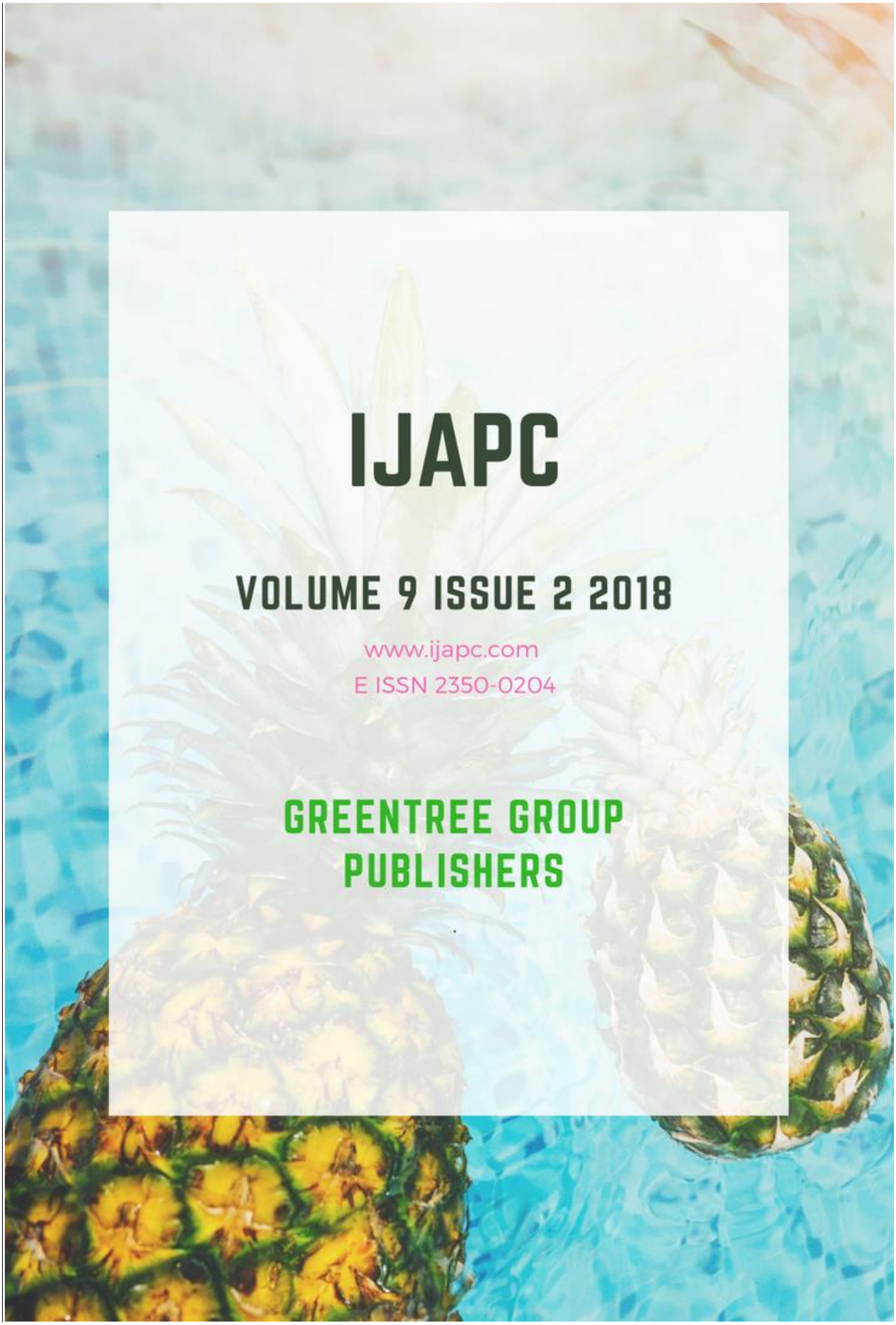

IJAPC

VOLUME 9 ISSUE 2 2018

www.ijapc.com

E ISSN 2350-0204

GREENTREE GROUP
PUBLISHERS

Int J Ayu Pharm Chem

REVIEW ARTICLE

www.ijapc.com

e-ISSN 2350-0204

Cancer in Perspective of *Dooshivisha* (Latent Poisoning) w.s.r. to Possible Role of *Dooshivishari Agada* in Treating Cancer

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ABSTRACT

With modernisation & urbanisation every individual is frequently exposed to many toxic substances like polycyclic hydrocarbons, nitrosamine, pyrogenic compound & many other which are now known to be potent mutagens & carcinogens. These carcinogens enter in the body through air, water, radiation, drugs, cosmetics & different food product resulting in manifestation of sever disease such as cancer. After studying the etiological factor of cancer in view of Ayurveda as well as modern medicine, it is seen that most of the etiological factor & pathology of cancer can be correlated to *Dooshivisha* which is latent stage of poison explained under the one of disciple of Ayurveda. *Dooshivishari Agad* is one of the formulation mentioned for the management of *Dooshivisha*. After reviewing the experimental study of herbs in *Dooshivishari Agad* it is found that all these herbs are useful in anticancer therapy so formulation may be much more effect due to the synergistic action. Integrated approach of modern medicine with Ayurvedic principle is the time need. Application of management of *Dooshivisha* in this context may be the new horizon for cancer patient. So this review is taken to study cancer & its management in context of Dooshivisha.

