

LITERARY RESEARCH OF 'TWAK SHARIR' W.R.T. AYURVEDA AND MODERN
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ABSTRACT

In *Samhitas Twak/Twacha* is described as outermost protective layer of body as well as largest sensory organ of body. *Acharya Sushrut* and *Acharya Charak* very minutely described its layers according to their functions and also diseases which are related to those layers. Modern health science described skin in detail according to division of cell. In this literary research comparative study of *twacha/skin* is done as per Ayurveda and Modern health science.

KEYWORDS: Twak, Twacha, skin layers.

INTRODUCTION

Sensory organs (*dnyanendrias*) mean which those organs which receive the knowledge through their location (*adhithanas*). *Twak*(skin), *Jivha* (tongue), *Nasa* (nose), *Akshi* (eye), *Karna* (ear) these are five Sense Organs,^[1] *Shabda* (voice), *Sparsh* (touch), *Rupa* (vision), *Rasa* (taste), *Gandha* (smell) are five subjects of those sensory organs (*Tanmatras*).^[2]

Twacha (skin) is one of the five sensory organs which helps to determine the touch sensation and covers whole body, and it is also a location (*ashray sthana*) of sweat channels (*swedvahi strotas*), hairs (*loma*), hair pits (*lomkupas*).

It is the largest organ constituting 15 -20% of total body mass.^[3]

Aim and objective of the study

To study the concept of skin (*twacha*) as per Ayurveda and Modern health science and compare those concepts.

Formation of Twacha (Utpatti)

When life induced by union of Sperm (*Shukra*) and ovum (*Shonita*) in uterus (*garbhashaya*) it undergoes rapid transformation and formation and seven layers of skin form during embryonic period in third and fifth month of fetal age.^[4]

A/c to modern health science skin is derived from three diverse components:

The dermis on the dorsal aspect of head, and trunk arises from dermatomes.

The dermis of limb and lateral and ventral aspect of trunk arises from lateral plate of mesoderm.

The dermis over most of head and over anterior aspect of neck is derived from neural crest.^[5]

Combination of 5 basic elements (Panch bhautiktvam)

Skin (*Twacha*) is one of the five sensory organ (*dnyanendrias*) having dominance of *vayu mahabhut* and related to touch sensation. It is the derivation (*upadhatu*) of flesh (*mansa*) and covers all body and protects inner organs of body. Skin and hairs are related to *parthivansh*, Glow, color are related to *tejansh*, hair pits (*Lomkupas*) and opening of sweat glands are related to *akashansh*., Rasa and lymph etc. related to *aapyansha*.^[6]

Relation with Tridosha

Touch sensation (*Sparsh*) and circulation is related to *Vyan Vayu*. *Bhrajak pitta* related for giving luster and color. Excess *vayu* represented by darkness, excess *pitta* by yellowness while excess *kapha* represented whiteness of skin.

Relation with trimala

Sweat (*Sweda*) among *trimala* excreted by skin which helps to maintain body temperature.

Appearance (Swarup) and layers of skin

There are different opinions of *Acharyas* about *twacha*. *Acharya Charak* and *Wagbhata* and Modern health science stated that there are six layers and *Acharya Sushrut* stated seven layers of skin (*twacha*).

Ancient science described layers of *twacha* a/c to their functions, while modern health science described a/c to division of cells.

Different opinions of Acharyas according to layers of twacha^[7]

