

RELATION OF *TWAK* TO *DHATUSAARATHA*

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Abstract

The skin which forms the largest organ in the body is involved in many homeostatic functions like temperature regulation, Vitamin D synthesis and forms a mechanical barrier against pathogens. It is a site of expression of various normal and abnormal processes in the body. The role of vata, pitta and kapha dosha are important in determining the nature of skin. The excellence of the dhatu is also expressed as healthy skin or *dhatusaaratha*. *Rasasaaratha* is equivalent to *twaksaaratha*. The equivalence of *rasa* to *twak* is an important factor in deciding the route of medicine as internal or external in skin disorders.

Keywords: *Twak, dhatusaaratha, rasa*

Introduction

The skin which is the outer covering of the body covers the inner tissues and acts as a partition between the external environment and internal compartments of the body. It functions as the first barrier against pathogens, chemicals, mechanical injury and ultraviolet radiations. It is involved in temperature regulation as well as excretion of water and electrolytes. The skin which covers the entire external surface of the body is part of the four levels of organisation of human body from cellular to systemic. It is made up of millions of cells which are arranged into the four kinds of tissues making it the largest organ in the body. It is considered as an organ as it is made up of the four kinds of basic tissues – epithelial, connective, muscle and nervous. The outer layer of the skin, the epidermis is made up of stratified squamous epithelium which contains four – five layers of keratinocytes arranged from living to dead from deep to superficial. The dermis which lies deeper to the epidermis is made up of fibrous and elastic connective tissue. The subcutaneous layer or the hypodermis is made up of adipose tissue. The dermis and hypodermis have a rich network of blood vessels which constitutes the cutaneous circulation. The arrector pili is a smooth muscle that is linked to the hair follicles. The tactile receptors with the afferent neurons are scattered in different areas of the skin and are responsible for the perception of touch, pressure, pain, temperature and sensations of position and movement¹. One inch of skin is made up of millions of epithelial cells, hairs, network of blood vessels, sensory nerve fibres, smooth muscle fibres and fat cells and hence the skin becomes the largest organ in the body. Along with the appendages formed by hair and nails and the secretory sweat and sebaceous glands, the skin forms the integumentary system.

The functions of skin which comprise protection, immunity, temperature regulation, excretion, Vitamin D synthesis and its role as a blood reservoir highlight its importance in maintaining general health and wellbeing. *Twak* forms a part of the *bahya roga marga*, but it is related to all the components of the body - *dosha, dhatu* and *mala* through its varied functions. Embryologically, the epidermis of the skin is derived from ectoderm while the connective tissue components of the dermis and hypodermis are derived from mesoderm². Thus, it can be seen that the skin is not completely external in relation to its structure and function. The understanding of the relation of skin to all components that make up the body – *dosha, dhatu, mala* - is essential to understand the role of skin in the body completely. This review article intends to explore the functional relationship between *twak* and all components of the body.

Twak in relation to dosha

Twak, according to *Sabdakalpadruma* is formed from the root word *Twach* which means that which covers *medas* [fat] and *sonitha* [blood]. The word is also used in the meaning of one that spreads indicating its extent throughout the body³. *Twak* is a part of the *bahya rogamarga*⁴. Structurally since the skin is the outer covering of the body, it should be considered in this *rogamarga*. The structure and functions of all components of the body can be related to the triad of *dosha*, *dhatu*, *mala*. The *dosha* related to *Twak* are *vata* and *pitta*⁵. *Twak* is the seat of touch which is the sensation related to *vata*. So, the seat of perception is related to *vata*. Skin is also considered as the seat of *pitta*, especially of *bhrajaka pitta* which is responsible for the skin lustre and the action of topical applications on the skin including *abhyanga* and *lepa*. It is observed that topical applications like oil produce changes in the colour and nature of skin and this is possible only by the action of *pitta* in that location⁶. The abnormality of *pitta* produces various colours on the skin which has got a diagnostic importance. Yellowish discolouration of skin is an important sign of aggravated *pitta* while all colours except white and black are also produced by abnormal *pitta*⁷. Therefore, normal lustre [*Prabha*] and abnormal pigmentation of skin is the action of *pitta*. *Kapha* is the dosha that bestows firmness and stability to the body⁸. The mechanical barrier presented by an intact epidermis with its cornified keratinised layer represents the role of *kapha* in the skin. The alignment of collagen fibres and the presence of elastic fibres in the dermal layer makes the skin stretched. The loss of alignment of collagen fibres and reduced number of elastic fibres is responsible for the aging changes in skin. These changes happen after 50 years⁹ which is the age specified in *Astangasangraha* when the skin starts deteriorating¹⁰. The dosha state that constitutes the *prakruti* of an individual also is responsible for characters of the skin and its appendages.

