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# DERMATOLOGICAL MANIFESTATION OF *VISHA* – A REVIEW

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## ABSTRACT

**Background**:- Ayurveda is an ancient science in Indian system of medicine. The foundation of Ayurveda is based on eight clinical branches (Ashtang Ayurveda). Among these branches Agadtantra is one of the clinical branches in which treatment of various poison is described. We aim to evaluate this knowledge regarding dermatological manifestation due to Visha (toxins) and contemporary knowledge. **Method**:- The references available regarding the different type of poison and their dermatological manifestation in classical text were studied and compared with the available information in the contemporary medical literatures. **Results**:- The term visha and its type incorporates all kind of toxin. Initially, exposure to sthavara visha manifests into contact dermatitis and jangama visha manifests into contact urticaria. Dooshivisha and gara visha can be understood in terms with pesticide exposure, cosmetic toxicity, occupational exposure etc. **Conclusion**:- The dermatological play clear cut role in diagnosis and prognosis. The abundant reference in Ayurveda literatures regarding same is useful at exploring the causative factors through toxicological aspect.

**KEYWORDS**:- Agada, Dermatology, Skin, Toxicology, Toxin, Visha.

## INTRODUCTION

The skin is largest organ and acts as barrier between the body and its environment. It is multi-layered, layers of living cells lie underneath the layer of dead cells. Toxin is a naturally (plant, animal and micro-organism) produced chemical that alters the normal function of another organism. However, in alternative medicine and by the lifestyle journalists, the term 'toxin' is used to refer to any substance alleged to cause ill health. This could include the

sthavara visha (poison of plant origin), jangama visha (poison of animal origin), dhatu visha (poisonous metals and minerals), dooshivisha (cumulative poison), gara visha (artificial poison) etc mentioned in ayurveda treatises. Ayurveda has a separate branch called Agada Tantra which deals with these toxicological aspects including the dermatological manifestation due to visha.

When the toxin reaches the rakta dhatu and living cells of skin, the response is inflammation. Whenever visha comes in contact with body, either externally or internally, skin manifestations are seen. These are twenty-four types of skin manifestations mentioned under the heading of rakta pradoshaja vikara. These diseases occur due to the vitiation of rakta dhatu, i.e the blood and its components. These are Kustha (skin disease), visarpa (eryseplas), pidika (furuncles and carbuncles),raktapitta (bleeding from different parts of the body), raktapradara (menorrhagia), guda-medhrapaka (suppuration in perinium region), pliha roga (spleen disorder), vidradhi (abscess), Kamla (jaundice), nilika (blackish spots), vyanga (freckles), piplu (portwine mark), tilakalaka (non-elevated black mole), dadru (ringworm), charmadala (mole), switra (vitiligo), pama (papules), kotha (urticarial rash), nyachha (mole), indralupta (alopecia), vatashonita, arsha (haemorrhoids), arbuda (tumour), raktamandala (reddish lesions). If patches of kustha are hard and rough like stone, if there is numbness and unresponsive or if condition is chronic, then patient should be given agada yogas (formulations against toxins) internally and thereafter, pradeha (anointments) containing agada drugs applied.

Chemical- skin interactions

Local effect- Exposure to chemicals can cause a problem at the point of contact. These effects are called direct effects.

1) Drying – some chemicals remove the natural oils from the skin, causing it to become very dry. The most frequent causes of dry skin are exposure to soaps, solvents, and moisture.
2) Irritation – some chemicals cause reddening, drying and cracking of the skin at the point of contact. These chemicals are known as irritants. Fiberglass, soaps, oils and solvents are examples.
3) Change in skin colour- A permanent change in skin colour may be due to certain chemicals like tar, asphalt and disinfectants etc.
4) Corrosion – corrosive substance can cause severe damage to the skin like scarring, eg. acid and strong alkalis.

5) Acne – it may be caused by direct contact of the chemical like chlorine.
6) Skin cancer- many carcinogens are found at the work place. They may directly cause malignant tumours at site of contact.

Systemic effect- chemicals may enter the body through skin and may damage specific organs like liver and kidney by solvents containing toluene and xylene. Toxins may enter the body through skin and may damage the nervous system, reproductive system and immune system. Several pesticides enter the body through skin and damage the nervous system and even cause death.

Sensitization effect- Chemical exposure may cause a person to become unusually sensitive to that chemical or group of chemicals. Reaction may occur from exposure to small amount of that toxin. Once sensitized, the person will suffer allergic reaction to that chemical.

Impact of chemical exposure on skin – Chemical exposures to the skin can cause temporary or permanent health damage. Temporary skin damage may occur from exposure to chemicals. For example, many workers may experience dry, red, cracked skin from contact with water, soaps, gasoline, and certain types of solvents. These health problems usually heal quickly when the skin is no longer in contact with the substance. Permanent skin damage may result if the skin is exposed to a chemical that is known to have a severe impact. For example, a chemical burn, as shown, may leave a permanent scar. Exposure to certain chemicals can result in permanent loss of skin colour.

