



IJAPC

VOLUME 9 ISSUE 3 2018

**GREEENTREE GROUP
PUBLISHERS**

E ISSN 2350-0204

WWW.IJAPC.COM

"A peer-reviewed journal dedicated to allied Sciences"



Critical Review on Artificial Food Preservatives and their Impact on Health w.s.r. *Dushivisha*

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ABSTRACT

Every living organism needs food to live. Foods have many nutrients such as carbohydrates, fats, proteins, vitamins or minerals. These nutrients present in food are ingested and absorbed by an organism to produce energy stimulate growth and maintain life. The food has limited shelf life, in order to increase the shelf life and maintain the quality certain artificial preservative are used. These preservatives having chemicals in it easily enters into food chain and then accumulate into human body. Thus shows various types of cumulative toxic effects to the human beings and may have some harmful effects. This concept is explained in Ayurveda as *Dushivisha*. By using this concept, we can understand the cumulative toxicities due to various toxins present in the food and treat them by using the principles of Ayurved.

KEYWORDS

Preservatives, Food, Dushivisha, Cumulative toxicities



Greentree Group Publishers

Received 29/06/18 Accepted 18/10/18 Published 10/11/18



INTRODUCTION

Artificial food preservatives (Table 1) are a group of chemical substances which are used in food production to slow down spoilage, discolouration, or contamination by bacteria and other disease forming organisms or pathogens. The main categories of artificial preservatives are antimicrobials, antioxidants, and cheating agents. Antimicrobial preservatives help to prevent artificial way of food preservation can also be done by nuclear radiation, vacuum packing and hypobaric packing. Nowadays certain synthetic chemical are used as food preservatives. They are the most effective for a longer shelf life and can be stop or delay the growth of bacteria, suppress the reaction when food comes in contact with oxygen or heat.

Sodium benzoate, Benzoic acid, Sodium sorbate, Potassium sorbate, and Sodium nitrite are used as Antimicrobial agents as

they inhibit the growth of bacteria, molds, insects and other microorganisms.

Some substances used as Antioxidants are Vitamin E, Vitamin C, Sodium succinate, Succinic Acid, Ascorbic Acid, Propylphenols, Erythroic Acid.

There are some Cheating agents work as preservatives for eg. Disodium ethylenediaminetetraacetic acid (EDTA), Polyphosphates, Citric acid, Ascorbic acid Monosodium Glutamate (MSG) Disodium Guanylate and Disodium Inosinate are used as food flavouring agents

OBJECTIVES

1. To provide insight preservatives associated with food and its harmful effect on health.
2. To explore the concept of dushivisha and its correlation with cumulative toxicities in modern era.

Table 1 Artificial food Preservatives, its sources and side effects^{1,2,3}

Sr.No	Preservatives	Sources	Side effects
1	Sodium Benzoate	Fruit juices, Margarine, Acidic foods	Sodium benzoate combined with vit c or ascorbic acid present in fruit juices produces benzene which is a potential carcinogen
2	Sulfites	Fruits, canned olives peppers, corn syrup wine	Causes Asthama, Allergy, headaches, palpitations, allergies, cancer
3	Benzoic Acid	Fruit products, acidic foods, margarine	Hypertention, Asthama attacks, Kidney disease, stroke
4	Sodium Nitrite	Processed meats, sausage, salami	Decreases oxygen carrying capacity of red blood cells & it can cause respiratory problems



5	BHA/ BHT Butylated Hydroxyanisole Butylated Hydroxytoluence	Preserves oils & fats in food like meat, butter, baked goods, cereals	Harmful to liver , kidneys & can cause cancer
6	Ammonium sulfate	Household cleaning materials & fertilizers, bread	Respiratory tract & gastrointestinal disturbances & pulmonary Diseases
7	Potassium nitrite	Added to meats like ham	Headache, dizziness, convulsions, coma, irregular heart beat, cancer
8	Phosphoric Acid	Used in sodas, fruit juices	Erodes teeth, linked to kidney disease, low bone density
9	Titanium dioxide	Vanilla pudding, doughnuts, whipped cream, chocolate bars	Cause cancer in respiratory tract to toxic effect in cells of brain which may lead to degenerative diseases
10	Monosodium glutamate	Candy, chewing gum, drinks, IV fluid, chicken pox vaccine	Causes brain lesions, seizures, migraine, Depression
11	Propyl Gallate	Soup bases, vegetable oils, processed meat	Liver disease, kidney disease, cancers, cause hormonal imbalance in body
12	Bromates	White flour, Breads	Diarrhoea
13	Monoglycerides and diglycerides	Cookies, cakes, breads, roasted nuts, peanut butter	Birth defects, cancer
14	Maleic hydrazide	Preserve potatoes to prevent from sprouting	Cancer
15	Propylene glycol and carboxymethylcellulose	Ice cream, salad dressing, chocolate milk	Tumors
16	Brominated oils	Bottled fruit juice, soft drinks	Changes in heart tissue, enlargement of thyroid, decrease in liver metabolism, kidney damage and withered testicles

CONCEPT OF DUSHIVISHA IN AYURVEDA

Poison which is old or attenuated by anti-poisonous remedies or dried in forest fire, wind and the sun or naturally deficient in

properties attains the nature of dushivisha. It is not fatal due to mild potency but as it is encapsulated by kapha dosha it remains accumulated in the body for several years producing various ill effects ⁴.