Twak is an important site in the examination of a patient because normal or abnormal body functions are expressed in the skin. The nature of skin, pigmentations, the presence of growths, moles are important in the assessment of *dosha prakruti* and *dosha vridhi kshaya*. For eg; The colour of *vata prakruti* is *dhoosara* (greyish) while in *pitta prakruti* it is coppery in colour.¹¹

Twak in relation to sweda

The nature of skin is also a pointer to the state of *sweda* in the body. The water component of the body collectively called as *Udakam* is an important constituent of the skin and it forms the outermost layer called the *udakadhara* layer, the fluid part which comes out through the hair follicles is *Sweda* and that which is in between skin and *mamsa* is *lasika*¹². The formation of *sweda* is related to *medo dhatu* as it is considered as a byproduct [*upadhatu/dhatumala*] formed during the metabolism of *medo dhatu*. So *medo dhatu* is considered as the *moolasthan* of *swedavahasrotas*. The hair follicles which constitute the route of excretion of *sweda* is also included in the *moolasthan*¹³. The functions of *sweda* are maintaining moisture and oiliness in the skin along with contributing to hair growth and maintenance¹⁴. Water is an important component of the skin and is important to maintain its barrier function¹⁵. Since *sweda* is part of the water component in the body, its normal production and excretion is a factor in determining the whole moisture content of the body including skin. Hydration of the skin is an important factor in maintaining integrity and TEWL loss due to various reasons can cause wrinkling and loss of skin health¹⁶. It is commonly observed that loss of water in conditions like diarrhoea affects the elasticity of the skin. The dryness of skin is, therefore, a feature of *sweda kshaya*. The secretions of the sebaceous glands coats the hair surface and prevents it from being brittle and dry. It also prevents excess evaporation of water from the skin surface and keeps the skin soft and pliable. Since sebum is an oily secretion made up of triglycerides, oils and waxes, the role of *medo dhatu* in its formation can be inferred. The functions of *sweda* are a combination of sweat and sebum.

Twak in relation to dhatu

The formation of *twak* is from the *raktha dhatu*¹⁷ and so the disorders of *raktha dhatu* are manifested in the skin. *Raktamoksha* is an important therapeutic procedure in pigmentation or eruptive disorders which appear on

the skin. So the relation of *raktadhatu* to skin is an indirect inference from this clinical observation¹⁸. In conditions like the *uttana* stage of *vataraktha* also, the clinical features appear in the skin while in the more chronic *gambheera* stage it affects the joints¹⁹. *Twak* is considered as the *upadhatu* of *mamsa*. Functionally *twak* and *mamsa* are linked by the function of *lepana* or covering. The superficial stages of diseases like *vataraktha* are considered when the site of *sthanasamshraya* of *dosha* is *twak* and *mamsa*. Though nail, hair are considered as appendages of skin according to modern anatomy, they are considered in relation to deep *dhatu* in Ayurveda. Nails and body hair are considered as the byproducts of *asthi dhatu* while scalp hair is considered as the *upadhatu* of *majja dhatu*²⁰. Though nail and hair are appendages of skin, the brittleness and abnormal shaped nails like koilonychia indicate deeper pathologies like vitamin deficiency and cardio pulmonary conditions. Nutritional status is an important determinant of hair and nail growth and hence, hair loss and discolouration also necessitate dietary modification like inclusion of sufficient proteins²¹.

