Role of Mutravegadharana (Suppression of Urine Urge) in the causation of Mutravahasroto Dushtijanya Vikaras (Urinary Tract Diseases) – An Appraisal

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ABSTRACT:
Ayurveda is an ancient medical system that emphasizes holistic health. Indian sages described a healthy human lifestyle thousands of years ago. Ayurveda aims to maintain healthy people's health and to cure diseases. Vegadharana has been identified as a major cause of illness and disease. Mutra Vegadharana is one cause of Mutravaha Srotas Vikaras. Mutravaha Srotas Vikaras are conditions that affect the kidneys, ureters, bladder, and urethra, as well as other parts of the urinary tract. Mutrakrichchhra (Urinary Tract Infection), Mutraghata (Obstructive Uropathy either mechanical or functional), Prameha (Obstinate Urinary Disorders including diabetes) are some common diseases of the urinary system. It is estimated that 150 million UTIs occur yearly on a global basis. Ignorance of these diseases can lead to some serious renal complications. Suppression of urine urge prevents the passage of urine; keeping it inside the bladder for too long creates an environment where such diseases can develop. Here, an effort is made to explain how Mutra Vegadharana and Mutravaha Srotas Vikara are related.

Keywords: Diseases of Urinary Tract, Mutra, Mutravega, Mutravegadharana, and Suppression of urine urge, Vegadharana

INTRODUCTION
The aim of Ayurveda is to maintain healthy people's health and to cure diseases.¹ The World Health Organization, in the twenty-first century also emphasizing on 'Lifestyle Disorders', and fortunately, Ayurveda has a lot to offer in this field. Total health is a lifelong journey
that requires daily effort. That is why an emphasis has been placed on disease prevention. To stay healthy, Ayurveda provides a detailed description of different regimens based on seasonal and diurnal variations. Vegadharana has been identified as a major cause of illness and diseases\textsuperscript{3}. Acharya Charaka mentioned thirteen types of Adharneeya Vegas,\textsuperscript{4} and Acharya Sushruta mentioned the same thirteen Vegas under the disease ‘Udavarata’.\textsuperscript{5} It is crucially important to respond to such urges rather than suppress them as they arise. One of the most common Adharneeya vegas is the Mutravagadharana. It is the first natural urge explained by Acharya Charaka because it occurs far more frequently than other urges. It is an unavoidable daily desire. Suppressing the urge to urinate will undoubtedly affect the channel through which urine flows and is excreted from the body. As a result, Mutravagadharana has an effect on the Mutravaha Srotas.

Srotas

The smallest and most refined transport mechanism in the human system is called a Srotas. Both the development of the diseased state of the body and the normal state of the body are equally attributable to these Srotas. Acharya Charaka has described Srotas is the structure through which the sravanakriya takes place.\textsuperscript{6} Mainly, there are two types of Srotas: 1) Bahirmukha Srotas having external openings or apertures). 2) Antar-mukha Srotas (having openings within the body) also known as Sukshma Srotas (microscopic channels) or Yogavahi Srotas, are the body's internal pathways. There are thirteen major Antarmukha Srotas, according to Acharya Charaka. There are eleven pairs of Yogavahi or Antarmukha Srotas, according to Acharya Sushruta. Sukshma (subtle) and Mahan (gross) Srotas are the two sorts of Srotas that Kashyapa has discussed. Sukshma types Srotas include the Nabhi (umbilicus) and Roma Koopa (hair follicle), whereas Mahan Srotas are nine in number, with two in the lower body and seven in the head.\textsuperscript{7} The term ‘randra’ is introduced as a synonym for ‘Srotas’ by Acharya Sharangdhara. In a male, there are ten randras, or one in each of the eye, nose, ear, urethra, rectum, mouth, and head. A woman has three more, one each in two stana (mammary glands) and third one in yonimarga (Female Reproductive Tract).\textsuperscript{8} The Srotas is derived from the root "Sru" dhatu. The word "Sru" means to exude, ooze, or filter. According to Acharya Charaka, the definition of the term Srotas is “Sravanat Srotansi,”\textsuperscript{9} which indicates that anything flows out or passes through. Thus, the channels which carry ‘Mutra’ can be referred to as Mutravaha Srotas.

