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A correlative study of *Shosha*, As a '*Rasavaha Srotovidda Lakshana*' with emaciation caused by '*Short Bowel Syndrome*'

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ABSTRACT

Human body is made up of numerous channels of transportation through which the *Dhatu*s circulate. These channels are termed as '*Srotas*'. The concept of *Srotas* is explained very scientifically and distinctly in *Ayurvedic* texts. It is stated that, any corporeal entity do not arise or decay without the *Srotases*. There are divergent opinions regarding the number of *Srotas*. *Charaka* has explained 13 *Srotas* while *Sushruta* has mentioned 11 pairs of *Srotas*. *Rasavaha Srotas*, as explained by both the *Acharyas*, has its root in *Hridaya* and *Rasavaha Dasha Dhamani*. This particular *Srotas* is concerned with the absorption of *Ahararasa* and nourishing the subsequent *Dhatu*s. When the *Srotas* is vitiated due to various causes, the nutrition to the subsequent *Dhatu*s is disturbed, which may lead to the depletion of *Dhatu*s resulting into *Shosha* i.e., emaciation. The '*Short Bowel Syndrome*' is a disorder clinically defined by malabsorption, diarrhoea, steatorrhoea, malnutrition as well as fluid and electrolyte disturbances. All these conditions give rise to the malnourishment leading to the condition called 'emaciation'. The clinical findings of emaciation resemble the signs and symptoms of *Shosha* explained in *Ayurveda* as a *Viddalakshana* of *Rasavaha Srotas*. Since the malabsorption is a common finding in both, the disorder emaciation can be correlated with *Shosha*. In this article, an attempt has been made to establish the co-relation between the *Shosha* due to the vitiation or injury to *Rasavaha Srotas* with its applied aspects.

Key words: *Rasavaha Srotas, Shosha, Srotodusti, Small Intestine, Ischemia, Resection, Malabsorption.*

INTRODUCTION

Ayurveda is an ancient Indian practice of holistic medical science which largely stresses on the equilibrium of *Dosha, Dhatu* and *Mala* in order to lead the healthy life. Although, to attain such equilibrium it is very important that these bodily elements should continuously be transported and circulated throughout the body. *Srotas* play a major role in transporting

various components from one part of the body to the other.

The word *Srotas* is etymologically derived from the *Sanskrit* root '*Sru-Sravane*' which has divergent meanings - exudation, oozing, filtration, permeation, to flow and to move etc. *Srotas* are the channels or tubular structures through which '*Sravana Karma*' i.e., flowing, moving, oozing and permeation of different constituents and nutrients of the body take place. *Srotas* perform the function of transportation in the body. Proper functioning of these *Srotas* is necessary to maintain the health and wellbeing of an individual. The *Srotas* mentioned by *Acharyas* can be correlated with various body channels transporting numerous objects throughout the body. Any obstruction in these body channels causes several diseases in the body. Hence, to understand the disease process and develop a cure for the same, there is a need to study the fundamental concept of *Srotas* in relation to various body channels.

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Srotases are not only the channels but also serve as inner transport system of the body which is the main site for the activities of other bodily elements like *Dosha, Dhatu, Mala* and *Agni* etc. There are many numbers and types of *Srotas* mentioned by different *Acharyas*. *Charaka* has explained *Srotas* from clinical view while *Acharya Sushruta* has described *Srotas* in relation with the surgical aspect.

Rasavaha Srotas

Rasavahe Dwe Tayormoolam Hridayam Rasavahinyascha Dhamanyaha, Tatra Viddasya Shoshaha Pranavahaviddhavachcha Maranam Tallingaani Cha | Su.Sha.9/12

Rasavahanaam Srotasam Hridayam Moolam Dasha Cha Dhamanyaha | Ch.Vi.5/8

Acharya Sushruta explains *Rasavaha Srotas* are two in number and have their root in *Hridaya* and *Rasavaahi Dhamanis*.^[1] *Acharya Charaka* also opines the same and describes as *Rasavaha Srotas* possess its root at the *Hridaya* and *Dasha Dhamanis*.^[2]

Rasavaha Srotodushti Lakshana

Acharya Charaka referred the symptoms caused due to deranged *Rasavaha Srotas* as *Rasapradoshaja Roga* and explained in *Vividhasitavitiya Adhyaya* of *Sutrasthana*. It includes *Ashraddha, Aruchi, Mukhavairasya, Jwara, Pandu, Klaibya* and *Krishangata*.^[3] *Sushruta* explains the impaired *Rasavaha Srotas* causes *Shosha*, the symptoms same as that of *Pranavaha Srotavidhha* and even to the death.^[1]

Short Bowel Syndrome

The surgical resection of a part of the intestine as a result of any underlying pathology develops a condition called "Short Bowel Syndrome" where the absorption of fats, proteins and other nutrients is hampered. This symptom complex occurs after the massive small bowel resection i.e., when more than 70% of the bowel is removed. This condition is also referred as "Short Gut Syndrome"^[4]

Causes of Short Bowel Syndrome

The most common causes of Short Bowel Syndrome include Crohn's disease, radiation enteritis, mesenteric

vascular ischemia, trauma and recurrent intestinal obstruction.

