



RESEARCH ARTICLE

A LITERATURE REVIEW ON MUTRAKRICCHA (LOWER URINARY TRACT INFECTION) BASED ON AYURVEDIC AND MODERN PERSPECTIVES

Dr. Neha Subhash Tambe¹ and Dr. Jai Kiran Kini²

1. P.G Scholar, Department of RogaNidanAvumVikritiVigyan, Y.M.T Ayurvedic Medical College, Kharghar, Navi Mumbai, India.
2. Associate Professor, Department of RogaNidanAvum, Y.M.T Ayurvedic Medical College, Kharghar, Navi Mumbai.

Manuscript Info

Manuscript History

Received: 05 April 2020

Final Accepted: 07 May 2020

Published: June 2020

Key words:-

Mutrakriccha, Mutravahasrotas, Lower Urinary Tract Infection, Bastimarma.

Abstract

The term Mutrakrichha comes under the disorders of MutravahaSrotas, description of this disease is mentioned in almost all classical texts which reflects its prevalence in ancient period. It is a disease involving bastimarma. As basti is one among the trimarma (main three vital organs), it has great therapeutic importance. Acharyashas mentioned and elaborately explained the mutrakriccha and its type in comprehensive manner. As manifestation of mutrakriccha and lower urinary tract infection are similar, an attempt has been made in this article to understand the concept of Lower urinary tract infection in ayurveda.

Copy Right, IJAR, 2020,. All rights reserved.

Introduction:-

The diseases of urinary system are dealt under two broad headings in Ayurveda. They are mutrakrichha and mutraghata. The symptom complex of both mutrakriccha and mutraghata seems to be overlapping each other, but Acharya Dalhana, Acharya Chakrapani, 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 latter with more of obstruction. (1) Mutra is an outcome product digestion of food and metabolism in the body, it passes through urethra. (2) In both mutraghata and mutrakrichha, krichhrata (dysuria) and mutra-vibandhta are simultaneously present but in Mutrakrichha there is predominance of Krichhrata (dysuria). The term Mutrakrichha comprises of two words Mutra and kriccha, the disease in which urine is passed with difficulty is called Mutrakriccha. (1) Considering this, it can be stated that mutrakriccha is a condition of urogenital system with dysuria as a prime symptom which include UTI. Urinary tract infection is defined as multiplication of organisms in the urinary tract. When the infection is restricted to lower urinary tract i.e. urethra, bladder, and prostate then it is called as Lower urinary tract infection (LUTI). (3) Urinary tract infections are second in frequency after upper respiratory tract infections. (4) Incidence and degree of morbidity and mortality from infections are greater with those in the urinary tract than with those of the upper respiratory tract. Bacteria are by far the most common invading organisms but fungi, yeasts and viruses also produce urinary tract infections. Thus, urinary tract infection is potentially a serious condition and failure to realize that this may lead to development of serious chronic pyelonephritis and chronic renal failure. With the introduction of effective antibiotics problem has been solved to some extent but the use of, antibiotics have limitations like side effects, chances of reinfection and relapse even after the long term therapy. Simultaneously increasing incidence of resistance and high cost of therapy are common problems.

Corresponding Author:- Dr. Neha Subhash Tambe

Address:- P.G Scholar, Department of RogaNidanAvumVikritiVigyan, Y.M.T Ayurvedic Medical College, Kharghar, Navi Mumbai, India.

Methods:-

In present article, literary aspects regarding Mutrakriccha and UTI are discussed with the help of available Ayurveda and Modern literature.

Conceptual Review:**Ayurvedic Review**

Mutra is liquid by-product of metabolism.

Panchabhautikatva

Every object consists of all five mahabhoot or the five elements i.e. prithvi (earth) jala (water), agni (fire), vayu (air), akasha (sky) but jala and agni are predominant in mutra.

