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“AYURVEDIC PERSPECTIVES OF RAKTA DHATU NIRMANA”

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ABSTRACT:

Seven *Dhatu*s have been described in contexts of *Ayurveda*. *Rasa* is first *Dhatu* and *Rakta* is second one. Blood is a connective tissue which is in liquid form. *Rasa* and *Rakta Dhatu* collectively may be considered as blood. But the difference of opinions exists. Modern medicine also describes the blood as Fluid of life for its function of carriage of oxygen and carbon dioxide to and from the tissues respectively. *Ayurveda* scientists described the concept of *Rakta Dhatu* in details which seems to be a broader concept as compared to the concept of blood described by modern scientists. Again the concept of *Rakta Dhatu* involves both circulatory and haemopoietic components, where as modern scientists described both these components separately. The article reviews the *Rasa Rakta Dhatu Nirmana Prakriya*, *Rasa* and *Rakta Dhatu* comparison with the concept of blood and difference in opinions forwarded by different *Acharyas* of *Ayurveda*.

Key words: *Rakta Dhatu*, *Rasa Dhatu*, *Ayurveda*, *Sapta Dhatu*

INTRODUCTION:

*Tri Dosha*¹ (*Vata, Pitta and Kapha*), *Sapta Dhatu*² (*Rasa, Rakta, Mamsa, Meda, Asthi, Majja, Shukra*), *Tri Mala* (*Mutra, Purisha and Sweda*), *Agni*³ and *Srotasa*⁴ are some of the basics of Ayurvedic physiology. Seven *Dhatu*s have been described in contexts of *Ayurveda*. *Rasa* is first *Dhatu* and *Rakta* is second one⁵. Blood is a connective tissue which is in liquid form. *Rasa* and *Rakta Dhatu* collectively may be considered as blood. But the difference of opinions exists. Both are liquid and stay in continuous circulation in circulatory passages. Their *Pramanas* are also described in *Anjali Pramana*⁶ by ancient *Acharyas*. *Rasa* is formed after complete digestion of food i.e. after *Vipaka*, and due to its continuous circulation it is called *Rasa*⁷. The function of *Rasa* is *Preenana*⁸ i.e. nutrition. *Rakta Dhatu* is considered as vital *Dhatu* amongst all since it is described as one of the *Pranayatana*⁹ (seats of *Prana*). Modern medicine also describes the blood as fluid of life because it carries oxygen from lungs to tissues and carbon dioxide from tissues to lungs. While in circulation it stays mixed with *Rasa Dhatu*. If we separate *Rasa Dhatu* i.e. plasma, the remaining part can be termed as *Rakta Dhatu*.

AIMS AND OBJECTIVES:

- To review the actual term wise difference between the *Rasa* and *Rakta Dhatu*.
- To review various opinions forwarded by ancient *Acharyas* regarding the difference between *Rasa* and *Rakta Dhatu*
- To compare the Ayurvedic and modern aspects regarding the concept of *Rasa -Rakta*.
- To study *Rakta Dhatu Nirmana* as per various *Acharyas* with respect to its *Parinamana*.
- To study the role of *Majja Dhatu* in the process of Hemopoiesis.
- To review aspect of *Srotasa* and *Mool Stahanas* of *Rakta Dhatu* regarding the *Nirmana Prakriya*

LITERATURE REVIEW:

As per *Acharya Susruta*, *Rakta Dhatu* is formed from *Jaleeya* (watery) *Rasa Dhatu* by the action of *Tejasa*¹⁰ (*Ranjaka Pitta*) present in body. *Rakta* formed is unvitiated, clear and colored fluid.

Ranjaka Pitta transforms *Rasa Dhatu* into *Rakta Dhatu* by *Ranjana Karma* so called *Ragkrita Pitta*. As per *Acharya Charaka*, *Prana* stays in *Rakta Dhatu*¹¹. Here *Prana* means oxygen. Oxygen is transported to body cells by binding with hemoglobin of RBCs.

Acharya Chakrapani, described the circulation of *Rasa Dhatu* by the action of

Vyana Vayu. Here he explained the term *Rasa Dhatu* as *Drava Dhatu* and so the *Rakta* also is *Drava*¹². From this consideration, it is clear that *Rasa* includes all circulating fluid in body including *Rakta*.

As per *Susruta Rakta Dhatu* is also responsible for increase or decrease¹³ of other *Dhatu*s because blood supplies nutrition to all other *Dhatu*s and if it is deprived, proper nutrition may not be carried out of other body tissues. Ischemia, hypoxia ultimately results in tissue deaths. Hence nutritional status of all tissues depends upon status of *Rasa Rakta Dhatu*. *Rakta Dhatu* plays an important role of *Jeevana*¹⁴ i.e. sustenance of life. In practice we see that acute blood loss more than 10-15% may lead to hypovolemic shock which is fatal one.

