

REVIEW ARTICLE ON SKIN: KRIYA SHARIR AND CHIKITSA POINT OF VIEW

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ABSTRACT

Skin is called "Twak," which covers the entire body. Joseph Listre said "skin is the best dressing," so a detailed study of Twak is important as it is the seat for all Twacha Rogas. The conceptual aspect of skin needs to be understood as skin disorder is the outer display of some sort of internal pathology. Skin, the human body's largest organ, plays an important role in maintaining normal physiological condition in humans. Ayurveda ancient science has noted its characteristics ages back. This article highlights the known and lesser known skin functions, their correlation with the anatomical and physiological aspect of Ayurvedic science w.r.t. The thermoregulatory skin modality is analyzed in depth. A list of different clinically proven Ayurveda indigenous drugs is also briefly discussed. Skin's significance as a tool for assessing the patient's health status is a boon of Ayurvedic diagnostic methodology, which is described in detail in this article. This article is the simple and sincere attempt by Kriya Sharir and Chikitsa to explain the skin.

KEYWORDS: *Twacha, Sharir Kriya, Ayurvedic Chikitsa.*

INTRODUCTION

Structure of Skin

Skin is our body's outermost coverage that protects our body from outer surroundings and plays an important role in the body's sensory and thermoregulatory function. In fact, skin is considered the human body's largest organ. It is *Mamsadhatu's Updhatu* (i.e. muscle) according to Ayurveda. Skin is thought to be formed by *Rakta dhatu* (i.e. blood) metabolism; a phenomenon similar to cream formation over milk after cooling it after heating.

The synonyms of skin are *Twak, Chavi, Chadani, Asrugdhara* the *Vyutpatti* of *Twak* dictates on the terms *Chaadhana* which means to cover.

Twacha i.e., according to *Charak Samhita*, the skin has six layers as well as *Kashyapa Samhita* and *Ashtang Sangraha*. The skin of seven layers was believed by *Acharya Sushrut* and *Sharangdhara*. They include *Sthula / Mamsadhara* that can be compared to hypodermis (layer under the skin). Skin has six layers according to Ayurveda. The skin is divided into two parts anatomically.

1) Epidermis (Outer Skin)

- Avabhasini (Stratum corneum)*
- Lohita (Stratum lucidum)*
- Shweta (Stratum granulosum)*

d. *Tamra (Stratum malphigi)*

2) Dermis (Inner Skin)

- Vedini (papillary layer)*
- Rohini (reticular layer)*
- Mamsadhara (hypodermis)*

Colour of Skin

Because of the presence of pigmentation and the blood flow at the capillary level, the skin gets colour. In sub-papillary venous plexus, pink, blue and pale are associated skin colours w.r.t blood flow. The following factors have a profound impact on skin colour.

- Melanin:** a pigment that is secreted by melanosomes in the basal epidermis layer. Melanin provides the skin with its black, white, yellow colour and protects against harmful UV radiation
- Melanoid:** a bio-transformative melanin derivative responsible for light absorption.
- Carotene:** colored yellow pigment found in our body's fat storage found more in females than in males. It is a vitamin A precursor.
- Oxyhaemoglobin:** gives the skin a warm reddish appearance.
- Reduced haemoglobin:** it gives cold and clammy skin a bluish appearance.

On the skin, ageing is most noticeable. Skin loses its elasticity with age, resulting in wrinkles. Hypodermic depletion of fat depots also contributes to wrinkles.

Skin luster: Ayurveda gives primary importance to the skin lustre if the diagnosis and prognosis of any disorder are to be decided. *Chaaya* is found to be assimilated into the skin's *Varna* (colour) and *Prabha*. *Sansthana* and *Akruti* (which are also *Lakshana* synonyms or signs of disease) are synonyms of *Chaaya*. *Chaaya* is thought to be the skin's reflection. The same is known as *Pratichaaya* when reflected by mirror or light.