Mutravaha Srotas

Acharya Sushruta describes Basti and Medhra as Moolasthana (root) of Mutravahasrotas\textsuperscript{10} whereas Acharya Charaka describes Basti and Vankshana as Moolasthana of Mutravahasrotas\textsuperscript{11}, respectively. Many diseases have been associated with Mutravaha Srotas in Ayurvedic texts. The Mutravaha Srotas’s (urinary system) function is to form and excrete urine. The description of the urinary system is scattered throughout the Ayurvedic classics. As a result, using modern science, anatomical descriptions of the urinary system can be correlated to Mutravaha Srotas. Mutravaha Srotas (Urinary System) is associated with the following structures:

1. Vrikka
2. Mutravaha Nadis
3. Mutravaha Dhamanis
4. Mutravaha Siras
5. Gavini
6. Basti
7. Mutrapraska

1. Vrikka (Kidney)

According to Acharya Sushruta Vrikkas are developed from the essence of rakta and meda\textsuperscript{12}. Vrikka is a derivative of the matrijabhava (maternal constituents).\textsuperscript{13} Vrikkas are two in number and they are situated in koshta, as it has been enumerated under the koshthanga by various Acharayas. There is no explicit mention of Vrikka’s role in urine production in any of the Ayurvedic classics.

2. Mutravaha Nadis (Ureter)\textsuperscript{14}

According to Acharya Sushruta, Mutravaha nadis are situated between Pakvashaya and Basti. It transports the Mutra from the Pakvashaya to Basti, like the rivers fill the ocean with water. It secretes the urine without break from both sides in to the Basti, this is situated in pelvic region with opening downwards. Acharaya Vagbhatta agrees with the opinion of Acharaya Sushruta.

3. Mutravaha Dhamanis (Renal arteries)

Acharya Sushruta has described the thirty adhogami-dhamanis or root of the human body. The root of these dhamanis is umbilicus and heart and lies between Amashaya and Pakvashaya. It carries urine to the Basti along with Vata, Purisha, Shukra, Artva, etc. to downwards. Due to heat of pittashaya it divided the ahara
into two parts - one is Ahara Rasa and second is Jaliya Rasa.\textsuperscript{15}

4. Mutravahasira (Renal veins)
There is no reference available with Brihattrayee about Mutravaha Sira, but Acharya Sharangadhara speaks about Drava Mala of digested food being transported to Basti by Sira i.e. Mutra. As per commentary on Sharangadhara Samhita by Acharya Aadhama, the Siras are concerned with Aahara Jala transported to Basti through Mutravaha Sira.\textsuperscript{16}

5. Gavini (Ureter)\textsuperscript{17}
These are two in number. It originates from the Vrikka (Kidneys). It transports urine from the Vrikka to the Basti. Gavini is described in Vedic literature. Urine is obstructed in the Antra (Intestine) and the both Gavinis. Mutra should be excreted from there. Considering all the descriptions of the entire urinary system, the Gavini can be related to Ureters.

6. Basti (Urinary Bladder)
Basti is an empty organ. Vayu enters the combination, which is created by the essence of Rakta, Kapha, and Pitta. The heat of Pitta acts on Rakta and Kapha, transforming them into the shape of the Basti in the abdomen.\textsuperscript{18} Basti is a derivative of the matrijabhava (maternal constituents).\textsuperscript{19}

Function- Basti is the receptacle of urine in to which all the channels of the body carrying liquid element.\textsuperscript{20} Basti is the receptacle of impure matter so it is called maladhara and forms the primary seats of Prana.\textsuperscript{21} It has been enumerated under Sadypranaharamartha, which if perforated may causes death within seven days.\textsuperscript{22} Acharya Chakrapani has also stated that basti is equivalent to Mutrashaya.\textsuperscript{23}

7. Mutrapraseka (Urethra)\textsuperscript{24}
It is the outlet of Bastimukha, which can be identified as urethra. In male it carries both Mutra and Shukra while in female only Mutra. It is two angulas in females and one angula in female child and four in males.

