

A detail review on conceptual study of *twacha* (skin) – Ayurvedic and modern view.

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ABSTRACT

Introduction

The ageless and timeless science of Ayurveda provides us with the tools to achieve and preserve our own ideal health and wellbeing. Throughout the ages, Ayurveda has been transmitted as a comprehensive medical system. Skin is the largest organ of body. With its ability to cover the whole exterior surface of the body, skin is one of the most vital body parts and sensory organs. According to *Acharya Sushruta* there are five sensory organs i.e. *Gyanendriyas*. *Sparshanendriya* is one of them whose *adhishtana* is *Twacha* (skin). As we know, skin is the largest sense organ of the body which sense touch, pain, pressure, temperature etc. It is also known as “The First Line of Defence”. Now a days skin diseases are developing rapidly and peoples are more curious for that. Healthy Skin represent and considered as beauty symbol, hence there is need to know more and detail knowledge about skin. Hence the study is done. Aim and objectives - To study concepts of *Twacha* (Skin) described in various Ayurvedic literatures.

Discussion – ayurveda not cure the symptoms but also removed disease from roots, skin diseases are cosmetically, psychologically is more important. This study helped to know about the details about *twacha* (skin).

Keywords – *twacha*, *twak*, *charma*, *twaka* *Utpatti*.

INTRODUCTION

Ayurveda is the science of life, and its goals are to treat illness and preserve health in the well-being of the individual. Cosmetic diseases are the disease which affects emotional, psychological and social wellbeing of affected person. Today whole world is familiar about most of the modern concepts about skin, but still many concepts about *Twacha* (Skin) mentioned in various Ayurvedic Text is yet to disclose. In this modern era, the physicians are confronted with many new diseases, as well as with new forms of old diseases, that make the medical practice more difficult and interesting too. But besides this, there is other category of diseases, i.e. continuing to be a challenge for medical practitioners, not by their news, but by their impact among same category of population and by their unsatisfactory solutions offered by medical practice. Out of them, group of skin diseases always remain a subject of our special interest and attention.

The skin, also known as the cutaneous membrane is the largest organ of the body, with a total area of about 20 square feet and weighs 4.5-5kg, about 7% of total body weight.

Skin is known as “The First Line of Defence” as it protects us from microbes and other invading elements. It is a part of integumentary system that contributes to homeostasis by protecting the body and helping regulate body temperature. It also allows us to sense pleasurable, painful and other stimuli in the external environment.¹

In this study an attempt is made to explore the hidden concept about *Twacha* such as *twacha niruktu*, synonyms, formation and development of skin (*Twacha Uttapati*), skin layers with associated disorder (*Twacha Sthana & Roga-adhithana*), Physiological aspect of skin (relation of *twacha* with *Dosha, Dhātu & Mala*).

Aim and objectives - To study concepts of *Twacha* (Skin) described in various Ayurvedic literatures.

Material and method – classical text book i.e. *samhitas*, published journals etc.

Study design – literature review

REVIEW OF TWACHA FROM CLASSICAL TEXT OF AYURVEDA

I) *Nirukti* :

The word “*Twak*” or skin is derived from the root *Twacha*.

त्वक्[च् / स्त्री

(त्वचति संवृणोति मेदशोणितादिकमिति । त्वच संवरणे + क्विप् ।

यद्वा तनोति विस्तारयतीति । तन + “तनोतेरनश्च वः ।” उणां । २ ।

६३ । इति चिक् अनश्च वः ।) (शब्दकल्पद्रुम) ”^{2,3,4}

त्वचति कवचेन देहं वीरः । इति दुर्गादासः ॥ ⁴

The word *twacha* is derived from “त्वक् संवरणे धातु” along with “तप् प्रत्यय” which means covering of the body.

According to *durgadas*, *twacha* means covering of the body.⁴

Twak refers to the body's covering, which includes fat, blood, muscular tissue, and other organs.^{2,3,4}

II) *Twak* Synonyms

अस्य पर्यायः । असृग्धरा २ । इत्यमरः ॥ असृग्धरा ३ । इति तट्टीका
॥ त्वचम् ४ त्वचा ५ चर्म ६ छली ७ छल्ली ८ । इति शब्दरत्नावली
॥ ³

According to *shabdaratnavali* synonyms of *twak* is *asrugdhar*, *ityamar*, *asrugwara*, *tattika*, *twacham*, *twacha*, *charma*, *chali*, *challi* etc.³

III) Historical Review of *Twak*:

Vedic reference - For the first time in Vedic literature, the word “*Twak*” is mentioned. The *Rugveda* mentioned about certain diseases manifesting on *twak* giving them the name of *Twak rogas* such as *Kushta*, *Shwitra* etc.

***Samhita kala* references** - In the third chapter of the *indriyasthana* (*parimarshaneeya indriya*), *Charaka* mentions the *arista lakshanas* (the indications and symptoms that indicate a person's death) in relation to *sparshanendriya*.⁵

In regard to *twacha*, *Sushruta* mentions *Sparshanendriya* (touch sense) and its attribute *Sparsha* (touch).⁶

According to *Vagbhata*, *Twak* is generated during the *Rakta dhatuparinama*. After the *Dhatuparinama*, when *Rakta* transforms into *Mamsadhatu*, the seven layers of *Twak* are generated.⁷

IV) *Twaka Utpatti* –

“तस्यं खल्वेवंप्रवृत्तस्य शुक्रशोणितस्याभिपच्यमानस्य क्षीरस्येव
सन्तानिकाः सप्तत्वचोभवन्ति।” (सु.शा. ४/४) ⁸

According to *Sushruta*⁸, *Twak* has developed after the fertilization of the ovum. At the time of fertilization *Shukra*, *Shonita* and Soul become united for the manifestation of *Garbha*. Its growth is rapid and nourished by *Tridosha*. Seven folds of the layers of the skin are formed and Deposited on this rapid transforming product in the same manner as the Layers of cream are formed and precipitated on the surface of the boiling milk.⁸

पच्यमानात्प्रजायते क्षीरत्सन्तानिका इव ॥" अ.ह.शा. 3/8⁹

According to Vagbhata⁹, Twak is formed by the Paka of Rakta Dhatu by its Dhatvagni. After the Paka of Rakta, by its Dhatvagni, Rakta Become dry in the form of skin like the deposition of cream on the surface of the boiling milk. Thus, Twak is also called as "Rakta Santanika".⁹

Among six garbhakarak bhava the skin is considered as responsible factor in the formation of embryo.

