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An insight into *Pittaja Mutrakrichra* w.s.r. to Lower Urinary Tract Infection with mechanism, risk factors & prevention

Sangeeta S.H¹, Sahana M², Waheeda Banu³

¹First Year Post Graduate Scholar, Dept. of P.G. Studies in Kayachikitsa, Karnataka Ayurvedic Medical College, Mangalore, Karnataka, India.

²Associate Professor, Dept. of P.G. Studies in Kayachikitsa, Karnataka Ayurvedic Medical College, Mangalore, Karnataka, India.

³Professor & HOD, Dept. of P.G. Studies in Kayachikitsa, Karnataka Ayurvedic Medical College, Mangalore, Karnataka, India.

ABSTRACT

In Ayurveda, diseases are named after taking into consideration of certain criteria which are very much significant. A disease named on the basis of *Pravrutti* of *Mootra* associated with difficulty in *Pravrutti* is *Mutrakrichra* i.e., passing urine with difficulty or pain. Eight types of *Mutrakrichra* are described in details in *Madhav Nidana* - i.e., *Vattaja*, *Pittaja*, *Kaphaja*, *Sannipataja*, *Shalyaja*, *Ashmarija*, *Shukraja*, *Purishaja* *Mutrakrichra*. *Pittaja Mutrakrichra* was well acknowledged in *Samhitas* with different treatment modalities, which can be concurrent to Lower urinary tract infections on theoretical and clinical symptomatology of disease. Urinary Tract Infection (UTI) is defined as multiplication of organism in urinary tract.^[1] Urinary tract infection is the inflammation of the tissues of the urinary tract.^[2] Upper urinary tract infection is infection involving the kidney and lower urinary tract infection is infection involving the bladder, prostate, and urethra.^[3] Hence in the present study, an attempt is made to critically analyze the disease *Pittaja Mutrakrichra* with its *Nidana*, *Samprapti*, *Lakshana* and with the disease Lower urinary tract infection. Lower urinary tract infection can be reduced by drinking plenty of fluids and completely emptying the bladder frequently. Menstrual hygiene changes sanitary pads or tampons regularly to maintain cleanliness and to prevent bacterial growth.

Key words: *Pittaja Mutrakrichra*, Lower Urinary tract infection, Preventive measures.

INTRODUCTION

Dosha, *Dhatu* and *Mala* are basic substratum of the *Shareera*.^[4] *Mala* being one among them, *Acharyas* have given importance to their function and their different status in the body. *Mutra* is one among the *Trimala*^[5] and it plays a major role in *Kledavahana*. *Mutravega* is one among the *Adharaniya Vegas*.^[6]

Address for correspondence:

Dr. Sangeeta S. H

First Year Post Graduate Scholar, Dept. of P.G. Studies in Kayachikitsa, Karnataka Ayurvedic Medical College, Mangalore, Karnataka, India.

E-mail: drsangeetash3@gmail.com

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Disorders related to *Mutra* have been elaborately explained by our *Acharyas* and *Mutrakrichra* is one among them. “*Yena Mootrakricchre Mootram Kricchrena Vahati*”^[7], “*Mootrakrichram Dukhena Mootrapravrutti*”^[8], “*Mootrakrichraniti Mootrasya Kricchrena Mahata Dhukhena Pravrutti: Mutrakrichra*”^[9] i.e., *Mutrakrichra* as passing urine with difficulty or pain. Eight types of *Mutrakrichra* are described in details in *Madhav Nidana* - i.e., *Vattaja*, *Pittaja*, *Kaphaja*, *Sannipataja*, *Shalyaja*, *Ashmarija*, *Shukraja*, *Purishaja* *Mutrakrichra*. All the *Nidana* of *Mutrakrichra* ultimately results in the *Tridosha Prokopa* and *Mandagni* (*Aam* production) which along with *Kha Vaigunya* initiates further pathogenesis and its features are *Sadaha Mutrata*, *Peeta Mutrata*, *Sarakta Mutrata*, *Krichhra Mutrata*, *Saruja Mutrata* and *Muhur Muhur Mutrata*.

While we analyse the disease *Pittaja Mutrakrichra*, it's *Nidanas*, *Samprapti* and *Lakshanas* can be compared to Lower urinary tract infection. The lower urinary tract

involves the urinary bladder, urethra and prostate.^[10] In this article, the disease *Pittaja Mutrakrichra* has been critically reviewed for better understanding of why and how it can be compared to lower urinary tract infection.

