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To Study the Anatomical Aspect of Raktavaha Srotas W.S.R to its Moolasthana as Per Ayurveda and Modern Science

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ABSTRACT

Srotas means body channels which are supposed to be an important entity of the body and is responsible for the transferring *(Vahana)* of *Dosha*, *Dhatu* etc. Full body is considered as *Srotomaya* i.e made of *Srotas*. These *Srotas* are very closely associated with their respective *moolasthana*. These *Moolsthana* are very important from treatment and prognostic aspect as its involvement in the formation, examination and control over the *Bhavapadartha* flowing through the *Srotasa*. The Rakta dhatu (blood) which is also referred as fourth *Dosha* by *Ayurveda,* is one of the important functional element of body of which formation, transformation and conduction is carried out by *Raktavaha Srotas*. The root of *Raktavaha Srotas* is considered as *Yakrut* (Liver) and *Pleeha* (Spleen). Injury to *Raktavaha Srotas* leads to Cyanoses, Fever, Anemia, hemorrhage, reddish discoloration of eyes. *Raktavaha Srotas* gets vitiated by consumption of spicy food and drinks, junk food & hot food stuffs and beverages, excessive consumption of liquids, excessive exposure to sunlight & wind. The characteristic manifestation of the vitiation of *Raktavaha Srotas* leads to different types of Skin disorders, abscess formation,Jaundice(*kamala*),*yakritvriddhi* (hepatomegaly),*pleeha vriddhi*(splenomegaly).

Keywords: Srotas, Moolasthana, Dosha, ,Yakrit, Pleeha Bhavpadartha, Raktavaha Strotas.

INTRODUCTION

Ayurvedic classics proclaim “Srotomayam hi shariram” means that living body is a channel system and/or is comprised of innumerable channels which are designed as inner transport system for divergent function, gross and subtle, biological and energetic. Body-mind-spirit organization has as many as Srotamsi the number of life factors operating in the life process- Yawantah Purushe Murtimanto Bhavavisheshah Tavantevasmin Srotasam Prakara Visheshah.[3] Ordinarily the word Srotas is used as a generic term indicating all the macro and micro channels and pathways operating in the living organism. The word Srotas is derived from Sanskrit root- “Sru- gatau” (Sru + tasi = Srotas) which means moving, filtering, flowing, leaking, secreting etc. Charak has defined it as “Sravanata Srotamsi” means the structure through which Sravanam takes place. Chakrapani has explained that Sravarnat means Sravanam of Rasadi Poshya Dhatu. The term Srotas means channels or systems in which some tissue is formed; some material is metabolized, secreted or transported. Charak has described that Srotamsi are channels which transport the Dhatus (Asthayi or Poshya Dhatu) which are subjected to transformation. Acharya Sushruta and Vagbhat both have compared Srotas to the extremely fine passages and pores present in the lotus stem, through which Rasadi Poshya Dhatu circulate all over the body and provide nutrition to body.[1],[2] According to