Mutra-Utpatti and Parinaman

Ayurvedic physiology explains in detail urine formation right from the process of digestion of food and its absorption, absorption of water (precursor of urine) from the pakwashaya i.e. the colon, upto the constant micro filtration of urine from blood through the mutravahsrotas i.e. nephrons, leading further down to its collection in basti i.e. urinary bladder through the mutravahii i.e. the two ureters and micturition through mutra-praseka i.e. urethra.

Presumably Ayurvedic physiology presupposes that the process begins right from the gut and blood circulation because unless the water i.e. the udak absorbed from the large gut and the metabolite wastes yielded by the circulating blood reach the filtering srotas system, the urine cannot form. Hence the kidney as urine forming organ is in a continuum with the precursor structures viz. GIT and CVS. As we now know, the kidney is the most vascular organ of the body and it works as filter for the blood. Thus, the Ayurvedic physiology depicts three phases of urine formation namely; 1) Udak i.e. water or precursor of urine. 2) Kleda i.e. the excreted bodily wastes. 3) Mutra i.e. the fully formed urine located in Basti (bladder).

This phenomenon refers to the fact that when the food is digested the digested material along with the ingested water (Udak) trickle down to the lower gut, gets absorbed in circulation gets loaded with metabolic wastes (Kleda), passes to the Mutravahsrotas i.e. Nephrons in the Basti (kidney) and further after filtration (Nisyandana) the outcome (Mutra / urine) gets collected in the Basti or the urinary bladder for final micturition.

Urinary micro-channels present in Pakwashaya, continuously fill the urinary bladder with urine, similar to the nonstop filling of sea with many small rivers. Each channel has thousands of microscopic openings. Process of filtration of toxic substances in nephrons is similar to the seeping of water from the pores of clay pot. This process of urine formation undergoes day and night continuously.

MutraPramana

The pramana or quantity of mutra is 4 anjali, as this mala is in fluid form the quantitative measurement is done in Anjali by acharyas. One Anjali is the unit equal to one handful of person.

Mutra -Mala karma

Mutramaintain the normal physiological processes of body. Kledavahanam is main function of mutra which means excretion of waste product which is form in metabolic process of food.

Mutranishkraman

The ahara rasa is acted upon by the agni and this metabolism result in formation of minor portion mala and major portion poshyabhaga of dhatu. The apanavayu by its nature stimulates the process of excretion of semen (shukra), menstrual fluid (Artava) faces (shkruta), urine (Mutra) and foetus (Garbha).

Mutramalavikruti**Mutravridhi**

Over indulgence of sheet, madhur, lavan, heavy food, can lead to vridhi (increase in quantity) of mutramala. The increase of mala from normal quantity has various effect on body and is presented as mentioned below: Muhurmuhupravrutti (increased frequency of urination), Bastitoda (severe pain in bladder), Adhmana (Distension), Kruteapyakrutsangyam (feeling of incomplete evacuation of bladder) are the symptoms of mutravridhi.

Mutrakshaya

Over indulgence of ushna, tikshna, ruksha, katu, tikta food can lead to kshaya(decrease in quantity) of mutra mala. The decrease of mala from normal quantity has various effect on body and is presented as mentioned below:

According to charakacharyamutra mala kshaya is presented in form of mutrakriccha (dysuria), mutravaivarnya(discolouration of urine), pipasa(thirst), mukhamparishushyati(dryness of mouth), bastitoda (severe pain after micturition), alpamutrata (Dysuria) are the symptoms of mutrakshaya stated by Sushrutacharya.

Mutralpata (dysuria), kruchata (dysuria), dvivarna (discolouration of urine), saraktamutrapravrutti (haematuria) are the symptoms of mutrakshaya stated by Vagbhatacharya.

Definition of Mutrakriccha

The painful voiding of urine is known as Mutrakriccha. In this disease patient has urge to micturate, but he/she passes urine with pain.

