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THE STUDY OF TWACHA SHARIR W.S.R TO AYURVED AND MODERN SCIENCE

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ABSTRACT

Twacha (Skin) is one of the important sensory organs which receive sense / stimuli through *Adhisthanas. Twacha* generates anticipated response against the stimuli like; *Sparsh* (Touch), *Twacha* (Skin) not only helps to understand touch sensation but it also covers whole body, protect from shock and perform functioning of thermostat through sweat channels (*Swedvahi Srotas*). In *Samhitas 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: *Sparshanendriya, Gyanendriyas, Twacha.*

INTRODUCTION

Ayurveda is an oldest system of Indian medicine. In *Ayurvedic* classics, *Sharir sthan* has given description about internal and external body features, out of these *Sushrut Samhita Sharir sthan* has great anatomical importance hence, it is said that *Sharire Sushruta Shrestha*. In *Sharir sthan Acharya Sushrut* has mentioned five sensory organ (*Gyanendriyas*). Twacha (Skin) is one of the five sensory organ having its perception as *Sparshgyan* (Touch sensation).

According to *Acharya Sushrut, Twacha* (Skin) comprises seven layers and mentioned their respective diseases. Each layer has importance as it is location for specific *Vyadhi.*

Twacha utpatti

According to *Acharya Sushrut Twacha* develops like a layer of *Santanika* (Cream) developed on *Ksheer* (Milk) after heating. The formation of *Twacha* result from heat generated in the process of union of *Shukra* and *Shonita* during the *Garbha nirmaana Kala*.[1]

Acharya Charak states that development of the *Twacha* results from the *Shukra Shonita Sanyoga* and formation of all *Sapta Dhatu.*[2] Acharya *Vagbhata* states that the development of *Twacha* occurs due to *Paka* of *Rakta Dhatu* by *Dhatvagni.*[3]

In Modern texts, it is stated that the development of skin starts at about fourth week after the fertilization. At the beginning of seventh week, the single layer known as the basal layer, divides and forms a superficial protected layer of flattened cells called periderm. By the fifth month, appearance of fatty layer called the vernix caseosa can be seen. By about eleventh week, epidermis and dermis are formed and hair follicles start to grow. The epidermis is derived from ectoderm while the dermis arises from mesoderm located deep to the surface ectoderm.[4]

Relation with *panchamahabhut*

Twacha is a *Matruja Avayava*.[5] It is made up of combination of *Panchamahabhut* of which *Vayu Mahabhut* is the most important.[6]

Relation with *trimal*

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

Relation with *tridosh*

Bhrajaka Pitta present in *Twacha* is responsible for luster of the *Twacha*.[7] The *Pittadosha vrddhi* in the body result in yellowish discoloration of the *Twacha*.[8] Where as its *Kshaya* result in the loss of luster of *Twacha*. *Vatadosha Vrddhi* in the body results in *Karshanyam* (hyperpigmentation) of *Twacha* and *Kapha vriddhi* causes *Shaukalyam* (whitish discoloration) and *Shaityam* (Coldness of *Twacha*).[9] *Kapha Kshaya* result in *Rukshata* (Dryness).[10]

***Swarup* and Layer of skin**

There are different opinions of *Acharyas* about *Twacha*. Acharya *Charak* and *Wagbhatta* and Modern health science stated that there are six layer and Acharya *Sushruta* stated seven layers of skin (*Twacha*). Ancient science described layer of *Twacha* a/c to their functions,

while modern health science described a/c to division of cells.

Different opinions of *Acharyas* according to layer of *Twacha*[11]

Acharya Charak	***Prathama Udakdhara***	***Dwitiya Asrugdhara***	***Sidhmakilasa Adhisthana***	***Dadrukusta Adhisthana***	***Alajividradi Adhisthana***	***Arushi Adhisthana***	
Acharya Wagbhatt	*Prathama Udakdhara*	*Dwitiya Asrugdhara*	*Trutiya*	*Chaturtha*	*Panchami*	*Shashthi*	
Acharya Sushrut	*Avabhasini*	*Lohita*	*Shweta*	*Tamra*	*Vedini*	*Rohini*	*Mansadhara*
Acharya Arundatt	*Avabhasini*	*Lohita*	*Shweta*	*Tamra*	*Vedini*	*Rohini*	*Mansadhara*
Dr. Ghanekar	Horny Layer	Stratum Lucidum	Stratum Granulosum	Malpighian Layer	Papillary Layer	Reticular layer	Tela sub cutanea
Modern Health Science	Stratum Corneum	Stratum Lucidum	Stratum Grenulesum	Stratum Malpighian	Papillary Layer	Reticular layer	Hypodermis
Maxi mov	Stratum Corneum	Stratum Lucidum	Stratum Granulosum	Stratum Germinatium layer	apillary Layer	eticular Layer	Hypodermis
Blum	Horny Layer	Clear Layer	Granular layer	Malpighian Layer			Sub cutanea
Abhinav Shariram	*Avabhasini* /St. corneum	*Lohita*/ St. Licudium	*Shweta*/ St. grenulosum	*Tamra*/ Malpighian	*Vedini*/ St.Papillary	*Rohini*/ St.Reticular layer	*Mansadhara*/ Sup. faccia

