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A critical review on *Mutrakrichra* w.s.r. to lower urinary tract infection

Dr. Aryamol AD¹, Dr. Umesh C.², Dr. Gopal Krishna G.³

¹Post Graduate Scholar, ²Professor, ³Professor & HOD, Department of Kayachikitsa, Sri Sri College of Ayurvedic Science and Research, Bengaluru, Karnataka, INDIA.

ABSTRACT

Mutrakrichra is a disease which is well explained by all the *Acharyas*. The word *Mutrakrichra* comprises of two words, *Mutra* and *Kruchra*, which means *Kruchra Pravritti* of *Mutravahana* (difficulty in micturition). *Mutrakrichra* can be an independent disease as well as associated symptom in other disease. In the contemporary science, the disease with similar signs and symptoms are Lower urinary tract infection. The *Nidana* of *Mutrakrichra* causes change in the concentration of urine which enhances the growth of microbes in urinary tract. Similarly, the *Lakshanas* of *Mutrakrichra* are also similar to that of symptoms of lower urinary tract infection. The *Chikitsa* and *Oushadha Yogas* mentioned by *Acharyas* are having antibacterial and diuretic property. Hence in the present study, an attempt is made to critically analyse the disease *Mutrakrichra* with its *Nidana*, *Samprapti*, *Lakshana* and *Chikitsa* with the disease lower urinary tract infection.

Key words: Lower urinary tract infection, *Mutrakrichra*.

INTRODUCTION

“*Doshadhathu mala mulam hi shareeram*”, *Dosha*, *Dhathu* and *Mala* are basic substratum of the *Shareera*.^[1] *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*^[2] and it plays a major role in *Kledavahana*. *Mutravega* is one among the *Adharaniya Vegas*.^[3] *Basti* which is the *Srotomula* of the *Mutra* is one among the *Trimarma*.^[4] All these factors show the importance of the *Mutra* and its related structures.

Address for correspondence:

Dr. Aryamol AD

Post Graduate Scholar, Department of Kayachikitsa, Sri Sri College of Ayurvedic Science and Research, Bengaluru, Karnataka, INDIA.

E-mail: draryavaidyanath.ayu@gmail.com

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Disorders related to *Mutra* have been elaborately explained by our *Acharyas* and *Mutrakrichra* is one among them. As the word itself denotes it is the *Kruchratha* in *Mutravahana* (difficulty in passing urine). All the *Acharyas* have explained the *Nidana*, *Bheda*, *Lakshana* and *Chikitsa* of *Mutrakrichra* in detail.

While we analyse the disease *Mutrakrichra*, its *Nidanas*, *Samprapti* and *Lakshanas* can be compared to urinary tract infection. The urinary tract can be divided into two, upper urinary tract and lower urinary tract. The upper urinary tract involves the kidney and ureters and the lower urinary tract involves the urinary bladder, urethra and prostate.^[5] In this article, the disease *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.^[6]

OBJECTIVES

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

MATERIALS AND METHODS

All the relevant information pertaining to *Mutrakrichra* and lower urinary tract infection was collected from different Ayurvedic and Modern texts.

Analysis of concept of *Mutrakrichra* was done by comparing with lower urinary tract infection.

REVIEW OF LITERATURE

Nidana of Mutrakrichra

Nidanas or the aetiology of *Mutrakrichra* can be primarily divided in to two categories, as *Nidanas* directly causing *Mutrakrichra* and the other *Nidanas* which causes *Mutravaha Srotodushti*. *Mutravaha Srotodushti Karanas* will cause *Khavaigunyata* in the *Mutravaha Srotas* making it susceptible for diseases.

