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CRITICAL ANALYSIS OF CONCEPT OF TWAK (SKIN) IN AYURVEDA

DR PIYUSH KUMAR TRIPATHI*

Declaration

The Declaration of the author for publication of Research Paper in The Indian Journal of Research Anvikshiki ISSN 0973-9777 Bi-monthly International Journal of all Research: I, *Piyush Kumar Tripathi* the author of the research paper entitled CRITICAL ANALYSIS OF CONCEPT OF TWAK (SKIN) IN AYURVEDA declare that , I take the responsibility of the content and material of my paper as I myself have written it and also have read the manuscript of my paper carefully. Also, I hereby give my consent to publish my paper in Anvikshiki journal , This Research paper is my original work and no part of it or it's similar version is Published or has been sent for Publication anywhere else. I authorise the Editorial Board of the Journal to modify and edit the manuscript. I also give my consent to the Editor of Anvikshiki Journal to own the copyright of my Research Paper.

Abstract

Twak(skin) is external outermost protecting cover which envelops the whole surface of the body. This is the seat of 'sparsana Gyanendriya' (tactile sensation) and extensive amongst all five gyanendriyas. Functions of all three dosha are well elaborated in the twak. Vata is responsible for carrying sensory input from twak to murdha by vyaan vayu, Piita in form of bhrajak pitta controls all the types of metabolic activities, and Kapaha regulates functions of sweat gland and sebaceous glands and maintains moisture. Being largest organ in the body it is also site of mana and rasa dhatu. Rasa dhatu kshaya is firstly and well elaborated in twak. Aging is the process that is well depicted in twak. Ayurveda advocates preventive and curative measure to control aging of twak.

Key Words : Twak, Twacha, Skin

Introduction

Twak (skin) is one of the most vital and largest organs of the body. This is the site of 'sparsana Gyanendriya' (Tactile sensation) and is extensive amongst all five gyanendriyas i.e. twak being a unique sense organ provides information regarding pain, pressure, touch, cold, heat and trauma etc and acts as a protective boundary between the organism and the environment. Position of twak is very crucial as it is the site of Vyaan Vata, Bhrajak Pitta and Mana also. It functions as bridge between body and mind. It should not be considered merely a covering of the body. It is in fact the mirror of the body which reflect the healthy or diseased state.

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Origin and Layers of Twak

If we consider embryonic development of fetus during intrauterine life, different body parts of the fetus are derived from shadabhavas. Twak is derived from matrija (maternal) bhava^{1,2}. Twak is considered as an updhatu of mamsa dhatu along with vasa that are again produced by matrija bhava itself. It is described in sushruta samhita that when we boil the milk for longer duration different layers of cream are formed over it, similarly twak is formed from heat generated in the process of union of shukra and shonita³.

If we consider physiological anatomy according to Acharya Sushruta and Charak there are seven and six layers of twak respectively.

Layers of Skin according to Sushruta Samhita

1. *Avabhasini*; The first and outermost layer that gives Varna(which reflects complexion and shines the colour) through bhrajak pitta; also provides five types of Chhaya(luster) according to panchamahabhuta.
2. *Lohita*; It is the seat of Tilakalak, Nyachha, Vyanga.
3. *Shweta*; It is the seat of Ajagallika, Charmadala and Masaka .
4. *Tamra*; It is the seat of various kinds of Kilash and Kushtha.
5. *Vedini*; Responsible for vedana gyana It is the seat of diseases like Kustha and Visarpa.
6. *Rohini*; From where the roma kupa takes origin. It is the seat of Granthi, Apachi, Arbuda, Sleepada and Galaganda.
7. *Mamsadhara*; Name is given due to close contact with mamsa. It is the seat of Bhagandara, Vidradhi and Arsha etc³.

Acharya Sushruta has clearly mentioned the thickness of each layer of twak but we are not able to find it applicable all over body uniformly. Twak width is having great anatomical variations i.e. different at different places e.g. it is quiet thick over chest, abdomen and thin over forehead and fingers. We should consider the twak width of abdomen as reference as Sushruta has mentioned that during surgery thickness of incision in abdomen should be of thumb width⁴.

According to Charak, twak is having six layers namely Udakadhara, Asrikdhara, Sidmakilasa adhisthana, dadrukushta adhisthana, Alajvidradhi adhisthana and sixth layer that is the site of abscesses that are very hard to treat. A feeling of entry into dark is there when this sixth layer is cut down⁵.

If we consider modern functional anatomy of twak (skin) it consists of two layers, the superficial layer called the epidermis (consisting of stratum corneum epidermis, stratum lucidum epidermis and stratum granulosum epidermis). It is made up of superficial cornified zone and deep germinative zone. In deep zone there are melanocytes. The second layer is (consisting of stratum malphighii dermis, papillary layer dermis & reticular layer dermis) which consists of superficial papillary layer and deep reticular layer⁶.

