

Role of Agada Tantra in Environmental Epidemiology – A Literary Review

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ABSTRACT

Ayurveda, a branch of Astanga Ayurveda, addresses pollution as a significant environmental problem. Agad Tantra, a branch of Astanga Ayurveda, focuses on poison identification and treatment. Ayurveda founders, the Acharyas, have described environmental wellness through Dinacharya, Ritucharya, and Janpadodhvansa. Dushi Visha, a concept involving cumulative toxicity, includes pollutants like dust, gases, metals, and chemicals that accumulate in our bodies.

INTRODUCTION

The complex issue of pollution impacts both industrialized and developing countries. The introduction of undesired material into the environment as a result of human activity is known as pollution. A physical, chemical, or biological material that is discharged into the environment and endangers people and other living things directly or indirectly is referred to as pollution.

Concerns about socioeconomic status are also significant; those who live in urban or impoverished locations may be more vulnerable. Because it may require significant participation and financial support from all governmental levels, from local communities to national authorities, combating pollution is a unique concern. For these and other reasons, pollution is a broad area of study.

Therefore, the focus of this paper will be on some of the traditional approaches of treating environmental toxicity. Air, water, soil, natural resources, flora, wildlife, and humans are all examples of the environment, which encompasses the habitat or conditions in which people, animals, or plants live.

Types of Environments

1. The natural world
2. The man-made world
3. The social world

A pandemic known as "Janpadodhvansa Rogas" is the result of the sickness spreading throughout the entire population and destroying the entire area. The symptoms of Samanya Vayu (Normal Air), Vikrutvayu (Polluted Air), and Vishdushit Vayu (Toxic Air) are also mentioned by Acharya Charak in Vimana Sthan chapter 3, where Vayu (Air), Desha (Earth), Kala (Season), and Jala (Water) are all impacted.

Abnormal conditions of the sun, planets, moons, stars, air, fire, and environment that disrupt the seasons are known as poorvarupa (early signs) of Janpadodhvansa^[1] From a modern perspective, it is evident that pollution contaminates the aforementioned four elements and causes epidemics, which also wipe out entire towns.

Frequent exposure to a wide range of pollutants results in the development of pathogenic illnesses in our bodies that mimic the consequences of Dushivisha, such as allergic skin disorders, asthma, hair loss, oligospermia, cardiac problems, neurological disorders, etc.

Whether it is an animal, vegetable, or chemical poison, dushivisha is a poison that is partially innate in the body and is lessened by anti-poisonous medications like the sun, fire, and wind, which have fewer qualities or less efficient than Visha's. Because of Kapha's physical protection, Dushivisha remains in the system for an extended period^[3]

Aims and Objectives

To examine the idea of environmental toxicity and how to treat it using Ayurvedic literature

MATERIAL & METHODS

There has been a thorough review of Ayurvedic literature and the commentary that goes along with it. Textbooks on modern medical sciences and peer-reviewed medical periodicals have also been mentioned as resource for this subject.

Toxin Types

1. Abuse of metals, medicinal substances, commercial chemicals, pollution, fuels, pesticides, herbicides, and (exogenous) medications
2. Bile, endogenous hormones, parasite products, and bacterial toxins
3. Even accumulated nutrients and medications can be hazardous (dose-dependent toxicity), as substances that build up in the body.
4. Man-made or natural, environmental toxins are endocrine disruptors and carcinogenic compounds that can damage human health by interfering with delicate biological processes.

Environmental Toxicity

- The term "toxicity" describes a substance's capacity to have negative or detrimental effects on an organism. Substances classified as toxic can have a negative impact on biological systems, cause significant harm to their structures or functions, and even cause death.
- The scientific study of the detrimental effects of different chemical, biological, and physical elements on living things is known as environmental toxicology. Numerous environmental toxins have several causes and are linked to a wide range of illnesses. Toxins found in our food, drink, and atmosphere A significant contributor to environmental toxicity is pollution.

Classification and epidemiology of pollution

Air pollution- The most well-known and hazardous type of pollution is this one. It occurs for a variety of causes. Large volumes of chemicals are released into the atmosphere daily as a result of driving, excessive fuel burning, and other industrial operations. As a result, they significantly contaminate the air.

Coal is the primary source of smoke from industry, automobiles, chimneys, and wood fires. This Guggula (Commiphora mukul Hook ex Stocks), Arjuna flower (Terminalia arjuna Roxb.), Raal (Extract of Shorea robusta Gaertn.), White Aparajita (Clitoria ternatea L.), and Cinnamomum (tamala Buch.-Ham. T. Nees).