Mutravahasrotas Dushti Hetu (Cause of Urinary Passages Diseases)
In general, diet and lifestyle that are favorable for dosha (similar in characteristics to dosha) but unsuitable for dhatu (dissimilar in properties to dhatu) produce morbidity in srotamsi.\textsuperscript{25} The morbidity of Srotas is characterized by increased flow, blockage, nodule formation, and flow of physiological fluids or contents in the incorrect or opposite directions.\textsuperscript{26} The Mutravaha Srotas are affected by the ingestion of water, food, and coitus during the urge for micturition, as well as the suppression of the urge for micturition, particularly in those suffering from wasting and trauma.\textsuperscript{27}

The symptoms Mutravaha Srotas Dushti include excessive excretion, excessive obstruction or suppression of urine, vitiated, diminished or frequent, thick urine with pain.\textsuperscript{28}

The recommended treatment plan for Mutravaha Srotas morbidities should be the same as that described for Mutrakrichchhra (dysuria).\textsuperscript{29}

So, keeping this in view to establish a bridge between Mutravagadhara and Mutravahasrotodushtijanyavikaras (disease of Urinary tract), the present work has been taken to critically analyze Mutravaha Srotas through Brihattrayi correlate them in the light of contemporary medicine and also to explore the effect of Mutra Vegadharana as a Mutravaha Srotas dushti hetu.

MATERIALS AND METHODS
Materials related to Mutra, Mutravaha Srotas, Vega and Vegadharana were extensively collected from classical texts like Charaka Samhita, Sushruta Samhita and Ashtanga Hridaya with their available commentaries. The obtained literature were critically analyzed and reorganized systematically to frame the present review article.

RESULTS
There are many diseases described in Ayurvedic classics which are directly related to Mutravaha Srotas. Some diseases are systemic disease but these have some symptoms related to Mutravaha Srotas.

Disease Related to Mutravaha Srotas
1. Mutrakrichchhra
2. Mutraghata
3. Mutrasharma
4. Nirudha Prakash
5. Mutraja Viridhi
6. Mutrodavarta
7. Mutravruta-vata

Some systemic diseases which are not having direct involvement of Mutravaha Srotas but having the Symptoms of Mutravaha Srotas Dushiti like
1. Prameha
2. Mutragata Raktpitta
3 Aamaja Jwara\textsuperscript{30}
4 Atisara\textsuperscript{31}
5. Aamvata etc.
1. Mutrakrichchhra (Urinary Tract Infection)
Difficulty in micturition or dysuria is known as ‘Mutrakrichchhra’. Almost all the Acharyas except Vagbhata have described eight types of Mutrakrichchhra. Acharya Charaka has described in the Siddhi Sthana that a person indulging in sexual intercourse with an active urge to micturate may cause the Mutrakrichchhra. In the seventh chapter of Sutra Sthana, Acharya Charaka mentions Mutrakrichchhra as one of the symptoms of Mutravegadharana.

2. Mutraghata (Retention of Urine)
In Sutra Sthana, Acharya Charaka lists eight different kinds of Mutraghata. Furthermore, thirteen other Bastiyo (Urinary Bladder Disease) are detailed in Siddhishthana under the term ‘Mutradosha’, which are comparable to those of Mutraghata as mentioned in Sushruta Uttaratantra. Acharya Sushruta describes twelve different types of Mutraghata.

3. Mutrashmari (Urolithiasis)
As one of the Ashtamahagada (group of eight dreadful diseases), Mutrashmari can alter the structures and physiology of the urinary system. It is described as Mutrakrichchhra in the Charaka Samhita. Vataja, Pittaja, Kaphaja, and Shukraja are the four kinds of Ashamari that Acharya Sushruta described.

Mutra Vegadharana is one of the causes of Mutrashmari, so suppression of micturition may lead to urinary stone formation.

4. Niruddha Prakash (Phimosis)
Niruddha Prakash (Phimosis) is mentioned by Sushrutacharya in the Kshudraroga. It is referred to as Niruddha-mani and is a part of Guhyaroga in Ashtanga Samgraha. Vatadosha vitiated Shishnacharma (prepuce) obscures Mutrasrosta and conceals Mani (glance). This results in painless Mandadharaka (slowed urine flow).

5. Mutrodavarta
Mutrodavarta can be classified as: (a) Vegavarodhaja, caused by suppression of micturition, (b) Apathyaja, due to indiscretion in diet and activity and (c) Upadravaranupa, as a complication of other diseases.

Symptoms of Mutra Udavarata are intense and frequent pain in urinary bladder, cardiac region, pelvis, abdomen, and also severe pain in back and sides of chest; flatulence, nausea, cutting pain, piercing pain, indigestion, inflammation of urinary bladder.

