PHYSIO-ANATOMICAL ASPECT OF MUTRAVHA SROTAS WITH SPECIAL REFERENCE TO APANA VAYU

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Abstract: The study of human physiology and anatomy is fundamental to understanding the complex systems that govern our bodies. Among these systems, the MutraVaha Srotas holds a pivotal role in regulating urinary function. This abstract presents an overview of a comprehensive physio-anatomical investigation into the MutraVaha Srotas, with a specific focus on the Apana Vayu - an essential component of the system. The MutraVaha Srotas, also known as the urinary system, comprises a network of interconnected organs responsible for the filtration, transportation, and elimination of waste products from the body. This system is influenced by the dynamic force of Apana Vayu, a vital energy in Ayurveda. The primary objective of this study was to delve into the intricate anatomical structures and physiological processes of the MutraVaha Srotas. Furthermore, the study explored the functional aspects of the MutraVaha Srotas, with particular emphasis on the role of Apana Vayu. Apana Vayu is believed to regulate the downward flow of urine, aiding in proper micturition and the elimination of waste products. The role of Apana Vayu in maintaining the flow of urine was evident, emphasizing its significance in maintaining urinary health and preventing disorders related to urinary disturbances.

KEYWORDS: Srotas, Apana Vayu, Urinary System, Mutravaha Srotas

Introduction:

Ayurveda, the ancient Indian system of medicine, has always emphasized a holistic approach to health, focusing on the balance and harmony between the body, mind, and spirit. One of the essential concepts in Ayurveda is the concept of Srotas (channels), which are responsible for the transportation and circulation of various substances throughout the body. Acharya Charaka mentioned 13 Srotas and Acharya Sushruta mentioned 11 Srotas. The urinary system is one such vital system, governed by the Mutravaha Srotas, which is responsible for the formation and elimination of urine. The functioning of Mutravaha Srotas is deeply connected to Apana Vayu, one of the five Vayus or vital forces responsible for various physiological functions. The term "Srotas" in Sanskrit refers to channels or pathways through which different substances flow. The Mutravaha Srotas specifically deals with the urinary system, including the kidneys, ureters, bladder, and urethra. It plays a pivotal role in eliminating waste products and maintaining the balance of fluids and electrolytes in the body. According to Ayurveda, the equilibrium of the doshas (Vata, Pitta, and Kapha) is essential for the proper functioning of the Mutravaha Srotas. Any imbalance in these doshas can lead to various urinary disorders such as dysuria, urinary tract infections, kidney stones, and urinary incontinence. In Ayurveda, Vayu represents the air element and is responsible for the movement and transportation of various substances throughout the body. There are five main types of Vayu, Prana Vayu, Udaan Vayu, Saman Vayu, Vyan Vayu, and Apana Vayu, which are one of them. Apana Vayu is located in the lower abdomen, below the navel, and governs the downward and outward movement of bodily substances. Its primary functions include the elimination of urine, feces, and reproductive fluids. It is also associated with menstruation and childbirth.

AIM AND OBJECTIVE:
Anatomical and physiological concept of Mutravaha Srotas concerning Apana Vayu.

MATERIAL AND METHODS

CONCEPTUAL STUDY:
This part will contain a detailed study and compilation of available literature on classic textbooks.

LITERATURE REVIEW:
The word Srotas is derived from the Sanskrit root “Sru-gateau”(Sru+tasi=Srotas) which means moving, filtering, flowing, leaking, secreting, etc.

Mutra vaha srotas:
"Mutra" means urine and "Avaha Srotas" refers to the channels of transportation. Thus, the Mutravaha Srotas represents the channels responsible for the formation, transportation, and elimination of urine in the body. These channels are interconnected with other bodily systems and play a pivotal role in maintaining overall health.

MOOLSTHAN OF MUTRAVHA SROTAS:
मूलस्थान मुत्रवहानी स्रोतसांना बस्तिमूलं वंक्षणी च । (च.वि. 5/8)
According to Acharya Charaka, the Moolsthan of Mutravaha Srotas is Vasti and Vanksha.

According to Acharya Shushruta the MoolStan of Mutravaha Srotas is Vasti and Medhra.

In Ayurveda, the concept of urine formation is that urine separates in the intestines and comes into the bladder through numerous subchannels from the bladder. In other words, the upper part of these channels is from the intestines and the lower part is from the bladder it is related. Separate from the intestines through the art of defecation, the liquid waste, along with the digestive fire (Agni) and the functions of the Samana Vayu (one of the five types of Vayu), while flowing through these channels, is completely transformed into urine and comes into the bladder. Just as rivers perpetually fill the oceans, thousands of these subchannels come from the bladder. Due to their subtlety, they cannot be recognized. They are conveyed through the Nadis (channels) and go from the urinary bladder to the interior of the bladder. (Sushruta, Nidana 3). The openings of the channels in the bladder are oriented downward, while the openings of the bladder are oriented upward. Using the subchannels situated anteriorly, the urine is directed towards the bladder. (Ashthanga Hridaya).

The liquid should be led through the openings of the bladder, and the openings of the bladder should be directed towards the bladder. (Sharangdhar). From the perspective of direct bodily function, the Ayurvedic concept of urine formation is not entirely accurate. Therefore, an exact English equivalent for “Mootravaha Srotas” cannot be provided. If we interpret it according to modern physiology, these “Mootravaha Srotas” can be understood as renal tubules or the structures responsible for urine formation within the kidneys. Similarly, if we want to maintain the concept of “Vasti” accurately, we can understand it as the ureters or the tubes connecting the kidneys. According to Acharya Harachandra and others consider “Gavini” as ureters—when urine flows from the kidneys. However, this interpretation is not entirely accurate, as Acharya Charaka has mentioned the “mootravaha srotas” in the context of urine channels and has prescribed treatments for their disorders similar to urinary obstructions. In Ayurveda or Paavādya Vaidya, there is no disease related to kidney-less ureters. Therefore, if we interpret “Gavini” as ureters, it is appropriate to interpret it as kidney-connected ureters.