Nidanas stated by Acharya Charaka for *Mutrakrichra* are *Aharaja Nidanas* like *Atisevana* of *Rukshaaahara*, *Madhyasevana*, *Aanupamatsya Sevana*, *Adhyashana*, *Ajeerna* and *Viharaja Nidanas* like *Ativyayama*, *Nityadrutha Prushtayana*. He has also mentions *Teekshanaoushadha Sevana* among the *Nidanas*.^[7]

Nidanas stated by Acharya Charaka for *Mutravaha Srotodushti* are *Aahara Sevana* while there is *Mutravega*, *Streesevana* while there is *Mutravega*, *Mutranigrahana*, *Ksheena* and *Kshata*.^[8]

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 *Klebseilla Pneumoniae* are rare causes.^[9]

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. Colonization of the vaginal introitus and periurethral area with organisms from the intestinal flora is the initial step in pathogenesis of UTI.^[9]

An anatomical and functional abnormality, any condition that permits urinary stasis or obstruction, predisposes the individual to UTI. Foreign bodies such as stone, urinary catheterization provide inert surface for bacterial colonization.^[9]

The genetic background of the host influences the individual's susceptibility to recurrent UTI, at least among women. Women with recurrent UTI are more likely to have had their first UTI before 15 years and to have a maternal history of UTI.^[9]

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.^[9]

Samprapti

Samprapti is the pathogenesis of the disease or the process of the manifestation of the disease. Acharya Charaka has explained the *Samanya Samprapti* of the *Mutrakrichra* in detail. *Nidana Sevana* as mentioned earlier leads to *Vatadidosha Prakopa*. This *Prakupita Doshas* enters the *Basti* or *Mutravaha Srotas* causing *Paripeedana* in the *Mutramarga* thus causing *Kruchrata* in *Mutravahana*.^[10]

Acharya Harita mentions the involvement *Pitta* as main *Dosha* in the pathogenesis of *Mutrakrichra*.^[11] Acharya Kashyapa also conveys similar opinion &

states *Mutrakrichra* as *Pitta Pradhanatridoshaja Vyadhi*.^[12]

Pathogenesis of LUTI

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 peri-urethral colonisation in females and from preputial colonisation in uncircumcised males. When host defences are weakened, urethral colonisation 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 favour the release of bacterial toxins; replication and antibiotic resistance. Iron trapping characteristics of bacteria like *E. coli* also contribute to the pathogenicity.^[9]

Mutrakrichra Bheda

Mutrakrichra is classified into 12 types. *Acharya Charaka* and *Acharya Susruta* have mentioned 8 types of *Mutrakrichra*, where in *Acharya Susruta* has added *Abhigataja Mutra Krichra* instead of *Raktaja Mutrakrichra*. Based on *Dosha* involvement in *Ashatanga Sangraha* and *Ashtanga Hrudaya*, *Mutrakrichra* is classified into 4 types. In *Madhava Nidana*,^[13] *Basava Rajeeyam*^[14] and in *Kashyapa Samhitha*,^[15] 7 types of *Mutrakrichra* are described. In *Bhaishajya Ratnavali*,^[15] *Bhava Prakasha*^[16] and *Yoga Ratnakara*^[17] 9 types of *Mutrakrichra* are described.

Purva Rupa

In Ayurvedic literature premonitory symptoms of *Mutrakrichra* have been not described. Similar thing is observed in contemporary science.

Samanya Lakshana

The *Samanya Lakshana* of *Mutrakrichra* has been mention 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* - haematuria as *Samanya Lakshana*.^[13]

Vataja Mutrakrichra Lakshana

The *Nidanas* like *Ruksha Ahara Sevana*, *Vegadharana*, *Atistresevana* leads to *Vataprakopa* leading to *Vatadosha Pradhana Mutrakrichra*. Because of the *Vataprakopalaghu*, *Ruksha* and *Sheetaguna* aggravates leading *Shula* as the *Pradhana Lakshana* along with *Kruchra Mutravahana* in *Vataja Mutrakrichra*.