## MATERIAL AND METHODS

The references regarding the venomous bites and stings, clinical skin manifestation due to poisons of plant and mineral origins, medicines, pesticides etc. will be collected from the ayurveda classical treatises and the same will be presented along with the outpatient observations, case report, published article and documents.

### 1. Skin manifestations due to sthavara visha

**Strong acids**

Strong acids may cause corrosion and burning of the tissues and charring & blackening of the skin. Tissue may get dehydrated with no blisters in case of acid. Scar remains permanently.

**Strong alkali**

Strong alkalis act as corrosive poison. On contact with skin may cause blister and brownish discolouration. Eg. sodium hydroxide

Non – metallic irritant poison

Phosphorus may cause subcutaneous haemorrhages, 2nd and 3rd degree with blisters and tissue necrosis. There is rapid penetration and delayed wound healing. Bromine may cause chronic ulcer on external contact. Chlorine causes irritation of skin in swimmer.

**Metallic irritant poison**

Arsenic poisoning may lead to alopecia, hyperkeratosis, Aldrich-mess line on nails and raindrop pigmentation. Large population-based studies from west Bengal in india showed a relationship between arsenic concentration in tube well water and hyperpigmentation and keratosis. Arsenic may cause basal cell carcinoma in a non-melanin pigmented skin. Mercury poisoning has skin manifestation like acrodynia or pink disease, itching, acral rashes and desquamation of palms and soles. Lead poisoning has dermatological symptoms like pallor face and alopecia. Copper poisoning may cause contact dermatitis and bluish-greenish discolouration of skin and gums.

**Irritant plant poison**

Jayapala (croton tiglium) cause burning sensation, redness and vesication. Gunja (abrus precatorius) may produce symptoms which resemble like viper snake bite, inflammation, oedema, oozing, and necrosis. Ergot (Claviceps perpura) produces dry gangrene without swelling and ulceration. Arka (calotropis procera) causes redness with blisters and excoriation later. Bhallataka (semicarpus anacardium) produces bruises and blisters.

**2. Skin manifestation due to jangam visha**

**Darvikara sarpa visha (cobra bite)**

Skin manifestation are blackish discolouration around bite mark, sensation of crawling of insect over skin in 1st vega (stage of symptoms), wound formation in 2nd vega and suppuration in 3rd vega. Local symptoms start within 6-8 minutes. Small reddish wheal develops which later turns purple-blackish with tenderness and burning sensation. Sloughing occurs in 1-2 days.

**Mandali visha (viper snake bite)**

It presents with yellowish discharge and yellowish discolouration of blood in 1st vega, yellowish discoloration of skin, burning sensation and swelling over skin in 2nd vega and suppuration of the tissue in 3rd vega. Pain and oozing, local necrosis gangrene, serous and serangious blisters and petechial haemorrhage are the major skin manifestation in viper bites.

**Vrischika (scorpion sting)**

It presents with severe burning sensation, acute, throbbing and pricking pain with blackish discoloration. Paraesthesia is common feature in scorpion sting.

**Loota visha (spider sting)**

Lesions like ringworm, white, black, reddish, yellowish, soft and elevated lesion which is blackish at the centre and thread like at the periphery. These lesions are fast spreading and painful and burning. Suppuration is formed and new lesion develops to whichever part of the body comes in contact with the existing lesion.

**Makshika (Bee sting)**

Bee sting presents with severe burning sensation, itching and pain. Fast spreading, blackish, discolouration, burning sensation and elevated lesion.

**Kanava (wasp)**

Wasp sting are fast spreading with severe swelling and pain. Skin tissues may fall off.

**Alarka visha (Rabid bite)**

Itching, pain, discolouration, numbness, suppuration, swelling and shrinkage, tearing pain, blisters, nodular lesions are found at the bite mark over the period.

**Mooshika visha (Rat)**

Wherever the toxin i.e. semen from rats touches, new lesions are formed. Pallor discolouration, nodular swelling and suppurative lesions, horripilation, chronic ulcer and thick, slimy discharge from the wound.

**3. Dooshivisha**

Dooshi visha is a form of toxin (animal origin, plant origin, artificial poison) that has not been completely eliminated or neutralised due to various reasons, remains in the body for some time and eventually gets manifested in the form of some disease. Dooshivisha vitiates

the rakta and hence manifests symptoms like aruh, kitibha and kotha. Even venomous bite if not treated completely can act as dooshivisha. Cases of non-healing ulcer with known history of snake bite up to 20 years back have been reported in outpatient departments. For contemporary relevance, several agents can be considered as dooshivisha. Such can be categorised into animate poison, inanimate poison and artificial poison. Inanimate poisons include cumulative toxicity of herbs, chronic exposure to metal & mineral. Animate poison may be considered as rat bite, keeta, loota visha etc. artificial poison include agriculture pesticides and fertilizers, medicinal preparations, alcoholism, incompatible diet, skin manifestation like vaivarnya (vitiated body complexion), kustha (skin diseases), mandal (circular skin lesions), kotha (skin rashes), aruh(eruption on skin) are observed on exposure to above said dooshivisha.

