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Review of Chemical toxicity in Cosmetic products w.s.r. *Dushi Visha*

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Abstract

The concept of beauty and cosmetic is as old as mankind and civilization. Cosmetic product for females like sun scream, lipsticks, facial cream, nail paints, deodorants and sindoor are very popular in the market. They are generally the combination of various chemical compounds and some of them are derived from natural sources and others from synthetic method. In females regular external application of cosmetic products to improve beauty and appearance of a person which increases the self confidence. Most of the cosmetic products contains hazardous chemicals like talcum, parabens, coal, tar dye, phthalates, fragrance, tri ethanolamine and use of some heavy metals e.g. lead, mercury etc. Peoples are not aware of adverse effect of regular use of cosmetic products it accumulates in the body can cause contact dermatitis, skin disorders, allergies, hair loss and effect on nails etc. In Ayurveda cosmetic toxicity is compare to cumulative type of toxicity, so the cumulative type of toxicity is similar to *Dushi Visha* describes in Ayurveda.

Keywords: Cosmetic product, Chemical toxicity, *Dushi Visha*.

INTRODUCTION:

Ayurveda is the science of human life, which mainly deals with physical, psychological as well as spiritual wellbeing of an individual. *Ayurveda*, which has arisen from *Vedas*, is fine balance of science, religion & philosophy as well. This science has to be dominated by philosophy & spirituality, as well. Ayurveda is consisting of eight branches; one of them is Agada Tantra (Toxicology). Now a day several toxins are present in foods, vegetables, water and in atmosphere. Environmental Toxins enter into human body by two different routes i.e. external or internal. Long term use of chemical products produces various toxic hazardous effects to the human body. This type of toxicity is known as Cumulative toxicity. Cumulative toxicity is like Dushi Visha concepts explain by Acharya Sushruta. Humans are constantly exposed to these environmental toxic chemicals in their day today life. Now a day each and everything like food, water, air, soil,

milk, etc. are polluted. For e.g. Synthetic hormones are in the milk, meat and other dairy product we eat. Pesticides, herbicides and fungicides are also present in grains and vegetables. These toxins enter into our body by different routes. They enter the system through blood circulation, and retention of these toxins results Toxaemia which slowly affect our vital system and immune system and can cause various diseases. According to Acharaya Sushruta, Dushi Visha is defined as the toxin having origin plant, animal or artificial poison, that has not been eliminated, neutralized or remains in the body for a long time and manifested some disease if not treated[1]. Cosmetics are one of them having some hazardous chemical also. Every person wants to look more impressive, beautiful and smart. Cosmetics are the products use for external application to improve the appearance and self-confidence of a person. Although the aim is not always achieved, because it depends upon the selection of the quality of product which is based on the type of skin like oily, dry, normal or combine. Due to poor quality of products, lack of experience and skill person cannot achieve his or her goal. According to dermatologist cosmetics may be grouped as-

1. Skin Care Cosmetics –Cleansing agent, moisturizing agent,
2. Hair Care Cosmetics-Shampoo, Hair, Colour agent etc.,
3. Face Care Cosmetics-Facial foundation, Powder, eye shadow, lipsticks etc.,
4. Nail Care Cosmetics- Nail paint, Paint remover.
5. Fragrance Product-Deodorants, Perfumes etc.
6. UV light screening preparations.

The demand of cosmetic products ranging from creams, beauty, soap, face powder, lotion, shampoo, etc. has increased in recent times, resulting in massive production of cosmetic industry without following any standard guidelines. Cosmetics may contain several toxic chemicals like lead; cadmium etc. may cause various diseases like cancer, birth defect, development and reproductive disorder. Therefore, this type of review study was carried out which was conceptual type in nature. The aim was to highlight the toxic effect of cosmetics, so that a common man can also know the hazardous effect of cosmetics.

AIM & OBJECTIVES:

- To study the concept of *Dushivisha.*
- To study the toxic effects of cosmetics on human body.
- To correlate the *Dushivisha* w.s.r. cu-mulative toxicity of cosmetics.
- To highlight on the toxic effects of cosmetics on human body in front of society.
- To educate the people regarding the preventive measure of toxic effects of cosmetics on human body.

MATERIALS & METHODS:

A] Literature search- Review of literature regarding *Dushivisha* is collected from *Ayurvedic* compendium. Review of literature regarding cumulative toxicity of

cosmetics is collected from modern science & on different website. Research articles are also searched from various websites. All Compiled matter is reorganized and criti-cally analysed for the discussion and at-tempt has been made to draw some fruitful conclusions.

