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A CONCEPT OF SWEDA MALA IN SHARIR KRIYA

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ABSTRACT

The fluid element expelled out of the small pores of the body due to heat or other activity is known as *Sweda*. The term *Sweda* means sweat or perspiration. The word *Sweda* literally means the element expelled out of the body due to fomentation or heat treatments. It is one of three metabolic excretory products (*Mala*) like urine (*Mutra*) and stools (*Purisha*). These are also known as *Dushya* (which gets vitiated). Excretory products (*Mala*) are important in human physiology. They are formed in routine physiological and metabolic activities in the body. It is important to cleanse or purify the body by removing the waste. If accumulated, the mala has the ability to pollute the *Dosha* and *Dhatu* of the body. Perspiration or sweating (*Sweda*) is important for removing waste formed in the skin and maintaining body temperature i.e., thermoregulation. *Sweda* is basically the end product of *Meda Dhatu* metabolism. This article describes the concept of *Sweda* in Ayurveda and contemporary sciences.

Keywords: *Mala, Sweda, Dhatu, Aahararasa.*

INTRODUCTION

Mala is an important part of human physiology or *Sharir Kriya* in *Ayurveda*. *Mala* is the waste product or substances that are excreted out of the human body regularly. *Mala* represents a by-product resulting from physiological and metabolic activities going inside the human body. In contemporary medical dictionaries, the literal meaning of the word 'sweat' is perspiration or exudation or moisture from the sweat

pore.[1] Elimination of their *Malas* in an effective way is important for the maintenance of better health. In the ayurvedic system of medicine, *purish* - stool, *mutra* - urine, and *sweda* - sweat is considered to be the major class of *malas. Malas* are better known as *dushya* - pollutants, as they have an influential effect on the *vikriti* - pathology caused which is caused by imbalanced three biological humours. Precisely, malas get the name due to its properties of *malini karan* - toxification. After three *doshas* and seven *dhatu*, *mala* is the third important factor of the body.

Ayurveda generally recognizes two kinds of *malas*:

• ***Ahara mala*** or wastes from food

• ***Dhatu mala*** or wastes from the tissues

The *ahara malas* include feces (*purisha*), urine (*mutra*), and sweat (*sweda*). These are the three main *malas*. The *dhatu malas* include the various secretions of the nose, eyes, ears, lactic acid, carbon dioxide, and other metabolites of cellular respiration, exfoliated hair, skin, and nails Although these are all waste products, they serve a role in maintaining health as long as they are normal in their quantity (*pramana*), qualities (*gunas*) and function (*karma*) However, if the *malas* become abnormal in some regard (i.e. increased or decreased) they become a factor in creating disease. When the *dhatus* and *malas* become unbalanced they are called *dushyas* (soiled).

MATERIAL AND METHODS

It is a literary review to explore the understanding of *sweda mala* in *sharir kriya* with the help of data collected from classical and contemporary Ayurvedic texts and published research articles.

DISCUSSION

1. DEFINITION -

मला: मूत्रशकृतस्वेदादयोऽपि च । -वाग्भट

यच्योष्मणाSनुबद्धं लोमकूपेभ्यो निष्पतत् स्वेदशब्दमवाप्नोति॥

- चरक शारीरस्थान अ. ७

Charaka describes the process of expulsion or excretion of *sweda* in the *Sharirsthana* of the compendium stating that the *sweda* binds with the excess heat from the body and is then expelled out through the small pores on the skin. The average amount of *sweda* is 10 *Anjali* but is known to vary according to the heat and humidity levels of the atmosphere. Hence, a fixed quantity of *sweda* as a bodily element is difficult to predict.[2]

2. Synonyms -

1) Gharma,

2) Nidagha,

3) Seka,

4) *Medomala*.[3]

3. *Panchabhautika* constitution –

Sweda has dominance of *Jala* and *Teja Mahabhuta*. Some scholars consider it as *Jala Mahabhuta* dominant. It is listed among the watery components in the body.

4. Physiology of formation and excretion -

किट्टमन्नस्य विण्मूत्रं, रसस्य तु कफोऽसृजः ।

पित्तं, मांसस्य खमला, मलः स्वेदस्तु मेदसः ॥ १८ ॥

- च. चिकित्सा स्थान अध्याय 15/18[4]

Sweda is produced as a by-product in the metabolism of *meda dhatu [Cha. Sa. Chikitsa Sthana* 15/18], in channels of transformation and transportation of *meda dhatu (medovaha srotasa). Sweda* bestows moistness and softness on the skin. It is a part of the waste part (*kitta bhaga*) of the metabolized food.