Pancha Mahabhautika description of Chaaya

- 1) Lightly colored *Nabhiya Mahabhuta*-Blue and *Sneha + Prabha*.
- 2) Color mixed *Vayu*-Black / *Aruna*, dry, destroyed.
- 3) Pure and presentable *Prabha*, *Agneya*-Red and *Shuddha*.
- 4) *Jaliya-Shuddha* as a gemstone of the cat eye, *Snigdha* etc.
- 5) *Parthiva-Shira*, *Snigdha*, *Ghana*, *Shlakshana*, *Krushna* / *Svetavarna*.

The *Vayaviya Chaaya* is the worst out of the above compared to other good *Chaaya*. *Prabha* is the one that exemplifies *Varna* in *Twacha*. *Prabha* is *Tejas* and is classified into seven types: *Harita* (green), *Peeta* (yellow), *Shveta* (white), *Krushna* (black), *Pandura* (white) and *Shyaava* (grayish black).

The *Prabha* that spreads all over is *Snigdha* and *Vishaala* (huge) is opposite to *Shubha*; of which is *Ashubha*.

Bhrajaka Pitta: The *Pitta* in *Twacha* is known as *Bhrajaka Pitta* and its function is as follows.

- The medicine applied to the skin, i.e. *Abhyanga*, *Parisheka*, *Avgahana* and *Lepana*, is digested.
- The *Chaaya* is an example.
- It gives the skin a natural color.
- Provides the skin with luster.
- Gives the body adequate amount of heat.

Functions of the Skin

- 1) Protects against harsh external surroundings. Provides a barrier to germs of dust and other pathogens.
- 2) Temperature control-Skin was actively involved in thermoregulation through the following modes.
 - Conduction, convection and radiation are the three exchange modes in which the body evaporates 300 to 400 ml of water in warm surroundings.
 - Skin acts as an insulator that causes heat dissipation stability.
 - Skin has heat-sensory receptors that cause blood capillaries to dilate through the vasomotor mechanism, causing excessive sweat production through the sweat pores. The opposite is true in the case of cold weather.

- The hair on the skin also provides an additive advantage for heat preservation in the cold environment.

- 3) General sensation-skin is a major organ with multiple endings of nerves per square inch. These nerve endings give our brain a tactile sensory response and convey the message. Heat / cold (caloric sensory response) and pain are also transmitted to the higher brain centres.
- 4) Absorption-Many topical drugs such as steroids, NSAIDs and so on are absorbed from our skin. Skin is water-resistant, although continuous water exposure causes hypodermal layers to swell due to osmosis.
- 5) Excretion-Skin excretes in the form of sweat excess electrolytes and water. Some medicines and toxic metabolites are also excreted in small amounts.
- 6) Synthesization-Ergosterol in the skin is transformed into *Vita. D* precursor under the influence of sunlight by its hydroxylation.
- 7) Secretion-skin is responsible for the secretion of sebaceous mucinous material that keeps the skin moist and elastic.
- 8) Water balance-Evaporation of water through the skin is controlled by the skin based on the body's water concentration.
- 9) Acid base equilibrium-If acidosis occurs, the body tends to secrete excess H^+ ions through sweat out of the body, thus maintaining the pH of the blood.
- 10) Storage- The sub-papillary plexus stores approximately 1000 ml of blood in an emergency. It is also the responsibility of subcutaneous fat to store essential fat soluble vitamins (A, D, E, K) etc.
- 11) Gaseous exchange- CO_2 is excreted from the skin by sweat in very small quantities.
- 12) The seat of *Bhrajak Pitta* absorbs medicine from *Lepa* etc.
- 13) The skin has 5 types of *Chaaya*, 7 types of *Prabha* and the quality of *Varna Prakashaka*.

Body temperature

According to body Temperature, the animal kingdom is divided into two types viz,

1. Warm animals with blood or homeothermic organisms. These types of animals maintain constant body temperature regardless of weather or climate. eg- man changes etc.
2. Cold blooded or poikilothermic- These animal types are unable to keep their body temperature constant and hence their body temperature fluctuates with the w.r.t climate, i.e. the body becomes hot during hot weather and vice versa. E.g.-Lizards and so on.

Average Body temperature of Body.