तृतीये मासि सर्वेन्द्रियणि सर्वांग अवयवाश्च योगपद्येनाभिनवर्तते ॥"
(च.शा. ४/११)¹⁰

According to Charakacharya¹⁰ twacha is first organ derived from Matruj. Skin is generated during 3rd month as it is Dyanendriya (sense organ). Twacha is upadhatu of mamsa so derived from mamsa dhatu.¹¹

V) Origin Of Twacha: -

According to Sushruta⁸ 7 layers of skin form during Shukrashonita samyoga, exactly as the cream rises above the milk as it is heated.⁸ Twacha is a matruj organ¹² and the upadhatu of mamsa¹¹ according to Charaka. According to Ashtanga Sangraha (Sha.5/24)¹³, pachyamana asruk produces six layers of twacha.

षष्ठे स्नायुसिरारोम बलवर्णनखत्वचाम् ॥¹⁴

Vagbhata¹⁴ states that the Twak is formed in the sixth month of embryonic life along with snayu, sira, nakha, bala and varna.

VI) Panchamahabhautikta Of twacha (skin):

"सर्वम् द्रव्यं पाञ्चभौतिकं अस्मिन्नर्थे ।"

Sankhya darshan says that all Chetana and achetana dravya in this world are made from panchamahabhut, so human body and its organs are also panchmahabhautik.

Skin is derived out of Panchamahabhuta, Bhrajaka pitta helps in absorption and metabolism of oil and other topical medicaments also give luster and complexion to the body. Vayu mahabhuta predominance creates tactile sensation.

"तत्र यद्विशेषतः स्थूल नखास्थिदंतमासर्चम तत पार्थिवं ।"

(च.शा. ७/१६)¹⁵

स्यात्किं के शलोमास्थो, मज्जः स्नेहोऽक्षिविद्वत् त्वचाम् ॥

च. चि. 15/19¹¹

"तत्रानुमानगम्यानां स्पर्शनिऽनिलो विशेषेणोपपद्यते।"

(च.सू. ८/१४)¹⁶

"स्पर्शनिऽभ्यधिको वायुः स्पर्शनं च त्वगाश्रितम् ।"

(च.सू. ५/८७)¹⁷

Pruthvi- Twacha is parthiva avayava (upadhatu of mamsa)¹¹.

Jala - Skin is snigdha and mrudu, tanu due to Jala mahabhut.

Teja - Varna, kanti and aabha of skin is due to Teja mahabhut.⁸

Vayu - Twak is sparshanendriya adhishtana which is main Sthana of vata all the sparshas or touch we feel by touching skin is due to presence of Vata mahabhuta.^{16,17}

Akash - Swedavahi strotasa are indicative of Akash mahabhut all the pores/ randhra in skin are due to this.

VII) Layers Of Twacha-

Regarding to the layers of skin, there are different opinions among all Acharyas.

According To Charak¹⁸

शरीरे षट् त्वचाः तद्यता उदकधरा त्वग्बाह्या, द्वितीया त्वसृग्धरा, तृतीया सिदमकिलासंभवाधिष्ठाना, चतुर्थी दद्रुकुष्ठसंभवाधिष्ठाना, पंचमि त्वलजिविद्रधि संभवाधिष्ठाना, षष्ठे यस्यां छिन्नायां ताम्यत्यन्ध इव इ तमः प्रविशति चाप्यधिष्ठायारूषि जायन्ते पर्वसु कृष्णरक्तानि स्थूलमूलानि दुश्चिकित्स्यतमानि इ इत षट् त्वचः । एता षडंग शरीरमवतत्थ तिष्ठन्ति ॥ च. शा. 7/4¹⁸

1) **Udakadhara Twak:** This is the lymph-bearing layer on the outside of the body.

2) **Asrugdhara Twak :** This layer contains blood capillaries and is the second layer.

3) **Thritiya Twak:** This is an adhishtana of Sidma and Kilasa skin lesions.

- 4) **Chaturti Twak** : The *adhishtana* of Dadru and Kushta is the fourth stratum.
5) **Panchami Twak**: The *adhishtana* of Alaji and Vidradhi is the fifth tier.

- 6) **Shashti Twak**: The sixth layer is the one whose removal causes the vision to blur and the subject to experience darkness.

Table no.1 shows the layer of twacha according to charak¹⁸

Sr no.	Name of layer	Disorder
1	Udakadhara (bahya)	-
2	Asrugdhara	-
3	Tritiya	Adhishtana of Sidma and Kilasa
4	Chaturthi	Adhishtana of Dadru and Kushta
5	Panchami	Adhishtana of Alaji and Vidradhi
6	Shashti	If incised, causes loss of vision & deep ulcers which are tedious to treat.