Lower urinary tract infection is one among the most common infections to the mankind. Hence it is the most common condition encountered in general practice. Urinary tract infection affects more than 150 million people every year world wide. Lower urinary tract infection occurs far more commonly in females than males. As many as 50-80% of women in general population acquire at least one incidence of lower urinary tract infection during their lifetime.^[11]

AIM AND OBJECTIVE

Critically analyze the concept of *Pittaja Mutrakrichra* by comparing with lower urinary tract infection.

MATERIALS AND METHODS

All the relevant evidence pertaining to *Mutrakrichra* and lower urinary tract infection was

collected from different Ayurvedic, Contemporary texts relevant research articles & relevant internet related articles. Analysis of concept of *Pittaja Mutrakrichra* was done by comparing with lower urinary tract infection.

REVIEW OF LITERATURE

Table 1: Adhikarana of Mutrakrichra

Samhitas	References
Charaka Samhita	Sutrasthana & Chikitsasthana 26 th Adhyaya Chikitsa, Siddhi Sthana 12 th Adhyaya
Sushruta Samhita	Uttaratantra 59 th Adhyaya
Ashtanga Hridaya	Nidana Sthana 9 th Adhyaya
Ashtanga Sangrah	Nidana Sthana 9 th Adhyaya
Madhava Nidana	30 th Adhyaya

Table 2: Types of Mutrakrichra

Samhitas	Types of Mutrakrichra
Charaka Samhita ^[12]	1) Vataja Mutrakrichhra
	2) Pittaja Mutrakrichhra
	3) Kaphaja Mutrakrichhra
	4) Sannipataja Mutrakrichhra
	5) Raktaja Mutrakrichhra
	6) Shukraja Mutrakrichhra
	7) Ashmarija Mutrakrichhra
	8) Sharkaraja Mutrakrichhra
Sushruta Samhita ^[13]	Eight types of <i>Mutrakrichhra</i> are described in Sushruta Samhita. Possibility of <i>Shukara</i> causing <i>Mutrakrichhra</i> was not recognized. However separate description of <i>Mutrashukra</i> under the heading <i>Mutraghata</i> is available.
Ashtanga Hridaya & Asthanga Sangraha ^[14]	1) Vataja
	2) Pittaja
	3) Kaphaja
	4) Sannipataja

Nidana

व्यायामतीक्ष्णौषधरूक्षमद्यप्रसङ्गनित्यद्रुतपृष्ठयानात्।

आनूपमत्स्याध्यशनादजीर्णात् स्युर्मूत्रकृच्छ्राणि नृणामिहाष्टौ।

Table 3: Nidanans of Mutrakrichra

Nidana ^{[15],[16]}	Type of Nidana
Aharaja Nidanans	Atisevana of Rukshaahara, Madhyasevana, Aanupamatsya Sevana, Adhyashana, Ajeerna
Viharaja Nidanans	Ativyayama, Nityadrutha Prushatayana

<i>Aoushadaja Nidana</i>	<i>Teekshanaoushadha Sevana</i>
<i>Mutravaha Srotodushti</i>	<i>Aahara Sevana</i> while there is <i>Mutravega</i> , <i>Streesevana</i> while there is <i>Mutravega</i> , <i>Mutranigrahana</i> , <i>Ksheena</i> and <i>Kshata</i>

Etiology of urinary tract infection

The uropathogens causing UTI vary by clinical syndrome but are usually enteric gram negative rods that have migrated to the urinary tract. Usually, the organisms involved in the infection are E. Coli & staphylosaprophyticus. Proteus mirabilis and Klebsiella Pneumoniae are rare causes.

The route of urinary tract infection is either ascending route or through haematological route. In majority of UTI, bacteria ascend from urethra to bladder. It can continue its ascend upto kidney.

There are several factors which influence UTI like vaginal ecology, environmental and microbial factor. In women, vaginal ecology is an important factor affecting risk of UTI.