The average body temperature is $98.4^\circ F$ ($97-99^\circ F$), that is to say $36.89^\circ C$ ($36.11-37.2^\circ C$). This is the temperature of the mouth. In the temperature recorded elsewhere in the body, not much difference is noted. The axillary temperature is $1^\circ F$ to $0.55^\circ F$ lower than the

oral temperature, while the rectal temperature is 0.55 to 1 ° F lower than the oral temperature. The following classification can be made based on the site of recording the temperature:

1. Core temperature where we obtain a rough estimation of the food temperature through oral / rectal recording of temperature.
2. Peripheral Temperature-to record the temperature of the anatomical peripheral structures noted through recording of axillary temperature.

Variation in Temperature

1. Diurnal variation-Temperature in the early morning around 5 am is the least variation whereas temperature in the evening around 5-7 pm is the maximum variation in temperature. The difference is about 1-1.5 ° F between the two temperatures.
2. Age-Children (especially neonates) have developed a mechanism for heat regulation that causes changes in the temperature of the body with respect to the environment. Old age, on the other hand, due to sluggish metabolism, causes reduced body temperature.
3. Built-heat convection is directly proportional to the surface area thus increasing the size of the body; the tendency to lose heat is faster and vice versa.
4. Diet-specific dynamic action (SDA) causes increased body temperature following food consumption (especially food rich in protein). *Pachaka Pitta's* action during *Amla Avasthapaka* causes a rise in *Ushma* (one of Pitta's Karma), according to Ayurveda.
5. Sex-Normally, females have lower body temperature due to the presence of more fat in the female and less surface area compared to males. Due to the calorific action of corpus luteum (by releasing progesterone), their body temperature reaches a maximum of 24 to 48 hours after ovulation.
6. Exercise-it raises the temperature of the body.
7. Atmosphere-Extreme temperature interferes with the thermoregulatory homeostasis making the body cool or heat quickly.
8. Sleep-Due to reduced temperature decrease in muscle action.
9. Mental agitation-This can give a temperature rise of even 2 ° C.
10. Interaction with drugs— certain drugs such as morphine, chlorpromazine, etc. Act on CNS and lower the temperature of the body. Curare is a drug that causes temperature reduction in peripheral muscle palsy. On the other hand, strychnine increases the body's core temperature. Antipyretic medicine reduces the synthesis of PGE2 and therefore reduces the threshold of prostaglandin in hypothalamus.

Regulation Of body Temperature

Although the human body is subjected to extreme temperatures, due to a complex mechanism of heat regulation, it maintains its core body temperature. We

must first understand thermogenesis, thermolysis and its balance in detail in order to better understand this mechanism.

1) Thermogenesis

During the digestion process of complex food materials such as proteins, fats and carbohydrates, chemical interactions release heat energy due to certain exothermic reactions. Majority of heat production occurs due to skeletal activity. The primary mode of heat production is through friction. This is the principle behind shivering when subjected to cold environment. Majority of the heat in our body is produced in liver followed by heart, glandular secretions like insulin, thyroxin and epinephrine have important role in heat regulation. Different digestive enzymes as well as gut mobility yield carbohydrate heat. 1 g and protein on breakdown yield 4kcal energy, while fats yield 9kcal energy.

2) Thermolysis: Our body's heat loss occurs through 3 routes, i.e. skin, lungs, waste products. Skin wards off heat through conduction, convection and radiation. According to the thermodynamics law, heat loss is directly proportional to the body's surface area and also the difference between our body's temperature and the cooler environment. Clothing colour also makes heat absorption easier. For example, white reflects radiation while black absorbs maximum heat radiation. Through the skin medium, 55% of heat loss occurs.

Production of heat and loss of heat: 25% of body heat is lost through sweat. Body fluid evaporation occurs from the skin and lungs. Under the skin there is a large capillary network that continually supplies blood-shaped fluid. To control the temperature of the body, this fluid is evaporated. 2% the body's total body heat loss is caused by lungs. Similarly, the excretion of macro waste products (stool and urine) causes another 2 percent of total body heat loss.

Regulation of thermo taxis

1) Hypothalamus

The thermoregulatory centre is located in the hypothalamus anterior part. When the nerve ending in the skin is stimulated by heat and cold sensory response and the signal is transmitted to the hypothalamus that releases it to the subcutaneous papillary plexus, in response to which they dilate the blood flow and result in increased sweat formation causing heat loss. The back part of the hypothalamus is responsible for increasing the temperature of the body when the body loses heat. By inducing the act of shivering and increasing hormone secretion such as thyroxin and epinephrine, it achieves this phenomenon.