Nidana(Etiology)

It can be concluded that Vyayama, adhyashan, rukshasevana, yanagamanaare causative factors for vataprakopa. (5)Tikshnaaushadha, amlasevana causes pitta prakopa(6) and anupamamsasevana, vyayama,adhyashan causes kaphaprakopa. (7) So these Nidanas cause vitiation of doshas along with stoto-dushti of mutrvahasrotas. Stoto-dusti will cause kha-vaigunya in mutravahasrotas. These factor leads to Mutrakriccha. These etiological factors can be summarized as:

AharajaNidana

Adhyashana, Ajirna, Rukshaannasevana, Tikshnaaushadhasevana, Rukshamadyasevana.

ViharajaNidana

Yana gamana, Ativyayama, Aghata.

PartantraNidana

Kaphajaarsha(8), Ajirna(9), Bastividradhi,(10)Gulma,(11)Udavarta(12)Due to above etiological factors dosasvitiated separately by their respective causes or all together get localized in the bastiand afflicts its passage leading to genesis of Mutrakriccha. Due to above hetu's eight varieties of Mutrakriccha develops.

SampraptiGhataka of Mutrakriccha

1. Dosa: Tridosaja (Vatapradhana)
2. Vata- Apana
3. Pitta- Pacaka
4. Kapha- Kledaka
5. Dushya: Dhatu – Rasa, Rakta, Sukra
6. Saririka Mala- Mutra, Purisa
7. Dhatu Mala- Kapha, Pitta
8. Agni: Jatharagni, Dhatvagni
9. Agnidusti: Mandagni
10. Ama: Agnijanya
11. Strotas: Mutravaha, Purisavaha
12. Strotodusti: Sanga, Siragranthi
13. Adhisthana: Basti
14. Udbhavasthana: Pakvasayottha&Amasayottha
15. Sancarasthana: Mutravahinyah
16. Vyaktasthana: MutravahaStrotoAvayava, Basti, Mehana
17. Svabhava: Cirakari&Asukari
18. Prabhava: Krucchasadhya
19. Rogamarga: Madhyama

RogaBheda:

Mutrakricchais classified into eight varieties.

1. Vataja 2. Pittaja 3. Kaphaja 4. Sannipataja 5. Abhighataja 6. Sakradaja 7. Asmarija
8. Sarkaraja

Charakaclassified into eight kinds namely 1. Vataja 2. Pittaja 3. Kaphaja 4. Sannipataja 5. Ksataja 6. Sakradaja 7. Asmarija 8. Sarkaraja

VatajaMutrakriccha

VatajaMutrakriccha is characterized by elimination of little quantity of urine frequently with difficulty associated with excruciating pain in the groins, scrotum, penis and urinary bladder.

PittajaMutrakriccha

PittajaMutrakriccha is characterized by elimination of unctuous, white, little warm, slimy urine associated with heaviness & swelling in bladder & penis, feeling in scrotum, penis and urinary bladder.

SannipatajaMutrakriccha

SannipatajaMutrakriccha is characterized by elimination of multi coloured urine, frequently associated with burning sensation or cold, pain & loss of consciousness. Appearance of all the above signs & symptoms are observed. It is very difficult for management.

AsmarijaMutrakriccha

Aggravated Vata dries up the semen, urine, Pitta & Kapha located in the urinary bladder leading to development of Asmari(stones) like gallstone in cow. It is classified into four varieties namely 1. Vataja 2. Pittaja 3. Kaphaja 4. Sukraja

1. VatajaAsmari appears like the flower of Kadamba& is of triputi (having three layers)
2. PittajaAsmari appears like stone & which is smooth.
3. Kaphaja&SukrajaAsmariare soft.

Obstruction to urinary passage takes place due to asmari as a result patient suffers from pain in the urinary bladder, perineum, phallus & hypo gastric region associated with splitting of urine while micturition. Due to agonizing pain, patient squeezes penis and frequently passes urine & stool. If the urinary passage gets injured by asmari leading to elimination of urine mixed with blood. Patient passes urine easily after eliminating asmari. Susruta says symptoms of asmari&sarkaraare similar.

