

CONCEPT OF LOWER URINARY TRACT INFECTION IN AYURVEDA

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ABSTRACT

Urinary tract infection (UTI) is the second most common type of infection in the body. It results in 3.6 million hospital visits each year and greater than 100,000 hospital admissions annually. They may be confined to the lower urinary tract infection resulting in cystitis and urethritis or involve the upper urinary tract and cause pyelonephritis. Urinary tract infection can be understood as a type of *Mutrakrichhra* in Ayurveda. It is a disease involving the *bastimarma*. As *basti* (~bladder) is one among the *trimarma* (three vital organs), it has greater therapeutic importance. The symptoms of different types of *Mutrakrichhra* particularly *Pittaja Mutrakrichhra* are similar to signs and symptoms of Lower urinary tract infection (LUTI). An attempt has been made in this article to understand the etiopathogenesis of Lower urinary tract infection in Ayurveda.

Keywords : Lower urinary tract infection, *Mutrakrichhra*, *Bastimarma*

INTRODUCTION

Urinary tract infection is defined as multiplication of organisms in the urinary tract. It is usually associated with the presence of neutrophils and $> 10^5$ organisms/ml in a midstream sample of urine (MSU). When the infection is restricted to the lower urinary tract i.e. urethra, bladder and prostate then it is called as Lower urinary tract infection (LUTI).¹UTIs are subdivided into catheter-associated (or nosocomial) infections and non-catheter associated (or community acquired) infections. Infections in either category may be symptomatic or asymptomatic. Acute community-acquired UTIs are very common and account for more than 7 million hospital visits annually. In the female population, these infections occur in 1–3% of school girls and then increase markedly in incidence with the onset of sexual activity in adolescence.²

The diseases of urinary system are dealt under two broad headings in Ayurveda. They are *Mutrakrichhra* and *mutraghata*. The symptom complex of both the *Mutrakrichhra* and *mutraghata* seems to be overlapping each other, but Acharya Dalhana, Acharya Chakrapani, and Acharya Vijayarakshita have demarcated

the difference between them. This difference is based on the intensity of obstruction. The earlier suggest that the disease is characterized with painful micturition whereas the latter with more of obstruction³.

The term *Mutrakrichhra* comprises of two words– *Mutra* and *Krichhra*. The term ‘*Mutram*’ is derived from the root ‘*Mutra + Ghanzh’pratyay*’ which means *Mutra- prasaravane*. The term ‘*Krichhra*’ is derived from the root ‘*Krish – Kaste*’ means causing trouble or painful. The disease in which urine is passed with difficulty is called *Mutrakrichhra*⁴. Considering this, it can be inferred that *Mutrakrichhra* is a condition of urogenital system with dysuria as a prime symptom which includes UTI.

ETIOLOGY

Many different microorganisms can infect the urinary tract, but by far the most common agents are the gram-negative bacilli. *Escherichia coli* cause 80% of acute infections in patients without catheters, urologic abnormalities, or calculi. Other gram-negative rods, especially *Proteus* and *Klebsiella* and occasionally *Enterobacter*, account for a smaller proportion of uncomplicated infections.

The etiological factors for *Mutrakrichchra* have been dealt in detail in *trimarmiya chikitsa* of Charaka samhitha. These etiological factors can be categorised under three headings. They are *aharaja* (food articles causing the disease), *viharaja* (habits causing the disease) and *vaidhyakrita* (iatrogenic factors). Common etiological factors which affect *mutravaha srotas* (urinary tract) can also be considered as a causative factor for manifestation of the disease *Mutrakrichchra*.

Intake of *Ruksha madya* (dry alcoholic beverages), *anupamamsa* (meat of marshy place), *matsya* (fish), *adyashana* (eating before the digestion of previous meal), *atikatu amla lavana rasa* (excessive spicy, sour & salty food articles), *mutritodaka bhakshya* (intake of food with the urge of urination) *ajeerna bhojana* (intake of food during the state of indigestion) are considered as *aharaja nidanas* for *Mutrakrichchra*. *Viharaja nidanas* for *Mutrakrichchra* are excessive indulgence in *vyayama* (exercise), *nityadruta prustayana* (traveling), *stree sevana/ vyavaya* (sexual intercourse), *shrama* (labour/ physical activity), *mutravega dharana* (withholding the urge of micturition). *Teekshna oushada* (drugs of strong potency) is the *vaidyakrita karanas* for the disease *Mutrakrichchra*.

