



Review Article

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GARAVISHA IN ENVIRONMENTAL TOXICITY W.S.R TO PESTICIDES- REVIEW STUDY

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ABSTRACT

Agadatantra is one among the *Ashtanga Ayurveda*, where it deals with *Visha*, its *Laxanas*, *Prabhavas* and its *Bhedhas*, *Acharyas* differentiate *Visha* mainly into two types i.e. *Akritrima* & *kritrima*. *Akritrima* classifies into *Sthavara* & *Jangamaa*, *Kritrima* classifies into *Garavisha*. *Acharya's* given the name for *kritrima* as *Garavisha*, where the combination of both poisonous and non-poisonous substances. *Garavisha* is artificially prepared toxic substances which produces ill effects in Healthy individuals, As *Vagbhata* and *sushruta* considers *Garavisha* only when it is formed from waste materials of animals, *Bhasmas* or medicines having opposite properties or the poison having less potency. As we can correlate *Garavisha* with chronic toxicity, Now a days due to change in the life style of Human beings like *Aharaja* and *Viharaja*, leads to imbalance in *Doshas*. Preservatives, pesticides, insecticides, various types of medicines which are taking for longer period leads to chronic toxicity in our body. As *Viharaja* mainly includes inhaling polluted air, drinking contaminated water, contaminated soil with pesticides and chemical fertilizers etc leads to accumulation of toxic metabolites in the body, Early diagnosis of *garavisha* in our body plays important role in treating the person.

Key words: *Garavisha*, pesticides, Human health

INTRODUCTION:

Environment is the word which defines the living and non-living elements. Their effects which influence the human life, living elements are also called as Biotic elements, where biotic elements includes Animals, Plants, Forests, Fisheries and Birds. Abiotic elements include water, land, sunlight, rocks and air. The sun, soil, water, air are essential for Human life. But now a day's rapid growth of science leads to bad effects on biological, physical and chemical Hazards, it impacts the living organisms. India is mainly an agricultural country where the impact of agricultural pesticides on animals and humans is severe, As well as environmental toxins produced by industrial activity, Hence there are many chemicals, which affects the body. The adverse effects depends on route of exposure & the dose/quantity/concentration of exposure .Mainly there are two types of exposures like acute exposure and chronic exposure , Exposure may be through skin, ingestion, absorption and inhalation. As pesticides are used to kill pests but indirectly it effects on plants Humans and Animals As in our classics concept of *Garavisha* and *Dooshivisha* explained, Hence *Garavisha* is the combination of two or more poisonous substances which effects on body, so we can correlate with these factors.

Ideally pesticides must be lethal to targeted pests but not to non-targeted species including man, The production of pesticides started in India in 1952 with establishment of plant for production of BHC near Calcutta , Organophosphate (OP) insecticides introduced in 1960, Carbamates in (1970), pyrethroids in (1980), Herbicides & fungicides in (1970-1980) These are contributed greatly to pest control & agricultural output.

Term pesticides covers a wide range of compounds includes **Insecticides, Fungicides, Herbicides, Rodenticides, Molluscicides, Nematicides**, plant growth regulators & others etc

India is now second largest manufacturer of pesticides in Asia.

Their has been steady growth in production of technical grade pesticides in India from 5000 metric tons in 1958 to 102,240 metric tons in 1998.

Main use of pesticide in India is for cotton crops, paddy, and wheat.

Direct impact of Pesticides on Humans

Credits of pesticides includes, enhanced economic potential in terms of increased production of food and fibre & their debits have vector born diseases resulted in serious health implications to man & his environment. Some of chemicals pose a potential risk to humans & other life forms, unwanted side effects , Worldwide deaths & chronic diseases due to pesticides poisoning number about 1 million per year.

