REVIEW ON ENVIRONMENTAL POISONING AND ITS IMPACT ON HEALTH

Dr. Rupali Narendra Chandewar
Assistant Professor
Department of Agadntantra,
Bhausaheb Mulak Ayurved Mahavidyalaya Nagpur

Abstract: Environmental poisoning is the poisoning of the environmental factors which occurs because of long term exposure to toxins. Because of this long term exposure to sublethal doses of compounds causes risk to everyone in the environment. Environmental toxins such as lead, mercury, cadmium, benzene contaminate air, water, and soil. These contaminants can be either naturally occurring or due to the result of industrial or man-made impact to the environment. Because of these toxins both human as well as animals have to suffer from various hazardous effects such as IHD, COPD, lung cancer, stroke, kidney damage, liver toxicity etc. In ancient time acharya Charak has quoted Janapadodhwansa, (mass destruction) & its 4 reasons asdushitavayu(Air), jala(Water),kala(time), desh(region). Janapadodhwansa, (mass destruction) occurs due to vitiation of vayu, jala, desh, kala. They are nothing but modes by which infectious diseases spread. Prevention as well as cure of this diseases is very important. A detailed regimen for such diseases is also described in CharakSamhita as use of Panchakarma and Rasayana along with Sadvrittapalan. Also purification of such vitiated air, water and land are described.

Keywords: Environmental poisoning, Environmental toxins, Janapadodhwansa

INTRODUCTION

Environmental poisoning is the unfavourable alteration of surrounding and occurs mainly because of the action of man. As regards industrialization, the actions of man include excess energy consumption using earth fuels (oil, coal), use of various chemicals and use of radioactive substances. These factors contaminate air, water, soil. The vitiated of air, water, soil harm human being as well as animals also. In ancient time, in Sushrut Sahita it is described that enemies defeated in wars awaits a chance to kill the king due to their anger and hated. Kings and his military travel far and wide in pursuit of conquering various kingdoms and face the threat of being poisoned. During war, king and his military should be careful as the enemies may divert path, road, water to drink, shade, food, drink fuels and their food etc. In kalpastana- king when entering the kingdom should examine the-Grass, Water, Path, Food, Smoke Air and so on, which may be poisoned by enemies. He described vitiation method and method of purifying them.

MATERIAL AND METHOD

Environmental poisoning

Environmental poisoning occurs due to the chronic exposure to toxins. The repeated exposure to toxins to sublethal doses of compounds causes various hazardous effects.[1]

Environmental toxins

Environmental toxins are cancer-causing chemicals, both naturally occurring and human –made, that becomes harmful to health by disrupting biological system. [2]

ENVIRONMENTAL TOXINS[3]

Naturally occurring environmental toxins include:

- Mercury
- Lead
- Formaldehyde
- Benzene
- Cadmium
- Radon

Human made chemicals:

- Phthalates
- BPA
- Pesticides
<table>
<thead>
<tr>
<th>Environmental toxins</th>
<th>Sources</th>
<th>Side effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>Coal power plant, electrical equipment, pesticides, cosmetics, mining, paper and pulp, cement</td>
<td>Minimata disease, Mercury vapours causes asthma, bronchitis, temporary respiratory problems, Memory problems, fatigue, hairloss, headache</td>
</tr>
<tr>
<td>Lead</td>
<td>Old paint, old pipes, Paper dyeing, coal, mining, petrochemicals, automobiles</td>
<td>Mental retardation, headache, abdominal pain, fatigue, arthritis, vertigo, psychosis, paralysis, Brain and kidney damage, muscular weakness</td>
</tr>
<tr>
<td>Formaldehyde</td>
<td>Cigarette smoke, fuel-burning appliances, plywood, permanent press fabrics, preservatives in mortuaries and medical laboratories, disinfectant</td>
<td>Leukemia, Nasopharyngeal cancer</td>
</tr>
<tr>
<td>Benzene</td>
<td>Gasoline, Tobacco smoke, Pesticides, Synthetic fibres, Plastics, Inks, Detergent</td>
<td>Leukemia, Bone marrow abnormalities, Aplastic anaemia</td>
</tr>
<tr>
<td>Cadmium</td>
<td>Ceramics, toys, coal, nuclear and coal power plant</td>
<td>Itai Itai disease, Osteoporosis, vomiting, diarrhea, fragile bones, formation of renal stones, kidney damage, lung damage</td>
</tr>
<tr>
<td>Phthalates</td>
<td>Cosmetics, nail polish, deodorants, lotions, shampoos</td>
<td>Low sperm count, Changes in sex hormone levels, Altered development of genitals</td>
</tr>
<tr>
<td>BPA</td>
<td>Polycarbonate plastics, baby bottles, bottle tops, water supply pipes, food and drink packaging</td>
<td>Infertility, Obesity, Early onset of puberty, Aggressive behavior, Low testosterone levels and sperm production</td>
</tr>
<tr>
<td>Pesticides</td>
<td>Insecticides, Fungicides, Herbicides, disinfectants</td>
<td>Headaches, Hand tremors, Fatigue, Dizziness, Insomnia, Neurological symptoms</td>
</tr>
<tr>
<td>BHA</td>
<td>Food preservatives</td>
<td>Male infertility, Disrupting hormones</td>
</tr>
<tr>
<td>Brominated Vegetable Oil</td>
<td>Fruit flavored drinks and sodas</td>
<td>Reproductive and behavioural problems</td>
</tr>
<tr>
<td>Dioxins</td>
<td>Fatty food</td>
<td>Birth defects, Liver damage, Cancer</td>
</tr>
</tbody>
</table>
Types of pollution

AIR pollution

WATER pollution

SOIL pollution

AIR pollution

Causes

- **Agricultural activities**
  
  Use of pesticides, insecticides, fertilizers in agriculture emits harmful chemicals into air causing air pollution

- **Mining operations**
  
  During mining operation dust and chemicals released in air causing massive air pollution

- **Burning of fossil fuels**

  CO emitted from vehicles, SO2 emitted from the combustion of fossil fuels like petroleum, coal.

- **Exhaust from factories and industries**

  Manufacturing industries release CO, organic compounds and chemicals in air

Health Effects

- COPD
- IHD
- Stroke
- Lung cancer

Control and Prevention

- Scrubber
- Filter: Remove particulate matter from gaseous stream.
- Inertial collectors
- Electrostatic precipitators: Used in furnaces, boilers

WATER pollution

Causes

**Organic pollutants:**

- Insecticides
- Detergents
- VOC (Volatile Organic Compounds)
- Chlorinated Solvent
- PCB’S
- Trichloroethylene

**Inorganic Pollutants:**

- Fertilizers containing nitrates and phosphorous
- Heavy metals from motor vehicles
- Chemical as industrial waste products

Health Effects

- Pollution of water bodies by means of mercury causes minamata disease in human and dropsy in fishes
- Cadmium causes ITAI-ITAI disease
- Lead causes Displexia
- Metals like Zinc, arsenic, lead adversely affects humans and animals causing rough skin, dry and thickening of skin and skin cancer.
- Water borne diseases like Cholera, Typhoid, Amoebiasis, Hepatitis.
Methods of controlling

- The quantity of waste water discharge should be minimized
- Water recycling
- Proper treatment of sewage water by sedimentation, filtration, disinfection, aeration.

SOIL pollution

Causes

- Deforestation
- Illegal dumping
- Acid rain
- Buried waste
- Intensive farming

Health Effect

- Mercury - Kidney damage
- Benzene - Leukaemia
- PCB’S - Liver toxicity
- Headache, nausea, skin rashes

Control

- Use of plastic bags should be stopped
- Industrial waste should be properly treated
- Biomedical waste should be separately collected and incinerated
- Indiscriminate disposal of solid waste should be avoided.