SarkarajaMutrakriccha

When asmaribecomes disintegrated into small particles by vata& these come out from urinary passage is known as Sarkara.

Asmari undergoing processing by pitta, broken into many pieces by vata, separated into parts by kapha& the same comes out of urine is known as Sarkara. It is characterized by pain in the region of heart, shivering, abdominal pain, sluggishness of digestive fire, fainting & severe dysuria. Pain subsides after elimination of urine & appears again when the passage is blocked by stone gravel.

SukrajaMutrakriccha

It is characterized by pain in the groin, urinary bladder & penis, testicles become enlarged & painful. Due to obstruction to urinary flow by semen patient passes urine with difficulty and stiffness in testicles.

All the malas (dosas) located in the urinary bladder obstruct the passage of semen causing pain in the penis & urinary bladder. Patient suffers difficulty in micturition & ejaculation of semen associated with stiffness, swelling, excessive pricking pain in the region of urinary bladder & testicles.

KsatajaMutrakriccha

Blood present in the urinary bladder gets vitiated due to trauma, sukraksaya, it causes obstruction & excruciating pain in the urinary bladder. Excessively accumulated vitiated blood forms calculus in association with urine, which causes distention & heaviness in the urinary bladder and which is relieved after the calculus passes out.

SakrtajaMutrakriccha

Vata getting aggravated by the retention of stool, causes flatulence, painful micturition & retention of urine.

Upasaya/ Pathya

The following products are very much beneficial for the patient suffering from mutrakriccha: old red coloured sali rice, ksara products, barely, hot products, buttermilk, milk, curd of cow, meat of wild animals and birds, water of mugda pulse, sugar, fruit of kusmanda, leaves of patola, wild ginger, goksura, ghrtakumari, betel nut, date fruit, pulp of unripe coconut, cucumber, smaller cardamom, cold edibles, fresh water of river and camphor.

Anupasaya/ Apathya

Mutrakriccha patients should avoid exercise, suppression of natural urges, dry & rough food substances & flour preparation, exposure to wind, sexual intercourse, kharjura, lotus root, kapittha, jambu, lotus stem & substances having astringent taste.

The following measures are prohibited to the patient of mutrakriccha: hard labour, suppression of natural urges, intercourse and riding elephants or horses. The patient should also avoid taking incompatible meals, excessive or very less amount of food, betel nuts, fishes, salty edibles, ginger, oily edibles, kalka of sesame seeds, sesame oil, mustard oil, masa or foods prepared from it, karirphala or the like bitter, hot, unctuous and citrus edibles.

Chikitsa(Management)**Shamanachikitsa:**

It includes Mutra-vishodhaniya, mutra-virechaniya, mutra-virajaniya and ashmariharadravyas.

Shodhanachikitsa:

It includes diuretic drugs & uttarabasti which dilutes and flushes various infective agents along with urine.

Bahirparimarjanachikitsa:

It includes medicines that can be used extremely in the form of douches, fomentation, showers, poultices and ointment etc.

Specific Management:**a) Vatajamutrakricchachikitsa**

1. Bahirparimarjanachikitsa- Abhyanga, svedana, upanaha, vatashamakadravyas like dashmool, eranda, nirgundi, parisheka on katipradesh with vatashamaktaila and kwath.(13)
2. Antahparimarjanachikitsa
Shodhana- Niruhabasti, Uttarabasti with vatashamakkwath like dashmoolakwath.
Shamana- Amritadikwatha, Sthiradiashadha, Shwadanshtrataila, traivrittataila (Su.), Mishrakasneha.

b) Pittajamutrakricchachikitsa

1. Bahirparimarjanachikitsa- Sheetaparisheka, avagahanain cold water, pralepana with chandan and karpur.(14)
2. Antahparimarjanachikitsa
Shodhana- Virechana with tiktaevammadhur, kashaya, uttarabasti.
Shamana- Shatavaryadikwatha (Ch.), haritakyadikwatha, trinapanchmulatrinapanchamulakwatha(Y.R.), churna(Su.), ervarubeeja, yashtimadhu, devdaru with tanduldhavan.