According To Sushrut⁸

"तासां प्रथमाऽवभावसनी नाम या सर्वान् वर्णानवभासयति पञ्चविधां
च छाया प्रकाशयति, सान्नीह्येष्टादशभागप्रमाणा,
सिध्मपद्मकण्टकाधिष्ठाना, द्वितीया लोहिता नाम, षोडशभागप्रमाणा,
तिलकालकन्यच्छव्यङ्गाधिष्ठाना: तृतीया श्वेता नाम,
द्वादशभागप्रमाणा, चर्मदलाजगल्लीमषकाधिष्ठाना;
चतुर्थीताम्रानामाष्टभागप्रमाणा, विविधकिलासकुष्ठाधिष्ठाना; पञ्चमी
वेदनी नाम पञ्चभागप्रमाणा, कुष्ठविसर्पाधिष्ठाना; षष्ठीरोहिनाम
ब्रीहिप्रमाणा, ग्रन्थ्यपच्यर्बुदश्लीपदगलगण्डाधिष्ठाना; सप्तमीमांसधरा
नाम ब्रीहिविद्वयप्रमाणा, भगन्दरविद्रध्यर्शोऽधिष्ठाना। यदेतत् प्रमाणं निर्दिष्टं
तन्मांसलेष्ववकाशेषु न ललाटे सूक्ष्माङ्गुल्यादिषु च।" (सु.शा. ४/४)⁸

avabhasini :

This is the top layer, which provides all of the colours and reflects the five different types of *chhaya*. This layer is responsible for the skin's appearance. Because of this property, it has been given such name. It is 1/18 of a *vrihi* in thickness. In this layer, disorders like *Sidhma* and *Padmakantaka* can be found.

Table no. 2- Showing Layers of skin as mentioned in sushruta⁸ and comparison with modern review.¹

Sr. No	Name of the layer ⁸	Thickness (pramana in vrihidhanya) ⁸	Common diseases occurring ⁸	Modern correlation ^{1,47}
1	Avabhasini	1/18 th of vrihi	Sidma, Padma, Kantaka.	Stratum corneum (epidermis)
2	Lohita	1/16 th of vrihi	Tilakalaka, Nycha, Vyanga.	Stratum lucidum (epidermis)
3	Shweta	1/12 th vrihi	Charmadala, Ajagallika, Masaka.	Stratum granulosum (epidermis)
4	Tamra	1/8 th of vrihi	Kilasa, Kushta.	Stratum spinosum (epidermis)
5	Vedini	1/5 th of vrihi	Kushta, Visarpa.	Stratum basale and papillary layer (dermis)
6	Rohini	1 vrihi	Granthi, Apachi, Arbuda.	Reticular layer (dermis)

7	Mamsadhara	2 vrihi	Bhagandara, Vidradhi, Arshas.	Subcutaneous tissue and muscle
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Dr. Bhaskar Govind Ghanekar in his commentary in *Su.Sha.* 4/4, he correlates the layers of skin with the latest modern anatomy of skin.^{1,47}

According To Sharangdhara

ज्ञेयावभासिनी पूर्व सिध्मस्थानं च सा मता । द्वितीया लोहिता ज्ञेया
तिलकालकजन्मभूः ॥३७॥

श्वेता तृतीया संख्याता स्थानं चर्मदलस्य सा । ताम्रा चतुर्थी विज्ञेया
किलासश्चित्रभूमिका ॥ ३८ ॥
पञ्चमी वेदनी ख्याता सर्वकुष्ठोद्भवस्ततः । विख्याता रोहिणी षष्ठी
ग्रन्थिगण्डापचीस्थितिः ॥ ३९ ॥
स्थूला त्वक्सप्तमी ख्याता विद्रध्यादेः स्थितिश्च सा । इति सप्त त्वचः
प्रोक्ताः स्थूला ब्रीहिद्विमात्रयाः ॥ ४० ॥
(शा.पू. ५/३७-४०)¹⁹

Table no. 3- showing layers of skin according to sharangdhara and disease related to them¹⁹

Sr no	Layers of twacha	Disease
1	Avabhasini	Sidhma
2	Lohita	Tilkalak
3	Shweta	Charmadala
4	Tamra	Kilas, shwitra
5	Vedini	Sarvakushta
6	Rohini	Granthi, gand, apachi
7	Mamsadhara	Vidhardi

Table no. 4 - Name of Twacha According to Different Acharyas^{7,8,19,20}

Sr No	Charak ²⁰	Sushrut ⁸	Vagbhat ⁷	Arundatt	Sharangdhar ¹⁹	Bhela
1	Udakadhar a	Avabhasini	Avabhasini	Avabhasini	Avabhasini	Udakadhar a
2	Asrugadhar a	Lohita	Lohita	Lohita	Lohita	Asrugadhar a
3	Tritiya	Shweta	Shweta	Shweta	Shweta	Tritiya
4	Chaturthi	Tamra	Tamra	Tamra	Tamra	Chaturthi
5	Panchami	Vedini	Vedini	Vedini	Vedini	Panchami
6	Shashti	Rohini	Rohini	Rohini	Rohini	Shashti
7	-	Mamsadhar a	Mamsadhar a	Mamsadhar a	Sthoola	-

VIII) Twaka Varna Utpatti (Color of The Skin)

The *Mahabhuta*, which determines skin colour, was elucidated by Acharyas. Also, when the skin is formed, *pradhan Mahabuta* is present.

Charakacharya²¹ - he discussed the *purusha's prakrut* and *vikrut* skin colours.

निलश्यावताग्रहरितशुक्लाश्च वर्णाः शरिरस्य वैकारिका भवन्ति ॥

(च.ई. १/९)²¹

अपि तु तेजोधातुरप्युदकान्तरिक्षधातुप्रायो ऽवदातवर्णकरो भवति,
पृथ्विवायुधातुप्रायः कृष्णवर्ण कर, समसर्वधातुप्रायः श्यामवर्णकरः ॥

(च.शा ८/१५)²²

Prakruta varna - Krushna, Shyama, Shyamavadata, Avadata
Vikruta varna - Neela, Shyava, Tamra, Harita and shukla

This shows how to differentiate between normal and abnormal type of skin.