KEYWORDS

Cancer, Carcinogen, Dooshivisha, Ayurveda, Dooshivishari Agad

Greentree Group Publishers

Received 07/08/18 Accepted 27/08/18 Published 10/09/18

INTRODUCTION

Cancer is the one word which is very scary for every human beings. Every year about 8,00,000 new cancer patients get registered with the national cancer registry program in India[1]. Cancer is the second leading cause of death next to cardivovascular diseases[2]. The world's population is expected to be 7.5 billion by 2020 and approximations predict that about 15.0 million new cancer cases will be diagnosed, with deaths of about 12.0 million cancer patients[3]. Cancer is one of the leading causes of death in India, with about 2.5 million cancer patients, one million new cases are added every year and with a chance five times rising up to 2025[4].Though heredity plays its role in causing cancer but that include only 5% of cancer cases, non -heredity factors such as life style, food, level of physical activity, personal hygiene, environmental pollution are the major causing factors[5] .

Cancer is a disease in which normal cells are damaged and do not undergo programmed cell death as fast as they divide via mitosis .Today due to modernisation & urbanisation each & every individual is frequently exposed to many toxic substances which are mostly carcinogenic. Polycyclic hydrocarbons, nitrosamine , pyrogenic compound & many other which are now known to be potent mutagens & carcinogens. These carcinogens enter in the body through air , water, radiation, drugs, cosmetics & different food product. These increase the risk of cancer by altering cellular metabolism or damaging DNA directly in cells, which interferes with biological processes, and induces the uncontrolled, malignant division, ultimately leading to the formation of tumors. Usually, severe DNA damage leads to programmed cell death, but if the programmed cell death pathway is damaged, then the cell cannot prevent itself from becoming a cancer cell[6].

Carcinogens[7] (Table 1):

A carcinogen is any substance that promotes the formation of cancer. This may be due to the ability to damage the genome or to the disruption of cellular metabolic processes.Two types of carcinogenic mechanisms have been identified. One is genotoxic that alter genes through interaction with DNA and other is epigenetics. Genotoxic are of three types:

- **Direct or primary carcinogens**: Chemicals that act without any bioactivation; for example, bis(chloromethyl) ether, ethylene dibromide, and dimethyl sulfate.
- **Procarcinogens**: Chemicals that require biotransformation to activate them to a carcinogen; for example, vinyl chloride and 2-naphthylamine.

• **Inorganic carcinogen**: Some of these are preliminarily categorized as genotoxic due to potential for DNA damage. Other compounds in the group may operate through epigenetic mechanisms.

• **Epigenetic**: These are carcinogens that do not act directly with genetic material. Several types are possible:Cocarcinogen: Increases the overall response of a carcinogen when they are administered together; for example, sulfur dioxide, ethanol, and catechol.

• **Promoter**: Increases response of a carcinogen when applied after the carcinogen but will not induce cancer by itself; for example, phenol and dithranol.

• **Solid-state**: Works by unknown mechanism, but physical form vital to effect; for example, asbestos and metal foils.

• **Hormone**: Usually is not genotoxic, but alters endocrine balance; often acts as promoter (e.g. DES and estrogens).

• **Immunosuppressor**: Mainly stimulates virally induced, transplanted, or metastatic neoplasms by weakening host's immune system (e.g., antilymphocytic serum, used in organ transplants).

Genotoxic carcinogens are sometimes effective after a single exposure, can act in a cumulative manner, or act with other genotoxic carcinogens which affect the same organs. Some epigenetic carcinogens, however, only cause cancers when concentrations are high and exposure long. The implication is that while there may be a "safe" threshold level of exposure for some carcinogens,others may have "zero" threshold; that is, one molecule of the chemical can induce a cancer[8].