Vagbhat in Ashtanghridaya Sharirsthana mention two types of Srotas that is Abhyantar Srotas and Bahya Srotas. Acharya Charaka has described Srotas in Vimanasthana Chapter 5 (Srotovimaniya Adhyaya) in detail but he gave incisive definition of Srotas in Sutrasthana chapter 30 (Arthedasamahamulia) as Sravanat Srotansi, means the organ which differentiate it from Sira, Dhamani. The number of Srotas is that much as the number of Specific structures present in the body of Purusha. The term Moola is used in different meaning in ancient Indian Literature. Acharya Charaka has used this term in meaning of Karan or Adhara means reason or base. In Sushrut Samhita & Ashtanng Hridaya, Moola word has been used as tracer, director or prob. In broad term Moolasthana means Utpattisthana (seat of origin of Dhatu and Mala), Sangrahasthana (Seat of storage) Naidaniksthama (diagnostic importance), Chikitsatmaksthana means important in treatment. Among the list is given of Srotas prime importance is given to Raktavahavaha Srotas. The word meaning of Raktavaha Srotas signifies that, the channel through which Rakta flows can be considered as the Raktavaha Srotas. The root of Raktavaha Srotas is considered as Yakrut (Liver) and Pleeha (Spleen). Injury to Raktavaha Srotas leads to Cynosis, Fever, Anemia, hemorrhage, reddish discoloration of eyes.[5] Raktavaha Srotas gets vitiated by consumption of spicy food and drinks, Unctuous & hot food stuffs and beverages, excessive consumption of liquids, excessive exposure to sunlight & wind. The characteristic manifestation of the vitiation of Raktavaha Srotas leads to different types of Skin disorders, abscess formation, Jaundice.[4] Anatomical understanding of blood is required for the better understanding of Mula Sthana of Raktavaha Srotas. Formation of blood in fetus in early stages is under Yolk sac, from 3rd – 5th month formation of blood is under the control of liver and spleen hence it's called as hepatic phase and later bone marrow takes the function of formation of blood. Erythropoiesis, the production of RBCs, starts in the red bone marrow with a precursor cell called a proerythroblast. The proerythroblast divides several times, producing cells that begin to synthesize hemoglobin. Ultimately, a cell near the end of the development sequence ejects its nucleus and becomes a reticulocyte. Loss of the nucleus causes the center of the cell to indent, producing the red blood cell's distinctive biconcave shape. Reticulocytes retain some mitochondria, ribosomes, and endoplasmic reticulum. They pass from red bone marrow into the bloodstream by squeezing between the endothelial cells of blood capillaries. Reticulocytes develop into mature red blood cells within 1 to 2 days after their release from red bone marrow. Normally, erythropoiesis and red blood cell destruction proceed at roughly the same pace. If the oxygen-carrying capacity of the blood falls because erythropoiesis is not keeping up with RBC destruction, a negative feedback system steps up RBC production. The controlled condition is the amount of oxygen delivered to body tissues. Cellular oxygen deficiency, called hypoxia, may occur if too little oxygen enters the blood. For example, the lower oxygen content of air at high altitudes reduces the amount of oxygen in the blood. Oxygen delivery may also fall due to anemia, which has many causes: Lack of iron, lack of certain amino acids, and lack of vitamin B12 are but a few. Circulatory problems that reduce blood flow to tissues may also reduce oxygen delivery. Whatever the cause, hypoxia stimulates the kidneys to step up the release of erythropoietin, which speeds the development of proerythroblasts into reticulocytes in the red bone marrow. As the number of circulating RBCs increases, more oxygen can be delivered to body tissues. Premature newborns often exhibit anemia, due in part to inadequate production of erythropoietin. During the first weeks after birth, the liver, not the kidneys, produces most EPO. Because the liver is less sensitive than the kidneys to hypoxia, newborns have a smaller EPO response to anemia than do adults. Because fetal hemoglobin (hemoglobin present at birth) carries up to 30% more oxygen, the loss of fetal hemoglobin, due to insufficient erythropoietin production makes the anemia worse.[7] Red blood cells live only about 120 days because of the wear and tear their plasma membranes

undergo as they squeeze through blood capillaries. Without a nucleus and other organelles, RBCs cannot synthesize new components to replace damaged ones. The plasma membrane becomes more fragile with age, and the cells are more likely to burst, especially as they squeeze through narrow channels in the spleen. Ruptured red blood cells are removed from circulation and destroyed by fixed phagocytic macrophages in the spleen and liver, and the breakdown products are recycled, as follows: Macrophages in the spleen, liver, or red bone marrow phagocytize ruptured and worn-out red blood cells. The globin and heme portions of hemoglobin are split apart. Globin is broken down into amino acids, which can be reused to synthesize other proteins. Iron is removed from the heme portion in the form of Fe3_, which associates with the plasma protein transferrin, a transporter for Fe3_ in the bloodstream. In muscle fibers, liver cells, and macrophages of the spleen and liver, Fe3_ detaches from transferrin and attaches to an iron-storage protein called ferritin. Upon release from a storage site or absorption from the gastrointestinal tract, Fe3_ reattaches to transferrin. The Fe3_–transferrin complex is then carried to red bone marrow, where RBC precursor cells take it up through receptor-mediated endocytosis for use in hemoglobin synthesis. Iron is needed for the heme needed for the globin portion. Vitamin B12 is also needed for the synthesis of hemoglobin. Erythropoiesis in red bone marrow results in the production of red blood cells, which enter the circulation. When iron is removed from heme, the non-iron portion of heme is converted to biliverdin, a green pigment, and then into bilirubin, a yellow orange pigment. Bilirubin enters the blood and is transported to the liver. Within the liver, bilirubin is released by liver cells into bile, which passes into the small intestine and then into the large intestine. In the large intestine, bacteria convert bilirubin into urobilinogen. Some urobilinogen is absorbed back into the blood, converted to a yellow pigment called urobilin and excreted in urine. Most urobilinogen is eliminated in feces in the form of a brown pigment called stercobilin, which gives feces its characteristic color.[6]

AIMS AND OBJECTIVE

To study the anatomical aspect of Raktavaha Srotas Moolasthana as per Ayurveda and modern science.