Table 2 General Clinical Features of Dushi Visha as per various Acharya^{5,6,7,8}

Sr	Feature	S.S	Ch.	A.S.	A.H.	Y.R.	B.R.	V.S.
1	Inebriant after food (Annamada)	+	-	-	-	+	+	+
2	Indigestion (Vipaka)	✓	-	-	-	+	+	+
3	Loss of Taste (Arochak)	+	-	-	-	+	+	+
4	Patches & Rashes on Skin (Mandal-Kotha)	+	+	+	+	+	+	+
5	Delusion (Moha)	+	-	-	-	-	-	-



6	Wasting of Tissues (Dhatukshaya)	+	-	-	-	+	+	+
7	Oedema of Feet & Hand (Pada-Karasya Shoph)	+	-	-	-	+	+	+
8	Ascites (Dusyodar)	+	-	+	+	-	-	-
9	Vomiting (Chhardi)	+	-	+	+	+	+	+
10	Lose Motion (Atisar)	+	-	+	+	+	+	+
11	Discolouration of body (Vaivarnya)	+	-	+	+	-	-	-
12	Unconsciousness (Murchha)	+	-	+	+	+	+	+
13	Fever (Visham Jwar)	+	-	-	-	+	+	+
14	Profound Thirst (Trushna)	+	-	+	-	+	+	+
15	Insanity (Unmad)	+	-	-	-	-	+	-
16	Flatulence (Anaha)	+	-	-	-	-	+	-
17	Aspermatogenesis (Shukra Kshyaya)	+	-	-	-	-	+	-
18	Stammering Speech (Swar Vikriti)	+	-	+	+	+	+	-
19	Bad Smell of Mouth (Vaigandha Mukh)	+	-	-	-	+	-	+
20	Bad Taste of Mouth (Vairasya Mukh)	+	-	-	-	+	-	+
21	Giddiness (Bhram)	+	-	-	-	+	-	+
22	Abnormal Activity (Vicheshta)	+	-	-	-	+	-	+
23	Dyspnea (Shwas)(+	-	+	+	+	+	+

Complications of Dooshivisha

Pyrexia, Diarrhea, Burning sensation, Fainting, Hiccough, Cardiac disorders, Distention of abdomen, Abdominal enlargement, Oligospermia, Insanity, Edema, Tremors⁹.

Dushi Visha (cumulative poison)

Treatment

• According to acharya Sushrut patient should be given swedana firstly then vaman , virechan and after these panchakarma procedure dooshivishari Agad should be administered with madhu¹⁰.

• According to acharya charaka if the seat of dooshivisha is rakta dhatu, then siravedha and panchakarma is advised¹¹.

Classified into 2 groups

1) Shodhan chikitsa

It is a panchakarma therapy or biopurification procedure to detoxify the human body as well as cleanse the body.

Panchakarma therapy consists of 3 steps

- Purvakarma- preparations which have to be done before detoxification
- Pradhan Karma- main detoxifying process s



c) Pashchatkarma- Rehabilitating the diet and lifestyle after detoxification process.

Purvakarma

- a) Snehana Karma (oleation therapy)
- b) Swedana karma (Fomentation/ Sudation Therapy)

According to acharya sushrut in dushivisha chikitsa swedan karma is mentioned. he had not mentioned snehana karma

Pradhan karma

It includes mainly five procedure

1. Vamana- emesis Therapy
2. Virechana- Purgation Therapy
3. Basti Karma- enema Therapy
4. Nasya Karma- errhine Thrapy
5. Rakta mokshana- Blood letting

Paschat karma

A strict diet and lifestyle procedure has to be followed throughout panchakarma treatment. The rehabilitative procedures to bring back the diet and lifestyle to normal. In this stage, the digestive power is brought to normalcy.

2) Shaman Chikitsa

When there is contraindication of Shodhana, Shamana is very effective in them. Shaman chikitsa is advised when doshas are not deeply rooted.

Agada-

Dushivishari Agada

- Pippali, gandhatrina, jatamansi, rodhr a, ela, hulhula, kevatimotha, tagara, kushtha, y

ashtimadhu, chandan and gairika, these are the ingredients of dooshivishari agada, which can also be used in other vishaktata too ¹².

Pippalyadi Agad ¹³

Some other Shamana Chikitsa

Tankan Yog ¹⁴

Sarkaradi leha ¹⁵

Krutrim Vishagraha dhoom tail ¹⁶

DISCUSSION

Chemicals present in artificial food preservatives accumulate into the body and cause cumulative toxicities. In Ayurveda it is nothing but dushivisha. There is some relation between dushivisha symptoms & symptoms caused due to artificial food preservatives. In dushivisha avipaka, arochak, vomiting, diarrhea symptoms are explained while in GIT disturbances can be seen due to artificial food preservatives. Patches & rashes on skin can be seen due to dushivisha whereas due to benzoates & sorbates skin rashes & contact dermatitis can be observed. Dyspnoea due to dushivisha whereas asthma in artificial food poisoning. Insanity in dushivisha whereas seizures in artificial food poisoning. Cardiac disorders can be seen in dushivisha whereas irregular heart-beat, changes in heart tissue can be seen in artificial food poisoning.





CONCLUSION

Preservatives are used to increase the shelf life of food and to maintain the quality for longer period of time. It has been reported that chemicals which are used as preservatives have side effects. These preservatives can be acts like dushivisha concept in Ayurved and it can be correlate with the cumulative toxicities occurs in modern lifestyle. Thus these toxicities can be treated as dushivisha explained by our ancient acharyas.



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