Difference Between UTI and Bladder Infection

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Key Difference – UTI vs Bladder Infection

Urinary tract infections are commonly seen in women, children and elderly men. The occurrence of UTI in men is fairly uncommon and a male getting recurrent UTIs is more likely to have an abnormal urinary tract. These infections in the urinary tract can give rise to acute complications like gram negative septicemia and acute renal failure. Clinically UTIs can be divided into two categories as upper UTI and lower UTI. Bladder infections are a type of lower urinary tract infections. Thus, the key difference between UTI and bladder infection is that **UTI is an infection in any part of the urinary tract while bladder infection is an infection in the lower urinary tract.** It is also important to note that bladder infection is a subset of UTI.

What is a UTI?

UTI or **urinary tract infection** can be defined as infections involving the kidneys, ureters, bladder, and urethra. The majority of UTIs are isolated attacks but in 10% of the cases, there is a possibility of having recurrent attacks. Of that 10%, 20% is because of relapses and the remaining 80% is because of re-infections. UTIs have been recognized as the commonest cause of septicemia.

Pathogenesis

Organisms of the normal bowel flora are the commonest causative agents of UTIs. Sexual intercourse and poor personal hygiene facilitate the entry of these microbes into the urinary tract. Once inside the urinary tract, they ascend up along the urethra and penetrate the overlying urothelium. Using the virulence factors such as fimbriae, these pathogens adhere to the urothelium and start to release various toxins that initiate the pathogenesis.

Commonest causative agents of UTI are,

- *Escherichia coli*(mainly)
- *Proteus* spp.
- *Klebsiella* spp.

- *Pseudomonas* spp.
- *Streptococcus faecalis*
- *Staphylococcus epidermidis/ saprophyticus/ aureus*

Factors that Predispose UTI

1. Abnormal urinary tract
    - Stones
    - Strictures
    - Vesico ureteric reflux
    - Gynecological causes ex: vesicovaginal fistula
    - Neurological causes
    - Enlarged prostate
2. Instrumentation
3. Immune suppression due to diabetes or pregnancy

Signs and Symptoms

Acute Pyelonephritis

Symptoms: Loin pain, High fever with chills and vomiting

Signs: Renal angle and lumbar region tenderness

Cystitis, Urethritis

Symptoms: Dysuria, increased frequency of micturition, supra pubic pain

Signs: Supra pubic tenderness

Diagnosis

A diagnosis of UTI can be made in younger women (age <65) who do not have any urinary tract abnormality, urinary tract instrumentation or systemic illness, if they show at least two of the three cardinal symptoms – dysuria, urgency, frequency.

Following investigations can be performed to confirm the diagnosis.

- Urine Full Report(UFR); to look for the presence of pus cells, red blood cells or pus cell casts
- Urine culture and ABST; to look for the presence of a pure growth which is more than 10^5 per milliliter of fresh urine

Low colony count is significant if the urine specimen is collected from the nephrostomy tube, supra-pubis aspirate, in partially treated UTI or in severe dysuria. Other investigations include FBC, Blood urea, Serum electrolyte, FBS, USS, KUB X-ray, MRI, and CT.

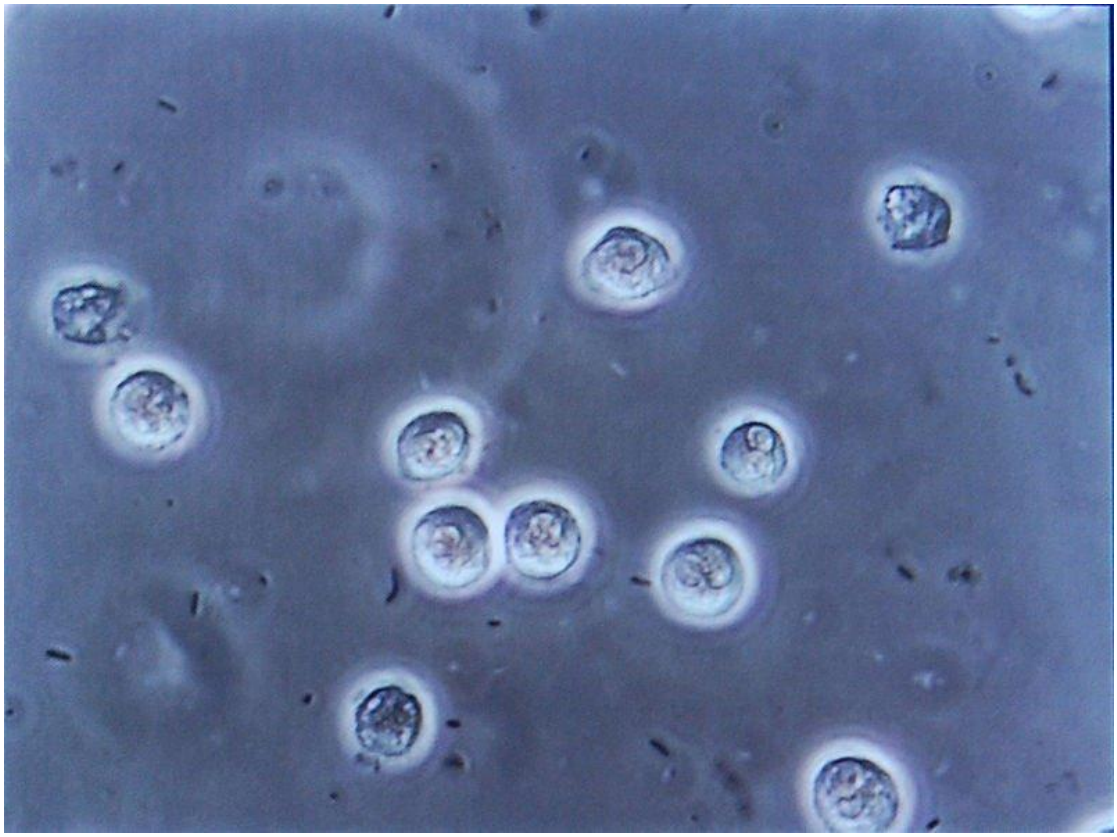

Figure 01: Multiple bacilli between white blood cells in urinary microscopy, which is indicative of UTI.

