

A REVIEW ARTICLE ON **RASA DHATU** IN AYURVEDA AND ITS COMPARISON WITH BLOOD PLASMA

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ABSTRACT

The humoral theory of health and causes of diseases was rejected due to discovery of circulation of blood by William Harvey. Even *Ayurveda* has had to face an unprecedented crisis to overcome the resistance faced by growing technological usage in the growth of modern medicine. This article tries to adjust the relation between *Ayurveda* and modern medicine. *Rasa dhatu* is an important *dhatu* that has a varied role in nourishment of the human body as well as all the other tissues of the body. *Rasa dhatu* functions and its various properties are in a way similar to modern day blood plasma. Literary Research for the review was taken from ancient *Ayurveda* Texts, modern medical books and the internet. On the basis of the above research it was concluded that '*Rasa dhatu* as the foremost *dhatu* is an important part of the human body. *Rasa dhatu* has many similarities with Plasma part of the blood'.

Keywords Humoral, Health, Disease, Technology, *Rasa Dhatu*, Plasma

INTRODUCTION: In modern Europe in the medieval ages *humoral* theory of diseases was quite prevalent. This theory was discarded due to the concepts of circulation of blood and the function of the heart published by William Harvey [1578-1657]^[1]. The above publication lead to widespread research in blood, further leading to its division into plasma and the blood^[2] and furthered the relevance of disease spread through blood. In *Ayurveda* the role of blood in causing diseases was discussed by Acharya Sushruth^[3] but it was stated that as blood is the life sustaining entity of every human being, it will not cause diseases by its own but by other factors [namely- *the tridoshas*] that will vitiate it.

Rasa dhatu according to *Ayurveda* is a very important component of the human body and is basically one of the *Sapta Dhatus* [tissues] that are supporting the human body structurally as well as

functionally. Also, *Rasa Dhatu* is quite similar to the modern day blood plasma.

MATERIAL AND METHODS

The literary references and discussions related to *Rasa Dhatu* from ancient and modern *Ayurveda* texts were compiled for the above review article.

Literary Review of *Rasa Dhatu*-

Rasa dhatu is formed after digestion of food and is also known as *Aahara Rasa*[*Vachaspati*]^[4].

According to Acharya Sushrutha 'Rasa' word is derived from 'Rasa Gatou'dhatu and it means that it is the entity in the human body that is continuously circulating^[3].

According to Acharya Sushrutha *Rasa dhatu* is formed after complete digestion of consumed food. The food that is consumed is *Panchabhautik* [formed from all five elements], is of four types [*Peyya, Lehya, Bhakshya, Bhojya*] , has six *Rasas* [*Madhura, Amla, Lavana, Katu, Tikta, Kashaya*], two potencies [*Dwividha-*

Veerya-Sheeta & *Ushna*] or eight potencies [*Asthavidha Veerya-Sheeta, Ushna, Snigdha, Ruksha, Picchila, Vishada, Mridu, Kathina*] and many other properties. This consumed food is acted upon by the *Jatharagni* and complete digestion is completed. After digestion the most important part that is beneficial to the body and provides nourishment to the whole body is known as *Rasa*^[3].

The characteristic features of *Rasa Dhatu* according to *Madhava Nidana* are that it is *Tejo Bhuta* [Lustrous], *Param Sukshma* [it is highly diffusible] and hence is known as *Rakta-Rasa* [the juice of blood]^[5].

The location of *Rasa Dhatu* according to *Acharya Sushrutha* is the heart and it circulates in the whole body through the 24 *dhamanis* [24 arteries], 10 *urdhwaga dhamani* [10 arteries going in the above direction], 10 *Adhoga Dhamani* [10 arteries going in the downward direction] and 4 *tiryak Dhamani* [4 going in other directions]^[3].

Bhel Samhita also states that the location of *Rasa Dhatu* is *Hridaya* [the heart]^[6].

According to *Charaka Samhita*, *Rasavaha Srotas* [*Rasa Dhatu* producing channels] has its roots in *Hridaya* [The heart] and *Dasha Dhamani* [10 arteries]^[7]. *Acharya Sushrutha* has also mentioned the same, except he mentioned *Rasavahi Dhamani* [arteries transporting *Rasa Dhatu*]^[3].