The *Visistha Lakshanas* of *Vataja Mutrakrichra* are *Vankshanashula* - pain in the inguinal region, *Bastishula* - pain in the lower abdomen, *Medhrashula* - pain in the penis or urethral region, *Muhurmuhur Mutra Pravartana* - increased frequency of urination, *Alpamutrata* - scanty urination, *Kruchramutrata* - difficulty in urination, *Phenamutrata* - frothy urine, *Arunamutrata* - *Arunavarna* of urine, *Avarchastvam* - difficulty in defecation.^[14]

Pittaja Mutrakrichra Lakshana

The *Nidanas* like *Madhya*, *Aanupamatsya Sevana*, *Amla Lavana Ahara Sevana* and *Teekshna Aushadha Sevana* leads to increase in *Ushna* and *Teekshna Guna* of *Pitta Dosha* leading to *Pittaja Mutrakrichra*. The *Pradhana Lakshana* of *Pittaja Mutrakrichra* is *Sadhamutrata*.

Other *Lakshanas* of *Pittaja Mutrakrichra* are *Daha* in *Mushka* and *Mehanapradesha*, *Sarujamutrata*- pain during urination, *Kruchramutrata* - difficulty in micturition, *Muhurmutrata* - increased frequency of urination, *Peeta* or *Haridramutrata* - yellow

discoloration of urine, *Krushnamutrata*, *Saraktamutrata* - presence of blood in the, *Ushnabashpasamhitham* - feeling of *Ushnata* along with perspiration.^[14]

Kaphaja Mutrakrichra Lakshana

The *Nidanas* like *Ajeerna* and *Aanupamatsya Sevana* leads to increase in *Guru Guna* of *Kaphadosha* causing *Kaphaja Mutrakrichra*. *Shotha* and *Gurutwa* of *Basti*, *Linga* and *Mushka* and *Picchilamutra* are the predominant symptoms of *Kaphaja Mutrakrichra*.

Apart from the above said *Shukla Mutrata*, *Anushnamutra*, *Samhrushtaroma* - horripilations, *Vibandha*, and *Alpamutrata* are mentioned.^[14]

Sannipataja Mutrakrichra Lakshana

When an individual indulges in multiple *Nidanas* like *Katu*, *Amla*, *Lavana Aahara Sevana*, *Ativyayama*, *Vegadharana* and *Ajeerna* all the three *Dosha* gets aggravate & leading to *Sannipataja Mutrakrichra*.

The *Lakshanas* of *Sannipataja Mutrakrichra* are *Sarvanirupa* - *Lakshanas* of all the *Tridoshas* will be manifested. *Daha* - burning micturition, *Ruja* - pain while micturition, *Nanavarnamutra* - multi-coloured urine, *Muhrmutrata* - increased frequency of urination, *Murcha*, *Bhrama* and *Vilepa* are also seen.^[14]

Acharya Kashyapa has mentioned *Dwandwaja Mutrakrichra*, where in the *Lakshanas* will be based on the combination of respective type of *Doshas*.^[15]

Abhigataja Mutrakrichra Lakshana

Abhigataja Mutrakrichra manifests when there is *Kshatha* or *Abhigata* by a *Shalya* causing *Mutrakrichra*. *Acharyas* mention *Abhigataja Mutrakrichra Lakshana* similar to that of *Vataja Mutrakrichra*. As *Abhigata* leads to *Vatadosha Prakopa*, the *Pradhana Lakshana* of *Abhigataja Mutrakrichra* is *Basti Kukshi Peeda* along with *Kruchramutrata*.^[15]

Shakrutaja Mutrakrichra

When *Pureesha* gets to *Pratighataavastha* leading to *Vayuvigunata* it leads to *Shakrutaja Mutrakrichra*.

Vegadharana might be considered as *Nidana* of *Shakrutaja Mutrakrichra* leading to *Vatadosha Prakopa* leading to symptoms such as, *Aadhmana*, *Shula* and *Mutrasanga*.^[15]

Ashmarija Mutrakrichra Lakshana

Its *Mutrakrichra* due to the presence of *Ashmari*. According to *Acharya Charaka*, *Ashmari* will be *Kadamba Pushpaakruti* and *Triputa*. *Ashmari* when reaches the *Mutra Marga* causes *Avarodha* and leads to *Lakshanas* such as *Vedana* in *Basti*, *Sevani*, *Mehana*, *Visheernadharamutra* and *Dourbalya*.^[16]