OBJECTIVE

Tstudy raktavaha strotas and its moolasthana from Ayurveda as well as modern text to make it helpful for diagnosis & treatment of various diseases**.**

MATERIALS AND METHODS

Literary review of Sharir Rachanatmak aspect of Raktavaha Srotas Moolasthana from Ayurvedic & Modern science texts in detail.

DISCUSSION

To know the Rachana Sharir (Anatomy) of Raktavaha Srotas their Moolasthana is considered. Both Charaka & Vaghbhata considered Yakrit (Liver and Pleeha (Spleen) but Sushrut has described Yakrit, Pleeha and Raktavahhi Dhamani as Moolasthana. Raktavahi Dhamanis are none other than blood vessels means arteries, veins & capillaries. Injury to Raktavaha Srotas leads to Cyanosis, Fever, Anemia, Hemorrhage, reddish discoloration of eyes. Raktavaha Srotas gets vitiated by consumption of spicy food and drinks, Unctous & hot food stuffs and beverages, excessive consumption of liquids, excessive exposure to sunlight & wind. The characteristic manifestation of the vitiation of Raktavaha Srotas leads to different types of Skin disorders, abscess formation, Jaundice. Formation of blood in fetus in early

stages is under Yolk sac, from 3 rd - 5th month formation of blood is under the control of liver and spleen hence it's called as hepatic phase and later bone marrow takes the function of formation of blood. Red blood cells live only about 120 days because of the wear and tear their plasma membranes undergo as they squeeze through blood capillaries. Without a nucleus and other organelles, RBCs cannot synthesize new components to replace damaged ones. The plasma membrane becomes more fragile with age, and the cells are more likely to burst, especially as they squeeze through narrow channels in the spleen. Ruptured red blood cells are removed from circulation and destroyed by fixed phagocytic macrophages in the spleen and liver, and the breakdown products are recycled. Liver and spleen plays a major role life cycle of RBC, its destruction and recycling of components. Macrophages in the spleen, liver, or red bone marrow phagocytize ruptured and worn-out red blood cells. The globin and heme portions of hemoglobin are split apart. Globin is broken down into amino acids, which can be reused to synthesize other proteins. Iron is removed from the eme portion in the form of Fe3_, which associates with the plasma protein transferrin, a transporter for Fe3_ in the bloodstream. In muscle fibers, liver cells, and macrophages of the spleen and liver, Fe3_ detaches from transferrin and attaches to an ironstorage protein called ferritin. Upon release from a storage site or absorption from the gastrointestinal tract, Fe3_ reattaches to transferrin.The Fe3_–transferrin complex is then carried to red bone marrow, where RBC precursor cells take it up through receptor-mediated endocytosis for use in hemoglobin synthesis. Iron is needed for the heme needed for the globin portion. Vitamin B12 is also needed for the synthesis of hemoglobin. Erythropoiesis in red bone marrow results in the production of red blood cells, which enter the circulation. Considering above aspect Yakrut (Liver) and Pleeha (Spleen) are considered as moolasthana (roots) of Raktavaha Srotas.

CONCLUSION

Anatomicaly the Srotas are the tubular channels originating from the root space, spread within the whole body to acts as a transport system for the fulfillment of nutritional needs of organism. Raktavaha Srotas from its Utpattisthana we can compare with Haemopoietic system. From the Sangrahasthane come to know liver and spleen act as reservoir of blood and from the Vahansthan we can also compare with the circulatory system of the body and also the ruptured red blood cells are removed from circulation and destroyed by fixed phagocytic macrophages in the spleen and liver, and the breakdown products are recycled. Liver and spleen plays a major role life cycle of RBC, its destruction and recycling of components. Considering above aspect Yakrut (Liver) and Pleeha (Spleen) are considered as roots of Raktavaha Srotas.

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