Twaksaratha in relation to rasasaratha

The excellence of *dhatu* is expressed as *dhatusaratha*. Skin is a prominent site of expression of characters of *dhatusaratha*. *Medosaratha*, *majjasaratha* and *sukrasaratha* produce *varna* in the individual. Among the eight *sara*, *twaksara* is the first one. Since *rasasaratha* is not mentioned separately, *twaksaratha* is taken to be equivalent to *rasasaratha*²². The characters of *twaksara* include features of healthy skin and body hair. The integrity of structure and functions of skin is very much related to the process of digestion and metabolism. Skin is considered as a part of integumentary system. The word integument is derived from ‘In’ which means inward and ‘Tegere’ which means to cover. Even though the GIT is situated inside the body – it is open at the two ends and therefore any food and waste material which is inside the lumen of the GIT is technically considered to be outside the body²³. The GIT also acts as a partition between the external and internal environment and it also functions as a barrier to antigen. The skin and GIT represent two borders of the body with the intervening skeleton, muscles and organs. This is very clearly indicated in the treatment of *kushta* where external application for skin diseases should be done only after the internal *dosha* has been normalised.

The gut microbiome represents another area of linking between the GIT and skin. The gut skin crosslinking is also due to the presence of large number of immune cells and bacteria²⁴. Changes in the composition of the gut microbiome lead to the development of skin diseases like psoriasis, acne and atopic dermatitis²⁵. Hence this reiterates the concept of *rasasaratha* being equivalent to *twaksaratha*.

Table 1 – Relation between Twak and Dhatu

Dhatu	Role in structure and functions of skin	Relations
<i>Rasa</i>	<i>Twaksaratha</i>	Gut microbiome and skin
<i>Rakta</i>	Formation of <i>twak</i>	<i>Raktamokshana</i> in skin diseases
<i>Mamsa</i>	<i>Lepana</i> function	<i>Upadhatu</i> of <i>twak</i>
<i>Medas</i>	<i>Sweda</i> as <i>Upadhatu</i> and <i>dhatumala</i>	Role of sebum in preventing dryness of skin
<i>Asthi</i>	<i>Nakha</i> as <i>upadhatu</i>	Role of skin in Vitamin D synthesis
<i>Majja</i>	<i>Kesha</i> as <i>upadhatu</i>	Role in producing <i>varna</i>
<i>Sukra</i>	<i>Saratha</i> of <i>Sukra</i> produces <i>varna</i>	Role in producing <i>varna</i>

Relation of twak to ojas

It is clear from table 1 that the integrity of the skin can be maintained only with contributions from all *dhatu* from *rasa* to *sukra*. The contribution of all *dhatu* is necessary for the formation of *ojas*. Also, the proper formation of *dhatu* which results in proper function of *ojas* is expressed as radiance in the skin. On the contrary, the depletion of *ojas* is also expressed as loss of radiance or lustre. Hence, skin is an important tissue for the assessment of

health. It is for this reason that *twak* is called as *Pranadhara*. Thus it can be concluded that the role of skin is not just a covering for the body, but it is related to all *dhatu* and *ojas* physiologically and pathologically.

Conclusion

The skin which forms the outer covering of the body is an expression of the state of all *dosha*, *dhatu* and *mala* in the body. So the integrity of all *dhatu* is responsible for the integrity of the skin. It represents the alignment between the primary region or *koshta* and the secondary region or *sakha*. The understanding of this alignment can be made from observations based on the effect of medicines and procedures on the skin. It also has an impact on tackling skin disorders and maintaining a healthy skin.

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