

CRITICAL REVIEW OF COSMETIC TOXICITY W.S.R. DUSHI VISHA* *Usturage Revenshidh R.* ** *Pawade Uday V.* *** *Supugade Vikram V.*

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ABSTRACT

In present state thousands of hurtful toxins are accumulated in environment are taken by the human being itself. Cosmetics are one of them. Cosmetics are those elements which are used to improve the appearance of the human body. They are generally combinations of chemical compounds, some being derived from natural sources, many being synthetic. But the people are not aware of adverse effects of these chemical substances on human body due to its long term usage. Therefore this study was carried out which was conceptual type in nature. The aim & objectives of this study was to study the concept *Dushivisha* & to study the toxic effects of cosmetics on human body & correlate the *Dushivisha* w.s.r. cumulative toxicity of cosmetics. All the relevant material was compiled from *Brihatrayi* and available commentaries on it. Research articles are also searched from various websites. All the references were collected & analysed & finally conclusion was drawn. Conclusion of this study is that cosmetics can be included under cumulative type of toxicity. Due to cumulative toxicity hazards of this substance not seen on the body immediately but they can be seen slowly after their long term use. This cumulative type of toxicity is similar to *Dushivisha* concept described by Ayurveda.

Keywords: Cosmetics, cumulative Poison, *Dushivisha*, toxicity.

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 mostly consist of eight branches. One of them is toxicology. Toxic effect of various substances are seen frequently in today's day to day routine mostly in the cosmetic. Today's trend of society is towards the consumption & applying the things which ever easily available & long

term use of these leads to toxicity which is seen very commonly.

Cumulative toxicity is the accumulation of the toxins over a period of time & in turn resulting in the harsh effects on the body & mind. This cumulative toxicity is similar to the *Dushivisha* concept defined by *Acharya Sushruta*. *Dushivisha* is a burning issue in the present scenario. This is fact that in today's fast life every person is exposed to the pollutants in one or the other way. The exposure may be due to polluted atmosphere, certain professions & long term use of certain medicines & therapies also. After exposure to the body some of the component of this substance does not get completely eradicated from the body & in due course of time, this fre-

quent addition lead to cumulative toxicity. In *Ayurvedic* classical texts we found some associated reference by the name *Dushivisha*. Currently there are number of natural, synthetic & semisynthetic agents which are playing major role of causative factors in human body due to continuous persistent exposure. Cosmetics are the one of the major factors.

Everybody wants to have persuasive, attractive personality. Since everybody not born with desired appearances, people tend to achieve that by the use of various kinds of cosmetics in their day to day life. All the types of cosmetics & foods we eat sometimes manipulate with the health of our tissues, at times pronouncing as ill effects of *Dushivisha*. The toxins are accumulated in the body by many ways as described by *Acharyas*. In present time these toxins enter into our body by the means of cosmetics & beauty enhancing chemical treatment also.

Cosmetics are the products proposed to be applied to human body for cleansing, improving, promoting attractiveness or altering the appearance without affecting structure or function of the body. Though it was recognised initially to safer, due to the increased demand, competition, commercialisation the safer cosmetics are replaced by eye catching, bright products which are not only heavy for our pockets but also potentially toxic. Cosmetic toxicology deals with or induces the harmful or toxic effects caused by these products.

More than 10,000 constituents are allowed for use in personal care products & the average woman wears 515 of them every day. Very little is known about the health effects of these chemicals. More than 90% have never been tested for their effects on human health & complete toxicity data are available for only 7% of them. Even though government agencies are aware of the health hazards of some ingredients they are still allowed in personal care products.

By knowing the importance of this sole concept of Ayurveda study was selected which was conceptual and literary in nature. This study was little effort to explain & highlight over the importance of *Dushivisha* literary. By this study now along with physician common man also will take care of himself & will free from these hazardous effect of *Dushivisha*.