Management

Trimethoprim-sulfamethoxazole (160/800 mg twice daily for 3-7 days) and nitrofurantoin (100 mg twice daily for 5-7 days) are the most appropriate antibiotics. Men with uncomplicated UTI also can be treated with these antibiotics but the treatment should be continued for 7-14 days. Shorter courses with amoxicillin (250 mg three times daily), trimethoprim (200 mg twice daily) or an oral cephalosporin are also used occasionally. If the patient has acute

pyelonephritis intravenous antibiotics such as aztreonam, cefuroxime, ciprofloxacin, and gentamicin are given. A high fluid intake (2L daily) should be encouraged during the drug therapy and for some weeks following the treatments.

Prophylactic Measures to Prevent UTI

- Consuming more fluids
- Improving the personal hygiene
- Low dose antibiotic prophylaxis
- Controlling diabetes
- Treating the underlying cause

What is a Bladder Infection?

Bladder infections (cystitis) are caused by the bacterial invasion of the bladder. As mentioned at the beginning they are a subgroup of UTIs. Most of the cases of cystitis are acute.

UTI causing microbes enter the urinary tract from the perianal region and ascend along the urethra. When these organisms enter the bladder they initiate their pathogenesis inside the bladder resulting in cystitis. Usually, organisms entering the bladder in this manner are flushed out with urine. But depending on the virulence of the pathogen, the strength of the host immune response and the presence of any urinary tract abnormalities, these cystitis causing pathogens can get colonized in the mucosal lining of the bladder. The commonest causative agent is E. coli. Women are more prone to get bladder infections because of the close proximity of the urethra to the anus.

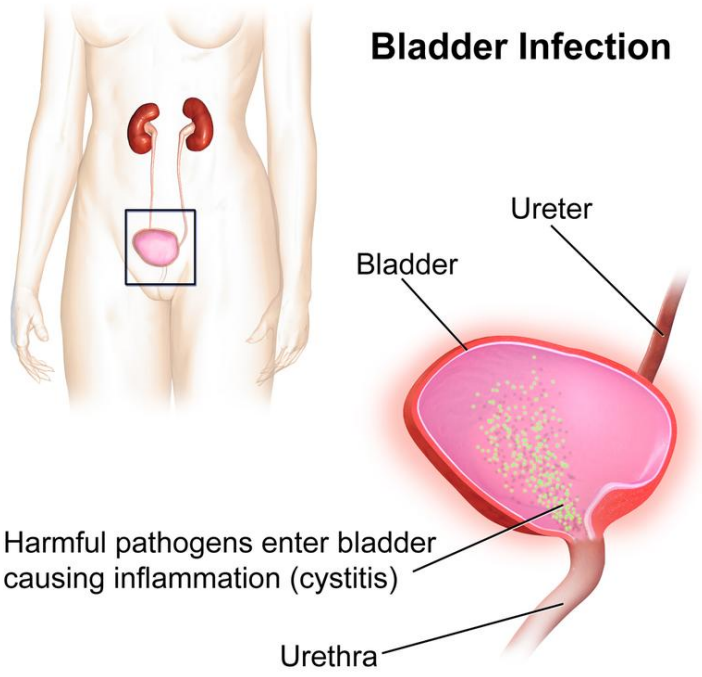

Figure 02: Bladder Infection

Signs and Symptoms

- Dysuria and increased frequency of micturition
- Supra pubic pain
- Cloudy or bloody urine with a foul odor
- Cramping in the lower abdomen

Risk Factors

- Advanced age
- Reduced fluid intake
- Urethral instrumentation
- Urinary tract obstructions
- Urinary tract abnormalities

Diagnosis

A Urine Full Report (UFR) can be taken to check the presence of white blood cells, red blood cells, and organisms. Urine culture and ABST can be done to identify the disease causing organism and to decide the appropriate antibiotic.

Treatment

Oral antibiotics of the group quinolones (norfloxacin, ciprofloxacin) and co-amoxiclav can be administered for 5-7 days. 2-3 days after the course of antibiotics the urine culture should be repeated.

What are the similarities between UTI and Bladder Infection?

- Both UTI and bladder infection happen due to the action of microbes in the urinary tract.
- Commensals of the gastrointestinal tract are the commonest causative agents of both UTIs and bladder infections.

What is the difference between UTI and Bladder Infection?

UTI vs Bladder Infection	
UTIs can be defined as infections involving the kidneys, ureters, bladder, and urethra.	Bladder infections are infections caused by the bacterial invasion of the bladder
Location	
UTI affects the lower and upper urinary tract.	Bladder infections infect the bladder.
Relationship	
UTI is a broad term used to describe an infection in any part of the urinary tract.	Bladder infections are actually a subgroup of the UTIs

Summary - UTI vs Bladder Infection

As explained above, both urinary tract infections and bladder infections occur due to the action of microbes in the urinary tract. UTI can affect both upper and lower urinary tracts since it involves infections in the kidneys, ureters, bladder, and urethra. Bladder infections only affect the bladder and are a subtype of UTI. This is the difference between UTI and bladder infection.

References:

1. Kumar, Parveen J., and Michael L. Clark. Kumar & Clark clinical medicine. Edinburgh: W.B. Saunders, 2009. Print.

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