

Urinary tract infections (UTIs)

The urinary tract is one of the most common sites of bacterial infection, particularly in females. The majority of infections are acute and short lived, but they do contribute to a significant amount of morbidity in the population. Severe infections result in a loss of renal function.

Aetiology

Bacterial infection is usually acquired by the ascending route from the urethra to the bladder, the infection may then proceed to the kidney. UTIs may be community acquired or nosocomially acquired due to catheterization. The gram-negative rod *Escheria coli* is the most common cause of ascending UTIs. *Citrobacter*, *Klebsiella*, *Enterobacter*, *Proteus* and *Pseudomonas aeruginosa*, are frequently found in hospital acquired UTIs as their resistance to antibiotics favours their selection in hospital patients. The gram-positive species *Staphylococcus saprophyticus* can cause UTIs, especially in young sexually active women. Viral causes of UTI appear to be rare, although there are associations with hemorrhagic cystitis and other renal syndromes. Certain viruses may be recovered from the urine in the absence of UT disease, eg. the human polyomaviruses JC and BK. urine samples are commonly investigated by virus isolation, immunological and genomic detection methods. Very few parasites cause UTIs. Other causes of UTI include; the fungi *Candida* spp. And *Histoplasma capsulatum*, the protozoan *Trichomonas vaginales*, and infections with *Schistosoma haematobium*.

Pathogenesis

A variety of mechanical factors predispose to UTI. The shorter female urethra is a less effective deterrent to infection than the male urethra. Sexual intercourse facilitates the movement of organisms up the urethra. UTIs are common in uncircumcised male infants. Pregnancy, prostatic hypertrophy, renal calculi, tumors, and strictures are the main causes of obstruction to complete bladder emptying and hence UTIs. increased volumes of post-void residual urine are associated with a greater likelihood of infection. Studies suggest an increased propensity for UTI in individuals with diabetes mellitus. Catheterization is a major predisposing factor for UTI. During insertion of the catheter, bacteria may be carried directly into the bladder, and while in situ, the catheter facilitates bacterial access to a bladder either via the lumen of the catheter or by tracking up between the outside of the catheter and urethral wall. The duration of catheterization is directly associated with increased probability of infection, due in part to the formation of biofilms. A variety of virulence factors are present in the causative organisms. Uropathogenic *E.coli* contains genes associated with colonisation of the periurethral areas, such as adhesion known as P.fimbriae (pyelonephritis-associated pili), which allows uropathogenic *E.coli* to adhere specifically to urethral and bladder epithelium the healthy urinary tract is resistant to bacterial colonisation.

Clinical features

Acute lower UTIs cause dysuria, urgency and frequency. However, UTIs in the elderly and those with indwelling catheters are usually asymptomatic. The urine is cloudy owing to the presence of pus cells (pyuria) and bacteria (bacteriuria), and may contain blood (haematuria). Examination of urine specimens in the laboratory is essential to confirm the