B] Type of study- Conceptual study

Conceptual Review:

The substance after entering into the body causes despair is called as *Visa*. According to modern science a poison is a substance which when administered, inhaled or ingested is capable of acting deleteriously on the human body. Thus almost anything is poison. According to *Bhavaprakasa* the basic classification of poison is same as like that of *Samhitas*, but he classified the *Krtrimavisa* in different manner. The one which is prepared by nonpoisonous substances is called as *Garavisa* & other one which is prepared by poisonous substances is called as *Dushivish* Modern science classified these poisons on the basis of effect produced by them in to four types. Fulminate, acute, chronic and sub acute. Out of which fulminate means poisoning produced by massive dose of poison by which death occurs rapidly, acute means poisoning produced by a single large dose or several small doses taken in a short period, onset of signs & symptoms is usually abrupt. Chronic poisoning produced by small doses taken over a long period. Onset is insidious. Sub-acute is characterised by mixture of features of acute & chronic poisoning. The word *Dusi* is derived from the root word *"Dusa*" & with suffix "Nic" & "In". The word *Dushi* means impure or possessing the property to vitiate.

Definition of *Dushivisa:* The poison which vitiates *Dhaatus* because of factors such as *Desha (habitat),Kaala (season)*,food & sleeping during day time is called *Dushivisha*. A poison either *Sthavara, Jangma* or *Kritrima* whenever not fully eradicated from the body & weakened by anti Poisonous medications or gets dried up by *Davagni, Vata, Tapa* (the fire, the wind & the sun) or when foresaid natural ten qualities of poison becomes less potent is called as *Dushivisa* Because of its mild strength does not prove fatal for an individual & as it get enveloped by the *Kapha* it be present in the body for many years.

Avyakta Awasthaa of Dushivisa: The *Veerya* of *Dushivisa* being less, it does not show any immediate fatality. On the other hand, it becomes *Aavritta* by *Kapha* & stays in that state for years. Its symptoms do not arise immediately

Aggravating Time (*Prakopkala):* It gets aggravated on the body on a cloudy day &by exposure to cold & wind and aggravated by direct breeze, use uncooked food, sleeping during day and infestation of unsuitable foods and then vitiates the *Dhatu.*

Prodromal features *(Poorvaroopa*): When *Dushivisa* is about to flare up it produces some prodromal symptoms such sleepiness, heaviness, yawning, a sense of looseness in the joint, horripilation (piloerection), bodyachae.

Symptoms

Appear intoxication after taking food, indigestion, anorexia, patches, allergic rashes, mental confusion, depletion of Dhatu, oedema in feet, hands and faces, ascities, vomiting, diarrhoea, discolouration, fainting, intermittent fever or severe thirst, some causes insanity, other causes hardness of bowels, other diminishes semen, other produces muffled voice while other causes kustha and respective disorders of various type. Acharya Charaka describe that the artificial poison vitiating the blood causes ulcers and keloids and the poison, vitiating gradually one after another of the body elements, and kill the man ultimately. The person troubled by this will develop stammering speech, vertigo & accompanied with symptoms of dusyodara. Dushivisa produces pustules, kitibha & urticarial rashes due to disorder of blood. Thus poi-son takes away life soon by affecting each dosa.

Systemic effect of Dushi visha

One suffering from Dushi visha passes liquid stool of abnormal colour has foul smell and tasteless in mouth, thirst, fainting, vomiting muffled voice and symptoms of toxicity and dushyaudara. If it is in stomach, the poison suffers from disorders of kapha and vata if located in intestines, then causes disorder caused by vata and pitta. In these cases, hair fall off and limbs drops drown and the person becomes like a bird without wings. It produces the disorder related to Rasa Dhatu respectively.

Samprapti (Pathogenesis)

The Samprapti of the chemical toxicity of cosmetics has not been mentioned clearly in the classics but it may be somewhat correlated with Samprapti of Dushi Visha

Nidan Sevana (Aggravating factors):
Aggravation of Dosha

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Vitiation of Dhatu specially Rakta Dhatu

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Visha can be Sthavar, Jangama or Kritrima

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If not expelled out properly or suppressed by Environmental Factor

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Deposit into the body tissues having mild potency in nature, envelope by Kapha Dosha

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Produce symptoms like Arunshika (acne vulgaris), Kotha (Urticaria) etc.

Impact of *Dushivisa* on the body: *Dushi-visa* produces sense of intoxication after meals, indigestion, anorexia, eruption of circular patches on the skin, urticaria, men-tal confusion, *Dhatukashya*, oedema on the face & extremities, ascites, vomiting, diar-rhoea, discolouration, fainting, intermittent high grade fever & unquenchable thirst. Some poisons produce insanity, abdominal distension, *Shukra Kshya*, muffled voice while other causes *Kustha* & respective disorders of various type. Today's generation is

fascinated more toward

westernized life style & cosmetics are care materials used to develop the appearance, they are proposed to apply to the human body for cleaning, enlightening, increasing charm of the body. A wide range of chemicals are used in the cosmetics as ingredient, active substances, colorants & preservatives. These cosmetics include skin care creams & lotions, cleansers & body washes, nail polishes, deodorants & many more. In this paper only the cosmetics products which are frequently used have been discussed.

