-term recovery by enhancing tissue regeneration, immune competence, and systemic resilience. Rasayana therapy supports restoration of metabolic and immunological balance, analogous to post-chelation nutritional rehabilitation and immune modulation strategies used in contemporary medicine[37]

Thus, the convergence of Ayurveda and environmental medicine offers a synergistic model for the prevention and management of both acute and chronic environmental toxin exposure, wherein Ayurveda contributes through sustainable lifestyle modification, natural detoxification protocols, and immune enhancement using holistic means[38.]

Conclusion:

Environmental and lifestyle toxins exhibit considerable risk to human health. These toxins get accumulate in body and results in oxidative stress, inflammation, and hormonal disturbance leading to manifestation of toxicity features. The concept of environmental and toxicity features resembles with Dushivisha and Janapadodhvansa. Ayurveda offers a holistic approach by ingregative approach of Swasthavritta and Agadtantra. These are efficient way to prevent and treat diseases by focussing on lifestyle changes, strict eating habits, detoxification therapies, and boosting the immune system. It also offers a sustainable way to reduce exposure to environmental and lifestyle toxins promoting long-term health.

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