TYPES

Charaka samhitha classifies *Mutrakrichchra* into 8 types. They are *Vataja Mutakrichchra*, *Pittaja Mutrakrichchra*, *Kaphaja Mutrakrichchra*, *Sannipataja Mutrakrichchra*, *Raktaja Mutrakrichchra*, *Shukraja Mutrakrichchra*, *Ashmari* and *Sharkaraja Mutrakrichchra*. Suhruta samhitha also mentions 8 types of *Mutrakrichchra* but with a slight deviation from that of Charaka samhitha. *Raktaja Mutrakrichchra*, one among the 8 types of *Mutrakrichchra* mentioned in Charaka samhitha is caused due to injury, whereas it is explained as *Shalyabhighataja Mutrakrichchra* in Sushrutasamhitha. Also Sushrutasamhitha does not mention *Shukraja Mutrakrichchra* but instead *Pureeshaja Mutrakrichchra* is explained.

PATHOGENESIS:

In majority of UTIs, bacteria gain access to the bladder via the urethra. The vaginal introitus and distal urethra are normally colonised by Diphtheroids, Streptococcal species, Lactobacilli, and Staphylococcal species but not by the enteric gram-negative bacilli that commonly cause UTIs. In females who are more prone to the development of cystitis, however, these enteric gram-negative organisms residing in the bowel colonise the introitus, the periurethral skin, and the distal urethra before and during episodes of bacteriuria. The factors that predispose to periurethral colonisation with gram-negative bacilli remain poorly understood, but alteration of the normal vaginal flora by antibiotics, other genital infections, or contraceptives (especially spermicide) appears to play an important role. Loss of the normally dominant H₂O₂-producing lactobacilli in the vaginal flora appears to facilitate colonisation by *E coli*⁵.

Ayurvedic concept of pathogenesis lies in understanding the *dosha* and *dushya* involved in the manifestation of the disease. Indulgence in causative factors like *mutritodakabhakshyasevana*, *atistree sevana/ atimaitihuna*, *ativyayama*, *mutravegadharana*, *katiskhandaatidharana* and *nityadrutaprustayana* leads to aggravation of *vata dosha* specially *apanavata*. Excessive intake of *madya*, *matsya* and *katuamlalavana rasa* causes aggravation of *pitta dosha*. *epachaka pitta*. Intake of *anupamamsa*, *adhyashana* and *ajeernabhojana* aggravates *kaphadosha* which in turn leads to reduced state of *agni* (digestive power). Hence all the *tridoshas* get vitiated.

The vitiated tridoshas along with the state of *agnimandhya* (reduced digestive capacity) invariably produce *ama*. *Ama* mixes with the *doshas* forming *samadoshas*. These *samadoshas* produce symptoms such as *peetamutrata* (yellowish urine), *sadahamutra pravrutti* (burning micturition), *basti and mutrendriya gurutwa* (inflammation of bladder), *shweta, snigda and picchila mutra* (turbid urine with the presence of leucocytes).

These samadoshas circulates all over the body. As there is pre-existing *khavaigunyata* (a weak or defective space within an organ / tissue where a pathological condition is likely to begin) in the *basti* due to indulgence in causative factors, these circulating *samadoshas* get lodged in *basti*. This causes vitiation of the dosha residing in the *basti* i.e *kapha dosha* and *dushya* residing in *basti* i.e *mutra*. Here *kapha dosha* is considered because of its *ashraya ashrayee bhava* with *mutra* (urine)⁶. The type of *kapha dosha* involved is debatable. This vitiated *kapha* causes obstruction to *mutra* and thereby leads to aggravation of *apanavata*. Vitiating of *apanavata* results in the alteration in its normal function and thus causes *Mutrakrichchra*.

When an individual consumes alcoholic beverages, fish and spicy articles in excess *pitta dosha* gets vitiated. Also in LUTI there will be increased urine concentration and change in urine pH which is suggestive of *pitta dusti*. This suggests that *pitta*, the *agantuja dosha* (external factor leading to aggravation of *dosha*) has a major role to play in etiopathogenesis of LUTI.

SYMPTOMS:

The most common presentation of urinary tract infection are; a strong, persistent urge to urinate, burning sensation when urinating, passing frequent, small amounts of urine. Also urine appears cloudy. Many symptoms are mentioned in the classics for various types of *Mutrakrichchra*. The symptoms like *krichchrata* (hesitancy), *muhurmuhur mutra pravrutti* (increased frequency of micturition) and *shula* (dysuria) are present in almost all types of *Mutrakrichchra* as explained in the classics. Hence these symptoms can be considered as important clinical features of *Mutrakrichchra*.

The most presenting features, *Shula* and *muhurmuhur mutrata* are due to aggravation of *vata dosha*; *peeta mutrata* and *daha* are due to aggravated *pitta dosha* and *picchila mutra* (turbid urine) and *shweta mutra* (presence of leukocytes in urine) are due to aggravated *kapha dosha*.

