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Common cause of UTI and its regimen a review paper

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Abstract
Common reasons of UTI is vary it shows that people get UTI through many reasons like in Pregnancy UTI is common, Catheter induced UTI, Recurrent urinary tract infections and in condition of Diabetes, in babies due to nappy and unhygienic toilets, in Hospital Patient get it through hospital staff un hygiene hands practice or by unsterile handling of foley catheter it may be the cause of UTI due to different reasons, rest of it we may get UTI at any stage and in any condition our general awareness may keep us away fom it if we could understand the different causes of UTI and its mechanisms.

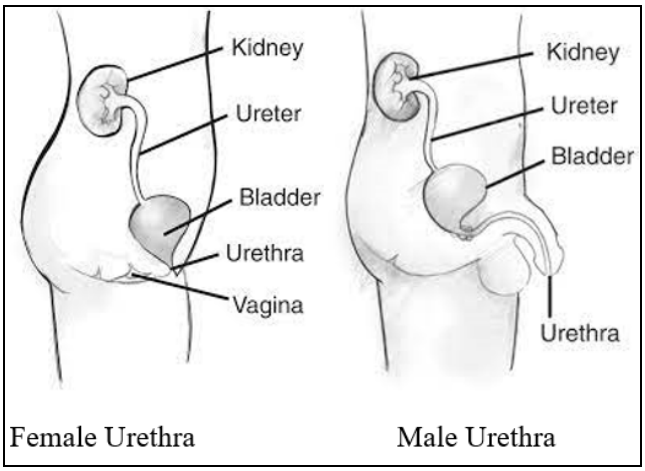
Keywords: Urinary tract infection, *escherichia coli, enterococcus fecalis,* urogenitaltract

Introduction
The urinary tract infection is the first most common infection even it comes in list of common infection after respiratory infection. We may easily found that urinary tract infection always connects with the nosocomial infection which is very common in hospital and somehow it may be the cause of death of a patient in a very large scale. The urinary tract infection may become the common infection during Hospitalization, due to less immunity of the Patient especially with long stay of the patient, poor hygiene of the patients and negligence of the hand hygiene may increase the chances of UTI in hospitalized patients. The inappropriate treatment of a patient in term of experimental treatment of a patient with incorrect antibiotics creates a condition of "super bugs [1].

Purpose of this study
The purpose to publish this review paper is to throw the light on, what is the common cause of UTI and its correct regimen.

Common Etiology behind UTI
There are N numbers of reasons why UTI is so common but here we just take a look on the most common reason behind this condition.
Urinary tract infections (UTIs) in women are one of the most prevalent infections occurring at various stages of life. Women are much more prone to UTIs than men, mainly due to the female lower urinary tract anatomy and its proximity to the reproductive organs. The female urethra is relatively short, reducing the distance for bacterial ingress. Furthermore, it opens into the vulvar vestibule, i.e. a structure that is also quite prone to infections, given the prevalence of vulvar vestibulitis and vaginitis. In this case, sexual activity as well excessive use of intimate hygiene products interfering with natural vaginal microbiome are often to blame. On the other hand, the proximity of the anus facilitates the colonization of both the reproductive organs and distal parts of the urinary tract by Escherichia coli, Enterococcus fecalis, and the Streptococcus species. Pregnancy and the perinatal period are other characteristic time points marked by frequent urinary tract infections [2]. (Look in to the picture).
Catheter acquired urinary tract infection is one of the most common health care acquired infections [3a, 3b]; 70-80% of these infections are attributable to use of an indwelling urethral catheter. Recent prevalence surveys report a urinary catheter is the most common indwelling device, with 17.5% of patients in 66 European hospitals having a catheter [3].

Image by the Curtsy of Cleveland Clinic 2022



In Pregnancy

Urinary Tract Infections (UTIs) commonly occur pregnancy, due to the morphological and physiological changes that take place in the genitourinary tract. UTIs are of two types, symptomatic and asymptomatic. Asymptomatic Bacteriuria (ASB) is defined as the presence of actively multiplying bacteria, which is greater than 105/ml of urine within the urinary tract, excluding the distal urethra, at a time when the patient has no symptoms of a UTI [4].The Pediatric Population is also at risk at the age of early infants younger than 6 months have a higher incidence of UTI. The most common reason of pediatric to get infections are vary like nappy in infancy, shorter the female urethra distance and fore skin surface area in uncircumcised males [4].Most urinary tract infections are due to the colonization of the urogenital tract with rectal and perineal flora. The most common organisms include Escherichia coli, Enterococcus, Klebsiella, Pseudomonas, and other Enterococcus or Staphylococcus species. Of these, Escherichia coli is the most common, followed by Klebsiella. Residential care patients, diabetics, and those with indwelling catheters or any form of immunocompromised can also colonize with Candida [5]. E. coli and possibly Klebsiella overwhelmingly cause simple UTIs. Complicated UTIs tend to be caused by a much wider range of organisms which is significant because multidrug resistance is increasing, and therefore specific antibiotic regimens will vary.

Catheter-Associated UTIs (CAUTIs)

The Infectious Disease Society of America (IFDSA) defines a CAUTI as:

- Having an indwelling catheter for at least two days after initial insertion.
- One UTI sign or symptom (fever, chills, suprapubic pain, cost vertebral angle tenderness, flank pain, or urinary symptoms (dysuria, urgency, or frequency)). (Older patients may present with altered mental status or hypotension).
- Urine culture with at least 1,000 CFU/ml of a single bacterial species [6a, 6b, 6c].