Ayurvedic concept

Janpadodhwans

Janpadodhwans is that people of similar demographic region possess some common factors like air, climatic conditions and habitants. etc. As per Ayurveda it is stated that vitiation or toxic (dushta) vayu, jala, desha and kala leads to janpadodhwans.\(^7\)

Toxic environmental air

- Vitiated air flow in the direction other than its normal course in a particular season.
- Excessively stormy.
- Noisy
- No air movement
- Very hot / Cold
- Birds fly with difficulty in sky
- Stormy seas
- Earthquake
- Carrying dust, mist with its flow
- Possesses bad odour with sand particles, dust and smoke
- Destroy crops \(^8\)

Treatment:

Dhupan treatment (smoke treatmet) with laksha, haridra, ativisha, abhaya, harenuk, ela, dal, vakra, kushtha, priyangu etc. should be done for purification of air.\(^9\)

Toxic environmental water

- Dushit (vitiated) water possess abnormal colour, odor, touch, taste and appearance.
- It possess worms and insects and vitiated by fecral matter, urine, dead and decayed animals etc.
- It will be pungent, slimy, sharp taste, hot and foaming.
- All aquatic habitat animals are found dead and floating over.
- The animals that baths in it may develop odema, fever, burning sensation, vomiting, and confusion.
It will be heavy to digest
The dead fishes found floating
It leads to disorders like skin lesions, asthma, edema, pallor, cough, cold, ascites, pain.
It produces swelling, pain, irritation touching.
The rice cooked in that water causes burning sensation, and gets digested after a long time.
All aquatic animals are found dead and floating water.\(^{[10]}\)

Treatment:

Dhavashwakarnadi yog in purification of polluted water

This yog is given in sushrut samhita kalpasthan adhyyay 3 in samarik visha prakaran. It contains

1) Ashwakarn (Anogeissus latifolia)
2) Asaan (Dipterocarpus alatus)
3) Paribhadra (Pterocarpus marsupium)
4) Patala (Erythrina indica)
5) Siddhak (Stereospermum suaveolens)
6) Mokshak (Shrebera swieteniodes)
7) Amaltas (Cassia fistula)
8) Somvalka (Holeotelia integrifolia)

This all herbs should be burn into ash and then this ash should be poured in vessel containing one anjali water. This how the water is purified.\(^{[11]}\)

Toxic environmental Land

- The vitiated land lost its natural colour, odor, texture.
- Excessively slimy
- Having lot of hay, grass, overgrowth etc.
- Loud barking of dogs, bird flying around, many animals running around frantically
- Reservoir of water in that place will be stormy with high waves lashing.
- People that live in that place may lose all their civic qualities.
- Sun masked with dry, ill looking.\(^{[12]}\)

Treatment:

- The roots of vetiver, soma asafetida, drumsticks mixed with little amount of curds and it is administered to all.
- They should be sprinkled with paste ananta (H. indicus) and sugandhtrik (three perfumes)
- Milk mixed with soil is to be sprinkled over road.
  * The urine, flesh and blood of goat, sheep and elephant all the the fragment drug are to be boiled well in water and spread all over poisoned land.\(^{[13]}\)

DISCUSSION

Now a days the focus on environmental toxicity, its sources and effect on health is very essential because of the changing lifestyle. As there are many sources that lead to the presence of toxicants in our water, air, food. These sources include both organic and inorganic pollutants, biological agents, pesticides, all of these have harmful effects on living organisms. The harmful effects of such chemical and biological agents as toxicants can affect an organism and its community by reducing its species diversity and abundance.\(^{[1]}\). According to ancient view janapadodhwansa was described by Acharya charaka. Janapadodhwansa, (mass destruction) occurs due to vitiation of vayu, jala, desh, kala. They are nothing but modes by which infectious diseases spread. Purification of such vitiated water, land and air are described in samhitas.

CONCLUSION

Rapid industrialization and urbanization have caused contamination of environment. Within the industrialised world and advanced lifestyle the environment is composed of harmful chemicals, out of which many are poisonous if present in large amounts, and some of which are poisonous even in small amount. Due to the release of such toxic chemical substances causes environmental damage and directly or indirectly damages living organism. In ancient time acharya charaka has described janapadodhwansa as mass destruction that associated with asdusitavayu, kala, jala and desh. These vitiated factors affect living organisms. So to protect these living organism from harm Acharya charaka described the method of purification of these vitiated factors.
REFERENCES