c) Kaphajamutrakricchachikitsa

1. Bahirparimarjanachikitsa- Svedana, Abhyangawith taila containing tiktaushnadravya.
2. Antahparimarjanachikitsa
Shodhana- Vamana, niruhabasti with kshara, tikshna, and katudravaya.
Shamana- Vyoshadichurna, pravalbhasma(Ch.), shwadanshtradi kwatha, trikankantakadighritabhaksh, takra

d) Sannipattajamutrakricchachikitsa

In Sannipataja Mutrakriccha the treatment should be done according to vatasthana. "The dosha which is more dominant is treated first."

1. Antahparimarjanachikitsa

Shodhana- If kapha is predominant then vamana, if pitta is predominant then virechana and if vata is predominant then basti karma should be performed.

Shamana- Pashanbhedadi yoga, brihatyadikwatha, Gudadugdha yoga, dhatriyadi yoga.

- e) Raktajmutrakricchachikitsa
It should be managed as sadyovrana.
- f) Shakritajanyamutrakricchachikitsa
Vataharakriyais done in shakritajanyamutrakriccha.
- 1. Bahirparimarjanachikitsa- Abhyanga, svedana, avagahana.
- 2. Antahparimarjanachikitsa
Shodhana: basti
Shamana: Churnakriya

Some other important formulations include:

- i. Varunadikwatha
- ii. Varunshigruadikwatha
- iii. Gokshuradiguggulu
- iv. Gokshuradikwatha
- v. Chandanasava
- vi. Chandraprabhavati
- vii. Trivikrama rasa
- viii. Chandrakala rasa

Modern Review:

Urinary tract infection refers to both microbial colonization of the urine and tissue invasion of any structure of the urinary tract. Bacteria are most commonly responsible, although yeast, fungi and viruses may produce urinary infection. When it affects the lower urinary tract it is known as bladder infection (cystitis) and when it affects the urinary tract it is known as kidney infection (pyelonephritis). Symptoms from a lower urinary tract include pain with urination, frequent urination, and feeling the need to urinate despite having an empty bladder (15). Infections of the urethra and bladder are often considered superficial or (mucosal) infections, pyelonephritis and renal suppuration signify tissue invasion. The 3 basic form of UTI are pyelonephritis, cystitis and asymptomatic bacteriuria. Focal pyelonephritis and renal abscess are less common. (16) From a microbiological perspective, urinary tract infection exists when pathogenic microorganisms are detected in the urine, urethra, and kidney. Symptoms of dysuria, urgency, and frequency unaccompanied by significant bacteriuria have been termed as acute urethral syndrome. Although widely used, this term lacks anatomic precision because many cases so designated are actually bladder infections. Moreover, since the causative agent can usually be identified in these patients, the term syndrome- implying unknown causation is inappropriate.

Etiology

Bacterial infection are the most common cause of UTI, with E.coli being the most frequent pathogen, causing 75-90% of acute infections in patients without catheters (15). Other gram negative bacilli, especially Proteus and Klebsiella and occasionally Enterobacter, account for a smaller proportion of uncomplicated infections. Gram-positive cocci play a lesser role in urinary tract infections, nonetheless Staphylococcus saprophyticus, Enterococci, Staphylococcus aureus are associated with acute urinary tract infection in young females and in-patient with renal stone or previous instrumentation. (15)

Treatment(16)