Table 1 Common carcinogen involving occupation[9]

Carcinogen	Associated cancer sites or types	Occupational uses or sources
Arsenic & its compound	Lung ,Skin ,Haemangiosarcoma	Smelting byproduct Component of: • Alloys • Electrical and semiconductor devices • Medications (e.g. melarsoprol) • Herbicides • Fungicides • Animal dips • Drinking water from contaminated aquifers.
Asbestos	Lung, Gastrointestinal tract	Not in widespread use, but found in: • Constructions • Roofing papers • Floor tiles • Fire-resistant textiles • Replacement friction linings for automobiles still may contain asbestos

Benzene	Leukemia, Hodgkins lymphoma	• Light fuel oil • Former use as solvent and fumigant • Printing • Lithography • Paint • Rubber • Dry cleaning • Adhesives • Coatings • Detergents
Beryllium & its compound	Lung	• Missile fuel • Lightweight alloys • Aerospace applications • Nuclear reactors
Cadmium & its compound	Prostate	• Yellow pigments • Phosphors • Solders • Batteries • Metal paintings and coatings
Hexavalent chromiumcompound	Lung	• Paints • Pigments • Preservatives
IC engine exhaust gas	Lung, Bladder	Exhaust gas from engine
Ethylene oxide	Leukemia	• Ripening agents for fruits& nuts • Rocket propellant • Fumigant for foodstuffs and textiles • Sterilant for hospital equipment
Nickle	Nose,Lung	• Nickel plating • Ferrous alloys • Ceramics • Batteries • Stainless-steel welding byproduct
Radon & its decay product	Lung	• Uranium decay • Quarries and mines • Cellars and poorly ventilated places
Vinyl chloride	Haemangiosarcoma, liver	• Refrigerant • Production for polyvinyl chloride • Adhesive for plastics • Former use in pressurized containers
Involuntary smoking (Passive smoking)	Lung	
Radium ,Plutonium	Bone ,Liver	Nuclear fuel processing Radium dial manufacturing.

There are some other carcinogenetic agent which include Gasoline (contains aromatics) Alkylating antineoplastic agents (e.g. mechlorethamine) other alkylating agents (e.g. dimethyl sulfate), Ultraviolet radiation from the sun and UV lamps,Alcohol (causing head and neck cancers),Other ionizing radiation (X-rays, gamma rays, etc.) These carcinogenetic agents cause four main types of cancer,

lung cancer, breast cancer, colon cancer & stomach cancer.

Concept of *Dooshivisha* :

Agadtantra is a specialised branch of Ayurveda which deals with the management of toxicity. This specialised branch has given the novel concept of *Dooshivisha* which is a transformable state of *Visha* (Toxins) which can be attained by any type of poison, if it is not eliminated from the body completely. Ancient seers describe that it is part of poison originating from inanimate or animate or artificial source which retained in the body after partial expulsion or which are provisionally undergone detoxification, by the anti-poisonous drug but not completely eliminated from body .Due to low potency and also due to enveloping (awarana) action by *kapha*, it does not cause sudden death. It is retained in the body for a long period without producing any grave or fatal symptoms. It slowly vitiates the *dosha* & then vitiates *rasa-raktadi dhatu* (tissue). Same pathology is seen in cancer. After long term exposure to carcinogenic substances, Rasaraktadi Dhatu (tissue) get vitiated which causes the mutation of cells[10].

Management of cancer in terms of *Dooshivisha*:

Radiotherapy & chemotherapy are the line of treatment for cancer in conventional medicine which is very effective but on other side it produces harmful toxic effects. So to minimise the toxic effect of this therapy & for the improvement of quality of life in cancer patient, integrated approach of modern medicine with *Ayurvedic* principle is the time need. Exposure & deposition of carcinogenic substance is lead to cancer which ultimately the type of chronic toxicity. So removal of toxin from body may be effective for the treatment of cancer.Liver, skin, kidney, and lung are the major detoxification centers of the body and in a cancer patient this toxin clearance mechanism get compromised. In *Agdtantra* in the context of *Dooshivisha* antitoxic treatment modalities is prescribed that includes *Vaman* (emesis) which eliminate the toxin deposited in the body and after Vamana *Dooshivishari agada,* which is one of the formulations mentioned for the management of the *Dooshivisha*, is to be administered .

Pharmacokinetics of *Vamana*: Poison are mainly fat soluble in nature, by the oleation therapy which is carried out before *Vamana* ,these toxic substances dissolve into oil & the toxin which are firstly present in cytoplasm of cell now become membrane bound. After oleation, *swedana* (fomentation) is carried out due to which cell permeability changes leading to excretion of fat soluble protein bound toxin

into circulation. Due to emetic agents CTZ (emetic center- chemoreceptor trigger zone)centre get activated with the stimulation of vagus nerve. Vasodilatation of portal vein, superior & inferior mesenteric vein, microvasculature of vellus increased the secretion in gut. By this mechanism the toxin which excretes into circulation is expelled into lumen of gut[11].