Table 5 – a/c to charak Colour of skin and mahabhuta related to them²²

Sr no.	Color of skin	Mahabhuta
1	Goura varna	Tejas + aap + akash
2	Krishna varna	Tejas + Prithvi + vayu
3	Shyam varna	Tejas + Prithvi + akash + aap + vayu

Sushrutacharya- according to him all skin colour were formed only because of *Tejas mahabhuta*. He says that all *mahabhuta* are responsible but the manifestation of the colour is due to *Tejas mahabhuta*. Without it the colour won't form. Sushruta explained two other types of colours, both of which are different from Charka. According to

Sushruta, the *mahabhuta* involved in colour production differ from the charaka. *Tejas mahabhuta* with the help of rest *mahabhutas* gives origin to different colour to skin which varies person to person according to *prakruti*.²³

Table no.6- a/c sushruta colour of skin and mahabhuta related to skin²³

Sr no.	Color of skin	Mahabhut
1	Goura varna	Tejas + aap
2	Krishna	Tejas + Prithvi
3	Krishna shyam varna	Tejas + Prithvi + akash
4	Goura shyam varna	Tejas + akash + aap

Vagbhat:

तथा क्षीरादिमधुराणामुपयोगान्मातुरुदक विहाराच्च गौरता ।
तिलान्वविदाहिना कृष्णता व्यामिश्राणां श्यामता । देशकुलानुवृत्तित्व
वर्णभेदः ॥
तथा तेजोधातोरुदकाकाशधातुसंपर्काद्विरता भूवायुसंपर्कत कृष्णता
सर्वधातुसाम्ये श्यामता ॥ (अ.सं. शा १/६५)²⁴

According to Vagbhata, the Varna (skin colour) of shukra, Matru aahar, Vihar Desh, Kula, and Teja dhatu determines the Varna (skin colour).

Table no.7- a/c Vagbhata varna of shukra, matru ahar vihar and teja dhatu are responsible for varna (colour) of garbha²³

Varna of Shukra	Matru ahar vihar	Dhatu	Varna of Garbha
Shukla or Ghrutamandabha	Kshiradi Madhura ahara, udaka vihara	Teja + Udaka + Akasha	Gaura
Tailabha	Tiladi vidahi ahara	Teja + Bhu + Vayu	Krushna
Madhvabha	Mishra ahara	Sarvdhatu Samya	Shyam

IX) KRIYA SHARIR OF TWAK

To comprehend the physiology of Twak, we must first comprehend Twak's relationship to Dosha, Dhatu, and Mala.

a) Relation Of Twak with Dosha

1. Relation of Twak with Vata -

स्पर्शनेऽभ्यधिको वायु स्पर्शनं च त्वगाश्रितम् । (च.सू. ५/८७)²¹

"पक्वाशय कटि सक्थि श्रोत्रास्थि स्पर्शनेन्द्रियम् स्थानं वातस्य तत्रापि

पक्काधानं विशेषतः ॥ (अ.ह.सु. १२/१)²⁵

While explaining *karmukatva* of *Abhyanga*, Charaka says that *Vayu* is predominant in *sparshanendriya* which is seated in *twacha*. *Twak* is one of the main *sthana* of *vata dosha*, which is responsible for sensation of touch, pain and temperature and called as *Sparshanendriya*.

The colour of skin is due to *Udana Vayu*, *Samana vayu* is situated in *Swedavaha Strotasa* and *Swedan* makes *twaka* clean and healthy.

2. Relation of Twaka with Pitta -

यत्तु त्वचि पित्तं तस्मिन्
भ्राजकोनिरितिसंज्ञा, सोभ्यङ्गपरिषेकावगाहालेपनादीनां क्रियाद्रव्याणां
पक्ता छायाणां च प्रकाशकः ॥ सु.सु. 21/10²⁶

Twak is the *sthan* of *Bhrajak pitta*, Acharya Charaka said that the *Bhrajak pitta* is responsible for *pachana* of medicine applied over the skin like *Lepa*, *Pralepa*, *Abhyanga*, *Parisheka* etc. so *Bhrajak pitta* enhance the colour of skin.

"पित्तं पक्त्व्यूष्मदर्शिनैः । क्षुत्तुङ् रुचिप्रभामेधाधिशौर्यतनुमार्दवेः

॥" (अ.ह.सु. ११/२)²⁷

"...दुक् स्पर्शनं च पित्तस्य नाभिरत्र विशेषतः ॥" (अ.ह.सु. 12/2)²⁸

According to *Vagbhata*²⁷ *sparshanendriya* is one of the *sthana* of *pitta*. It is also *sthana* of *Bhrajak pitta*, which gives luster and colour to the skin. Acharya Chakrapani also said about *Bhrajak pitta* that it is responsible for the regulation of body heat.

Pitta is also responsible for *Prabha* of skin as decreased *pitta* also fades *Prabha* of skin.

3. Relation of Twak with Kapha -

श्लेष्मा स्थिरत्वस्निग्धत्वा" (अ.ह.सु. ११/३)²⁷

"इन्द्रियतर्पणात् तर्पकः । (अ.सं.सु. २०/८)⁷

Kapha maintain the properties of skin like *Snigdhatva* and *Mrudutva*. "Sneseshu Shleshmana" said by Ashtang Hridaya²⁷ in chapter where he explained *Ashrayashrayi Sambandha* in *Dosha* and *Dhatu*, which

indirectly enlists *twacha* as the *sthana* of *Kapha dosha*.

यत्तु प्रच्यवमानं पुरीषमनुबध्नाति अतियोगेन तथा मूत्रं रुधिरं अन्यांश्च
शरीरधातून् यत्तुसर्वशरीरचरं बाह्या त्वग्बिभर्ति, यत्तु त्वगन्तरे व्रणगतं

लसीकाशब्दं लभते, यच्चोष्मणाऽनुबद्धं लोमकूपेभ्योनिष्पतत्

स्वेदशब्दमवाप्नोति तदुदकम् (च.शा. ७/१५)²⁹

According to Chakrapani in his comment on (Cha.Sha.7/15)²⁹, the *udakadhatu* in the body is one of the forms of *Kapha* & the *Lasika* in *twacha* is *udakadhatu*.²⁹

b) Relation of Twak with Dhatu

1. Rasa Dhatu -

"रसात् स्तन्यं ततो रक्तमसृजः कण्डराः सिराः । मांसाद्वसा त्वचः षट्

च मेदसः स्रायुसम्भवः ॥ (च.चि. १५/१८)¹¹

रसे रौक्ष्य । अ.ह.सु. ११/१७²⁸

Chakrapani mentioned in his commentary that the word *twak* represents '*Tadashrita*' *Rasa dhatu*.¹¹ While explaining *Rogamarga* Acharya Charka explained *Twak* and *Rasa* as a *bahya* or *Shakhashrita rogamarga*. Ashtang hridayakar says that deficiency of *rasadhatu* causes *rauiksha*.²⁸