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. cumulative 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 critically analysed for the discussion and attempt 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*.¹ According to modern science a poison is a substance which when administered, inhaled or ingested is capable of acting deleteriously on the human body.² 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 non-poisonous substances is called as *Garavisa* & other one which is prepared by poisonous substances is called as *Dushivisa*.³ Modern science classified these poisons on the basis of effect produced by them in to four types. Fulminant, acute, chronic & sub-acute. Out of which fulminant 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 *Dushivisa*.⁴ 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*.⁵ Because of its mild strength does not prove fatal for an individual & as it get enveloped by the *Kapha* it be present in 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 immediately⁶

Aggravating Time (*Prakopkala*): It gets aggravated on the body on a cloudy day & by exposure to cold & wind.

Prodromal features (*Poorvaroopa*): When *Dushivisa* is about to flare up it pro-

duces some prodromal symptoms such as sleepiness, heaviness, yawning, a sense of looseness in the joint, horripilation (pilorection), bodyachae.⁷

Features: The person troubled by this will develop diarrhoea, discolouration of skin, thirst, anorexia, fainting, vomiting, stammering speech, vertigo & accompanied with symptoms of *dusyodara*.⁸ *Dushivisa* produces pustules, *kitibha* & urticarial rashes due to disorder of blood. Thus poison takes away life soon by affecting each *dosa*.⁹

Impact of *Dushivisa* on the body: *Dushivisa* produces sense of intoxication after meals, indigestion, anorexia, eruption of circular patches on the skin, urticaria, mental confusion, *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.

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.

Skin care creams & lotions: In these group products like foundations, moisturizers, hand lotions & lotions are included.

FOUNDATION: The main elements in most of the foundations are talc; silica & alumina all are respiratory irritants when inhaled as powders. Aluminium salt is the constituent of some of the foundation which is toxic to the nervous system. Tri-

ethanolamine (TEA) is also one of the ingredients of foundation can also be contaminated with cancer causing nitrosamines. Parabens are often used as preservatives in foundations can interrupt the hormone system & have been found in breast cancer tumours.

LOTIONS: These are basically a mixture of water & oils, with an emulsifier added to keep the product from separating. A variety of other chemicals are added to the mixture as moisturizing agents, thickeners & preservatives. Mineral oils & petrolatum, both petroleum products are widely used as oils in lotions to keep the skin moist & smooth by locking moisture in both can be contaminated with potentially carcinogenic polycyclic aromatic hydrocarbons (PAHS). Propylene glycol & lanolin are used for the same purpose. Propylene glycol is a recognised neurotoxin & is known to cause contact dermatitis at very low concentration. Lanolin is an animal product that can be contaminated with pesticides. It may also cause allergies. TEA a skin irritant & immune system toxicant is also a common ingredient in lotions. Retinal palmitate which is supposed to reduce wrinkles is an ingredient in many facial creams & anti-aging products. It can produce free radicals & damage skin DNA. It can increase the risk of skin cancer when skin is exposed to UV light. Fragrance is added to most lotions, moisturizers. It contains many toxic ingredients including asthma triggers & hormone disrupting phthalates.

SUNSCREEN: Is a cream or lotion used to protect the skin from sun rays. These sunscreen creams or lotions contains toxic principles like cinnamates, salicylates, zinc oxide which may cause skin rashes as an allergic reactions & irritation of eyes is seen if the product comes in contact with eyes.

BODY POWDER: Body dusting powders are used to absorb sweat odours & to soothe irritate skin. Conventional body powder often contain talc or amorphous

silica both of which can cause lung irritation when inhaled. Studies have shown that women using talc in the genital area & on the sanitary napkins have an increased risk of ovarian cancer. Parabens which are endocrine disruptors are used as preservatives in body powders. Talcum powder is made from purified mineral called talc. Inhalation of this produces inflammatory lung disorders including lung cancer.