Panchabhautik Composition of Twak

Romakupa and space between different layers are specially due to Akash mahabhoota and different type of sensations carried by skin are special feature of Vaayu mahabhoota. Varna (colour complexion) and Chhaya (lusture) is special feature imposed by the Agni in Twak. Sweda and shape of twak are unique properties that are characters held responsible by Jala and Prithvi respectively.

Physiological Aspect of Vata (Vyaan & Praan) in Twak

When we consider the panchgyanendriya, sparshgyanendriya dwells the twak. It is vata that is key factor in any type of sparsh gyan(sensory knowledge). It is vyaan vata that is specially located in the twak and is responsible for carrying information from twak to mana and same is carried to soul by prana vata. If we consider things in terms of contemporary medicine, we find that a variety of sensory receptors are found in skin e.g. free nerve endings for pain, ruffini end organ and krause end bulb for warmth and cold respectively, meissner corpuscle and merkel disc for touch and pacinian corpuscle for pressure sensation. Basically all these receptors act like transducers that convert various form of energy (stimuli) into action potentials in nerve fibers. Different level of neurons carry these sensory information form sensory receptor to spinal cord, spinal cord to thalamus and finally from thalamus to cerebral cortex⁷.

Physiological Aspect of Pitta (Bhrajak) in Twak

Twak is considered as seat of pitta dosha also⁸ specially Bhrajak pitta. Bhrajak pitta is responsible for digestion and absorption of substances used in the form of abhyanga(oleation therapy), parisheka(bathing), avagaha(washing), lepana(poulticing) etc. It is responsible for glow of one's natural complexion⁹.

In Charak Samhita it has been stated that production of normal and abnormal temperature of the body as well as normal and abnormal color of the skin is due to Pitta¹⁰. Chakrapanidutt, in his commentary on this has stated that regulation of the heat and variations in the color of the body are function of bhrajak pitta. As per modern physiology pigment melanin, melanoid, carotene etc. are responsible for colour of skin. Melanocytes present in the germinal layer of epidermis are the cells which synthesize melanin by enzyme tyrosinase, which is located in avabhasini layer of skin. It is the amount of melanin in skin that causes the skin's colour to vary from pale yellow to black. The number of melanocytes is almost same in all people, difference in skin colour is mainly due to the amount of pigment produced by melanocytes .All these phenomenon are attributed to function of Bhrajaka pitta but same can not be only limited to this. Mode of function of absorption of medicaments applied on twak is one of the important task to be understood. Prabha or chhaya is correlated to circulatory events that takes place in the Asrigdhara layer of the skin which corresponds to the vascular bed of the skin. The hue and intensity of the skin depends upon the rate of flow of rakta. Again Udakadhara layer which is first layer of twak as per Charak , is layer that regulates water homeostasis in the body.

Physiological Aspect of Kapha in Twak

A prominent layer of fatty tissue is found below twak(skin). This adipose tissue is nothing else but meda dhatu only. Meda dhatu is considered as one of sites where kapha resides. Twak itself is updhatu of vasa or fatty element. Ultimately we can interpret that kapha and meda(adipose) are found below twak. Sweda(sweat) is considered as mala of meda that is excreted or expelled from body with help of Roma Koopa(sweat gland). Sweat by evaporation not only removes excessive amount of salt from body but other harmful chemicals also. It also regulates body temperature e.g. after exercise or in fever it decreases temperature¹¹. In condition of kapha kshaya there is dryness in the skin¹². This raukshtva is nothing but decrease/absence of jala mahabhoota. Secretions by sebaceous glands may be attributed to meda(adipose tissue) dhatu underlying twak.

Twak according to different Prakriti

According to Physiological point of view skin is reflection of healthy state, as each constitutional type has its own skin colour like Vata prakriti people has krishna and aruna complexion, Pitta prakriti individuals have kapil complexion and Kapha prakriti individuals has shweta complexion¹³. Healthy twak also reflects a good status of Ojas as varna bheda is one of the important feature of Ojas vyapad¹⁴.

Twak aging yogic exercises and meditation

A complex phenomenon and sum total of irreversible changes that occur in a living organism with the passage of time ultimately leading to decreased ability to survive against stress, increasing functional impairment leading towards death is known as aging commonly seen in skin also as wrinkles. It can be attributed to genetic defects, environmental effect, disease and an apoptosis¹⁵.

According to concept of ayurveda aging is known as jara means becoming old. Charak and Sushruta considers that jara starts when an individual attains the age of 60 and 70 respectively and exhibits progressively the traits of maturity i.e. where in after 60–70 years, the body elements, sense organs, strength, and so forth begin to decay^{16,17}. According to Ayurveda, a number of factors determine skin health and youthfulness, and these include proper moisture balance (kapha in balance), effective metabolic activities to maintain bhrajak pitta (pitta in balance), and efficient circulation of blood and nutrients to the different layers of the skin (vata in balance) as well as rasa, rakta and mamsa has to provide support to all of these area. Urjaskara (promotive) and vyadhihara (curative) modalities, rasayan therapy, practice of yoga which is a disciplined science of life, are some of very natural measures to control the aging of skin¹⁸.