Apana Vayu

In Ayurveda, Vayu represents the air element and is responsible for the movement and transportation of various substances throughout the body. There are five main types of Vayu these are Prana Vayu, Udaan Vayu, Saman Vayu, Vyan Vayu, and Apana Vayu. Apana Vayu is located in the lower abdomen, below the navel, and governs the downward and outward movement of bodily substances. Its primary functions include the elimination of urine, feces, semen, menstrual blood, and childbirth.

In Charak Samhita Acharya Charak explain about Apana vayu and its function:

Apana Vayu circulates in the lower part of the abdomen, including the pelvis, thighs, testicles, urinary bladder, and inguinal region. It controls the processes related to the elimination of urine, semen, menstruation, feces, and the expulsion of the fetus in the body. Indu suggests that Apana Vayu is responsible for regulating these activities.

Interconnection between Mutravaha Srotas and Apana Vayu:

The physiological aspect of Apana Vayu is closely connected with the proper functioning of the Mutravaha Srotas. Apana Vayu provides the necessary impetus for the elimination of urine from the body. It creates the pressure required to expel urine from the bladder and facilitates its flow through the urethra. Any disturbance in the balance of Apana Vayu can lead to difficulties in passing urine, urinary retention, or even involuntary urination.
Moreover, *Apana Vayu* is also responsible for maintaining the tone and strength of the urinary muscles and pelvic floor. Weakness in these muscles can lead to urinary incontinence, where an individual loses control over their bladder, resulting in accidental leakage of urine.

Some of the diseases related to *Mutravaha Srotas* in relation to *Apana Vayu* are:

1. **Mutrakrichra (Dysuria):** *Mutrakrichra* is a condition characterized by painful or difficult urination. When *Apana Vayu* is aggravated, it can cause an obstruction in the urinary flow, leading to difficulty and pain during urination.

2. **Mutraghata (Urinary Retention):** *Mutraghata* refers to the inability to pass urine despite having the urge to urinate. An imbalance in *Apana Vayu* can cause a disturbance in the normal downward movement of urine, leading to urinary retention.

3. **Ashmari (Urinary Calculi/Kidney Stones):** When there is an imbalance in *Apana Vayu* and the *Mutravaha Srotas*, it can result in the formation of kidney stones. The improper flow of urine can lead to the accumulation of minerals and salts, forming stones in the kidneys or urinary tract.

4. **Prameha (Urinary Disorders/Diabetes):** *Prameha* encompasses various urinary disorders, including increased frequency of urination, excessive urination, and the presence of abnormal constituents in the urine. *Apana Vayu* imbalance can contribute to the development of *Prameha*.

5. **Mutrakshaya (Renal Failure):** *Mutrakshaya* refers to the deterioration of kidney function, leading to reduced urine production or complete cessation of urine formation. An imbalance in *Apana Vayu* can adversely affect the renal tissues and lead to renal failure.

6. **Mutratisara (Urinary Tract Infections):** *Mutratisara* is a condition characterized by inflammation and infection of the urinary tract. When *Apana Vayu* is imbalanced, it can weaken the natural defense mechanisms of the urinary system, making it more susceptible to infections.

7. **Mutrashukra (Spermatorrhea/Involuntary Ejaculation):** Involuntary ejaculation of semen can also be attributed to an imbalance of *Apana Vayu*. When *Apana Vayu* is disturbed, it can lead to involuntary semen discharge during urination or other times.

**DISCUSSION AND CONCLUSION**

The study of *Mutravaha Srotas* in conjunction with the influence of *Apana Vayu* underscores the remarkable interplay between anatomical structures and physiological forces within the human body. This discussion has shed light on the symbiotic relationship between these components, highlighting their vital roles in waste elimination and overall well-being. The intricate network of the *Mutravaha Srotas*, comprising the kidneys, ureters, bladder, and urethra, orchestrates a complex filtration and elimination process that maintains the body's equilibrium. This system ensures the removal of waste products and excess fluids while retaining essential nutrients, contributing significantly to homeostasis.

The concept of *Apana Vayu*, a sub *dosha* of *Vata*, brings an added layer of understanding to this process. With its downward-moving energy, *Apana Vayu* aids in the propulsion of waste materials out of the body, influencing peristaltic movements, muscular contractions, and sphincter relaxation essential for the efficient functioning of the urinary system.

The physio-anatomical mechanisms discussed underscore the harmonious collaboration between structure and function. From the intricate glomerular filtration within the kidneys to the controlled contractions of the bladder and coordinated movements of the ureters, the synergy between *Mutravaha Srotas* and *Apana Vayu* is evident at every step.

In conclusion, the study of *Mutravaha Srotas* with special reference to *Apana Vayu* illuminates the intricate choreography that sustains waste elimination and optimal functioning within the human body. This integrated perspective bridges the gap between anatomical structure and physiological action, enriching our comprehension of both Ayurvedic principles and modern medical insights. As we continue to delve deeper into the interconnections of the body's systems, we gain a more profound appreciation for the remarkable symphony of life that unfolds within us.

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