2. Rakta Dhatu -

"शोणितक्षये त्वक्पारुष्यम् ।" सु.सू. 15/9³⁰

"कण्ड्वरुः कोठपिडिकाकुष्ठचर्मदलादयः । विकाराः सर्व एवैते विज्ञेयाः

शोणिताश्रयाः ॥" (च.सू. २४/१६)³¹

परुषास्फुटिताम्लानात्वयुक्षा रक्तसंक्षये । च.सू. १७/६५³²

Acharya Charka explained that the *Vridhhi*, *Kshya*, and *Dushti* of *Rakta dhatu* leads to various skin disease like *kushtha*, *kilas*, *kandu*, *pidaka*, *visarpa* etc. Acharya Sushruta says that *Rakta dhatu* is responsible for *Varnaprasadan* and *rasa kshaya* causes *twak parushyam*³⁰. According to Charak³² the deficiency of *Rakta* makes the skin *Parusha*, *Ruksha*.

3. Mamsa Dhatu -

"मांसाद्वसा त्वचः षट् च....।" (च.चि. १५/१७)¹¹

Twak is the *Upadhatu* of *Mamsa* so they are closely related because the *utpatti* of *twak* is from *Mamsa dhatu*.

4. Meda Dhatu -

मलायनानि अन्यानि इति अनेन पञ्चेन्द्रियाधिष्ठाना मुखनासिकाचक्षुः
कर्णानां त्वगिन्द्रियाधिष्ठानभूतानां च लोमकूपप्रजननानां यथास्वम्
मलायनानि गृह्यन्ते । (च.सू. १७/७चक्र.टीका)³³

Sweda is the mala of Meda and sweda is a waste product of body which is excreted through skin.

5. Asthi Dhatu -

नखरोमाणि च अस्थ्यानां मलाः ।" (अ.ह.शा. ३/६४)³⁴

As per Acharya Vagbhata^{18-B} Roma and Nakha are present on the skin are the mala of Asthi dhatu.

6. Majja Dhatu -

"मज्ज किं स्नेहोऽक्षिवित् त्वचाम ।" (च.चि. १५/१९)¹¹

Mala of Majja dhatu is Sneha which resides below twak.

7. Shukra Dhatu -

The coincidence of shukra with Sparshan is through body. Shukra dhatu occupied all body same as twak.

c) RELATION TWAK WITH MALA –

1. Sweda

स्वेदे रोमच्युति स्तब्धरोमता स्फुटन च । अ सु 11/22³⁵
मलायनान्यत्यानि इति अनेन पञ्चेन्द्रियाधिष्ठानां मुखनासिकाचक्षुः
कर्णानां त्वगिन्द्रियाधिष्ठानभूतानां च लोमकूपप्रजननानां यथास्वम्
मलायनानि गृह्यन्ते । च.सू. १७/७२ चक्र, टीका³⁶

"स्वेदक्षये रोमच्युतिः स्तब्धरोमता स्फुटनं त्वचः ॥

अ.ह.सू. 11/22³⁵

Maintaining loma, twaka sneha and kleda is the function of Sweda.

Sweda is the mala of Meda dhatu.

According to Acharya Vagbhata twak excrete sweda as its mala, he also said that if there is kshya /decrease in sweda leads to dry and scaly skin also caused Romachyuti and cracking of skin.³⁵

Twacha is Malayana because (Ch.Su.17/72)³⁶ Chakrapani comments that the Adhishtana of panchendriya are the malayanani. The sneha in twacha is the mala of Majja Dhatu.

2. Kesh & Loma: The mala of Asthi Dhatu are Kesh and Loma, which are related with twak.

3. Twakgata Sneha: Twakgata sneha is the mala of majja dhatu.

X) Twacha & Garbhini Paricharya

अम्लनित्या रक्तपित्तिनं त्वनक्षिरोणिं वा । च.शा. ८/२१³⁷

The Varna of the to be born child is determined by lots of things described in detail in sharira Sthan of charaka³⁷ & Sushruta. But, an essential fact to be known is if a Garbhini is Amlanitya (Sour taste is predominant in diet), she gives birth to a baby with either Raktapitta or Twak roga or Akshi roga.

XI) Relation of Twak and strotasa- 1.Mamsavaha strotasa:

मांसवहाना स्रोतसां स्नायुर्मूलं त्वक च ॥ च.वि. 5/7-4³⁸

Twak is the mulasthan of Mamsavaha strotas and Upadhatu of Mamsa dhatu.

2.Swedvaha strotasa:

"स्वेदवहाना स्रोतसा मेदोमूल लोमकूपाक्ष । च.वि.5/7-7³⁸

Swedavaha srotamsi carrying the sweat has their root in the adipose tissue and hair follicles (loamkoop). Moolasthan of swedvaha srotas is meda and loamkoop. Loamkoop is situated on twacha.

3.Rasavaha strotasa:

"अश्रद्धा चारुचिश्चास्यवैरस्यमरसज्ञता... नाशोऽनेर्यथाकालं वलयः
पलितानिच ॥१॥ च.सु. 28/9³⁹

It is also related to skin. Due to Rasavaha strotasa dushti, hair fall, wrinkles on the skin occurs, along with other symptoms.