1. Acute cystitis should be treated promptly to prevent possible progression to pyelonephritis. If the symptoms are severe, a specimen of bladder urine is obtained for culture, and treatment is started immediately.
2. If the symptoms are mild or the diagnosis is doubtful, treatment can be delayed until the results of culture are known, and the culture can be repeated if the results are uncertain. For example, if a midstream culture grows between 10⁴ and 10⁵ colonies of a gram-negative organism, a second culture may be obtained by catheterization before treatment is initiated.
3. If treatment is initiated before the results of a culture and sensitivities are available, a 3 to 5 day course of therapy with trimethoprim- sulfamethoxazole is effective against most strains of E.coli. Nitrofurantoin (5–7 mg/kg/24 hr in 3 to 4 divided doses) also is effective and has the advantage of being active against Klebsiella-Enterobacter organisms. Amoxicillin (50 mg/kg/24 hr) also is effective as initial treatment but has no clear advantages over sulfonamides or nitrofurantoin.

4. In acute febrile infections suggestive of pyelonephritis, a 10 to 14 day course of broad spectrum antibiotics capable of reaching significant tissue levels is preferable.
5. Children who are dehydrated, are vomiting, or are unable to drink fluids, are ≤ 1 month of age, or in whom urosepsis is a possibility should be admitted to the hospital for intravenous rehydration and intravenous antibiotic therapy.
6. Parenteral treatment with ceftriaxone (50–75 mg/kg/24 hr, not to exceed 2g) or ampicillin (100 mg/kg/24 hr) with an aminoglycoside such as gentamicin (3–5 mg/kg/24 hr in 1 to 3 divided doses) is preferable.
7. The potential ototoxicity and nephrotoxicity of aminoglycosides should be considered, and serum creatinine and trough gentamicin levels must be obtained before initiating treatment, as well as daily thereafter as long as treatment continues.
8. Treatment with aminoglycosides is particularly effective against *Pseudomonas* spp., and alkalization of urine with sodium bicarbonate increases their effectiveness in the urinary tract.
9. Oral 3rd-generation cephalosporins such as cefixime are as effective as parenteral ceftriaxone against a variety of gram-negative organisms other than *Pseudomonas*, and these medications are considered by some authorities to be the treatment of choice for oral therapy.
10. Nitrofurantoin should not be used routinely in children with a febrile UTI because it does not achieve significant renal tissue levels.
11. The oral fluoroquinolone ciprofloxacin is an alternative agent for resistant microorganisms, particularly *Pseudomonas*, in patients older than 17 yr. It also has been used in younger children with cystic fibrosis and pulmonary infection secondary to *Pseudomonas* and is used on occasion for short-course therapy in children with *Pseudomonas* UTI.
12. However, the clinical use of fluoroquinolones in children should be restricted because of potential cartilage damage that has been seen in research with immature animals.
13. The safety and efficacy of oral ciprofloxacin in children is under study. In some children with a febrile UTI, intramuscular injection of a loading dose of ceftriaxone followed by oral therapy with a 3rd generation cephalosporin is effective.
14. A urine culture 1 week after the termination of treatment of a UTI ensures that the urine is sterile; in most children, this is unnecessary, because the cultures often are negative.
15. Children with a renal or perirenal abscess or with infection in obstructed urinary tracts often require surgical or percutaneous drainage in addition to antibiotic therapy and other supportive measures.
16. In a child with recurrent UTIs, identification of predisposing factors is beneficial. Many school-aged girls have voiding dysfunction; treatment of this condition often reduces the likelihood of recurrent UTI.
17. Some children with urinary tract infections void infrequently, and many also have severe constipation. Counseling of parents and patients to try to establish more normal patterns of voiding and defecation may be helpful in controlling recurrences.
18. Prophylaxis against reinfection, using sulfamethoxazole-trimethoprim, trimethoprim, or nitrofurantoin at $\frac{1}{3}$ of the normal therapeutic dose once a day, often is effective.
19. Prophylaxis with amoxicillin or cephalixin also may be effective, but the risk of breakthrough UTI may be higher because bacterial resistance may be induced.
20. There is interest in probiotic therapy, which replaces normal vaginal flora, and cranberry juice, which prevents bacterial adhesion and biofilm formation, but these agents have not proved beneficial in preventing UTI.
21. The main consequences of chronic renal damage caused by pyelonephritis are arterial hypertension and renal insufficiency; when they are found they should be treated appropriately.