| | | | | | | | |
|--------------------------|-------------------------------|----------------------------|------------------------------|--------------------------|-----------------------------|-----------------------------------|--------------------------------|
| <i>Acharya Charak</i> | <i>Prathama Udakdhara</i> | <i>Dwitiya Asugdhara</i> | <i>Trutiya</i> | <i>Chaturtha</i> | <i>Panchami</i> | <i>Shashthi</i> | |
| <i>Acharya Wagbhata</i> | <i>Prathama Udakdhara</i> | <i>Dwitiya Asugdhara</i> | <i>Trutiya</i> | <i>Chaturtha</i> | <i>Panchami</i> | <i>Shashthi</i> | |
| <i>Acharya Sushrut</i> | <i>Avabhasini</i> | <i>Lohita</i> | <i>Shweta</i> | <i>Tamra</i> | <i>Vedini</i> | <i>Rohini</i> | <i>Mansadhara</i> |
| <i>Acharya Arundatt</i> | <i>Avabhasini</i> | <i>Lohita</i> | <i>Shweta</i> | <i>Tamra</i> | <i>Vedini</i> | <i>Rohini</i> | <i>Mansadhara</i> |
| Dr. Ghanekar | Horny layer | Stratum Lucidum | Stratum Granulosum | Malpighian layer | Papillary layer | Reticular layer | Subcutaneous tissue and muscle |
| <i>Kavi Gananath sen</i> | <i>Shankhini</i> | <i>Shabdini</i> | <i>Kanini</i> | | <i>Ankurini</i> | <i>Jalini</i> | |
| Modern health science | St.Corneum | St.Lucidum | St.Grenulesum | St.Malpighian | Papillary layer | Reticular layer | Tela sub cutanea |
| Maxi mov | St.Corneum | St.Lucidum | St.Granulosum | St.germinatum layer | Papillary layer | Reticular layer | Hypodermis |
| Blum | Horny layer | Clear layer | Granular layer | Malpighian layer | | | Sub cutanea layer |
| <i>Abhinav-shariram</i> | <i>Avabhasini/ St.corneum</i> | <i>Lohita/ St.Licudium</i> | <i>Shweta/ St.grenulosum</i> | <i>Tamra /Malpighian</i> | <i>Vedini /St.papillary</i> | <i>Rohini/ St.Reticular layer</i> | <i>Mansadhara/ Sup.faccia</i> |

Seven layers are as

| Layer A/c Sushrut/Charak | Importance | Width | Rogadhistan | Modern concept | Function |
|------------------------------|---|------------------------------------|---|--|---------------------|
| <i>Avabhasini/ Udakdhara</i> | Most superficial layer | 1/18 vrihi, thick at palm and sole | <i>Sidhma, Padmakantak</i> | Epithelial layer, horny layer, Stratum Carneum | Glow, color of skin |
| <i>Lohita/Asrugdhara</i> | Outer second layer | 1/16 vrihi | <i>Tilkalak, Nyachchha, Vyang</i> | Stratum Lucida | |
| <i>Shweta /trutiya</i> | Outer third layer | 1/12 vrihi | <i>Ajagallika, Charma dala</i> | Stratum granuloma | |
| <i>Tamra/ chaturtha</i> | Outer forth, having more melanin | 1/8 vrihi | <i>Kilas, Kushta</i> | Malpighian layer | |
| <i>Vedini/ panchami</i> | Outer fifth, having papillae, nerve ending | 1/5 vrihi | <i>Kushta, Visarp</i> | Papillary layer | |
| <i>Rohini /shsthi</i> | Outer sixth, having <i>romkupa</i> , sweat glands, sebum gland, fiber, <i>uptwacha</i> below it having fats, blood vessels, lymph glands, providing nutrition to outer layers | 1 vrihi | <i>Apachi, Arbud, Shlipad, Galganda</i> | Reticular layer | |
| <i>Mansdhara</i> | Inner most layer | 2 vrihi | <i>Bhagandar, Vidradhi, Arsh</i> | Sub cutaneous tissue, Muscle | |

A/c to Modern Health Science

It is the largest organ of body. It is uniformly thick; at some places it is thick and thin at some place. Average thickness is about 1 to 2 mm. There are two layers of skin. Thin or hairy skin - It is very thin and contains hair and found all over the body except palm and sole. Thick or glabrous skin - Epidermis is very thick with thick layer of stratum Carneum, having no hairs and at palm and sole.

Structure

It consists of two layers. Superficial layer is called epidermis, made up of stratified squamous epithelium. Deeper layer- dermis made up of connective tissue.