LIPSTICKS & LIP GLOSS: A woman may ingest more than four pounds of lipstick in her life even more if she used each day. Lipsticks composed of oils, petroleum waxes & synthetic colours. The colours usually come from coal tar dyes, which can cause skin irritation & allergies & some may cause malignancy. Lead is often found as an impurity in the colours used in lipsticks. This lead is enormously toxic to the nervous system & cause developmental problems for children. Lead is also detected in lip gloss & lip conditioners. Traces of lead, arsenic, cadmium & other heavy metals are found in lip tints & glosses. Petrochemicals are also used in manufacturing of lipsticks. These are harmful to the human health. In addition to this lipsticks may contain formaldehyde which is a preservative & known as cancer-causing agent.

CLEANSERS & BODY WASHES: Profitmaking cleansers rely on alcohol & petroleum products to remove dirt & clean the skin. However, these ingredients also take away natural oils & cause drying. To counteract this producers may add mineral oil to make the skin feel soft. The chemicals that form foam are also added to cleansers to allow them to spread more easily. The foam creating chemicals include sodium laurel sulphate, ammonium laurel sulphate & myreth sulphate. These chemicals are known skin irritants & may be contaminated 1, 4 dioxane a probable carcinogen.

Common preservatives in cleansers comprise parabens which can disrupt hor-

mone system along with methylisothiazoline & methylchloroisothiazoline which are immune system toxins. Many also have bouquet which generally includes phthalates which have been linked to reproductive complications.

NAIL POLISH: Nail products are among the most toxic cosmetics in the market nails can absorb the chemicals used in polishes, removers & cuticle creams.

Nail polish contains three most harmful ingredients. They are toluene, formaldehyde & dibutyl phthalate. These are named as “toxic trio” by the US Environmental working group. Toluene may contain up to 50% of the volume of nail polishes which is known as neurotoxin & may put pregnant women at risk of having a baby with birth faults or late growth. Breathing large amounts of toluene for a short period of time can damage kidneys, liver & the heart. Dibutyl phthalate (DBP) is an oestrogen representing plasticizer that may disrupt thyroid function & accelerate sexual development in young girls. Animal studies have found that DBP may result in birth deformities like cleft palate & undescended testicles. DBP has been an also linked to low sperm count in males. Conventional nail polishes may contain other chemicals such as ethyl acetate which infuriates the respiratory system, benzophenone-1 which is an endocrine distracting chemical & triphenyl phosphate which is neurotoxic. Chronic poisoning of these toxins produce a syndrome called “PAINTER SYNDROME”. It includes symptoms like walking & verbal problems, memorial loss, headache, tiredness, temper turbulences, sleep maladies.

NAIL POLISH REMOVER: Orthodox nail polish removers contain acetone. Long term dealings to acetone may harm the liver, kidneys & nervous system & may increase the danger of birth shortcomings.

PERMANENT WAVES: Using permanent waves to whorl straight hairs is just as popular as straightening of curly hair. The

active components in waves & in some straighteners is the toxic ammonium thio-glyconate. It can cause eye & skin irritation & allergic reactions in some people. Permant wave solutions can also result in first degree burn & even hair loss. They can cause hair to become injured & debilitated, making it more vulnerable to chemical & ultraviolet damage.

HAIR COLOURS & HAIR SPRAYS: Hair colours & hair sprays are often used for colouring hairs & also for setting a hair style. But these products contain many harmful toxic components. A study by Harvard school of Public Health suggested that women who use hair dyes five or more times a year have twice the risk of developing ovarian cancer. Darker more permant dyes pose a greater risk. Studies have shown that using permanent hair dyes regularly over a long period of time is associated with an increased risk of bladder cancer, non-Hodgkin’s lymphoma & multiple myeloma. Use of permant hair dyes could be linked to 20 % of all cases of non-Hodgkin’s lymphoma in women. Also women using hair dyes at least once a month doubled their risk of bladder cancer.

DEODORANTS & ANTIPERSPIRANTS: Deodorants & antiperspirants both fight body odour. Deodorants work by inhibiting the growth of bacteria that cause odour. Antiperspirants actually stop perspiration by blocking the sweat ducts. Most conventional antiperspirants contain aluminium compounds such as aluminium trichlorohydrate gly as active agent. These aluminium compounds are toxic to the nervous system.