Common pathogen of UTI

UTI are caused by both gram- positive and by gram-negative bacteria as well by certain fungi. The most common causative agent for both uncomplicated and complicated UTI is uropathogenic E scherichia Coli after E. Colio other causative agents of UTI are Klebsiella Pneumonia Staphy lococus saphrophyticus, Etercoccsfecalis, group B Streptococcus Proteus mirabilis Pseudomonas aeruginosa, Staphylococcus aureus and Candida spp. The most common infecting organism is Escherichia coli [7] Other Enterobacteriaceae as well as Enterococci spp, coagulase negative Staphylococcus, Pseudomonas aeruginosa, other non-fermenters, and Candida spp are also frequently isolated [8] Antimicrobial-resistant organisms are common. The urine of patients with indwelling catheters is the major site of isolation of resistant gram negative organisms in both acute and long term care facilities, including extended spectrum beta-lactamase (ESBL) producing Enterobacteriaceae and CRE [9a, 9b, 9c].

E. coliis usually the most frequent species isolated from bacteraemia CAUTI patients in acute care Proteus mirabilis is an organism of unique importance for patients with chronic indwelling catheters. This species is seldom isolated following initial colonization of the catheterized urinary tract, so it is not common in patients undergoing short term catheterization [10] the longer catheter is in place the more likely P. mirabilis will be present. This organism is isolated from about 40% of urine samples collected from patients with chronic indwelling catheters [11] Adherence is a key event initiating each step in UTI pathogenesis. A UTI typically starts with peri urethral contamination by a uropathogen residing in the gut, followed by colonization of the urethra and subsequent migration of the pathogen to the bladder, an event that requires appendages such as flagella and pili. In the bladder, the consequences of complex host–pathogen interactions ultimately determine whether uropathogens are successful in colonization or eliminated [12].

Recurrent urinary tract infections

Recurrent urinary tract infections (UTIs) are defined as two episodes of acute bacterial cystitis, along with associated symptoms within the last six months or three episodes within the last year. Recurrent UTIs are much more common in the female population [13] Urinary tract infections (UTIs) are frequently encountered in pregnant women. Pyelonephritis is the most common serious medical condition seen in pregnancy. Thus, it is crucial for providers of obstetric care to be knowledgeable about normal findings of the urinary tract, evaluation of abnormalities, and treatment of disease. Fortunately, UT During pregnancy, urinary tract changes predispose women to infection. Ureteral dilation is seen due to compression of the ureters from the gravid uterus. Hormonal effects of progesterone also may cause smooth muscle relaxation leading to dilation and urinary stasis, and vesicoureteral reflux increases Is in pregnancy are most often easily treated with excellent outcomes. 14 Usually, UTI is caused by Escherichia coli and different studies have shown an alarming increase in resistance of this bacteria in invasive infections like urinary tract infections [15a, 15b, 15c, 15d, 15e]. Furthermore, UTI is caused by coliforms and Enterococcus spp. because of their presence in high numbers on the perineum [16]. Urinary tract candidiasis is known as the most frequent nosocomial fungal infection worldwide. Candida albicans is the most common cause of nosocomial fungal urinary tract infections; however, a rapid change in the distribution of Candida species is undergoing [17].

Regimen of UTI

Nitrofurantoin

Is an antibiotic medication that is used for the treatment of uncomplicated lower urinary tract infections? It is effective against most gram-positive and gram-negative organisms. Nitrofurantoin primary use has remained in treating and prophylaxis of urinary tract infections. Nitrofurantoin is advantageous as it concentrates in the lower urinary tract while maintaining a low serum concentration and does not significantly affect bowel flora. This activity outlines the indications, mechanism of action, methods of administration, important adverse effects, contraindications, monitoring, and toxicity of nitrofurantoin, so providers can direct patient therapy successfully in instances where nitrofurantoin provides a benefit to patient care [18].

The FDA approved nitrofurantoin in 1953 to treat lower urinary tract infections. Nitrofurantoin is a synthetic antimicrobial created from furan and an added nitro group and a side change containing hydantoin. Nitrofurantoin was widely used to treat lower urinary tract infections until the 1970s, when trimethoprim-sulfamethoxazole and newer beta-lactam antibiotics became available. Several major guidelines have recently declared nitrofurantoin the first-line therapy for treating uncomplicated lower urinary tract infections [19]. Cephalexin is an antibiotic that is effective against most gram-positive cocci. Additionally, cephalexin is effective against gram-negative bacteria, particularly E. coli, Proteus mirabilis, and Klebsiella pneumoniae [20].

Levofloxacin is a widely used Fluoroquinolones approved for the treatment of complicated urinary tract infections and acute pyelonephritis. Fluoroquinolones have been extensively used in the management of genitourinary infections, especially acute uncomplicated cystitis [21].

Conclusion

Urinary tract infections creates a major health problem for all human society in all over the world. The results of present review study reveals that UTI occurs in all age groups and both gender but prevalence was higher in females and most common causative agent of UTI is E. Colifollowedby K. pneumonae, P. aeruginosa, E. faecalis, S. aureusand P. vulgaris. The frequency of UTI may increase due to many reason it may human physiology to unhygienic bathroom or many others. It thus appears that awareness related to UTI may decrease the cases of UTI. So health awareness programme for general public should be conducted and they should advise to drink plenty of water and maintain personal hygiene to avoid risk of UTI. Rest of it the other reason is wrong antibiotic prescription or prescribing antibiotic without urine culture and sensitivity which is creating Antibiotic resistance or “superbugs.

Conflict of Interest

Not available

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