4.Raktavaha Strotas:

"कुष्ठ विसर्प पिडका रक्तपित्तमडसृग्दरः । गुदमेद्रास्य पाकश्च
प्लीहागुल्मोऽयं विद्रधिः ॥ नीलिका कामला व्यङ्ग
पित्तवस्तिकातकाः । ददुर्धर्मदलं श्वित्रं पामा कोठास्त्रमण्डलम् ॥
(च.सू. २८/१२)⁴⁰

Acharya Charka^{19-G} stated that Rakta dhatu dushti causes various Twak roga like kushtha, visarpa, pidika, nilika, vyanga so Twak is also related to Raktavaha strotas.

XII) Twaka Sarata Lakshana –

"तत्र स्निग्ध श्लक्ष्ण मृदुप्रसन्न सूक्ष्माल्पगम्भीसुकुमारलोमा सप्रभैव

चत्वकसाराणाम् |

सासारतासुखसौभाग्यः ऐश्वर्योपभोगबुद्धिविद्यारोग्यप्रहर्षणानि

आयुष्यत्वं च आचष्टे ॥" च. वि. ८/१०३ ⁴¹

*Twak Saar*⁴¹ person's skin should be shiny, smooth, fluffy, eye-pleasing, thin, mild tender with minimal fine hairs. Acharya kashyapa has plainly referenced that as *rasa dhatu* feeds *twak*, *twak sara lakshanas* are same as *rasa sara*. Skin of *twak sara* individual is portrayed by reflexive, smooth, delicate, clear, fine, less various, well established, and delicate hairs and such individual is invested with joy, favourable circumstances, power, happiness, mind, information, wellbeing and life span.

XIII) Prashasta Twacha –

While enlisting the features of an *aayushman* individual in *Cha.Sha.8/51*⁴², the characters of *twacha* are, *Sthira* & *Bahala*.

XIV) Twak Vikruti-

Twacha is a *Bahya rogamarga*.⁴³ As it is a seat of lot of constituents of the body, it expresses the homeostasis as well as its disturbance almost all the time. e.g. The *Tridosha* has their specific colours to express, which change the colour of *twacha* when they get vitiated.

XV) TWAK KARMAS –

1. *Twak* acts as an organ of sensation.
2. It shows colour, luster and aura of the skin.
3. It maintains body temperature.
4. It also absorbs the medicine when applied in the form of *lepa*, *abhyanga*, *upanaha* etc.
5. *Twak* protects and covers skeleton and muscles of the body.
6. It regulates formation, maintenance and excretion of wastes of the *Mamsa dhatu* i.e. sweat excreted through skin because it is an *upadhatu* of *mamsa*.

1. SKIN

I) EMBRYOLOGY OF SKIN: ⁴⁴

At the end of the second month, proliferating cells appear in groups in the stratum germinativum and hairs form in the brows, chin, and upper lip areas. A gradually elongating compact epithelial cylinder is formed as a hair germ grows into the dermis. The connective tissue beneath it is compacted, and the resulting hair papilla protrudes into the epithelial cylinder from below. The latter's direction isn't parallel to the skin's surface. On the side of the cylinder, two rounded projections develop. In the upper of these the central cells undergo fatty transformation and their further development produces the lobed outpouching from the hair follicles which is the sebaceous glands. The lower projection from the cylinder is the place of attachment of the erector pili muscle. Within the bulb of the cylinder which caps a papilla. A central cone of cornifying cells differentiates. These push upper wards by the multiplication of the cells on the summit of the papilla and so from the hair sack. Nails are the seen as flat areas on the back of the terminal phalanges during the third month of the intra-uterine life.

II) ANATOMY AND PHYSIOLOGY OF SKIN ^{45,46}.

Skin is composed of two primary layers. The epidermis is the ecto-dermally derived outer layer composed of keratinized stratified squamous epithelium. The dermis is the meso-dermally derived layer of dense irregular collagenous connective tissue that underlies and interdigitates with the epidermis. The hypodermis is a loose connective tissue containing varying amounts of adipose that underlies and supports the skin; it is the superficial fascia that covers the entire body.

a) EPIDERMIS:

Epidermis is composed of layers of epithelium. The innermost zone is the malpighian or prickle layer and is several

cells thick. The lowermost layer of malpighian cells is known as the basal layers and is composed of tall, palisade columnar like cells. The epidermis protrudes downward in finger-like projections, the rete ridges, into the upper portion of the dermis. As the prickly cells progress toward the surface, they become granular their nuclei become pyknotic and then disappear. The epidermis is composed of keratinized stratified squamous epithelium. It contains four principal types of cells:

- Keratinocytes
- Melanocytes
- Langerhans cells
- Merkel cells

1) Keratinocytes (keratino-horny; cytes = cells) Keratinocytes, which are organized in four or five layers and produce the protein keratin, make up about 90% of epidermal cells. Keratin is a fibrous, stiff protein that protects the skin and underlying tissue from heat, germs, and chemicals. Keratinocytes also create lamellar granules, which release a water-repellent sealant that prevents water from entering and leaving the cell.

2) Melanocytes - (melano-black) Melanocytes make up about 8% of epidermal cells and produce the pigment melanin. Their long, slender projections reach between the Keratinocytes and deliver melanin grains.

3) Langerhans cells - These cells originate in red bone marrow and move to the epidermis, where they make up a minor percentage of epidermal cells. They are easily destroyed by UV light and engage in immune responses against bacteria that enter the skin.

4) Markel cells - They are the epidermal cells with the smallest number of cells. They are found in the epidermis' lowest layer, where they come into contact with the flattened process of a sensory neuron, a structure known as a tactile (Markel) disc. Different components of touch sensation are detected by Markel cells and the tactile disc.

About 90% of epidermis cells are keratinocytes, which are arranged in four or five layers and produce the protein keratin. The epidermis has four strata or layers in most areas of the body.

- 1) The Basal Stratum
- 2) Spinosum Stratum This is referred to as thin skin.
- 3) Granulosum stratum
- 4) Corneum stratum

The epidermis has five layers where friction is highest, such as the fingertips, palms, and soles.