An anatomically normal urinary tract presents a stronger barrier to infection than a compromised

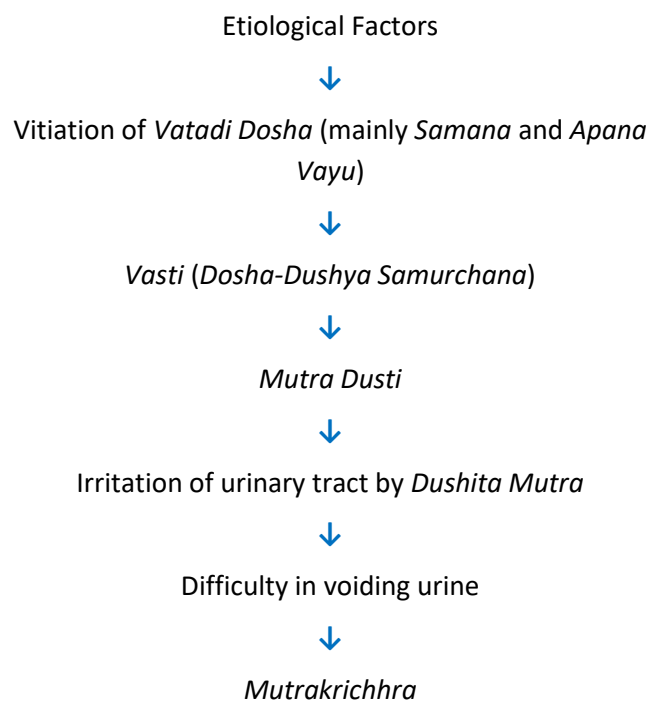
urinary tract. Thus, strains of E. coli that cause invasive symptomatic infection of the urinary tract in otherwise normal hosts often possess and express genetic virulence factor, including surface adhesions that mediate binding to the specific receptors on surface of epithelial cells.^[17]

Samprapti^[18]

पृथङ्गलाः स्वैः कुपिता निदानैः सर्वेऽथवा कोपमुपेत्य बस्तौ ।

मूत्रस्य मार्गं परिपीडयन्ति यदा तदा मूत्रयतीह कृच्छ्रात् ।

The *Dosha* (individual or altogether) are vitiated by the above mentioned aetiological factors. The vitiated *Dosha* entered into *Vasti* and cause *Dosha-Dushaya Samurchana* in individual where *Kha-Vaigunya* is already there. Hence *Mutra Dushti* manifests. *Dushit Mutra* causes irritation and spasm of urinary passage and leads to difficulty in micturition process.



Samprapti Ghataka

Dosha - Tridoshas (*Vata Pradhana*)

Dushya - Mootra, Rakta

Srothas - Mootravaha

Srotho Dushti Prakara - Sanga

Agni - Jatharagni & Dhatwagni

Ama - Jatharagni & Dhatwagni Mandya Janya

Udbhavasthana - Pakwashaya

Sanchara Sthana - Mootravaha/Mootramarga

Vyakta Sthana - Mootramarga

Rogamarga - Madyama

Samprapti Bheda

Sankya Samprapti: 8 types

Pradhana Samprapti:

Vata - Apana, Samana Vayu

Pitta - Pachakaa

Vikalpa Samprapti:

Vata - Gunah: Chala Guna increased, *Karmatah:* decreased as proper *Nishkramana* of *Mootra* will not take place.

Pitta - Gunatah: Daha Guna Vruddi and Kshaya in Saraguna

Acharya Harita mentions the involvement *Pitta* as main *Dosha* in the pathogenesis of *Mutrakrichra*.^[19] Acharya Kashyapa also conveys similar opinion & states *Mutrakrichra* as *Pitta Pradhanatridoshaja Vyadhi*.^[20]

Pathogenesis of Lower UTI

The urinary tract can be viewed as an anatomic unit united by a continuous column of urine extending from the urethra to the kidneys. The entry of uropathogens into the urinary tract is often from periurethral colonization in females and from preputial colonization in uncircumcised males. When host defenses are weakened, urethral colonization and mucosal adhesion of bacteria occur. Adherence of bacteria to uroepithelial cells is the critical first step in initiation of infection. Fimbriae mediates the attachment of bacteria to specific receptors on epithelial cells for both *E. coli* and *Proteus*. Haemolysin and aerobactin produced by uropathogenic strains of *E. coli* make them resistant to the bactericidal action of human serum. The presence of O antigen, capsular K antigens, and production of siderophores, haemolysins, adhesions and urease enhance the chances of a particular strain to cause infection. The virulence factors favor the release of bacterial toxins; replication and antibiotic resistance. Iron trapping characteristics of bacteria like *E. coli* also contribute to the pathogenicity.^[21]

Samanya Lakshana

The *Samanya Lakshana* of *Mutrakrichra* has been mentioned in *Madhukosha* commentary of *Madhava Nidana* as *Kruchrata* in *Mutravahana* i.e., difficulty in micturition. According to Acharya Harita, *Mutrakrichra* is a *Pitta Doshapradhana Vyadhi*, the symptoms mentioned by him are all *Pitta Dosha Pradhana Lakshanas*. He mentions *Kruchrapravrutti* of *Mutravahana* - difficulty in micturition, *Ushnadhara* - burning micturition, *Mutrasrotasharati* - *Dushti* of *Mutravaha Srotas* and *Raktapravrutti* - hematuria as *Samanya Lakshana*.^[22]