Layers of Epidermis

Stratum Basale - It is deepest or basal layer which is made up of single layer of columnar cells that rest on a basal lamina contains stem cells and called as germinal layer, stratum germinative because by undergoing mitosis keratinocytes form more superficial layers.

Stratum spinosum - It is also germinative zone of epidermis, sometimes by undergoing mitosis form skin layer here.

Stratum Granulosum - There are 1 to 5 layers of flattened cells by characterizing presence of deeply staining granules in their cytoplasm. Keratin filaments are more numerous and arranged in the form of thick layer.

Stratum Lucidum - (lucid-clear) called due to homogeneous appearance.

Stratum Carneum - Most superficial layer of epidermis, made up of flattened scale like element (squamous) containing keratin filaments embedded in protein. Glue like material containing lipids and carbohydrates held it together.

Thickness is greater at palm and sole.

Epidermis -consists of two types of cells

Keratinocytes and non-keratinocytes, including melanocytes, dendritic cells of Langerhans and cells of Merkel.

Keratinocytes - are predominant cells of epidermis, forms from stem cells present in basal layer. By further mitosis intermediate stem cells undergoes. Then after no further cell division.

Melanocytes - Derived from melanoblast that arises from neural crest and are responsible for melanin synthesis. Color of skin is influenced by melanin presence.

Dendritic cells of Langerhans - Originate in bone marrow and playing important role in protection of skin

against viral and other infections and controlling the rate of cell division in epidermis.

Increases in chronic skin diseases are due to allergy.

Present in oral mucosa, vagina and thymus and belong to mononuclear phagocyte system.

Cell of Merkel - Sensory nerve ending are present in these cells in basal layer of epidermis.

The Dermis - It is made up of connective tissue and stout collagen fibers, fibroblasts and histiocytes and divided in two layers.

Papillary layer - Forms superficial layer of dermis and includes the dense connective tissue of dermal papillae which are best develop in thick skin of palm and sole. Contains blood vessels lymphatic's, and nerve fibers and chromate ores (pigments).

Reticular layer - This layer is made up of Reticular and elastic fibers. Fibers are found around the hair bulbs, sweat glands, and sebaceous gland. Immediately below the dermis, sub cutaneous tissue in prunes.

Color of skin - Depends upon pigmentation and hemoglobin in blood.

Blood supply - By number of arterial plexuses. Deepest plexus present over deep fascia, Just below the dermis and just below the level of papillae. Capillary loop arising from this plexus pass into each dermal papillae.

Blood vessels do not penetrate into the epidermis, by diffusion from capillary epidermis derives nutrition.

Veins from dermalpapillae drain into venous plexes lying on deep fascia.

By the presense of arterio venous anastomoses regulate blood flow through the capillary bed and helping to maintain body temperature.

Nerve Supply - Superficial part of dermis by sensory nerves, and by autonomous nerve supply to smooth muscles in the wall of blood vessels and sweat glands.

Functions

Protection to underlying tissues. Physical barrier against micro organisms and other substances but not perfect, ointments and poisons and fat soluble substances may enter in to body by skin.

Regulate water and electrolyte balance. Store fat, water, chloride, and sugar and blood by dilation of blood vessels. Excrete small quantity of waste materials like urea, salts fatty substance. Secretes sweat through sweat glands, and sebum through sebaceous glands. Protect tissue from harmful ultraviolet light. (Ultra violet light 7

dehydrocholesterol to vitamin D.) Protects against damage to tissue by chemicals, heat and other osmotic influences. Important sensory organ. Regulates body temperature.^[8]

DISCUSSION

Classical texts and modern texts have different opinion about skin. But they both describe the layers, pigments, and thickness of skin. Moreover classical text describes the diseases which occurred in particular layer of skin.

Brain storming deep study has been done in above project. This explains various opinions of classical and modern text as well about skin. Its function, its formation and its structure.

CONCLUSION

Skin is most presentable part of body having definite role in personality. Hence to know abnormalities of skin one must have knowledge about normal state of its structure and function of skin must to be studied in detail.

In above literary research structural and functional aspects of skin according to modern and classical text were studied.

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