Table: Chronic toxicity of Cosmetics

Sr. No.	Cosmetic Name	Name of Toxic Chemicals	Effect to the Body
1.	Skin Care Cosmetics - Cleansing agent, Moisturizing agent.	DEA (Diethanolamine) and its compounds- (Used to make cosmetics creamy, act as a pH adjuster). MEA(Monoethanolamide), TEA (Triethanolamine)	Mild to moderate skin and eye irritation, high dose of these chemicals cause liver cancers and precancerous changes in skin and thyroid.
2.	Hair Care Cosmetics- Shampoo, Hair Colouring agent etc.	Cocamide and Lauramide, DEA found in shampoo. P-Phenylenediamine in many forms of permanent hair dyes Called oxidative Dyes (As a known Skin sensitizer), coal tar	Cocamide and Lauramide, DEA - It leads to allergic reactions. P-Phenylenediamine, as well as the products of its reactions with hydrogen, can alter the genetic material of cells. Coal tar can cause Skin tumours and neurological damage.
3.	Face Care Cosmetics- Facial foundation, Powder, eye shadow, lipsticks etc.	Lead (Pb)	Target multiple body systems, including the neurologic, hematologic, gastrointestinal, cardiovascular and renal systems.

4.	Nail Care Cosmetics- Nail paint, Paint remover	Formaldehyde and Formaldehyde-releasing preservatives (FRPs) like quaternium-15, diazolidinyl urea, polyoxymethylene urea, sodium hydroxyl methyl glycinate, bromopol and glyoxal. (More of These chemicals are Banned from use in cosmetics and toiletries in Japan and Sweden)	Acetone- (Nail polish remover), Headache, dizziness, irritated eyes, Skin and throat. Acetonitrile-Irritated nose and throat, breathing problems, nausea, vomiting, Weakness and exhaustion. Dibutyl Phthalate (DBP)- Nausea and irritated eye, skin, nose, mouth and throat, high level can cause fainting. Isopropyl acetate- Sleepiness and irritated eye, nose and throat. Toluene- Headache, Dizziness, numbness, irritated
			eye, nose, Throat and lungs. Damage to liver and kidney and harm to unborn children during pregnancy.
5.	Fragrance Product- Deodorants, Perfumes etc.	Coumarin, Phethleugenol Phthalates	Some irritants can cause allergies, severe headache, and asthma especially in children. It is ranked the second most common cause of allergy in patients. Coumarin, Phethleugenol are suspected as a carcinogen, Phthalates suspected as hormones disrupters. Perfume spray in air can cause air born contact dermatitis.
6.	UV light screening preparations	-DEA (diethanolamine) and DEA compounds -Benzophenones -Debenzoylmethanes -Para-aminobenzoic acid (PABA), cinnamates. -Heavy metal like inorganic mercury -Hydroquinone(HQ)	Sun screen agents can cause irritation, allergic, phototoxic or photo allergic reactions. Debenzoylmethanes, PABA and cinnamates may cause photo - allergic dermatitis. Hydroquinone can cause ochronosis and mutagenicity. Onchrosis is an adverse effect of HQ with progressive darkening of area of skin.

DISCUSSION:

The toxicity is nothing but the degree which a substance can harm human beings or animals. Chronic toxicity refers to the ability of a toxic substance to cause harmful effects over an extended period, usually upon repeated or continuous expo-sure. After exposure to the body some of the ingredient of this cosmetic substance does not get completely eliminated from the body & in due course of time, this repeated accumulation lead to cumulative toxicity. The clinical features developed due the prolong exposure similar to the *dushivisa.* According to Acharya sushrut *dushivisa* produces indigestion, anorexia, eruption of circular patches on the skin, urticaria, mental con-fusion, *dhatukashya*, oedema on the face & extremities, ascites, vomiting, diarrhoea, discolouration, fainting, intermittent high grade fever & unquenchable thirst. Some poisons produce insanity, abdominal distension, *Shukra Kshya*, muffled voice while other causes *Kustha* & respective disorders of various type. The long-term use of above discussed cosmetics produces various toxic effects & complications. They causes respiratory irritation, nervous disturbances, contact dermatitis, allergies, damage of skin DNA, skin cancer, asthma, ovarian cancer, endocrine disruptions, developmental problems, disturbance of hormone system, birth defects like cleft palate, undescended testis or delayed development, thyroid function disorders, early sexual development in young girls, low sperm count in males, walking & speech problems, memory loss, mood disturbances, sleep disorders, damage of liver, kidneys, nervous system, hair loss, bladder cancer, non-Hodgkin's lymphoma, breast cancer, temper turbulences, sleep maladies .

CONCLUSION:

From above discussion we can conclude that as per Ayurveda *Dushivisha* can be correlate with cumulative toxicity. *Dushivisha* is not acute condition its effect seen gradually on the body if it is accumulated in the body frequently. It definitely produce the toxic effect in the body. *Dushivisha* shows various types of toxic symptoms & disorders on different systems of the body which mainly includes skin, G.I tract, nervous system & many more. Cosmetics can be embraced under the cumulative type of toxicity. Long term use of cosmetics gives rise to hazardous toxic effect & multiple system disorders. So we can correlate the chronic toxicity of the cosmetics with the *Dushivisha.* Thus in today's day to day life we must use cosmetics very cautiously so as to avoid their lethal & harmful toxic effect on the body.

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