Pittaja Mutrakrichra^[23]

तीव्रा रुजो वङ्क्षणबस्तिमेद्रे स्वल्पं मुहुर्मूत्रयतीह वातात् ।

पीतं सरक्तं सरुजं सदाहं कृच्छ्रान्मुहुर्मूत्रयतीह पित्तात् ।

- Yellowish discolouration of urine
- Hematuria
- Painful micturition
- Burning micturition
- Difficulty in micturition
- Increased frequency of micturition

Clinical features of Lower Urinary Tract Infection

Lower urinary tract infection involves the infection of urinary bladder. Patients with cystitis or urethritis may be asymptomatic or present with symptoms such as abrupt onset of frequency of urination and urgency; dysuria - burning pain in urethra during micturition, nocturia, urge incontinence, suprapubic pain, sensation of incomplete bladder emptying due to spasm of inflamed bladder wall, urine may have offensive smell, blood and cloudy appearance.^[24]

DISCUSSION

Critical appraisal of Pittaja Mutrakrichra v/s Lower UTI

Comparison on the basis of Nidana

The basic factors which contribute to the mechanism of pathogenesis of LUTI are the pH or concentration of urine along with healthy status of genitourinary tract and immunity. Similarly, *Nidanas* of *Mutrakrichra* are either the factors which change the pH or concentration of urine or the one which is causing lowered immunity.

Comparison on the basis of Lakshana

Kruchrata in *Mutravahana* is the *Pradhana Lakshana* of all types of *Mutrakrichra*. Associated symptoms of *Mutrakrichra* depends upon the *Dosha* involved, like *Ruja* in *Vataja*, *Daha* in *Pittaja* and *Gouravata* in *Kaphaja*.

Muhurmuhurmutrata, *Alpamutrata* - Increased frequency of urination (Lower UTI)

Shotha of Basti - Sensation of incomplete bladder emptying due to spasm of inflamed bladder wall. (Lower UTI)

Sadahamutrata - Dysuria (Lower UTI)

Bastishula, Sarujamutrata - Suprapubic pain (Lower UTI)

Comparison on the basis of *Samprapti*

Vatadi Dosha Prakopa (mainly *Samana* and *Apana Vayu*) → Spreads all over the body in search of *Khavaigunya* → *Sthana Sansraya* in *Basti, Mootra Marga* (**First Step:** The lower vagina and periurethral area is heavily colonized by uropathogens). → Vitiating *Dosha's* produces *Sankocha Samrodha, Kshoba* in *Mootramarga* (**Second step:** These pathogens are transferred along the urethra to the bladder). → *Krichrata* in *Mootrapravrutti* (**Third step:** The third and most important step is the establishment and multiplication of bacteria (pathogens) within the bladder → difficulty in passing urine) → *Mutrakrichra*.

CONCLUSION

The *Nidana, Lakshana* and *Chikitsa* of *Mutrakrichra* can be well correlated with that of urinary tract infections. Females likely to be more prone than men because of their shorter urethra. Signs and symptoms of Lower urinary tract infections mentioned in contemporary texts are similar to that of *Pittaja Mutrakrichra*.

Preventive measures

- According to ayurveda *Nidana Parivarjana* is the main line of treatment i.e., avoiding oily spicy foods & unhealthy life style, incorporating foods rich in vitamin C and probiotics (yogurt & fermented foods) to support urinary health & bacterial growth.
- Lower urinary tract infection can be reduced by drinking plenty of fluids and completely emptying the bladder frequently.
- Menstrual hygiene changes sanitary pads or tampons regularly to maintain cleanliness and to prevent bacterial growth.

- Women in whom UTI tends to develop after sexual intercourse should be advised void before and specially after intercourse and may get benefit from a post coital use of single dose of antibiotic.
- Postmenopausal women with recurrent UTI's (three or more episodes per year) treated with vaginal estrogen either cream or ring have a significant reduction in infections.
- The risk of acquiring a catheter - associated UTI in hospitalized patients can be minimized by using indwelling catheters only when necessary implementing systems to ensure removal of catheters when no longer needed, using antimicrobial catheters in high risk patients.
- In men condom catheters to be used.^[20]

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