Conclusion

Dosha, dhatu, mala together form the basis of the body. All the three dosha are present in the skin and perform the various physiological functions i.e. sensory, metabolic transformations and sweat secretion etc. Different prakriti types also are having different features of skin. Aging of skin is one of most early signs of oldness. Ayurveda, the great Indian tradition also offers conceptual framework on various theories and concepts of aging process and offers time tested therapies for healthy aging.

REFERENCES

- ¹*Charak Samhita, with Vidyotini Hindi commentary*, by Dr Ganga Sahay Pandey and Dr Gorakh Nath Chaturvedi, Shaareer Sthana Chapter 3/6, Chaukhamba Bharati Academy; 2001. page. 855
- ²*Sushruta Samhita Dalhana commentary vol- 2 edited and translated by P V Sharma* Shaareer Sthan 3/33 Chaukhamba Vishwa Bharati; 2010. p. 148
- ³*Sushruta Samhita* edited by Kaviraj Ambikadutta Shastri, Shaareer Sthan, Chapter 4/4. Chaukhamba Sanskrit Sansthan, Varanasi; 2003. page 29.
- ⁴*Susrutha Samhita with Nibandhasangraha commentary of Dalhana*, edited by Acharya JT, Reprint ed. Shareerasthana chapter 4/4 Chaukambha Orientalia, Varanasi 2010 page. 355.
- ⁵*Charaka Samhita with Ayurveda Dipika commentary of Chakrapani Datta*, edited by Acharya JT, Reprint ed. Shareerasthana; 7/4 Chaukambha Prakashan, Varanasi 2007; page 337.
- ⁶*Handbook of General Anatomy Chaurasia B D. 4th edition*, CBS Publishers and Distributors Pvt Ltd; New Delhi: 2011, page. 173

⁷*Essentials of Medical Physiology* by K Sembulingam & Prema sembulingam, Jaypee Brothers Medical Publishers New Delhi. 16th Edition 2013. page 776.

⁸*Sushruta Samhita* edited by Kaviraj Ambikadutta Shastri, Shaareer Sthan, Chapter 4/67-68. Chaukhamba Sanskrit Sansthan, Varanasi; 2003. page 38.

⁹*Sushruta Samhita* edited by Kaviraj Ambikadutta Shastri, Sutra Sthan, Chapter 21/10. Chaukhamba Sanskrit Sansthan, Varanasi; 2003. Page 89.

¹⁰*Charak Samhita, with Vidyotini Hindi commentary*, by Dr Ganga Sahay Pandey and Dr Gorakh Nath Chaturvedi, Sutra Sthana Chapter 12/11, Chaukhamba Bharati Academy ; 2001. page. 251

¹¹*Ashtanga Hrudaya with Sarvangasundara commentary of Arunadatta and Ayurvedarasayana commentary of Hemadri* edited by H S S Paradakara, , Sootrasthana 11/5. 9th edition Chaukhamba Orientalia; Varanasi 2005. Page 183

¹²*Sushruta Samhita* edited by Kaviraj Ambikadutta Shastri, Sutra Sthan, Chapter 15/11. Chaukhamba Sanskrit Sansthan, Varanasi; 2003. page 58.

¹³*Charak Samhita, with Vidyotini Hindi commentary*, by Dr Ganga Sahay Pandey and Dr Gorakh Nath Chaturvedi, Vimaan Sthana Chapter 8/96-98, Chaukhamba Bharati Academy ; 2001. page. 772-775

¹⁴*Sushruta Samhita* edited by Kaviraj Ambikadutta Shastri, Sutra Sthana, chapter 15/29. Chaukhamba Sanskrit Sansthan, Varanasi; 2007. page 61.

¹⁵D. HARMAN, "Aging: overview," Annals of the New York Academy of Sciences, 2001 vol. 928, page. 1–21,.

¹⁶A. B. VAIDYA & R. A. VAIDYA, "Ancient insights and modern discoveries in the process of aging—an overview," Indian journal of medical sciences, 1997 vol. 51, no. 10, page.349–363,.

¹⁷R. D. LELE, "Rejuvenation of the elderly," in Ayurveda and Modern Medicine, , Bhartiya Vidya Bhavan, Bombay, India, 1986 page. 405–415

¹⁸K. YANG, "A review of yoga programs for four leading risk factors of chronic diseases," Evidence-Based Complementary and Alternative Medicine, 2007. vol. 4, no. 4, page 487–491.

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