

## CONCEPT OF UDAKAVAHA SROTAS AND ITS APPLIED ASPECTS

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Moodbidri, Karnataka, India.Article Received on  
19 Dec. 2021,Revised on 09 January 2022,  
Accepted on 29 January 2022

DOI: 10.20959/wjpr20222-23120

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India.**ABSTRACT**

"*Srotomayam ayam hi purusha*", Ayurveda explains the concept of *Srotas* in which the whole body is comprised of innumerable channels which are considered to be our inner transport system for subtle, biological and energetic functions. These are the channels or systems in which some of the tissues are formed, some materials are metabolized, secreted or transported. Acharyas described different *Srotas* and *Udakavaha Srotas* is one among them. It deals with various aspects of *Udaka* present in the body. Contemporarily *Udakavaha srotas* can be related to water and electrolyte balance in our body. So, if there is any *Dushti* in *Udakavaha Srotas*, it affects other *Srotas* in which *Udakadushti* leads to different *Vyadhi Avasthas*. Present article describes about various clinical features that occurs due to *Dushti* of *Udakavaha Srotas* in other *Srotas*.

**KEYWORDS:** *Udakavaha Srotas, Udakavaha Srotodushti, Kloma.***INTRODUCTION**

*Srotas* indicates the entire stages of health and disease condition in our physical body. *Srotodushti* is the process which takes place in the pathogenesis of any disease, where *Doshadushya Sammurcchana* leads to *Khavaigunya* and these processes occurs in the *Srotas*. The type of *Srotodushti* is having an important role in the treatment as well as prognosis of the disease. *Udakavaha Srotas* is one among the *Abhyantara Srotas*<sup>[1]</sup> which helps to maintain the water and electrolyte balance in our body. The *Udaka* present in our body is not having a separate channel for its circulation. It moves along with *Rasa* and *Rakta* through which it does the functions like *Preenana* and *Jeevana*.<sup>[2]</sup> The vitiation of *Udakavaha Srotas* causes a variety of illnesses such as *Prameha*, *Shophya*, *Udara*, *Tamakashwasa*,<sup>[3]</sup> etc. due to

*Dushti* of other *Srotas* along with this. Here, an attempt is made to explain how the involvement of vitiated *Udakavaha srotas* can lead to formation of illnesses in other *Srotas*.

### ***Udakavaha Srotas and Water balance***

The main function of *Udakavaha Srotas* is water balance mechanism. The water accounts for about one half to  $\frac{2}{3}$ <sup>rd</sup> of an average person's weight. A constant supply is needed to replenish the body fluids lost through normal physiological activities such as respiration, sweating, urination and through some other pathological conditions like diarrhoea, vomiting, etc. Balance of water is mainly by two mechanisms: drinking water to maintain the fluid level in the body and electrolyte balance. The water and electrolyte balance are closely linked to each other because the body works to keep the total amount of water and the levels of electrolytes in the blood constant.

### **Various aspects of *udaka***

Acharya Charaka in *Shareerasthana* explains the *Udaka* found in association with *Mootra* and *Rakta* and other tissues. It is *Sarva Shareerachara* (spreads all over the body) and protects by the *Twak*. When it exudes out from ulcers, it is known as *Lasika* and when it comes out from the roots of hair follicles is called as *Sweda*. The quantity of such *Udaka* is considered as *Dashanjali paramana*.<sup>[4]</sup> In the same chapter it is also explained that *Udakadhara* is considered as a layer of *Twak*.<sup>[5]</sup> This layer consists of watery substance or lymph. In Ashtanga Hridaya while explaining about *Avalambaka Kapha*, the word used *Tatstha Evambukarmana*,<sup>[6]</sup> here *Ambu* is the synonym of *Udaka*. So, the lymphatic drainage serves the *Ambukarma*. All the structure in the body, provided with lymphatic drainage through which antigen, microbes or toxin are taken to lymph nodes, where the lymph is filtered. The liquid part present in all organs and to each and every cells of the body in the form of blood, lymph, urine, sweat and faeces.

*Ap Mahabhuta* is the major constituent in *Udakavaha Srotas* exhibiting the properties like cohesion and viscosity, which makes it capable to bind things together and to keep them moving and owing the attributes like *Sara*, *Drava*, *Chala*, *Snigdha* and *Picchila*.<sup>[7]</sup> If there is any *Abhava* of *Ap Mahabhuta*, then it leads to *Trishna*.<sup>[8]</sup>

### ***Moolasthanas of udakavaha srotas***

*Taalu* and *Kloma* are the major *Moolasthanas* of *Udakavaha Srotas*.<sup>[9]</sup>

*Taalu* is considered as the roof of mouth or palate where as, *Kloma* is a controversial structure, though unavailability of direct explanation about *Kloma* is seen in our literature. *Taalu* and *Kloma* are said to be the *Pipasa Sthana* or the centers of thirst.