Seven layers are as

Layer A/C *Sushrut/ Charak*	**Importance**	**Width**	***Rogadhisthan***	**Modern Concept**	**Function**
Avabhasini/ Udakdhara	Most superficial layer	1/8 *Vrihi* Thick at palm and sole	*Sidhma, Padmakantak*	Epithelial layer, horny layer, Stratum Carneum	Glow color of skin
Lohita/ Asrugdhara	Outer second layer	1/16 *Vrihi*	*Tilkalak, Nyachahha, Vyang*	Stratum Lucida	
Shweta/ Trutiya	Outer third Layer	1/12 *Vrihi*	*Ajagallika, Charma dala*	Stratum Granuloma	
Tamra/ Chaturtha	Outer forth, Having more melanin	1/8 *Vrihi*	*Kilas, Kustha*	Malphigian Layer	
Vedini/ Panchami	Outer fifth, Having Papillae, nerve Ending	1/5 *Vrihi*	*Kushta, Visarp*	Papillary layer	

Rohini/ Shasthi	Outer sixth, having *Romkupa*, sweat glands, Sebum gland, fiber, *Uptwacha* below it having fats, blood vessels, lymph glands,	1 *Vrihi*	*Apachi, Arbud, Shlipad, Galganda*	Reticular layer	
	Providing nutrition to outer layers				
Mansdhara	Inner most layer	2 *Vrihi*	*Bhagandar, Vidradhi, Arsh*	Subcutaneous Tissue, Muscle	

A/C to Modern Health Science

It is one of the largest organ of the body in surface area and weight. In adults, the skin covers an area of about 2 square meter and weight 4.5-5kg. Its thickness is 0.5-4.0 mm, depending on location. Thick skin (5mm) is present in the sole of the foot, palm of the hand and inter-scapular region. Thin skin (0.5mm) is present over the eyelids and penis.

Structure

It consist of two layer.

1) Epidermis

2) Dermis

Epidermis

It is the superficial thinner portion which is composed of stratified epithelium.

Epidermis does not have blood vessels. Nutrition is provided by capillaries of the dermis.

Layers of epidermis

1) **Stratum corneum (corneum= horny) –** This layer consists of 25 – 30 layer of flat, dead cells completely filled with keratin. These cells are continuously shed and replaced by cells from deeper layer.
2) **Stratum lucidum (lucidus=clear)** – All cells of this layer have shiny appearance. This layer is present in the thick skin of the palms and soles and even absent in the thin skin. It consists of 3-5 layers of clear, fat, dead cells that contain droplets of an intermediate substance that is eventually transformed to keratin.
3) **Stratum granulosum (granulum=little grain)** - This layer consists of 3-5 layer of

flattened cells that develop darkly staining granules of a substance called keratohyalin.

4) **Stratum spinosum (spinosum=thorn like or prickly)** - This layer consists of 8-10 layers of polyhedral cells that fit closely together.
5) **Stratum germinativum (germ=sprout)** – This single layer of cuboidal to columnar cells contain stem cells which are capable of continued cell division, and melanocytes. The stem cells multiply, producing keratinocytes which push up towards the more superficial layers.

Epidermis- contain 4 types of cells

1) **Keratinocytes** – About 90% of epidermal cells are keratinocytes. They produce a protein called keratin. 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.
2) **Melanocytes** – About 8% of epidermal cells are melanocytes which produce the pigment melanin.
3) **Langerhans cell** – These cells arise from bone marrow and migrate to the epidermis. They interact with white blood cells called helper T cells in immune responses and are easily damaged by UV radiation.
4) **Merkel cell** – These cells are located in the deepest layer of the epidermis. Sensory nerve ending are present in these cells in basal layer of epidermis.

Dermis

It is made up of connective tissue containing collagen and elastic fibers. The few cells in the dermis include fibroblasts, macrophages and adipocytes. The dermis has superficial and deep parts.

1) **Papillary layer (region)** – It is the superficial part and forms about one fifth of the total thickness of the dermis. It consists of areolar connective tissue containing fine elastic fibers.
2) **Reticular layer (region)** – It is the deeper part of the dermis. It consist of dense, irregular connective tissue containing interlacing bundles of collagen and some coarse elastic fibers.

Glands of the skin

Several kinds of glands are associated with the skin: sebaceous glands, sweat glands, ceruminous glands and mammary glands. The mammary gland are the modified sweat gland.

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.

Function of skin-

1) **Protection** – against UV rays, mechanical blow, bacteria and toxic substances.
2) **Sensation** – Touch, pain, pressure and temperature.
3) **Storage** – Fat, water, chloride, sugar blood by cutaneous vasodilation.
4) **Synthesis of vitamin D**.
5) **Regulation of body temperature** – Heat loss by blood by cutaneous vasodilation, lipid content of sebum prevents loss of heats.
6) **Water and electrolyte balance** – by excreting water and salt through sweat.
7) **Excretion** – excretes small amount of urea, salts and fatty substance.
8) **Absorption** – absorbs fat soluble substances and some ointments.
9) **Secretion** – sweat regulates body temperature and water balance. Sebum keeps skin smooth and moist.[12]

MATERIAL / METHOD

Textual references from *Charak samhita*, *Sushruta samhita*, *Astanghriday*, and Modern text book were used for this study and these references are analyzed and Interpreted logically.

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

Twacha (Skin) is one of the important presentable organ of the body. It has a definite role in one's personality. Skin not only protects internal organs of body from external stimuli but it's also responsible for color, complexes and pigmentation of body. 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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