- 1) The Basal Stratum
- 2) Spinosum Stratum
- 3) Granulosum stratum this is referred to as thick skin.
- 4) Stratum lucidum (clear stratum)
- 5) Corneum stratum

1. Stratum corneum: The outermost layer made of 25-30 layers of dead flat keratinocytes. Lamellar granules provide water repellent action and are continuously shed & replaced.
2. Stratum lucidum: Only found in the fingertips, palm & soles. This layer is made up 3-5 layers of flat dead keratinocytes.
3. Stratum granulosum: made up of 3-5 layers of keratinocytes, site of keratin formation, keratohyalin gives the granular appearance.
4. Stratum spinosum: appear covered in thorn like spikes; provide strength & flexibility to the skin.
5. Stratum basal: The deepest layer, made up of a single layer of cuboidal or columnar cells produces here are constantly divided & move up to apical surface.

The stratum corneum, also called the horny layer, is the epidermis's outermost layer. Here keratinization, which by electron microscopy has been shown to start in the basal layers is now complete. The cells have been transformed into scales without nuclei or granules and cell boundaries are not

ordinarily seen with the light microscope on routine sections. Usually this scaling is invisible grossly. But in disease process, when it is increased or the keratin is abnormal, the scales may become visible. The stratum corneum is porous and loose, and it is the part of the skin that is closest to the outside world and loses the most water. Keratinization refers to the process of epithelial proliferation that continues to replace lost layers and transitions from the basal layer to the corneum. Hydrophilic lipids are created during the keratinization process, which serve to maintain the horny layer from getting too dry. Sweat and sebum also help to keep the skin moist. This corneal layer is thicker or improperly produced in callus development and scaling. In some diseases with prominent scales, such as psoriasis, the epithelium turnover rate is substantially faster than normal, the scales retain their nuclei, and the epidermis lacks a granule layer. This is known as parakeratosis. The stratified squamous epithelium of most of the normal mucosa of the lips oral cavity and vagina has no granular layer and normally has a nucleated parakeratotic layer. In some illnesses, uneven keratinization develops, most commonly in a single cell or group of cells in the Malpighian layer. This abnormal keratinization is known as dyskeratosis. The epithelium especially the layer is continuous with the epithelium of the dermal appendages (hair, sebaceous and sweat glands) which extend into the dermis and hypoderm. There is considerable evidence which indicates that these basal cells and their appendageal extensions are pluripotent that is they can form the surface type of epidermis or one or more appendages. In the healing of skin after a split thickness graft has been removed, or after surgical planning to remove acne scars, the epidermis and appendages will regrow as long as some of the deep portions of the appendages are still present. the basal layer may thus form keratin, sebaceous glands or hair follicles and conversely the sweat

glands or ducts, sebaceous glands or hair follicles may give rise to surface epithelium. Where all the epithelial structures have been destroyed, as by a severe burn, extensive x-radiation damage or full thickness graft, re-epithelialization will take place usually without regrowth of appendages, by the epithelium which has grown over from the adjacent margins.

b) DERMIS:

This is composed of a connective tissue stroma containing the blood vessels, nerves, various nerve end organs, lymphatic, arrectores pilorum muscles and dermal appendages. The upward extensions of the dermis between the epithelial fingers like rete ridges are known as the dermal papilla. The connective tissue is mostly made up of collagen and elastic fibers, both of which contribute to the skin's flexibility. It is the elastic fibers which rupture in the normal pubertal period to produce striae. The connective tissue fibers degenerate in skin exposed to sun light for years.

2. SUB-CUTANEOUS TISSUES:

These act as a fat storage receptacle as well as a support for the veins and nerves that travel from the tissue below to the corium above.

Discussion

The skin, also known as the cutaneous membrane is the largest organ of the body, with a total area of about 20 square feet and weighs 4.5-5kg, about 7% of total body weight. Skin is known as "The First Line of Defence" as it protects us from microbes and other invading elements. It is a part of integumentary system that contributes to homeostasis by protecting the body and helping regulate body temperature. It also allows us to sense pleasurable, painful and other stimuli in the external environment.⁴⁸ As the skin diseases are more important because of cosmetic as well as psychotic illness. The above review regarding *twacha*

in both ayurvedic and modern view is helpful to know the co relation between normal and abnormal things regarding the *twacha* (skin).

Conclusion

This detailed study of *Twacha* in both Ayurvedic and Modern sciences provided well established concept of *Twacha* (skin) in medical science. To know about the *Vikriti* of *Twacha*, it is necessary to know the normal physiology i.e. *Prakriti* of the *Twacha*. Thus, in medical science, for better diagnosis, detailed study of *Twacha* as per Ayurveda as well as Modern concepts are necessary.

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References

1. Badhoria A, Jasrotia R, Verma A. A review on conceptual study of *twacha* sharir (skin). Int J Health Sci Res. 2020; 10(1):96 100.
2. Raja radhakantadeva . Shabdakalpadruma – 3rd ed. Varanasi: Naga Publications;2006. 937pp. Vol.2,5.
3. Shabdakalpadruma app – app downloaded from play store.
4. Amarkosh app – app downloaded from play store.
5. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale.
6. drushtarth sushrut chintan with acharya dalhan's nibandh sangaraha commentary, with gayadas's nyayachandrika commentary and also with athawalekrut pandmini commentary by author Vaidya p. g. Athawale; published by godavary publishers and book promoters 148, shastri nagar, Nagpur. First edition; part 1st; sharirsthan -1st chapter; shlok no 4; pg no. 535
7. Acharya Vagbhat "Ashtang Sangrana" Ed. By Kaviraj Atridev Gupta, Krishnadas Academy, Varanasi, 1993.
8. drushtarth sushrut chintan with acharya dalhan's nibandh sangaraha commentary, with gayadas's nyayachandrika commentary and also with athawalekrut pandmini commentary by author Vaidya p. g. Athawale; published by godavary publishers and book promoters 148, shastri nagar, Nagpur. First edition; part 1st; sharirsthan -4th chapter; shlok no 4; pg no. 559.
9. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sharirsthan adhyay 3rd shlok no. 8-9, pg. no. 367
10. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 4th chapter; shlok no. 11 Pg no. 728
11. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 2 chikitsasthan 15th chapter; shlok no. 17-19; pg no. 356
12. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale.