Cosmetic toxicity is one of the major causes of skin problems. Cosmetic products contain various chemical agents which may not be suitable to every individual and may also end up having adverse reaction over prolonged use, lotions contain propylene glycol which may cause contact dermatitis and retinyl palmitate which has potential to change skin DNA, produce free radical and increase risk of cancer. Sunscreen lotions contain cinnamate and salicylate which are known to cause skin rash. Lipstick colour are from coal tar dyes which have every potential to cause skin irritation, allergy and malignancy. Cleanser and body wash contain sodium and ammonium laurel sulphates which are skin irritants and probable carcinogens.

**4. Gara visha**

Toxin can be administered as gara visha (artificial poison) by vitiation of food, drinks, tooth brush, anointing oil, comb, massaging powders or paste, bathing water unguents, garlands, dress, bed, armours, ornaments, footwear, nasal drops, eye salves etc. abhyanga visha (massage with vitiated oil), may cause eruptions, excessive perspiration, ulceration and exudation. Similar symptoms are observed in bathing, decoctions of bath, unguents, bed, cloths when vitiated with toxins. Abhusana visha and avharana visha (jewellery and clothing vitiated with some toxins or even if the individual is allergic to material) there is high chance of skin manifestations. Clothing and jewellery vitiated with toxins may cause burning sensation. Paduka visha (footwears are vitiated with toxins) may cause swelling, eruptions and discharge. Pralepa (anointments), if vitiated with toxins may cause burning sensation in hands and also falling of nails. Abhyanga (oil massage) if done with toxic agents may cause

eruptions, swelling, discharge etc. even the comb if made of improper material or smeared with toxins may cause hairfall and eruptions over scalp. Similar symptoms are observed due to poisoned materials of bath on head, helmet, headwear, garlands. The use of mukhalepa (facial cream), if adultered with toxins may cause blackish discolouration, eruptions, severe sweating, exudation, ulceration and comedons formation. Vahana visha (poisoned materials used for riding on animals) causes eruptions on rider's buttock, anus, penis and scrotum. On contact with body, mutra, purisa etc. which contains toxins, dermatological symptoms like kandu, daha, kotha, aru, pidika, toda, vedna, kleda, srava, tvacha paka etc. manifests.

### 5. Viruddha ahara

Viruddha ahara (incompatible food items) also act as gara or visha. All types of viruddha ahara do not produce disease because body elements like dushya and dehabala (immunity) protect the body from diseases. Viruddha ahara specially disturbed the functions of agni (metabolic energy) and srotas (channels). The vitiated jatharagni does not digest even the laghu ahara (food substances easy to digest), resulting in state of indigestion. The viruddha ahara, adhyasana (eating without previous food being digested) and ajirnasana (indigestion state) together leads to formation of toxins in the gut which is termed as amavisha. Tridosha get provocated by this type of amavisha. In general, food substances and activities (vihara) which are similar in quality to body humours (doshas) and deleterious to the body elements (dhatus) vitiate the body channels (srotas). The atipravritti (increased activity like excessive proliferation of cells), sang (obstructive like proper blockage), siragranthi (thickening and new growth like keratosis) and vimarga gaman (leaving its own path and entering other path like malignancy).

### 6. Vishaja vrana

Human beings are prone to injury in vrana (wound). Wound healing is a natural process but they often remain in inflammatory stages for too long because of the exotoxins and bacterial colonization. Complication of non-healing wounds are vast and patients are at risk of septicaemia, toxic shock syndrome and in some cases amputation. Histologically these types of wounds are infiltrated by t cells causing cascade of tissue toxicity.

### 7. Bacterial manifestation of skin

Streptococcal and staphylococcal bacteria produce alpha toxins (pyrogenic toxin super antigens and haemolysins). Impetigo, ecthyma, erysipelas, cellulitis, furuncle and carbuncle are some of the bacterial manifestations of skin. Impetigo is exudative plaques on

erythematous base. Ecthyma is a deeper pyoderma, often a consequence of neglected impetigo. Erysipelas is superficial spreading pyoderma. Cellulitis is deeper spreading pyoderma. Often both erysipelas and cellulitis co-exist. Folliculitis is inflammation of the hair follicles. Furuncle and carbuncle are deep seated follicular and perifollicular boils. Carbuncle have multiple heads. Clostridium perfringens alpha toxin (necrotizing, hemolytic, collagenase, protease) causes gas gangrene.