The causes of vitiation of *Rasavaha Srotas* have been mentioned by *Acharya Charaka* and they are- eating *Guru gunatmak* food [food having heavy property], *Sheeta* food [cold food], *Atisnidha* food [very unctuous food], *Atimatra* food [excessive eating] and

excess thinking [*chinta*] and mental stress [*Atichintan*]^[7].

According to *Acharya Sushrutha* *Rasa Dhatu* is a *Drava* [liquid] *dhatu* and it helps in the *Snehana* of the body organs [unctuousness or oiliness to the body organs], *Jivana* [provides sustenance of life], *Tarpana* [provides satisfaction of urges like thirst, etc.] and also *Dharana* [supports the body]. This *dhatu* is *Saumya* in nature^[3].

Rasa Dhatu helps in *Tushti* [satiation of hunger, thirst, etc.], *Preenan*^[8] [hydration] and nourishment of *Rakta Dhatu*^[3].

The circulatory nature of *Rasa dhatu* has been propounded by *Acharya Sushrutha* in a very thorough manner- he says that *Rasa dhatu* circulates in the body like- *Shabdasantanvat* [Circulation of sound waves], *Archisantanvat* [Circulation of fire] and *Jalasantanvat* [circulation of water]^[3].

The above terms have been explained by *Dalhana* and *Chakrapani* as- *Shabdasantanvat* means *Teeryaggamitva* [zig-zag motion- similar to oscillating sound waves], *Archisantanvat* means *Urdhwagamitva* [upward movement similar to that of flame] and *Jalasantanvat* means *Adhogamitva* [downward flow of water]^[3,9].

For circulation of *Rasa Dhatu* in the whole body, *Vyana vayu* plays an important role. *Vyana vayu* helps in circulation of *Rasa dhatu* simultaneously [*Yugpat*] and continuously [*Ajasra*] without stopping in the whole body and spreads the *Rasa dhatu* everywhere in the body^[7].

According to *Acharya Charak* when *Rasa dhatu kshaya* occurs following symptoms are seen in the human body- *Ghattate* means heaviness in the heart, intolerance to sound [*sahate shabdam na-*

ucchaihiih], *Hrudrava* means palpitation, *Hrudayam Tamyati* means pain in the retrosternal area on performing mild physical activities^[7].

According to *Ashtang Hridayam Samhita Rasa Dhatus Kshaya* leads to *Raukshya* [dryness], *Shrama* [exertional fatigue], *Shosha* [Emaciation], *Glaani* [Mental fatigue] and *Shabda-asahishnuta* [intolerance to sound]^[8].

When *Rasa Dhatus* increases in the body *Hrudayotkleda* [Nausea] and *Praseka* [excessive salivation] are seen in the human being^[3].

Ashtang Hridayam has stated that *Rasa dhatu vriddhi lakshanas* are similar to *Kapha Dosha vriddhi lakshanas* and they are as follows- *Agnisadana* [Decreased digestive power], *Praseka* [Excess salivation], *Alasya* [Laziness], *Gaurav* [heaviness in the body], *Shwaitya* [pale discoloration of the body], *Shaitya* [feeling of cold], *Shlathangatva* [looseness in the body parts], *Shwaasa* [Bronchial Asthma], *Kaasa* [Coughing] and *Atinidra* [Excess sleep]^[8].

Rasa Kshaya should be treated by administering medications having properties similar to *Rasa Dhatus*^[3].

Rasa Vriddhi should be treated by *Langhana Chikitsa* [treatment that involves various types of fasting techniques as well as administration of medications that cause healthy decrease in body weight and improved digestive power]^[7].