HIGH RISK GROUPS

- **Workers**
- **Formulators**
- **Sprayers**
- **Mixers**
- **Loaders**
- **Agricultural farmers**

Pesticides are termed as endocrine disruptors known to elicit their adverse effects by antagonising natural Hormone in body, Long term and low dose exposure is increasingly linked to Human health effects such as

- **Immune suppression**
- **Hormone disruption**
- **Diminished intelligence**
- **Reproductive abnormalities**
- **Cancer**

Negative effect of pesticides are not only just in the area of application, it may be of Runoff and pesticide drift can carry pesticides into distant aquatic environments. Pesticides enter water via drift, by runoff, leaching through the soil / may be applied directly into surface water, pesticide contaminated water pose great threat to aquatic form of life. Thus enters the Human body through ingestion , inhalation and dermally.

PESTICIDE CLASS	EFFECTS
1.Organochlorine	Endocrine disruptor, Thyroid disruptor in rodhents, birds, amphibians, fish, Acute mortality attributed to inhibition of acetylcholinesterase activity
2. DDT	Carcinogen , endocrine disruptor
3.Chlordane	Interact with vertebrate immune system
4. Triazine	Earthworms became infected
5. Organophosphate	Thyroid disruptor in rodhents, amphibians, birds, Immunotoxicity due to inhibition of Hydrolases esterase
6. Carbamates	Thyroid disruptor

Acute effects of pesticides:

Immediate effects of pesticides exposure includes headache, stinging of eyes and skin irritation of nose and throat, skin itching, appearance of rash and blisters on skin, dizziness, diahorrea, abdominal pain, nausea and vomiting, blurred vision, blindness

Chronic effects of pesticides:

Neurological health effects like loss of memory, leukaemia, brain cancer, lymphoma, breast cancer etc.

ACCORDING TO AYURVEDA

Acharya Sushruta in *kalpasthana* 3rd chapter 6th sloka mentions: king when he entering his enemy's kingdom he has to observe and examine the grass, path, water, food, smoke, air etc. which may be poisoned by enemies, he describes signs of vitiation and methods of purification. As Acharya said *Dooshita desha* , *Dooshita Jala*, *Dooshita vayu* etc. Now a days we can see these correlation with polluted soil, polluted water ,polluted air which becomes fatal to human beings.

LAXANAS OF DOOSHITA DESHA

- Looseness of texture, natural odor & colour
- Dead plants, dried habitat all around
- People living in that place lost their civic qualities

LAXANAS OF DOOSHITA JALA

As *Acharya Charaka* mentions

- Vitiated water possess *Vikruta Gandha, Varna, rasa, Sparsha, kleda*
- Absence of aquatic animals
- Animals bathing in it develops vomiting, confusion, fever, edema, burning sensation

LAXANAS OF DOOSHITA VAYU

- Atinischala(no air movement) / atyanta vegayukta (excessive stormy) and Ati sheeta/ati ushna
- Cough, cold, head, eye diseases resulted

SIGNS AND SYMPTOMS OF GARAVISHA

- Panduta
- Karshya
- Alpagni
- Marmapradhamana
- Adhmana
- Hasta swayathu
- Padaswayathu
- Jathararoga
- Grahanidosha
- Yakshma
- gulma
- ksaya

- jwara

According to *Vagbhata* if the person who having *Upadravas* or secondary inflections, the patient dies soon in absence of proper treatment

ADHISHTANAS OF GARAVISHA: *Anna, Paana, kasayas, Nasya, Anulepa, Dantakashta, Dhuma, Utsadana, Parisheka, Anjana, Vastra, Sayya, Paduka* etc

DIAGNOSIS: Sometimes Garavisha is mistakenly eaten, some time intensionly given or administered, Their *Laxanas* are manifested , sometime doctors examine and asks what, when, with whom he has eaten.