6. Mutraja Virdhhi (Hydrocele)
The practice of voluntarily holding urine is the cause of the disease known as Mutraja-virdhhi (hydrocele), characterized by softness and fluctuation on the surface of the inflated scrotum that resembles a skin bladder filled with fluid.

7. Mutravrita Vata
This is Vatavyadhri and Vegadharana is one of the causes of Vata vitiation. Mutravritavata gives rise to distension of the bladder and infrequent micturition.

8. Mutravriddi and Mutrakshaya
Mutravriddi (Increased Quantity of Urine)
The symptoms of an increased quantity of urine include bladder distension and pain, frequent urges to pass urine, and the sensation that one has not passed urine, even after passing urine.

Mutrakshaya (Decreased Quantity of Urine)
A decreased quantity of urine is characterized by scanty urine, dysuria, bladder pain, abnormal color or blood stained urine, thirst, and mouth dryness.

Some systemic diseases also have some symptoms related to the Mutravaha Srotas. Vata, according to Sushruta, is responsible for controlling regular urination, and when it becomes vitiated, it results in several ailments connected to Basti. According to Sushruta, the vitiated Doshas at the stage of Sthansamsraya manifest as Prameha, Ashmari, Mutraghata, and many other diseases when they reach Basti. Vivarnyta (discoloration) of Mutra is present in Rakpitta, Pandu, and Kamala etc. The Bahu Mutrata symptom is seen in Aamaja Jwara and Aamvata.

The manifestation of Mutravaha Srotas (Urinary System) vitiation includes

1. Atisristama Mutrayantam (Excessive excretion of Urine)- Excessive excretion of Urine can be called as Mutra-Atipravrittijanya roga includes twenty types of Prameha. In Prameha, Mutravaha Srotas are involved.

2. Atyodharaya Mutrayantam (Excessive obstruction or suppression of urine)- Eight types of Mutrakrichchhra (Dysuria) and thirteen types Mutraghata (Obstructive Uropathy), Mutraja Udavarata (neurological dysfunction of urinary tract) are mainly included in the Mutra Apravrittijanya Roja. Apana and Samana Vayu, or the autonomic nervous systems is irritated by the suppression of urination. The vitiated Apana and Samana Vayu disrupt
the coordination between bladder contraction and sphincter relaxation as well as the peristalsis of the colon and rectum, as well as the passage of urine from the pelvis to the ureter. It can lead to retention or suppression of urine. This may cause Mutraghata or Mutraja Udavarta. Due to suppression of urine there may be fullness of bladder, a full bladder can provide a habitat for germs to live in and grow. The sterile urine could start to harbor bacteria if it's left in the bladder for too long. In turn, this will result in the infection growing and spreading. This may lead to Mutrakrichhra (UTI).46

3. Prakupitam- Alpalpm- Abhikshanam (vitiating, diminished or frequent urination). This means Alpa-alpa Mutra Pravriti i.e. dribbling of the urine. In Vata –basti, Bastikundala the types of Mutraghata, Alpa-apla Mutra is also a symptom told by Acharya Sushruta in the Mutraja Udavarta.47 Acharya Charaka has told that, in Shanirameha, the patient passes small quantity of urine with difficulty and very slowly.48

4. Bahalam-Sashula Mutrayantam (thick urine with pain)
The thick or viscous urine is called Bahala Mutra. When stored overnight in Sandrameha, the person's urine becomes more viscous. When kept overnight in Sandraprasadameha, the patient's urine becomes partially viscous and partially clear.49

Urinary tract diseases have Sashula Mutra (Dysuria)::-Vatakundalika (scanty and painful flow of urine), Mutrajathara (accumulation of urine in abdominal cavity), Mutra-granthi (cyst at the neck of bladder), Mutrotsanga (residual urination), Mutrateeta, (delayed micturition) Mutrakshaya (oliguria), Mutroukasada (dense urine), Vidvighata (feces coming through urine), Mutrashakra (Retrograde flow of semen) and in Mutrakrichchhra i.e. discomforts during micturition.50

Due to Mutravegadhara, there is accumulation of urine in the urinary bladder more than a normal time. Various studies have shown that a full, distended bladder impacts the normal function of the whole urinary system. Different researchers have presented data to support this hypothesis.