Acharya Charak has described diseases caused due to vitiation of *Rasa Dhatus* and they are as follows- *Ashraaddha* [Anorexia], *Aruchi* [loss of interest in food], *Asyavairasya* [Asymmetry of Gustatory function], *Arasagnyata* [Loss of gustation], *Hruhhlas* [Nausea], *Gaurav* [Heaviness in the body], *Tandra*

[Lethargy/Somnolence], *Angamarda* [Generalized body ache], *Jwara* [Pyrexia], *Tama* [Temporary loss of vision], *Panduta* [Pale appearance of skin/anaemia], *Srotasaavarodha* [obstruction of secretory channels in the body], *Klaibya* [Impotence], *Saada* [Dis-spiritedness], *Krushangata* [Emaciation], *Agninasha* [loss of digestive power], *Ayathakala* *Valaya* [wrinkles in early age], *Ayathakala* *Palitya* [greying of hair in early age]^[7].

Pramana or quantity of *Rasa Dhatus* is 9 *anjali* [about 1700gm]^[7].

When the *Rasa Dhatus* is in a very pristine form in an individual, the individual will show features of *Rasa Dhatusarata* that is known as *Twaksarata*. A person with *Twaksarata* will show great characteristics in the body like- his/ her skin will be *Singdha* [unctuous], *Shlakshna* [Smooth], *Mridu* [Soft], *Prasanna* [Clean & clear]. Features like *Sukshma loma* [very fine body hairs], *Alpa loma* [very little amount of body hairs], *Gambhira Loma* [deeply rooted body hairs], *Sukumar Loma* [delicate body hairs] will be seen. Also, the skin will be very lustrous. Due to these features the *twaksara* individual is *Sukhi* [happy in life], *Saubhagyavana* [has all necessary material needs], *Aishwaryavana* [wealthy], *Upabhogvana* [is able to satisfy all his/her needs in life], *Buddhi* [is decisive], *Vidyavana* [interested in pursuing various study courses], *Praharshana* [is of jolly nature] and is *Ayushyavana* [lives a long & contented life]^[7].

Also Acharya *Sushrutha* has stated that *Twaksara* individual has skin and body hairs that are clean and clear and soft in nature^[3].

Comparison between *Rasa Dhatus* and Blood Plasma-

Rasa Dhatus is formed from digestion of food^[3], while Plasma contains 92% water and 1 & solute part that is formed from digested food and absorbed by the intestinal tract^[10].

Rasa Dhatus is known as *Raktarasa*^[5], which means it is a part of *Rakta Dhatus*, i.e. blood. Plasma is also a part of blood^[11].

Rasa Dhatus is the clear, liquid part of *Rakta Dhatus*^[3,5] and plasma is also the clear liquid part of blood^[11].

Rasa Dhatus is that part of *Rakta Dhatus* which is continuously circulating in the whole body^[3] and plasma in the blood is the liquid extracellular matrix mostly composed of water that circulates the formed elements and dissolved materials throughout the cardiovascular system^[10].

The major role of *Rasa Dhatus* is nourishment^[3], while that of plasma is also nourishment of the body^[12, 13].

The quantity of *Rasa Dhatus* is 9 anjali [about 1700gms]^[7], while plasma is 55% of blood [about 2750ml]^[12, 13].

RESULT AND DISCUSSION

From the above discussion it can be scientifically said that *Rasa Dhatus* described in Ayurveda is a very important element of the body and is essential for the nourishment and growth of the body. This *dhatu* is continuously circulating in the body and is helping the body maintain proper hydration that is necessary for all the necessary activities of life. On comparing with Plasma, it can be said that *Rasa Dhatus* has many similarities with Plasma. New additions in terms of plasma proteins and other solutes is necessary and should be used by Ayurveda physicians for understanding the core concepts of disease formation. *Hridayotkleda* [accumulation of *Kleda* or excess *Rasa Dhatus* in the heart] is a feature of *Rasa Dhatus vruddhi*, while

Congestive Cardiac Failure is the feature of Hypervolemia. Such features establish that ancient Ayurveda physicians were the pioneers of medicine and it is time Ayurveda physicians realize and use modern technology to enhance and explore their true potential.

Conclusion

Rasa Dhatus as the foremost *dhatu* is an important part of the human body. *Rasa Dhatus* has many similarities with Plasma part of the blood. The use of new technology is essential for understanding our concepts in a more radical manner, so that the *Shashvatatva* of our science is maintained for eternity. Thus, from the above discussion we can truly conclude that *Rasa Dhatus* is very similar to Plasma part of blood in its constitution as well as functions.

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