यच्चोष्मणानुबन्द्ध लोमकूपेभ्यो निश्पतत् स्वेदशब्दमवाप्नोति ।

- च. शारीर स्थान अध्याय 7/15[5]

Sweda or sweat is basically the fluid element excreted through sweat pores due to heat or activity along with dissolved minerals and solids. Its formation is regulated by means of external temperature, fomentation, or heat treatments. The main seat channels of formation and transportation of sweat (*swedavaha srotas)* are *meda dhatu* and the small pores on the skin (*romakoopa*). It depends on excess heat in the body.

5. *Sweda Anjali Pramana* (Quantity of sweda)-

मज्जमेदोवसामूत्रपित्तश्लेष्मशकृन्त्यसृक् ।

रसो जलं च देहेऽस्मिन्नेकैकाञ्जलिवर्द्धितम् ॥ ८०॥

- अ. हृदय, शारीरस्थान, अध्याय 3/80[6]

The average amount of *sweda* in the entire body is ten *anjali*. It varies according to heat and humidity level in the surrounding atmosphere. Howev-

er, due to individual variability, the amount may be variable and cannot be determined.

6. Physical properties - It is watery, slightly unctuous, and has a yellowish tinge and odor. Sometimes, it may be in a vapour state.

7. Regulation of sweat secretion -

व्यानो हृद्यवस्थितः कृत्स्नदेहचरः शीघ्रतरगतिर्गतिप्रसारणाकुञ्चनोत्क्षेपावक्षेपनिमेषोन्मेषजृम्भणान्नास्वादनस्रोतोविशोधन स्वेदासृक्स्रावणादिक्रियो योनौ च शुक्रप्रतिपादनो विभज्य चान्नस्यहृद्यवस्थितः किट्टात्सारं तेन क्रमशो धातुस्तर्पयति ।

- अ. संग्रह, सूत्रस्थान, 20/6[7]

Vyana vayu helps in the excretion of sweat from the body. Conduction of sweat from the root of the hair, opening of the skin pores and help in the excretion of sweat, all these functions belong to *vyana vayu*.

8. Functions of sweda -

स्वेदकार्य - स्वेद: क्लेदत्वक्सौकुमार्यकृत् ॥

- सु. सूत्रस्थान, 15/8[8]

Sweda controls body temperature by way of expelling excess water and toxins, cooling the body, moistening skin & hair, and carrying excess fat from the body and purification of the blood. Maintaining moisture (*Kledavidruti*) is the main function. Proper functioning of hair follicles (*kesha vidhruti* or *roma-avlambana*) is added. The moistness of the skin (*kleda* or *kledana*) and softness of the skin (*twak saukumarya*) are the main functions of sweda.

1. It keeps the skin and hair moist, delicate, and smooth & maintains the integrity of the skin.
2. It helps to maintain water balance in the body.
3. It helps in the maintenance of body temperature.
4. It prevents different vatika disorders.
5. It also excretes the various kinds of toxins from the body.

9. *Swedavaha strotas* -

स्वेदवह स्रोतस मूलस्थान - तत्र स्वेदोवहानां मेदो मूल, लोमकूपाश्च ॥ - चरक

Swedavaha Srotas is one among the thirteen gross channels, which flushes out the body waste in the form of sweat. In "*Bhanumati"tika, Acharya Chakrapani* said, that "*jala mahabhoot"* are predominantly present in *sweda*. *Acharya Charaka* stated in *sharir sthan*, that *jala, lasika*, and *sweda* are in "ten *Anjali" pramana*. The perspiration process is carried out by the *Sweadavaha srotas* through the pores present in the skin. The word *Sweda* is derived from Sanskrit '*Swid'*, meaning 'to sweat or to perspire'. The *Doshas* present in these *Srotas* are-*Kledaka Kapha, Pachaka Pitta, Bhrajaka Pitta Samana Vata*, and *Vyan Vata*. *Mula* of *Swedavaha Srotas* is *'Meda'* and *'Lomakupa'. Swedavaha Srotas* can understand in the following manners, *Mula* - Sweat Glands, *Marga* - Sweat Ducts, *Mukha* - Pores of the skin, and the opening of the sweat glands under the skin.

10.*Sweda Vriddhi Lakshana* (Symptoms of excessive sweating) -

स्वेदोऽतिस्वेददौर्गन्ध्य कण्डु एवं च लक्षयेत् ॥ अ. हृदय , सूत्रस्थान, 11/14[9]

1. Foul smell or excessive body odour (*daurgandhya*)
2. Itching (*kandu*)
3. Excess sweating (*Atisweda*)

Sweda vruddhi leads to excess expulsion of sweat from the pores along with a foul body odour and server itching.