This indicates *Mutrakrichchra* is a disease resulting from aggravation of *tridoshas*. These symptoms enlisted above are found in the infections of urinary tract. Among all these symptoms most agonising and predominant symptom of LUTI is burning micturition which suggests *pitta dusti* in the manifestation of this disease.

DISCUSSION:

Ushna (hot), *teekshna* (sharp), *ruksha* (dry) and *ashukari* (fast acting) qualities of alcohol will cause vitiation of *vata* and *pitta dosha*. Hence intake of alcoholic beverage changes the urine pH and inturn makes the bladder susceptible for the infection. Studies have revealed that there is considerable amount of increase in the risk of development of UTI with the intake of alcoholic beverages⁷. Excessive intake of meat of marshy places increases *kapha dosha* and fish acts as *maha abhishyandi* (obstruction to channels). This increases *kledata* (dampness) in *dhatus*, *mala* and *srotas* (channels) especially *mutravaha srotas*. The vitiated *kapha / kleda* affects the innate immunity of the individual. The reduced local immunity i.e of the urinary tract makes it vulnerable for infection.

Adhyashana & ajeerna bhojana leads to reduced state of *agni* which results in the formation of *ama* and there by aggravates the *tridoshas*. Thus these causative factors act as *viprakrista nidana* (distant/ remote cause) in producing the disease *Mutrakrichchra*. *Atikatu amla & lavana rasa* are hot in potency and hence cause vitiation of *pitta dosha*. Increased *pitta dosha* is responsible for the increase in urine concentration thereby altering the pH and decreases the volume of urine. Thus it creates an environment favourable for the growth of bacteria. Studies have suggested that spicy food articles tend to irritate bladder and thus facilitates cystitis⁸.

When a person indulges in eating or drinks water under the urge of micturition, the *apana vayu* gets vitiated causing *Mutrakrichchra*. *Nithya druta prusta yana* refers to riding the back of fast moving animals. It can be considered as excessive travelling on uneven surface. This cause

khavaigunya in *mutravaha srotas* and also aggravate *apana vata* whereas excessive exercise or physical activity causes aggravation of *apana vata*. Aggravated *vata-dosha* increases *rukshata*. Because of this, urine volume decreases and thereby causing increase in the urine concentration. This produces an environment favourable for bacterial growth.

The term *atistree sevana* refers to excessive sexual intercourse irrespective of the gender. *Atistree sevana* causes vitiation of *vata dosha*. The increased *vata dosha* causes deterioration of *dhatus* which in turn leads to reduced immunity. This reduced immune component of body makes the individual prone for infections. It is noted that sexual intercourse causes the introduction of bacteria into the bladder and is associated with the onset of cystitis and thus it appears to be important in the pathogenesis of UTI in young women⁹. Also sexual contact with infected partner increases the risk of development of UTI.

Withholding the urge of micturition is mentioned as one of the causative factor of *mutravaha srotodushti*¹⁰. It leads to aggravation of *apana vata* and thereby causing *pratiloma gati* (upward movement) of *apana vayu*. Thus it produces symptoms like dysuria, hesitancy and such other urinary symptoms. Because of habit of withholding the urge of micturition, there will be stretching of bladder muscle beyond its capacity, which in overtime causes weakness of bladder muscle. This causes incomplete emptying of bladder. The residual urine left in the bladder acts as a medium for bacterial growth. Also there will be alteration in the pH of the urine which makes an environment favourable for the growth of bacteria.

Intake of drugs with strong potency aggravates *pitta dosha*. This increases the urine concentration, thereby urine volume decreases and results in change of pH value. This creates an environment susceptible for infections. Studies have revealed that certain medications, particularly the chemotherapy drugs like Cyclophosphamide and Ifosfamide can cause

inflammation of bladder which is termed as drug induced cystitis¹¹.

Detailed analysis of the pathogenesis of the disease suggests that there is increase in *ruksha* and *chalaguna* of *vata* giving rise to impairment in the flow of urine through its channels. The *ushna* and *teekshna gunas* of *pitta* increase and thereby produce burning micturition. The *guru* and *picchila guna* of *kapha* gets vitiated, giving rise to *shotha* i.e. colonization of bacteria leading to inflammation of the urinary tract.

From Ayurvedic perspective any infection is perceived with the involvement of *pitta dosha*. *Pitta dusti* is responsible for manifestation of burning micturition as the presenting symptom of LUTI. The change in urine pH is also associated with *pitta dusti*. This suggests the importance of *pitta dosha* in the manifestation of LUTI.

CONCLUSION:

Urinary tract infection is a disease of *mutravaha srotas* produced due to the vitiation of all the *doshas*. Though there is involvement of *tridoshas*, etiopathogenesis of this disease suggests that *pitta dosha* plays a major role. Any factor that increases the urine concentration and alters the urine pH precipitates LUTI.

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