Acharya Susrutha has said the *Lakshanas* of *Ashmarija Mutrakrichra* are similar to that of the *Ashmari*.^[17]

Shukraja Mutrakrichra Lakshana

Vitiated *Sukra* when passes through the urinary tract, individual urinates with difficulty with semen and experiences pain in the bladder and penis. Other symptoms include *Vrushanaativrutte* - testicles become enlarged, painful with stiffness. *Vibandha* of *Mutra* and *Shukra* - obstruction to the voiding of urine and semen, and *Vedanashcha Tudyathe* - pricking kind of pain.^[18]

Raktaja Mutrakrichra Lakshana

Due to *Kshata* when there is blood in urinary tract it causes obstruction to urinary flow and pain in the lower abdomen. The *Lakshanas* are *Teevraarti* - excruciating pain, if this condition is associated with *Ashmari* it will lead to symptoms like *Aadhmana* and *Gourava* in *Basti*. When the *Ashmari* passes out, the patient feels *Laghutwa* in *Basti Pradesha*.^[9] *Acharya Kashyapa* highlights the involvement of *Pitta Dosha* in causing *Raktaja Mutrakrichra*.^[19]

Vatakundali Mutrakrichra Lakshana

In *Basavarajeeyam*, this type of *Mutrakrichra* is mentioned and *Lakshanas* are *Mutraalpatwam*, *Vedana*, *Aadhamana*, *Guruta* and *Kandu*.^[20]

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.^[21]

DISCUSSION

Comparison of Mutrakrichra and LUTI

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*. In lower urinary tract infection, the symptoms like burning micturition, pain abdomen and discomfort during micturition differs from person to person based on the predominance of *Dosha* involved in *Mutrakrichra*.

Lakshanas of Mutrakrichra	Clinical features of LUTI
<i>Muhurmuhurmutrata</i> , <i>Alpamutrata</i> (V, P)	Increased frequency of urination
<i>Shotha</i> of <i>Basti</i> (K)	Sensation of incomplete bladder emptying due to spasm of inflamed bladder wall.
<i>Sadahamutrata</i> (P)	Dysuria
<i>Bastishula</i> (V), <i>Sarujamutrata</i> (P)	Suprapubic pain

Comparing on the basis of *Mutrakrichra Chikitsa* and LUTI treatment

The treatments mentioned for *Mutrakrichra* are mainly *Shodhana* depending upon the *Dosha* involved, *Sthanika Chikitsa* like *Parisheka*, *Abhyanga*, *Avagaha* and *Shamana Oushadhi* containing drugs alleviating the *Doshas*. Where as in LUTI is treated with appropriate antibiotic and alkalizes.

Treatment of LUTI	Treatment of <i>Mutrakrichra</i>
Antibiotic	<i>Shamana Oushadhi</i> containing drugs like <i>Gokshura</i> , <i>Pashanabheda</i> , <i>Darbha</i> , <i>Kusha</i> , <i>Kasha</i> which has got antibacterial activity.
Alkalizers	The drugs like <i>Pashanabheda</i> , <i>Punarnava</i> , <i>Yava</i> has got <i>Mutrala</i> property which alkalises the urine.

CONCLUSION

The *Nidana*, *Lakshana* and *Chikitsa* of *Mutrakrichra* can be well correlated with that of lower urinary tract infection. Among types of *Mutrakrichra* specifically *Vataja*, *Pittaja*, *Kaphaja* and *Sannipataja Mutrakrichra* can be considered under the preview of lower urinary tract infection. In other types of *Mutrakrichra*, the symptoms of LUTI are because of other factors other than the involvement of *Doshas* like *Ashmari*, *Shalya*, *Shukra* & *Shakrut*. With supportive investigation like urine routine and microscopy and based on the symptoms of the patient, *Mutrakrichra* can be well managed by the different treatments modalities and *Shamana Oushadis* mentioned by our *Acharyas*.

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