Also these compounds interfere with oestrogen & play role in rising incidence of breast cancer. Deodorant & antiperspirant contain antibacterial agent triclosan which I suspected of disrupting the endocrine system & has been shown to harm the thyroid system in animal studies. Talc is also an ingredient in some deodorants & antiperspirants. It is used in some

aerosol products, it may cause lung irritation. Isobutene a gas which can be contaminated with carcinogenic butadiene is often used as a propellant in aerosol sprays. Aerosol sprays break chemicals in to minute particles can be more deeply inhaled than larger particles & this may increase their harmful effects.

SHAMPOO: Shampoos frequently contain harsh detergents, chemical fragrances & numerous irritating & carcinogenic compounds. Formaldehyde is a known human carcinogen which is used in many shampoo & conditioners to kill bacteria & reduce the risk of skin infections. Parabens endocrine disrupting chemicals which have been found in breast tumour tissue are also used as preservatives in many shampoos & hair products. In addition sodium lauryl sulphate & sodium laureate sulphate which are used to create foam in the shampoos are also ingredients of concern. Both are irritants which can be contaminated with ethylene dioxide which is known carcinogen. Carcinogen coal tar may be added as a biocide to some anti-dandruff shampoos.

HAIR REMOVAL: For centuries women in some cultures have used depilatories, usually liquid or creams to remove unwanted hairs. Chemical depilatories can burn skin & eyes & cause severe allergic reactions & pustular outbreaks. Depilatories use high Ph thioglycolic acid is commonly used as the active ingredient, sometimes in combination with lye to boost the effectiveness of the product.

LASER treatments are also used to reduce the amount & thickness of hair. LASER treatments can cause blistering, discolouration, swelling, redness & scarring. Sunlight should be avoided while skin heals. A major concern with laser hair removal is the use of skin numbing anaesthetics, which are sometimes applied before LASER treatment. According to the US food & drug administration's office of cosmetics, these products can cause serious side

effects including death if they are not applied properly.

SCRUBS: Scrubs contain exfoliating ingredients that remove dead skin. They are also used to unclog pores & moisturize the skin. Many conventional scrubs use micro beads which are actually fine granules of polyethylene plastic & are listed as "polyacrylamide" on the list of ingredients conventional scrubs also contain a variety of chemicals of concern including potentially carcinogenic coal tar colours, harsh alcohols & detergents, the surfactant TEA that can be contaminated with cancer causing nitrosamines, the skin irritant sodium lauryl sulphate & the antibacterial triclosan. They are also likely to contain harmful preservatives like hormone disrupting parabens, methylizothiazolone & methylchlorisothiazilone both of which are immune system toxins.

SHAVING CREAMS: Conventional shaving creams are usually based on water & a combination of synthetic chemicals. These include chemicals that can be contaminated with traces of carcinogenic residues like TEA, which can be contaminated with nitrosamines & PEG-90 a binding agent that can be contaminated with ethylene dioxide a known carcinogen.

Propylene glycol, which acts as a moisture carrying ingredient in many skin products is used in shaving creams. It is known skin irritant. Isobutene & Isopentane are the two most popular gases used as propellants in aerosol shaving creams. Out of these two isobutene is most widely used which can be contaminated with the carcinogen butadiene. Shaving creams are often preserved with hormone disrupting parabens or BHA which are classified as "reasonably anticipated to be a carcinogen" by the US National Toxicology programme. Potentially toxic fragrance & FD & C colours are common additives in shaving creams.