**8. Fungal manifestation of skin**

Dermatophytes live in dead keratin and stratum corneum. Mycotoxins are the secondary metabolite that weakens the receiving host by causing inflammation. The fungus uses this as strategy to further proliferate.

**9. Common skin disease due to chemical exposure**

The six common diseases are contact dermatitis, contact urticarial, acne, hyperpigmentation, photo-toxicity & photo-allergy and skin cancer.

**Contact dermatitis**

a) Irritant contact dermatitis may be acute or chronic. Agents involved are detergents, solvents, abrasive dusts, alkalis, cutting oils. Chemicals directly injure the skin without involving the immunological pathway. It may result into acute exudative lesion (eg. strong irritant) or dry dermatitis lesion (weak irritant). Several cases diagnosed in the outpatients as vicharchika (contact dermatitis) often have significant history of cement exposure common in construction labourers.

b) Allergic contact dermatitis may be acute eczema and chronic eczema. Immunological pathway is involved. Common allergens are –

1) Plants – Parthenium and ivy
2) Metal- nickel and chromate
3) Rubber – mercapto mix and thiuram mix
4) Medicine – neomycin and benzocaine
5) Fragrance, parabens and formaldehyde. Several cases diagnosed as kitibha in Agada Tantra outpatient have found to have history of pesticide exposure. Parthenium induced dermatitis is also very commonly seen.

**Contact urticarial**

It is an immediate transient skin swelling surrounded by areas of redness (wheal and flare). Causative agents may be foods, preservatives, fragrances, plant and animal's products, metals rubber latex etc.

**Acne and pigmentary disorders**

Acne may be caused by exposure to petroleum and its derivatives, metal working, coal tar products and halogenated aromatic compounds. Hyperpigmentation may result from excessive exposure to sunlight, glass workers, welders, open field cooks, bakers and silversmiths.

**Photo- toxicity**

Reactivity of the skin to the UV/ visible radiation is increased by chemical. Drug or its metabolite accumulates in the skin, absorbs light and undergoes photochemical reaction followed by a photobiological reaction resulting into local tissue damage, i.e erythema, oedema, blistering, hyperpigmentation and desquamation. The shorter wavelength is responsible. It involves non-immunological pathway. E.g coal tar, fluoroquinolones. Phenothiazines, psoralen, sulphonamides, tetracycline, thiazides, amiodarone, sulfones etc.

**Photo-Allergy**

Reactivity or the skin to the chemicals is increased by the light exposure. It involves the immunological pathway. Drugs or metabolite induces a cell-mediated response which on exposure to longer wavelength produces a popular or eczematous contact dermatitis. Eg. Benzocaine, halogenated phenols, p-aminobenzoic acid, pyridoxine hydrochloride, sandalwood oil, sulfonylureas, griseofulvin, chloroquine, chlorpromazine etc.

**Drug allergy and iatrogenic drug injury**

Most mild reaction like skin rash subside immediately and do not require treatment. However, in case of anaphylactic shock or angioedema, treatment is required. Drugs frequently causing allergic reaction are penicillin, cephalosporin, sulphonamides, tetracyclines, quinolones, anti-tubercular drugs, phenothiazines, salicylates, carbamazepine, allopurinol, ACE inhibitors, methyldopa. Hydralazine, local anaesthetics etc.

Iatrogenic drug injury may be seen as acne due to corticosteroids, urticaria and exfoliative dermatitis due to penicillin and sulphonamides and fixed drug eruptions due to chemotherapeutic agents.

## DISCUSSION

Scope of toxin is very broad, vague and controversial. While there is conflict to consider it as a biological product or chemical agent, the term 'Visha' seems to include all the forms of toxins. The relationship between dermal uptake and health effects observed elsewhere (i.e. systemic effect) in the body is still poorly understood. And most of the case presented at outpatient and diagnosed are of the local effect of toxins. Venoms contain fibrinolysin, haemolysin, agglutinin, phospholipase, coagulase, histamines etc. as toxic principles responsible for the action on blood and inflammation manifested on skin. Most of the irritant plant poison contains toxa-albumins and alkaloids. The initial skin manifestations of the sthavara visha has features of contact dermatitis, while the initial skin manifestations of jangama visha have features of contact urticaria. Skin manifestations due to dooshivisha and gara visha can be understood in view of the occupational exposure like pesticides, cosmetics, metals, rubber etc.

## CONCLUSION

Skin acts as one of the principle target organ for any poisonous manifestation. It may either spread all over the body or only to the part which is exposed to the environment or toxin. Dermatological manifestation plays an important role in clear cut diagnosis of the poison. It is useful for knowing the prognosis of the disease depending upon the size, shape, colour, depth of tissue involved and the time since manifestation occurred.

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