Any surgery on the small intestine and structural abnormalities sometimes can cause blind loops as well. A number of medical conditions can lead to bacterial overgrowth, including Crohn's disease, scleroderma and diabetes which can slow the rate at which food moves through the intestine. Massive resection is done for a necrotic, perforated, unhealthy bowel which results in 'Short Gut Syndrome'. Superior mesenteric artery being an end artery, thrombosis at its origin is invariably fatal.^[5]

The final common etiological factor in all the causes of Short Bowel Syndrome is the functional or anatomical loss of extensive segments of small intestine so that absorptive capacity is severely compromised. Massive small intestinal resection compromises digestive and absorptive processes. Common symptoms of malabsorption are impaired digestion, impaired absorption and impaired transport. Adequate digestion and absorption cannot take place and proper nutritional status cannot be maintained in these conditions. This causes anorexia, severe dehydration, muscle wasting and finally weight loss.^[6]

Pathophysiological effects of Short Bowel Syndrome

It depends on the extent of resection, site of resection, presence/absence of ileo-caecal valve and age of the patients. Patients with less than 100cm of the small bowel will develop severe nutritional deficiencies and may require parenteral nutrition.^[7]

Outcome of Short Bowel Syndrome

Severe malabsorption, severe dehydration, water and electrolyte imbalance, recurrent bacterial enteritis, osteomalacia and diarrhoea.^[8]

Complications

A blind loop can trigger an escalating series of problems, including:

Poor absorption of fats

As the bacteria in the small intestine break down (deconjugate) the bile salts needed to digest the fats, the fat in food as well as the fat-soluble vitamins A, D,

E and K aren't well absorbed. This leads to diarrhoea and often to steatorrhea.

Vitamin B-12 deficiency (macrocytic anaemia)

Vitamin B-12, which is essential for the normal functioning of nervous system and the production of blood cells, is not properly absorbed in the small intestine. Low levels of vitamin D affect the body's ability to absorb calcium, which can lead to weakened bones.

Damage to the intestinal lining: Bacterial overgrowth harms the mucous lining of the small intestine. It means, most nutrients including carbohydrates and proteins are poorly absorbed leading to serious nutritional deficiencies.

Anaemia: Iron, Vitamin B₁₂ and Folate deficiency due to mucosal disease in small intestine leads to anaemia and is represented by koilonychia and hyperpigmentation.^[9]

DISCUSSION

Rasavaha Srotas has its root in *Hridaya* and *Rasavaha Dasha Dhamani*. It performs vital functioning of the body related to circulatory process and absorption of the nutrients. The food after undergoing the process of digestion converted into *Ahararasa*. It is the main source of nutrients in the body. It circulates throughout the body along with the blood, as blood plays a significant role as a transporting media. Since the blood is pumped from the heart and along with it *Ahararasa* also circulates, it can be justified that the *Hridaya* will invariably form the root of *Rasavaha Srotas*. The *Rasavaha Srotas* originated from the *Hridaya* connected to all over the body through *Dhamanis*. These *Dhamanis* convey *Rasa* to all over the body through the pumping action of the *Hridaya*.

Any physiological disturbances to the functioning of this *Srotas* may lead to some pathological manifestation. The vitiated *Rasavaha Srotas* due to various causes may hamper the absorption of nutrients to the subsequent *Dhatu*, which may lead to the depletion of *Dhatu* resulting into the clinical manifestation resembling with the *Shosha* i.e., emaciation.

Both *Charaka* and *Sushruta* have explained *Shosha* or *Krishangata* as a common symptom of *Rasavahasrotodusti*. *Sushruta* has mainly emphasized *Shosha* as a *Srotovidda Lakshana*, while *Charaka* opined *Krishangata* as a *Rasapradoshaja Vikara*.^[10] Both the opinions seem to be more accurate here, as the *Rasavaha Srotas* is mainly related with nourishment of the *Dhatu*. Any derangement in the *Srotas* definitely interrupts the normalcy of the *Dhatu* leading to the under nutrition.

Not all patients with loss of significant amounts of small intestine develop the short-bowel syndrome. Important co-factors that help to determine whether the syndrome will develop or not include, the premorbid length of small bowel, and the segment of intestine that is lost, the age of the patient and the presence or absence of the ileo-cecal valve. If it is difficult to save the required length of the bowel during resection, it results in the short-bowel syndrome. The average length of the adult human small intestine is approximately 600cm. Any disease, traumatic injury, vascular accident, or any other pathology that leaves less than 200cm of viable small bowel or loss of 50% of the small intestine places the patient at risk for developing short-bowel syndrome.

Short Bowel Syndrome not only leads to malabsorption but also causes diarrhoea and steatorrhea when the resection is more than 100cm in the distal ileum. It then causes deficiency of Vitamin A, D, E and K. Removal of ileo-caecal valve reduces the intestinal transit time that reduces absorption of Vit B₁₂, calcium, magnesium and zinc.^[11] All these conditions result in the poor nutrition to the body tissues and manifest into the emaciation.

CONCLUSION

The understanding of applied aspect and co-relative study of *Srotases* is very much essential for a clinician along with its usual anatomy. The diagnosis and treatment in *Ayurveda* are built on the fundamental principles like how the *Srotas* are vitiated and what symptoms they exhibit.^[12] *Rasavaha Srotas* is the main channel system, as it nourishes the *Rasadhatu*, thereby nourishing all subsequent *Dhatu* in the body. So, any

disturbances in its functionality of the *Srotas* will affect the nutritional status of the body. When this condition progresses, may lead to depletion of all the *Dhatus* in the body gradually inducing the *Shosha* i.e., emaciation. 'Malabsorption' is the 'common finding' in both the conditions, '*Rasavaha Srotodusti*' and 'emaciation caused by Short Bowel Syndrome'. The clinical findings of emaciation caused due to malabsorption as a result of Short Bowel Syndrome resemble the signs and symptoms of *Shosha* explained as a *Rasavaha Srotovidda Lakshana* by *Acharya Sushruta* and *Krishangata* by *Charaka*. Hence the disorder emaciation can be invariably correlated with *Shosha*.

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