AFTER SHAVE: After shaves are designed to soothe irritated skin. They are

usually based just on water & denatured alcohol, but are heavily fragranced. Many individual ingredients in fragrances are irritant & some have been associated with neurotoxicity & cancer. Diethyl phthalate used to prolong the scent of products. It is suspected of interfering with endocrine system & causing reproductive problems. SUN PROTECTION: Sun protection are used to protect against sunburn & skin cancer. Sunscreens work in two different ways. Chemical sunscreens work by absorbing ultraviolet rays before they reach the skin's surface. Mineral blocks work by physically blocking the sun's rays from reaching the skin. The most common ingredients in chemical sunscreens are oxybenzone, cinnamates & retinyl palmitate. Out of these oxybenzone disrupts the body's hormones. It penetrates the skin & enters the bloodstream & increases sensitivity to the sun. Cinnamates which are often used in waterproof sunscreens also concern. They also disrupt the body's hormones, cause allergies & may be toxic to the immune system. Retinyl palmitate a synthetic form of vitamin A is another popular sunscreen ingredient. According to a US Food & Drug Administration study, retinyl palmitate is suspected of increasing skin cancer risk when skin is exposed to sunlight¹⁰.

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 exposure. After exposure to the body some of the ingredients of this cosmetic substance does not get completely eliminated from the body & in due course of time, this repeated accumulation leads to cumulative toxicity. The clinical features developed due to the prolonged exposure of cosmetics are

similar to the *dushivisa*. According to Acharya Sushruta *dushivisa* produces indigestion, anorexia, eruption of circular patches on the skin, urticaria, mental confusion, *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 types¹¹. The long-term use of above discussed cosmetics produces various toxic effects & complications. They cause 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 correlated with cumulative toxicity. *Dushivisha* is not an acute condition its effect is seen gradually on the body if it is accumulated in the body frequently. It definitely produces 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.

REFERENCES:

1. Sushruta Samhita of Maharsisushruta by Prof. K.R.Srikantha Murthy Vol.III Susrutkalpasthana Chapter no 3 Verse No 21 Page No 432, Chaukhambha Orientalia 1st edition 2002.
2. Parikh's Textbook of Medical Jurisprudence & Toxicology by Dr.C.K.Parikh Page No. 645 Published by CBS Publisher & Distributors Revised Reprint 1986.
3. Bhavpraksa Part second of Shri Bhavmisra by Bhisagratna Pandit Sri Brahma Sankar Misra Vishadhikar Verse 47 Page No.744 Published by Chaukhambha Sanskrit Sansthan Seventh Edition 2000.
4. Sushruta Samhita of Maharsisushruta by Prof. K.R.Srikantha Murthy Vol.III Susrutkalpasthana Chapter 2 Verse No 33 Page No 424, Chaukhambha Orientalia 1st edition 2002
5. Astanga Hrdayam of Acharya Vagbhata's Translated by Prof. K R Srikantha Murthy Vol. III Chapter 35 verse 33 Page 333 Published by Krishnadas academy 3rd edition 2000.
6. Astanga Hrdayam of Acharya Vagbhata's Translated by Prof. K R Srikantha Murthy Vol. III Chapter 35 verse 34 Page 333 Published by Krishnadas academy 3rd edition 2000.
7. Sushruta Samhita of Maharsisushruta by Prof. K.R.Srikantha Murthy Vol.III Susrutkalpasthana Chapter 2 Verse No 33 Page No 424, Chaukhambha Orientalia 1st edition 2002.
8. Sushruta Samhita of Maharsisushruta by Prof. K.R.Srikantha Murthy Vol.III Susrutkalpasthana Chapter 2 Verse No 27 Page No 423, Chaukhambha Orientalia 1st edition 2002.
9. Charaksamhita Agnivesa's Treatise Refined & Annotated by Charaka & Redacted by Drdhabala Edited by Prof. Priyavat Sharma Vol II Charaka Chikitsasthanam Chapter 23 Verse 31 Page No.367 Published by Chaukhambha Orientalia Sixth Edition 2001.
10. [http://www.lesstoxicguide.ca/index.asp?](http://www.lesstoxicguide.ca/index.asp)
11. Sushruta Samhita of Maharsisushruta by Prof. K.R.Srikantha Murthy Vol.III Susrutkalpasthana Chapter 2 Verse No 27 Page No 423, Chaukhambha Orientalia 1st edition 2002.

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