### Cocept of *Taalu*

*Taalu* is considered as the primary site of control of thirst. Anatomically the thirst centre present in the hypothalamus is near to the level of palate. When thirst appears in *Taalupradesha*, it becomes dry and sticky. By consuming water, these *Taalupradesha* become wet and the thirst is quenched. Thirst is an important component of blood volume regulation, which is slowly regulated by homeostasis. There are two mechanisms for thirst:

- i. Hypothalamus mediated thirst
- ii. Angiotensin mediated thirst

### Concept of *kloma*

The exact references about *Kloma* in various Ayurvedic Samhitas are in a scattered manner and the anatomical consideration of *Kloma* is also still controversial. In Charaka Shareerasthana, *Kloma* is included under one among the *Koshtanga* and Chakrapani commented on that, *Kloma* is *Pipasasthana*.<sup>[10]</sup> In different contexts, *Kloma* is narrated as *Gala*, *Kantanadi*, *Dakshina Phuphussa*, etc.

### Nirukti of *kloma*

#### 1. *Moolabhootam Kloma*

- The *Moola* of *kloma* starts from *Jihwamoola* or *Kantamoola* and it extends downwards as a *Koopanukara*. So, there is a similarity to the structure of laryngopharynx.

#### 2. *Skandhabhoota Klomanadi*

- Here the structure of *Kloma* is like a *Nadi* and it starts from *Grivapradesha* and extends downwards. From the site of *Vakshomadhya*, it divides into two *Shakhas* and enters into *Phuphussa*. Laryngotracheal tube exhibits similar structure.

#### 3. *Shakhabhoote Hridayanadike*

- Here the word *Hridayanadi* is used instead of *Klomanadi*, where it divides into two branches in *Urapradesha* near the heart region and enters into lungs. Two bronchi are having the similar characteristics.

#### 4. *Prashakhabhootaa Phuphussanadyashcheti*.<sup>[11]</sup>

- *Hridayanadi* divides into many branches inside the *Phuphussa* like broncial tree.

### ***Kloma as a Marma***

Impairment in the *Udakavaha Srotas* results into *Pipasa* and *Sadyomarana* might be the consequence of severe thirst.<sup>[12]</sup> *Sadyapranahara Marmaghata* also reflects severe dehydration because of shock especially due to severe haemorrhage and fluid loss. When *Moolasthana* gets injured, it causes severe thirst and immediate death even though it is not included in *Marma*. Hence, *Kloma* may be a close organ to the *Marma* point, wherein *Kaphasthana* ie, *Hridaya* is one among the *Sadyapranahara Marma*.

### **Involvement of *Udakavaha Srotas* in various pathological conditions**

#### **Acid – Base balance**

Acharyas explain *Udakavaha Srotas* after *Pranavaha Srotas*.<sup>[13]</sup> Similarly, after respiration or gas exchange, the next process is to maintain acid base balance and water balance in the body. Respiratory system is considered as the second line of defense mechanism. The lungs play an important role in the maintenance of acid base balance by removing CO<sub>2</sub> which is produced during various metabolic activities in the body.

The *Pranavaha Srotovikaras* like *Hikka*,<sup>[14]</sup> *Mahashwasa*<sup>[15]</sup> and *Tamakashwasa*<sup>[16]</sup> has given the involvement of *Udakavaha Srotas*. The *Dushti* of *Udakavaha Srotas* produces symptoms in these *Vyadhis*.

- Metabolic disturbances: In severe vomiting and diarrhoea, there is excessive fluid loss and there will be imbalance in the blood fluid volume and electrolyte. Loss of alkali in diarrhoea, malnutrition and starvation leads to metabolic disturbances (mainly hyponatremia). So, these disease entities predispose *Mahashwasa*.
- Bronchial asthma: Dehydration can worsen in exercise induced asthma. After exercise, the person will breathe through mouth, thereby entering dry air into the lungs and keep the airways hydrated. Asthmatic patients are more sensitive to dehydration. Dehydration can often be associated with a side effect of asthma and due to its medication.
- Pulmonary oedema: If there is any fluid load due to heart or kidney failure, it leads to heart problems, lung problems, etc. In lungs, the excess fluid fills in the air sac may cause asthma, respiratory infection etc.