TREATMENT

Treatment for *Dooshita desha*

Sushrutha says roads must be sprinkled with drugs of

- Ananta, Sugantri*
- Milk mixed with soil sprinkled over road
- Roots of drumsticks, soma asafetida mixed with little amount of curd is administered to all

Treatment for *Dooshita jala*

- Patala, Paribhadra, Ashwakarna, Shamyaka, Siddhaka* are all put into pot set on fire mouth of pot closed with lid, ash is taken out sprinkled over poisoned water

Treatment for *Dooshita vayu*

- *Dhoopana karma* with *Haridra, Abhaya* etc.

GARAVISHA CHIKITSA

1.Vamana karma- Tamraraja with Madhu

2.Hridaya shodhana- Hema churna

3.Agadapana

- **MoorvadiAgada**

● Naagadantyadi Ghrita

- According to *Acharya charaka tamaveksha* (intelligent) *Bhishak (vaidya)* when he come across the *Garavisha* patient he should make question and detail investigation.
- Patient should be given *Vamana karma* with *amraraja* (fine powder of copper) along with *ksudra* (Honey) for cleaning the heart. As *madhu* having *chedhana* (scraping of kapha) property it helps in metabolism of fat, it also having *shodhana*, *ropana*, *sandhana* properties. It also enhances medicinal properties.
- As Tamra is having ushna veerya, katu, kahaya, Amla, tikta, madhura rasa. As tamra is used in treatment of pitta and kapha predominance diseases like anemia, piles, cough, cold, skin diseases etc. Tamra having scraping quality, hence used in treatment of high cholesterol. It is also a very good emetic drug, any residual poison is cleaned by taking in smaller doses in food poisoning. More copper in our every diet could be good for heart, it also offsets the effects of stress on an overworked heart by preventing its enlargement.
- Hemachurna –After Hrudshodhana patient should give 1 sana (4grams) of hemachurna. This administration immediately counteracts all poisons including garavisha.
- As hemachurna used in Garavisha, hema acts as anti-inflammatory & anti-aging properties, it is tonic for our nervous system, it strengthens Heart, beneficial for diseases of liver, spleen, lymph and immune system.

DISCUSSION:

Pesticides are the chemicals which are widely used in agricultures, they provoke the major problems in the world, as pesticides may effects respiratory system, hormonal and endocrine system, circulatory system, nervous system, we should focus more on natural bio pesticides rather than chemicals, pesticides also entered into the food chain and they have been accumulated in the higher tropic level, acute illness and chronic illness are associated with pesticides exposure, about 3 million cases are reported worldwide every year that occur due to pesticidal poisoning, 2 million are suicide attempts rest are occupational or accidental.¹ Adopting an Integrated Pest Management (IPM) for controlling

pests as it is designed to have minimal environmental disturbance and to substitute hazardous chemicals with safe chemistry, Cultural control practices are the operations which are used to destroy the pests. Several methods like crop rotation, sanitisation, soil solarisation, using resistant varieties, certified seeds, intercropping, timed planting and harvesting must be used to avoid the risks of pesticides, exposing to the sun rays, steaming, moisture management are used. As acharya's mentioned dhupanakarma and parisheka of medicated drugs to avoid the poisonous metabolites.

CONCLUSION:

- Pesticides have proved to be boon for farmers as well as people all around the world by increasing agricultural yield, by providing innumerable benefits to society indirectly. But issue of hazards posed by pesticides to human health has raised concerns about safety of pesticides
- We cannot completely eliminate hazards but we can use alternate way hence it is minimized by alternative cropping methods, less toxic formulation / low dose concentration used i.e **“Right dose differentiates poison from a remedy”**
- As in future instead of chemicals, use natural remedies, as acharya said ancient methods to eliminate visha from bhoomi, jala and vayu
- Production of better, safe, environmental friendly pesticides reduce harmful effects with pesticide usage. Ayurveda describes garavisha as a non-natural poison, today's generations are unprotected to these factors unknowingly Hence people are of delayed onset of symptoms, early diagnosis is good so its need to diagnose early with proper treatment.

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