Discussion:-

1. 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 in turn makes the bladder susceptible for the infection.
2. Studies have revealed that there is considerable amount of increase in the risk of development of UTI with the intake of alcoholic beverages.
3. Excessive intake of meat of marshy places increases kaphadosha and fish acts as mahaabhisheya (obstruction to channels).
4. This increases kleda (dampness) in dhatus, mala and srotas (channels) especially mutravahasrotas. 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.

5. Adhyashana&ajeernabhojana 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 viprakristanidana(distant/ remote cause) in producing the disease Mutrakrichha. Atikatuamla&lavana rasa are hot in potency and hence cause vitiation of pitta dosha.
6. 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.
7. Studies have suggested that spicy food substances tend to irritate bladder and thus facilitates cystitis. (17)
8. When a person indulges in eating or drinks water under the urge of micturition, the apanavayu gets vitiated causing Mutrakriccha.
9. Nithyadrutaprustayanarefers to riding the back of fast moving animals. It can be considered as excessive travelling on uneven surface. This cause khavaigunya in mutravahasrotas and also aggravate apanavata whereas excessive exercise or physical activity causes aggravation of apanavata.
10. Aggravated vatadosha increases rukshata. Because of this, urine volume decreases and thereby causing increase in the urine concentration. This produces an environment favourable for bacterial growth.
11. The term atistreesevana refers to excessive sexual intercourse irrespective of the gender. Atistreesevana causes vitiation of vatadosha. The increased vatadosha causes deterioration of dhatus which inturn 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 women. (18)
12. 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 mutravahasrotodushti. (19) It leads to aggravation of apanavata and thereby causing pratilomagati (upward movement) of apanavayu.
13. 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.
14. This causes incomplete emptying of bladder. The residual urine left in the bladder acts as a medium for bacterial growth. Also there be will alteration in the pH of the urine which makes an environment favourable for the growth of bacteria.
15. 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.
16. 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 cystitis. (20)
17. Detailed analysis of the pathogenesis of the disease suggests that there is increase in ruksha and chalaguna of vatagiving rise to impairment in the flow of urine through its channels.
18. The ushna and teekshnagunas of pitta increase and thereby produce burning micturition. The guru and picchilaguna of kapha gets vitiated, giving rise to shothai.e colonization of bacteria leading to inflammation of the urinary tract.
19. From Ayurvedic perspective any infection is perceived with the involvement of pitta dosha. Pitta dustiis responsible for manifestation of burning micturition as the presenting symptom of LUTI. The change in urine pH is also associated with pitta dusti.
20. This suggests the importance of pitta dosha in the manifestation of LUTI.

Conclusion:-

1. Increasing prevalence of UTI is a global issue of concern due to associated long term compromise in the quality of life.
2. Urinary Tract Infections mentioned in Modern Medicine resembles with Mutakrichha.
3. It is a Vata Predominant Tridoshaj disease involving MutravahaSrotaswithdushtiofMutraandAmbu.
4. In both Ayurveda and modern management, primary prevention (Nidanprivarjanam) strategy has been given priority.
5. UTI causes by micro-organism, so patient should maintain their proper hygiene. Caregivers can help in preventing the disease in children by teaching good hygiene, maintaining healthy hydration and by being aware your child's daily bathroom habits.
6. Urinary tract infection is a disease of mutravahasrotas produced due to the vitiation of all the doshas. Though there is involvement of tridoshas,etiopathogenesis of this suggests that pitta dosha plays a major role.
7. Any factor that increases the urine concentration and alters the urine pH precipitates LUTI.