The *Udakavaha Srotas* is responsible for chemical regulation of respiration through water homeostasis and acid-base balance. Dryness of oral cavity, throat and lower respiratory tract have been described as being produced in the pathological involvement of *Udakavaha Srotas*.

### Ascites – Portal hypertension

As *Kloma* is included one among the *Koshtanga*, there is some involvement of *Udakavaha Srotas* in the *Samprapthi* of *Udara*.<sup>[17]</sup> In *Udara*, the accumulated *Doshas* obstructs the channels of *Sweda* and *Udaka*. Specifically, in *Jalodara*, due to *Nidana sevana* like consuming large amount of water by a person with *Mandagni* leads to vitiation of *Vata Dosh* in *Kloma* and creates disturbances in the natural flow of *Kapha* and *Jala*, thereby increases *Jala* in *Udara* and ultimately formation of *Jalodara*.<sup>[18]</sup>

Ascites caused due to many diseases, the commonest cause being liver cirrhosis, in which ascites develops due to portal hypertension. Renal sodium, water retention and ascites are associated with cirrhosis development in severe sinusoidal portal hypertension, hypervolemia, homeostatic activation of renin-angiotensin-aldosterone system and ADH production. There will be a marked increase in the hepatic and splanchnic lymph production and leakage of fluids within the peritoneal cavity leading to the formation of ascites.

### Polyuria - Diabetes insipidus

*Basti* is considered as the *Visramasthana* of *Udakavaha Srotas*.<sup>[19]</sup> All *Ambuvaha Srotamsi* drain their water, in the same way as rivers contributing their water into the ocean. In the urinary system, kidneys can adjust the concentration of the urine to reflect the body's water needs. In the concept of *Prameha*, the premonitory symptoms like *Pipasa*, *Mukha*, *Kanta*<sup>[20]</sup> and *Galashosha*<sup>[21]</sup> are caused due to *Dushti* of *Udakavaha Srotas*. *Prabhootavilamootratha*<sup>[22]</sup> or increased quantity of output can be seen in Diabetes insipidus. In this condition, either the body is unable to produce ADH or the kidneys cannot respond to ADH. There is decrease in free water reabsorption, thereby excessive loss of water through urine. The major symptoms of diabetes insipidus like excess thirst, dry mouth, etc are having the similar characteristics of *Udakavaha Srotodushti*.

### Excessive Sweating-Hyponatremia

In severe cases of diabetes mellitus and bladder infection, *Atisweda* can be seen as a symptom; thereby excess loss of water contents and electrolytes. Due to *Atisweda*, there will be hyponatremia by the elimination of excess sodium through hair follicles. Severe hyponatremia produces thirst in such patients. Water loss through sweating depends on atmospheric temperature and humidity.

## DISCUSSION

*Udakavaha Srotas* helps to maintain the water and electrolyte balance in the form of various fluids. Ayurveda Acharyas also explains the presence of *Udaka* in our body like *Rasa*, *Rakta*, *Lasika*, *Sweda*, *Mootra*, etc. *Taalu* and *Kloma* are the *Moolasthanas* of *Udakavaha Srotas* and these two are considered as the *Pipasa Sthanas*. Here, the *Taalu* depicts the palate, but the *Kloma* is a contentious structure because it is throughout our Ayurveda Samhitas in a scattered manner. There are various *Nirukti* of *Kloma* explained in Parishabda Shabdārtha Shareeram, where the structure of *Kloma* is having the similar characteristics of laryngopharynx, laryngotracheal tube and bronchi inside the lungs. *Dushti* of *Udakavaha Srotas* produces different *Dushti lakshanas* like *Jihwa-Talu-Aushtashosha* and mainly *Pipasa*. The normal and abnormal functions of *Udakavaha Srotas* can influence in the physiological and pathological conditions in other *Srotas* also. *Udaka* present in the body holds the *Kledatwa* in the presence of *Ap Mahabhoota* due to its attributes like *Sara*, *Drava*, *Chala*, *Snigdha* and *Picchila*.

## CONCLUSION

Fluid balance is an aspect of homeostasis of organisms in which the amount of water in the organism needs to be controlled via osmoregulation. The fluid balance is the amount of water lost through respiration, perspiration, urination, etc. must be equal to the input through eating, drinking or by parenteral route. Water and electrolyte imbalance produces mild to moderate symptoms and it can be fatal in case of water intoxication. *Dhatu*, *Upadhatu* and *Mala* represents various form of body fluids. Involvement of *Udakavaha Srotas* in the form of symptoms in various systems requires more attention while planning the treatment.

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