Water pollution- All of the earth's remaining species suffer greatly from water contamination. Nearly 60% of all species are aquatic. It happens for a number of reasons. When industrial waste is discharged into rivers and other bodies of water, the water balance is upset, which causes serious pollution and aquatic life mortality. Insecticides, DDT, and other pesticides sprayed on plants also contaminate groundwater systems, while oil poured into the ocean damages water bodies irreparably. Another important factor is eutrophication. It is brought on by routine tasks like cleaning dishes and clothes close to rivers, lakes, and ponds. This makes the water unlivable by allowing the detergent to dissolve in it, blocking sunshine and lowering oxygen levels. In addition to endangering aquatic life, water pollution contaminates the entire food chain and has a major negative impact on those who depend on it. Additionally, water-borne illnesses like diarrhea and cholera are spreading throughout the world.

Ayurvedic perspective

Water is the lifeblood of all living things, according to Pratinam Prana^[4]

The decomposing remains of aquatic creatures (such as insects, snakes, etc.), decayed aquatic plants, exposure to the sun, moon, air, microorganisms, and rainwater can all contaminate drinking water.^[5]

Vikrita Jala Lakshana: When water is too distorted in any of the six categories—Sparsha (touch), Roopa (sight/color), Rasa (taste), Gandha (odor), Veerya (potency), and Vipaka (chemical transformation)—it should be regarded as having no qualities.^[6]

Features and Impacts of Contaminated Water ^[7] The surface of a sheet of contaminated water becomes slimy, foul-smelling, foamy, and speckled with black lines. Fish and frogs in the water perish for no obvious reason. In animals and birds that inhabit the poisoned water, and on its shores, wandering around madly in confusion can be interpreted as its effects. If a man, horse, or elephant bathes in this poisoned water, they may experience fever, burning sensations, puking, and limb swelling.

- **Conditions brought on by drinking tainted water include:** Goiter (Granthi), heaviness (Angagaurav), abdominal pain (Udarshool), constipation (Kosthabaddhata), edema (Shotha), anemia (Pandu), indigestion (Ajeerna), asthma (Shwasa) & rhinitis (Pratishaya), excessive thirst (Trishna), flatulence (Adhmana), abdominal disease (Udarvyadhi), fever (Jwara), cough (Kasa), and loss of appetite (Kshudhamandhya) Itching (Kandu), conjunctivitis (Netrabhishyanda), and skin disorders (Kustha) are caused by coming into contact with tainted water through bathing or other means.^[8, 9]
- **Purification of contaminated water:** Medications such as Dhava (dhaya), Ashwakarna, Asana, Paribhadra, Patala, Siddhaka (Nigundi), Mokshaka (Makha), Amalatas, and Somavalka should be gathered and burned in order to purify the contaminated water. A handful of this ash (1 Anjali = 160 gm) should be added to the pot of drinking water to be used as needed, or the cold ashes should be thrown into the poisoned water to make it pure (nonpoisonous).^[10]
- Certain instruments that can render Kalushita Jala (contaminated water) acceptable have been covered in Ayurvedic texts. These are listed below.^[11,12]
 1. Vastra (cloth), Mukta (pearl), Bisagranthi (root of lotus), Kataka (Strychnos Potatorum L.), Gomeda (hessonite), and Mani (potash alum) are impregnated.
 2. Heated by immersion of red-hot iron balls in it, fire, or sunshine.
 3. The water should be made clearer by adding lotus plant knots (tubers) and parirrimula, a type of grass that dilutes the water.
 4. The flowers of Naga (Mesua ferrea L.), Champaka (Michelia chmpaca L.), Utpala (Nymphaea sellata Willd.), Patala (Stereospermum suaveolens DC.), Karvira (Nerium indica Mill.), and other fragrant plants are added to the water to eliminate the bad odor.
 5. Water should be consumed in a bowl made of bell metal or valuable stones, or in a goblet that is golden, silver, copper, or earthen and fragrant. It is thought that drinking water kept in copper vessels overnight has "health benefits." The ancient Ayurvedic texts state that when taken in little doses, copper has a scraping effect (Lekhana), heals, and nourishes.
 6. Chandrakanta mani (moonstone): It eliminates poison, insects, worms, and dangerous microorganisms from water through exudate.
 7. Hanshodaka^[13] during the autumnal Sharada Ritu The "best" quality water is that which is exposed to the sun's rays during the day and the moon's rays at night.
 8. Anabhishyandi (which does not block circulation channels), Medhya (which promotes intelligence), Balya (which promotes strength), and Rasayana (which rejuvenates) are all included.