Table 2 Pharmacological activity of ingredients of *Dooshivishari Agad*

Sr no.	Drug name	Botanical name	Pharmacological action in terms of cancer
1	Pimpali	Piper longum	Immunomodulatory [12] Hepatoprotective Anti-cancer activity [13] Anti-oxidative, anti-apoptotic, and restorative ability against cell proliferative mutagenic response [14]
2	Dhyamaka	Cymbopogon martini	Antioxidant [15]
3	Jatamansi	Nardostachys jatamansi	Hepatoprotective Activity[16] Antioxidant Activity [17] Antiestrogenic activity [18]
4	Ela	Elattaria Cardamum	Anticancer Activity [19] Antioxident Activity [20]
5	Lodhra	Symplocos racemosa	Anticancer activity [21-22] Antioxidant Activity[23] Hepato-protective activity[24]
6	Katunatam/shyonak	Oroxylum indicum	Hepato-protective activity [25] Anticancer activity [26-30] Immuno-stimulating activity[31] Gastro-protective [32]
7	Tagar	Valeriana wallichii	Radio-protective activity[33] Anti-oxident [34] Cytotoxic activity [35]
8	Kuth	Saussurea lappa.	Anti-cancer activity [36-39] Immuno-modulatory activity[40] Hepato-protective [41] Angiogenesis activity[42]
9	Mulethi	Glycyrrhiza glabra Linn.	Antioxidant [43] Hepato-protective [44-45] Anticancer Activity[46-47] Immunomodulator [48]
10	Chandan	Pterocarpus santalinus Linn. f.	Hepatoprotective [49] Antioxident [50] Anticancer Activity [51-53]
11	Suvarchika	Potassium nitrate	
12	Gairik	Red ochre	

DISCUSSION

Cancer is not simply localized lumps and bumps that we have been programmed to accept through the years. Cancer can partly be viewed as a degenerative process with symptoms representative of underlying systemic dysfunction. There are many causative factors, including emotional stress, diet, drugs and chemicals, infections, genetic mutation and environmental

pollutants. Out of this various factors various chemicals slowly get deposited in the body and act as carcinogenic.

Dooshivisha is a remaining portion of specific poison after the completion of treatment or cumulative nature of poison that get deposited in body and damage the cell. After reviewing the causative factor of cancer it is found that all get categorized under the heading of Dooshivisha that is artificial poison. This poison cumulatively deposited in particular (Dhatu) tissue then that tissue is more prone to produce cancer. Weakened *dhatus* and *dhatu agnis* were highlighted as important Ayurvedic concepts in the pathophysiology of cancer. The Vaidyas suggested that when the *dhatus* are weakened, that patients are vulnerable to disease and that in particular a weakened *dhatu agni* (Harmones & enzymes) predisposes them to cancer in that dhatu. This concept is unique to Ayurveda. However, a parallel exist in biomedicine, in which particular tissues (e.g., sites in the aerodigestive tract after tobacco exposure) are vulnerable to cancer[54].

The conventional treatment of surgery, radiation and chemotherapy has been the cornerstone of cancer treatment over the past 50 years. Today, the clinical success of these treatments has reached a ceiling but along with their toxic effect. In chemotherapy along with destroying neoplastic cell, it also damages healthy tissue, body fails to eliminate the excess drugs which leads to accumulation of these chemical as in the body & cause health problems of long period. These chemicals are in-excretable & indigestible. Due to these therapy there is anorexia, nausea, fatigue, malaise and drowsiness as acute symptoms. After someday there is ulceration of mouth & GI tract ,diarrhea, hair loss etc. occurs . All these symptoms resembles with the symptoms of *Dooshivisha*. So while treating the cancer patient along with this therapy if integrated approach of *Dooshivisha* is applied then it may be fruitful.

Dooshivsha is managed by detoxification of body with Vaman along with administration of *Dooshivishari Agada* . For cancer management the formulation needed is having property which strengthen the immune system ,prevent the spread of cancerous cell, create a environment that is unfavorable for cancer growth that means high oxygen level, detoxifying the body ,fighting free radicles that cause mutational changes. After reviewing pharmacological activity of *Dooshivishari Agad* it is found that it fulfills all the criteria which are needed for the management of cancer. Herbs of *Dooshivishari Agada* has individually proved this activity. So synergistic effect of

this formulation will be much more effective in cancer patient.

CONCLUSION

Management of cancer & its prevention can be done effectively if Ayurvedic approach of *Dooshivisha* is applied for the cancer management. Properties and individual actions of ingredients of *Dooshivishari Agada* represent its possible utility in management of cancer, however experimental study has to be carried out to establish them on scientific ground**.**

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