11.*Sweda Kshaya Lakshana* (Symptoms of reduced sweating) -

स्वेदेरोमच्युतिः स्तब्धरोमता स्फुटनं त्वचः । - अ. हृदय, सूत्रस्थान, 11/22[10]

1. Contracted sweat gland and ducts, stiffness, and obstruction of hair follicles (*stabdharomakoopta*)
2. Dryness of skin, cracking of skin (*twak paripatana*), and skin disorders (*twak dosha*)
3. Altered tactile sensation (*sparshavaigunya)*
4. Lack of sweat or absent sweat (*swedanasha*)
5. Scaling of skin (*twaksphootana*)
6. Falling of body hair (*romachyuti*)

Sweda kshaya causes goose pimples, dryness of skin, cracked skin, roughness, and a decrease in the amount of sweat produced. The patient suffering from *sweda kshaya* craves body massage and oleation treatments and resting in quiet, cool places. He also wishes to do a lot of heavy clothing.

12.*Sweda and pitta prakriti*: Excess sweating (*swedaadhikya*)is a characteristic of *pitta prakriti* individuals.

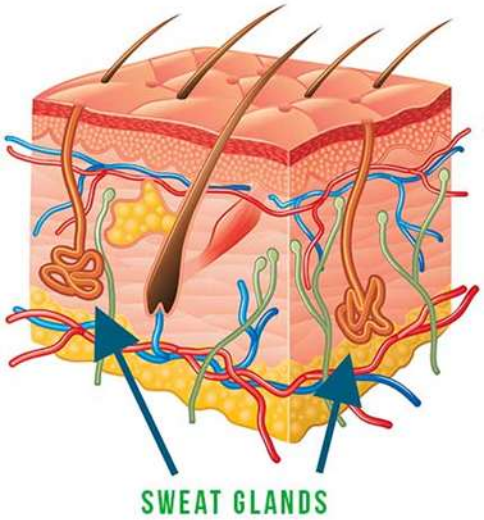
13.Sweda and pitta dosha relationship:

तत्रास्थनि स्थितो वायुः, पित्तम् तु स्वेदरक्तयो: । अ. हृदय , सूत्रस्थान, 11/26[11]

There is a close or concomitant relation between *pitta dosha* and *sweda*. This indicates the anatomical and physiological relation between the two components. These possess similar causes of vitiation, similar lines

of management, and similar patterns of disease affliction. Thus, the line of management of pitta ailments is in concordance with the management of *sweda*-related disorders. As both the entities i.e., *sweda* and *pitta* are related to the component of heat in the body (*ushma*), these are related closely like *pitta dosha* takes abode of sweda (*ashrayaashrayisambandha*).

B] Physiology of sweat - Sweat is a clear, watery, and salty liquid produced by the sweat glands present in the skin. Sweat is mainly produced in noticeable amounts under the arm, feet, and palms. When it comes in contact with the bacteria on the skin, it can cause a smell. Regular bathing and the use of antiperspirants or deodorant can help to control odor. In extreme conditions or during heavy exercise, large quantities of sweat are produced. It proves to be a great method of thermoregulation as long as humidity in the surrounding atmosphere is relatively low.[12] Stimulation of the anterior hypothalamus-preoptic area is responsible for the action of sweating. The impulses from this area are transmitted in the autonomic pathways to the cord and then through the sympathetic outflow to the skin and elsewhere in the body. The volume of sweat produced and expelled every day is generally about 100ml/day and may vary from person to person. The water loss through sweat may increase upto 1-2 L/hour in case of exercise or extremely hot weather.[13]



Sweat glands: Sweat glands are of two types:

1. Eccrine glands
2. Apocrine glands

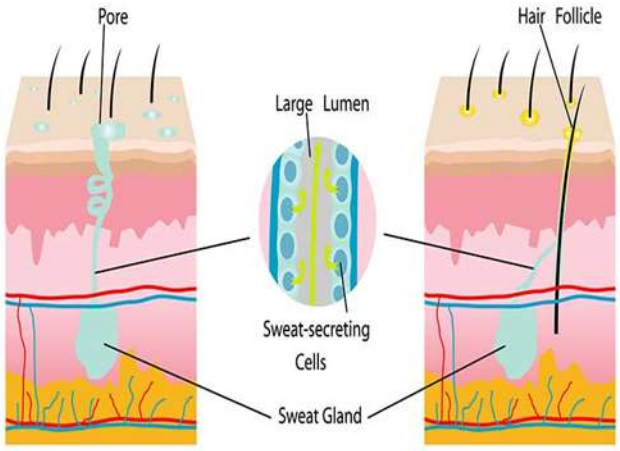
(a) Eccrine glands:

These are the common sweat glands distributed all over the body, especially over thick skin. The eccrine sweat gland is basically of tubular structure which at the beginning is in the deeper part of the dermis and is highly coiled. The rest of the gland courses through the dermis epidermis- open to the exterior. Sweat forms by coiled portion. These are functional throughout life. These are present largely over the back and chest regions.[14] When synthesized the sweat is isotonic, but while moving towards the exterior, some sodium ions are reabsorbed. In case of severe sweating, this reabsorption is more intense due to the action of aldosterone. Thermoregulation via sweating occurs through the eccrine glands innervated by sympathetic cholinergic fibres. The eccrine sweat is basically made up of water and sodium chloride (NACl). It may also contain a mixture of many other chemicals from the interstitial fluid as well. The amount of sodium and chloride in the eccrine sweat is considered to be less, 60 mmol/L and 70 mmol/L respectively.