- Part 1 sharirsthan 3rd chapter; shlok no. 06; Pg no. 717
13. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sharirsthan adhyay 3rd shlok no. 8-9, pg. no. 367
 14. Sarth vaghbhatt(Asthang hriday)Marathi transalation Dr.Ganesh krushna garde,Choukhamba surbharati prakashan Varanasi; sharirsthan. chapter 1 shlok no. 57 page no. 125
 15. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 7th chapter; shlok no. 16; pg no.769
 16. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan chapter 08 shlok no. 14; Pg no.147.
 17. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 5th chapter; shlok no. 87; pg no. 106
 18. Agnivesha. Charaka Samhita - Vidyotini Hindi commentary by Kashinath shashtri & Dr. Gorakhanath Chaturvedi. Reprint. Varanasi:Choukhamba Bharati Academy publication; Part 1 ; sharirsthan adhya 7th ; shlok no. 4; pg no. 910
 19. shrarangdharacharya virachit sharngadhar Samhita by shri radhakrushna Parashar; ayurved Vaidya bhavan; third edition 1984; purva khanda; kaladikhyan prakaran; shlok no. 37-40; pg no. 77
 20. Agnivesha. Charaka Samhita - Vidyotini Hindi commentary by Kashinath shashtri & Dr. Gorakhanath Chaturvedi. Reprint. Varanasi:Choukhamba Bharati Academy publication; Part 1 ; sharirsthan adhya 7th ; shlok no. 4; pg no. 910
 21. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 2 indriyasthan 1st chapter; shlok no. 9; pg no. 812
 22. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 8th chapter; shlok no. 15; pg no. 776
 23. Susruta Samhita, vd.jadavji trikamji Acharya,published by krushnadas academy Varanasi,edition reprint ,1995, Sharira Sthana, 2/35.page no.351.
 24. Ashtanga Samgraha, Sharira sthana 1/65.
 25. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sutrasthan.12th chapter; shlok no.1; pg no. 170
 26. drushtarth sushrut chintan with acharya dalhan's nibandh sangaraha commentary, with gayadas's nyayachandrika commentary and also with athawalekrut pandmini commentary by author Vaidya p. g. Athawale; published by godavary publishers and book promotors 148, shastri nagar, Nagpur. First edition; part 1st; sutrasthan21st chapter; shlok no 10; pg no. 189
 27. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sutrasthan.11th chapter; shlok no. 2,3; pg no. 160
 28. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sutrasthan.11th chapter; shlok no. 17; page no. 163
 29. charak Samhita with Vaidya Manorama commentary; hindi author acharya

- vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 7th chapter; shlok no. 15; pg no. 768
30. drushtarth sushrut chintan with acharya dalhan's nibandh sangaraha commentary, with gayadas's nyayachandrika commentary and also with athawalekrut pandmini commentary by author Vaidya p. g. Athawale; published by godavary publishers and book promoters 148, shastri nagar, Nagpur. First edition; part 1st; sutrasthan 15th chapter; shlok no. 9; pg no. 134
 31. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 24th chapter; shlok no. 16; pg no. 330
 32. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan D-17th chapter; shlok no. 65; pg no. 273
 33. Agnivesha. Charaka Samhita - Vidyotini Hindi commentary by Kashinath shashtri & Dr. Gorakhanath Chaturvedi. Reprint. Varanasi:Choukhamba Bharati Academy publication; Part 1; sutrasthan adhyay 17th
 34. Sarth vaghbhatt(Asthang hriday)Marathi transalation Dr.Ganesh krushna garde,Choukhamba surbharati prakashan Varanasi; sharirsthan. 3rd chapter; shlok no. 63; pg no. 138
 35. Astanga Hridayam of Srimadvagbhata Edited with 'Nirmala' Hindi Commentary Alongwith Special Deliberation etc. by Dr. Brahmanand Tripathi; chaukhamba Sanskrit pratishtan, dilli; sutrasthan.11th chapter; shlok no. 22; pg no. 164
 36. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 17th chapter; shlok no. 72; pg no. 271
 37. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 8th chapter; shlok no. 21; pg no. 779
 38. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 vimansthan 5th chapter; shlok no. 7(4) and 7(7); pg no. 588
 39. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 28th chapter; shlok no. 9-10; pg no. 433
 40. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 28th chapter; shlok no. 11-12; pg no. 433
 41. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 vimansthan 8th chapter; shlok no. 103; pg no. 647
 42. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sharirsthan 8th
 43. charak Samhita with Vaidya Manorama commentary; hindi author acharya vidyadhar Shukla and prof. ravidatta

- Tripathi published by chaukjhamba Sanskrit pratishtan, dilli. Trancelated by marathi bhashantarkar Vaidya vijay shankar kale. Part 1 sutrasthan 11th chapter; shlok no. 48; pg no. 185
44. P.N. Behl et.al. Practice of Dermatology. 10th ed. Published by CBs Publications. 2005
45. Stanley. Y. Robins Pathologic Basis of disease. west washingtons square Philadelphia: Published by W.B. Suders company; 1974. 1595pp
46. Gerard J. Tortora, Bryan Derrickson, Principles of Anatomy and Physiology Eleventh Edition published by John Wiley & Sons, Inc. page no. 145.
47. Ghanekar's commentary on Sushruta Samhita Sharirsthana "Ayurveda Rahasya Deepika" by Dr. Bhaskar Govind Ghanekar, published by Meherchand prakashan Delhi reprinted edition, Sushruta sharirsthana ch. 2007; 4(3):107.
48. Anatomy and Physiology 2015 Indian Edition by Gerard J. Tortora and Bryan Derrickson. Wiley India Pvt Ltd., 4435 36/7, Ansari Road, Daryaganj, New Delhi-110002. Reprint: 2016; 125

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