Reference:-

1. Madhavakara, Madavanidana with madhukosha Sanskrit commentary by Sri Vijayarakshita and Srikantadutta with Madhavavimarshini Hindi commentary by DrAnanthram Sharma, volume 1, Chaukambhasamskrutapratisthana, Delhi,1stEdition; Reprint2007;commentary on 30/1-2; p-491
2. Su.Sa.9/7 Shastri, KavirajAmbikaduttaSushrutaSamhita commentary "Ayurveda TattvaSandipika" part 1, Chaukhambha Sanskrit Sansthan, Varanasi, 1995.
3. Davidson's principle and practice of medicine, edited by Nicolas A. Boon, Nicki R College and Brian R. walker, Churchill Livingstone Elsevier publication, 20th edition, reprint: 2006; p- 467
4. <http://www.ncbi.nlm.nih.gov/>
5. .Su.21/19 shastri, KavirajAmbikaduttaSushrutaSamhita commentary "Ayurveda TattvaSandipika" part 1, Chaukhambha Sanskrit Sansthan, Varanasi, 1995.
6. Su.su.21/20 Shastri, KavirajAmbikaduttaSushrutaSamhita commentary "Ayurveda TattvaSandipika" part 1, Chaukhambha Sanskrit Sansthan, Varanasi, 1995
7. Su.su.21/21 Shastri, KavirajAmbikaduttaSushrutaSamhita commentary "Ayurveda TattvaSandipika" part 1, Chaukhambha Sanskrit Sansthan, Varanasi, 1995
8. Ch.Ch.14 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
9. Ch.Ch.15/49 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
10. Ch.Su.19/1 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
11. Ch.Ch.5 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
12. Ch.Ch.26/8 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
13. Ch.Chi.26/45 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
14. Ch.Chi.26/59 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
15. Harrison's principles of internal medicine by Fauci, Braunwald, Kasper, Hauser Longo, Jameson, Loscalzo, 17th edition p. 5665
16. Richard E, Behnsanh Robert M. Kliegman Hal B Jenson; Nelson Textbook of Pediatrics. SaundersElsevier, a Division of Reed Elsevier India Private Limited, New Delhi, 18th Ed.2008 chapter 538.
17. <http://www.cobfoundation.org/interstitial-cystitis-painful-bladder.../icpbs-diet>
18. Harrison, Principles of Internal Medicine, Eugene Braun Wald, Anthony S. Fauciet. Editors, vol-2nd,16th edition, Reprint: 2005; 1716.
19. F.J Bramble. R. Morley, Drug- induced cystitis: the need for vigilance, British Journal of Urology, 1997, 79, 3-7.
20. Harrison, Principles of Internal Medicine, Eugene Braun Wald, Anthony S. Fauciet. Editors, vol-2nd,16th edition, Reprint: 2005; 1715.
21. <https://www.wjpmr.com/download/article/25082017/1504228941.pdf>
22. Vagbhata: Astangasangraha, volume 1, Translated by Prof. K R Srikanthamurthy, ChaukambhaOrientalia, Varanasi, 5th edition, 2005, Sutra Sthana 19/8; p- 298.
23. Ka.Su.25/21 Bhishgacharya, Shri Satyapala. KashyapaSamhita "Vidyotini" Hindi commentary, Chaukhambha Sanskrit Sansthan Varanasi, 2004.
24. IAP Textbook of Pediatrics - IVth edition.
25. [http://www.iamj.in/posts/images/upload/555_559\(1\).pdf](http://www.iamj.in/posts/images/upload/555_559(1).pdf)
26. Ch. Su. 17/101 CarakaSamhita, with Ayurveda Dipika commentary by Cakrapanidatta, ChowkhambaKrishnadas Academy, 2nd edition, Varanasi.
27. Ma.Ni.30/2 (Madhukosha) Madhavakar, MadhavaNidana, revised by Vijayarakshita and Kanthadatta „Madhukosha“ commentary and Vidyotini Hindi commentary by Ayuredacharya Shri SudarshanaShashtri, Edited by Ayurvedacharya Shri YadunandanaUpadhyaya, Published by Chaukhambha Publications, New Delhi, Edition 32, Year of reprint 2002.