(b) Apocrine glands:

These glands are located deep in a subcutaneous layer in limited areas like the axilla (armpit), pubic region, around the nipple of the breast, and scalp. The activi-

ty of apocrine glands increases with the onset of puberty and declines in old age. This process shows that these glands have got some relationship with reproductive physiology. The secretion from apocrine glands is odourless but bacterial decomposition makes it odorous, secretion shows cyclic changes in females with the menstrual cycle. These glands are structurally similar to eccrine glands but are larger. Their coiled region lies within the subcutaneous tissue rather than the dermis.[15] In contrast to the eccrine glands, apocrine glands produce vicious, lipid-rich sweat comprising proteins, sugars, and ammonia. The third type of glands i.e., apocrine glands have been described by Sato et. al in 1987. These are intermediate in size and develop from both eccrine and apocrine glands. These are mainly located in the axillary part and don't play a significant role in thermoregulation.



Mechanism of secretion of sweat:

Though the eccrine glands are supplied by sympathetic fibres, adrenaline (epinephrine) has little or no action on them. The apocrine, however, responds to both adrenergic and cholinergic stimuli. Pilocarpine, which stimulates the parasympathetic fibers, increases the flow of sweat, and atropine which paralyses the parasympathetic endings, abolishes sweating.

Different types of sweating:

1. Insensible sweating: which occurs even in cold climates amounts to 600 – 800 ml daily.
2. Thermal sweating: This occurs in hot environmental temperatures, the threshold being 28°C for men and 31˚C for women. As the environmental temperature rises sweating increases. It is to be emphasized that when the ambient temperature is higher than the body temperature sweating is the only method of keeping the body temperature normal.
3. Psychic sweating:- Emotional sweating: In emotional conditions, sweating occurs chiefly in the palms, soles, and axilla and upto some extent it is also present at the head, neck, and elsewhere in the body.

In muscular exercise: The sweating i.e., both thermal and mental is reduced by cold, which at the same time also reduces cutaneous circulation. It is also reduced by dehydration which is the result of deprivation of fluids intake or due to the process of sweating itself.

Hot & spicy food intake: Eating spicy food stimulates sweating (gustatory sweating) because the pain in nerve endings in the mouth is stimulated. Hence reflect sweating on the forehead neck and face.

Composition of sweat -

Sweat mainly consists of secretions of the eccrine glands. It is the most diluted of all the animal fluids. When freshly collected, it contains epithelial cells and some sebum. When filtered, it forms a clear col-

ourless fluid. Human sweat has a specific gravity of about 1.001-1.006 and a pH of 3.8 to 6.5.

Table 1: Composition of sweat

Each 100 ml of sweat contains.

Water - 99.22- 99.74g
Solids - 1.174- 1.587g
Ash - 0.144- 0.566g
Creatinine - 0.1-1.3mg
Urea - 12-57 mg
Lactic acid - 285-336 mg
Carbolic acid - 2.8 mg
Sugar (as glucose) - 1-3 mg
Uric acid - 0.07-0.25 mg
Ascorbic acid(as a dehydroascorbic acid) - 70.5µg
Total nitrogen - 33.2mg
Nonprotein nitrogen - 27-64 mg
Amino acid N - 1.1- 10.2mg
Ammonia N - 5.9 mg
Urea N - 5-36 mg
Calcium - 1-8 mg
Iodine - 0.5-1.2 ug
Iron - 0.022-0.045
Chloride - 36-468 mg
Na+ - 24-312mg
K+ - 21-126mg
Sulphur - 0.7-7.4 mg
Cooper - 0.006mg
Amino acids - 43.62 mg

CONCLUSION

Understanding the concept of *mala* is an important step in the learning of *Kriya Sharir*. It enables scholars of *Ayurveda* to learn the normal physiology of the body to diagnose any illness related to it. Our study reveals that the concept of *Acharyas* in relation to mala as an important tool to gain specific knowledge seems true even in the present era. The present study also focused on a review regarding *sweda mala* which can also be correlated to sweat in contemporary science. Various aspect of *Sweda* is explored related to it such as its constitution, functions, *kshaya*, *vriddhi lakshana*, etc. Understanding *sweda mala* helps understand *twacha* and disease better which will help in the treatment and curing of patients.

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