1. A full, distended bladder causes a reduction in urine production. Harbert H studied the effect of a full bladder in 12 healthy females on urine production. She concluded that the urine production in the full-bladder test was significantly lower than in the empty-bladder test (P = 0.024). A significant increase in mean blood pressure was found (P= 0.01) in the full bladder.51

2. Harbert JC studied the effect of urinary filling with the radioactive isotope renogram pattern. The study shows that there is delayed accumulation of the tracer in the renal pelvis and delayed pelvis emptying on filling their bladders naturally by refraining from voiding. This means suppression of urine urge cause partial retention of urine.52

3. Fulop M conducted an animal experiment have shown that increased intratubular pressure markedly depressed glomerular filtration.53

4. Nogrady has done an experimental study to evaluate effect of (voluntary) bladder distention on the intravenous pyelogram. This study concluded that voluntary retention of urine in healthy occasionally produces ureteral dilatation and in some cases simulates hydronephrosis54, 55

5. W. B. GILL studied the effect of influence of bladder fullness on upper urinary tract dimension and renal excretory function on the patients of recurrent urinary tract infections or microscopic hematuria. On planimetry the urographic areas of the pelviocaliceal systems decreased by forty three percent on the right side and thirty eight per cent on the left side when the nearly full bladder was compared to the nearly empty bladder in ten patients. Renal excretory function also was affected by nearly full bladders. Urea clearances were twenty four lower and creatinine clearances were nine percent lower when the nearly full bladder as compared to starting with an empty bladder.56

6. Shukla M, studied 25 normal healthy volunteers of 20-45 years who suppressed their urine urge. The effect of retention of urine on biogenic amines and certain physiological parameters has been examined. Plasma and urine catecholamines and 5-HT significantly increased after retention. Simultaneously rise in Blood Pressure, Respiratory Rate, Pulse Rate were also observed. Retention of urine may induce stress as this increasing the catecholamines level.57

DISCUSSION

The body produces Vega to maintain internal equilibrium; therefore, if Vega are impeded, internal equilibrium is disturbed, resulting in a variety of diseases. In Ayurveda vitiated Samana and Apana are responsible for the disease of urinary tract. As Mutra is formed by the action of Kledaka Kapha, Samana Vayu on the Ahar and is excreted from the body with the help of Apana Vayu. Holding the urine urge cause the pratilomagati of the Apana Vayu which lead to the staying of the urine for the long time in the urinary bladder. This causes various
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diseases of the urinary system. Sometimes this leads to the Mutraghata (Retention of urine) and if any microorganism grows there then it can also lead to infection of the Urinary Tract System. Mutravegadharana affects the normal physiology and anatomy of the urinary system.

A long time, holding the urine causes bladder muscle distension, which impairs bladder sensation and increases bladder capacity. Long-term retention of urine impairs neuromuscular transmission after mechanical over distension, and as muscle fibers get increasingly more stretched, they gradually lose their ability to contract. This can cause retention of urine. Voluntary retention of urine in healthy occasionally produces ureteral dilatation. Sometimes it can also cause the vesico uretero renal reflux. Probably too much intravesical pressure is responsible for the back pressure. This intravesical pressure also reduces the urine formation. This can be a defense mechanism for the body to reduce the pressure. But if urine remains in the body for a long time, harmful toxins will also remain in the body. Mutravegadharana has an effect on physical and mental wellbeing. Voluntarily holding urine in humans causes an increase in catecholamine. This can lead to the increase in the blood pressure. Also this shows an effect on the psychological level. Retention of urine may induce stress as this increases the catecholamine level. Chronic suppression of urine desire, which develops through stress as this increases the catecholamine. This can lead to kidney function impairment.

CONCLUSION

Acharaya Charaka first explained the Mutravega among all the Vegas because of its higher frequency and since it is the most prevalent natural urge that a person suppresses. Mutravegadharana mainly causes the Sanga types of Strotodushti in the Mutravaha Stortas.

Before making a diagnosis, a physician must inquire about the suppression of Adharaneeya. Mutra Vegadharana has a significant role in the manifestation of urinary diseases. It can also worsen the symptoms of disease or can cause some complications. It can cause a reduction in urine production, delayed excretion of urine or sometime my cause retention of urine. Other than urinary tract disease, retention of urine can also capable of producing psychosomatic diseases. It also influences the physiological as well as biochemical parameter.

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