2) Spinal cord: spinal cord involvement is similar to that of the bridge that transmits the signal between the skin thermo receptor, the skeletal muscle, certain gland-producing hormones and the higher brain centre (hypothalamus).

3) Effects of the endocrine glands: the anterior pituitary gland releases excess TSH when the human body is exposed to cold, which in turn stimulates the thyroid gland to produce additional thyroxin. Thyroxin increases the heat-generating BMR result. Adrenal gland releases adrenaline, which also increases metabolism and produces heat. The process that takes place in the liver to convert glycogen to glucose causes heat production. The heat is also increased by peripheral vasoconstriction and the release of corticosteroids from the adrenal gland. Neonates' heat regulatory center is underdeveloped.

Herbal drugs useful in skin diseases

1) *Anjeer* (*Ficus carica*)

The *Anjeer* leaf juice is used for external application during the initial stage of *Shvetakustha*.

2) *Atibala* (*Abutilon indicum*).

Sunburn is washed with a decoction consisting of bark and old leaves.

3) *Amaltas* (*Cassia fistula*)

The leaf paste is used for local leprosy and ringworm applications.

4) *Erandakarkati* (*Carica papaya*)

The plant's latex is useful in treating gonorrhoea skin changes.

5) *Eranda* (*Ricinus communis*)

The roots of Decoction are used to wash certain wounds or boils.

6) *Atasi* (*Linum usitatissimum*)

16 parts mixed with 1 part of mustard seeds is poult-shaped and applied over boiling.

7) *Hydnocarpushitiana* (*Tuvaraka*)

Seed oil is used for external use.

8) *Khadir* (*Acacia catechu*)

Used by mixing it with beeswax for boils and pustules. Bath is useful in leprosy with its decoction.

9) *Kaner* (*indicum Nerium*)

Oil produced using *Kaner* decoction is used in all types of itching, as well as other skin conditions.

10) *Kampilak* (*Mallotus Philippinensis*)

Excellent vermifugal medication used to treat ringworm and infectious skin diseases.

11) *Kapoor* (*Cinnamomum camphora*)

12 gm *kapoor*, 12 gm catech and half gm *Sindoor* are mixed in a vessel with 120 gm ghee. This mixture is washed 121 times with water and applied to itching skin and gangrene skin wound as a balm.

12) *Kalonji* (*Nigella sativa*)

5 tola *Kalonji*, 5 tola *Bakuchi seeds*, 5 tola *Guggulu*, 5 tola *Daruharidra* roots, 2 1/2 tola sulfur and coconut oil are mixed together and kept seven days in the sun. For local application, this mixture is used.

13) *Gunja* (*Abrus precatorius*)

Used with mercury, sulphur, neem and cannabis leaves *Sativa* for boils and pustules.

14) *Chitrak* (*Plumbago zeylanica*)

The roots are mixed with milk or water and used over patches of vitiligo.

15) *Palasha* (*Butea monosperma*)

A very good anti-helminthic and vermifugal agent. It is used in all types of skin infection.

16) *Tulsi* (*Ocimum sanctum*)

The paste made of *Tulsi*'s leaves is applied to the face to enhance its luster.

17) *Nagkesar* (*Mesua ferrea*)

Gangrene and foul smelling wound exuding pus is treated well with *Nagkesar* oil. It enhances the complexion.

18) *Neem* (*Azadirachta indica*)

Used for anthelmintic purposes as well as for *kushta* and other skin disorders.

19) *Bael* (*Aegle marmelos*)

The leaves are made of small cakes (without water) and are instantly relieved on pustules.

CONCLUSION

- 1) The whole article concludes that skin not only protects the body's internal structure, but its complex structure and function creates a unique environment that protects the body's internal functioning and provides an amazing interface to interact with the outside world.
- 2) Skin also acts as a medium for the absorption of various medicinal products in the form of *Abhyanga*, *Parisheka*, etc.
- 3) The other and most important function of the skin is the thermoregulatory.

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