Rakta Dhatu Nirmana:

Here are some opinions forwarded by *Acharyas* of *Ayurveda*:

We know that, all *Dhatu*s are nourished by *Ahara rasa*. Nourishment also takes place by preceding *Dhatu*. In this way, *Rakta Dhatu* gets nourished by *Sukshma Bhaga* of *Rasa Dhatu*.

1. *Acharya Susruta*¹⁵ explained: The *Pitta* residing in liver and spleen, does the process of coloration of *Rasa* and turns it into *Rakta*, so called process of *Ranjana*. And the type of *Pitta* is described as *Ranjaka Pitta*. Whole nutrients required

for synthesis of blood cells are taken from *Rasa Dhatu*, liver produces Haem, clotting factors, plasma proteins, vitamin B12 and folic acid and are stored in liver.

2. *Acharya Charaka*¹⁶ described: *Teja* of *Rasa* in human being with heat of *Pitta* acquires red color, brings redness to *Rasa* and *Rasa* is transformed into *Rakta*.

3. *Acharya Vagbhata*¹⁷ explained it very differently: *Acharya Vagbhata* has mentioned stomach as the site of *Rakta Dhatu* formation including erythropoiesis, which is responsible for coloration of *Rasa*. It means that he already knew the role of stomach in *Rakta Dhatu nirmana* including erythropoiesis. As per modern opinion, intrinsic factor¹⁸ is synthesized by parietal cells of stomach which is required for the vitamin B12 absorption which in turn required for synthesis of RBC precursors in bone marrow.

4. *Acharya Harita*¹⁹ commented regarding transformation of *Rasa Dhatu* to *Rakta Dhatu*, he described the duration as seven days, each day is having a different color:

1st Day: *Shweta* (White)

2nd Day: *Kapota*

3rd Day: *Harita* (Greenish)

4th Day: *Haridra*

5th Day: *Padma*

6th Day: *Kinshuka*

7th Day: *Aalakta* (Dark Red)

Role of *Majja Dhatu* in Hemopoiesis:

Majja is present in cavities of large bones. *Sarakta Majja* i.e. red bone marrow is present in small bones. At the time of birth, all marrow is red but as age increases some of the marrow is converted into yellow marrow. Red bone marrow remains present in vertebrae, ribs, sternum, cranium and upper parts of long bones. Red bone marrow is precursor of hemopoiesis. *Acharya Susruta* has used the term: Sarvang-Netra-Gauravam²⁰ i.e. heaviness in eyes and body parts. In *Ashtang Sangraha*, *Rakta-Gauravam*²¹ is mentioned as feature of *Majja Vriddhi*. *Rakta Gaurav* indicates increased blood viscosity which may be seen in polycythemia. Again, the features of *Majja Pradoshaja Vikara*²² (disorders of *Majja Dhatu*), include *Moorchcha* (fainting) , *Bhrama* (dizziness), *Timira Darshana* (perception of darkness) resembles the symptoms of anemia occurring due to disorders of blood or decreased blood volume.

This all signifies the *Sukshma vigyana* possessed by our *Acharyas*, which should be explored sensibly and wisely.

Role of Srotasa:

Rasavaha Srotasa Mool (origin) is *Hridaya* and *Rasavahi Dhamanya*²³. *Hridaya* is reservoir of blood and pumps the blood to be circulated in the *Dhamanyas*. *Raktavaha Srotasa Mool* is *Yakrita* (liver) and *Pleeha* (spleen),

Raktavahi Dhamanya as per *Acharya Susruta*²⁴. The role of liver in erythropoiesis is well known. RBCs are produced in liver and spleen in between 3rd to 5th month of intrauterine life. Liver stores some important factors like vitamin B12, folic acid and iron required for the maturation of blood cells. *Acharya Susruta* considered liver and spleen and *Dhamanya* as *Raktavaha srotasa mool*. It means that *Raktavaha Srotasa* includes both haemopoietic as well as cardiovascular components. As per *Acharya Chakrapani*, *Mool Sthana* is *Prabhavsthana*²⁵ means *Mool* may be anatomical seat or it may be site of manifestation of disease related to that *srotasa* or it may be site of progression of disease related to that *Srotasa*. *Pandu*, *Tandra*²⁶, *Bhrama*, *Angamarda*²⁷ are some of the symptoms of *Rasa Pradoshaja Vikara* which are symptoms of anemia.

DISCUSSION AND CONCLUSION:

1. Rakta Dhatu in Ayurveda seems to be broader concept and involves all the components which are later described by modern physiologists separately.
2. The Acharyas of the Ayurveda very sensibly described their knowledge, even it is still found very relative when compared to the concepts described by modern scientists.
3. The concept of Rakta Nirmana Prakriya is described by various Acharyas of Ayurveda and has multiple opinions which

are to be correlated to the modern opinions.

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