Soil pollution

Desha Lakshan/Vikrita Bhumi ^[14] The desha (bhumi) described below is to be known as unwholesome; having unnatural color, odor, taste, and touch; being overly wet; being teeming with snakes, prey animals, mosquitoes, locusts, flies, mice, owls, birds, and animals like the jackal; being teeming with creepers where crops have fallen, withered, or been destroyed in a way never seen before; being smoky winds; the sound of birds is constant; the baying of dogs constantly assaults the ears; herds of animals and flocks of birds of various kinds are constantly in a state of alarm and pain.

Features and Impacts of Contaminated Ground ^[15] Swellings develop in the areas of the bodies of people, bullocks, horses, asses, camels, and elephants that may come into touch with a poisoned ground or stone slab, landing stage, or desert territory. In these situations, the afflicted areas experience a burning sensation, and the corresponding hair and nails fall off.

Purification ^[16] One way to purify the poisoned surface is to sprinkle it with a drug solution such as Ananta (Sariva), Sarva-Gandha with wine (Suraa), or with a sufficient amount of black clay dissolved in water, or with a drug decoction containing Vidanga, Pathaa, or Katabhi.

Pollution from Noise

Unpleasant sounds that damage our ears are known as noise pollution, and they can cause psychological issues like stress, hypertension, and hearing loss. They are brought on by loud music, industrial machines, etc.

Pollution from radioactivity

When radioactive contamination happens, it can be extremely harmful. It may be brought on by accidents, inappropriate nuclear waste disposal, broken nuclear power plants, etc. It results in birth blindness, infertility, and cancer. It has an effect on water and air and can sterilize

Symptoms and Signs

Inflammation, oxidative stress, thyroid and hormone disruption, mitochondrial dysfunction, preventing the absorption of vital minerals, and upset gut bacterial balance are just a few of the ways that environmental toxins can be harmful. Environmental toxicity can induce a wide range of symptoms due to these many pathways of injury, and it frequently mimics other disorders like fibromyalgia and chronic fatigue syndrome.

Compared to situations of acute toxicity or poisoning, where symptoms are more severe and appear soon after exposure, toxicity from chronic, low-grade toxicity is far more difficult to detect.

Management

Acharya Charaka states that Panchkarma therapy, which consists of Vamana, Virechana, Niruha, Anuvasanam, and Nasya, is part of the treatment of Janpadodhwansa ^[17]. The application of Rasayan (Rejuvenative therapy/Immuno-modulator) measures and the management of the medications collected in a standard environment are then recommended. The main cause of Janpadodhwansa, Adharma, can be lessened with the help of Sadvritta & Aachar Rasayan (Good Behavioral Activity and Personal Hygiene). Adharma is defined as disregarding the rules and values established by one's forefathers (ecosystem imbalance).

Dushi Visha treatment (cumulative toxicity) ^[18]

The first line of treatment for anyone with Dushivisha should be Swedana Karma, followed by Vaman & Virechana Karma, in accordance with the Dosha predominance. After body purification (Shodhan), the ill person should take antitoxic drugs (Agadapaan) such as Dushivishari Agada mix with honey every day. According to Acharya Charaka, if Dushivisha is present in the Rakta Dhatu (blood), Raktamokshana (bloodletting) should be performed. In the context of Dushivisha, the compound herbo-mineral preparation known as Dushivishari Agada is described.

DISCUSSION

Our Acharyas provide remedies for diseases and conditions linked to Janpadodhwansa and Dushi visha, which have shown great promise in treating issues with pollution in the environment. Ecotoxicology essentially belongs to the most significant branch of Ayurveda, agatantra, which deals with different kinds of toxicities and their remedies. Numerous studies have demonstrated that some of these Ayurvedic techniques may remove different contaminants from the environment. Due to their pharmacologic properties, several Vishaghana dhryvas that are listed in Ayurvedic literature have demonstrated their effectiveness in eliminating different types of pollutants. Numerous references to the Bhumi Shodana, Jala Shodana, and Vayu Shodana demonstrate the efficacy of various Aushdi Yogas in addressing environmental toxicity.

CONCLUSION

The great seer stated in the Charak Samhita under the title "Janpadodhwansa" that the Adharma of the local rulers and populace is the root cause of an unhealthy environment, which impairs the ecosystem and its constituent parts. The biggest issue facing all nations in the globe is the slow destruction of ecosystems caused by pollution brought on by modern technology. Future events will make the current situation much more terrible if we don't take it seriously. Numerous research has demonstrated that some of these Ayurvedic techniques may be able to remove different contaminants from the

environment. The efficacy of these Ayurvedic techniques for environmental and bodily detoxification requires more study. The efficacy of these beneficial Ayurvedic techniques in cleansing the body and surroundings without endangering other essential components can be demonstrated through experimental research.

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