A Practical Guide to the Management of Complicated Urinary Tract Infection

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Summary

Complicated urinary tract infections are infections in the setting of structural or functional abnormalities of the genitourinary tract. They encompass a wide variety of clinical syndromes and anticipated outcomes. The infecting microorganisms isolated are more varied and demonstrate a higher prevalence of antimicrobial resistance in complicated compared to uncomplicated urinary tract infections. The usual duration of therapy is 7 to 14 days, although comparative trials to define optimal treatment duration are lacking. Long term success of antimicrobial treatment is dependent upon whether or not the underlying genitourinary abnormality can be corrected. Treatment of complicated urinary tract infections will usually be successful and may be permanent if the underlying abnormality can be corrected. If the underlying abnormality cannot be corrected, failure rates of 50% at 4 to 6 weeks following therapy are expected. Antimicrobial agents are similar to those used to treat uncomplicated urinary tract infection. Certain agents, such as nitrofurantoin, should be avoided for individuals with renal failure. No specific agent or class of agents has consistently demonstrated greater therapeutic efficacy where the infecting organism is susceptible to the given agent.
1. Definitions

Complicated urinary tract infection (UTI) refers to urinary infection which occurs in an individual with functional or structural abnormalities of the genitourinary tract. For the diagnosis of complicated UTI in the asymptomatic patient, two consecutive urine cultures with ≥10^5 colony-forming units (cfu)/ml are required. For the symptomatic patient, one positive urine culture is sufficient.[1]

2. Considerations in the Management of Complicated Urinary Tract Infection (UTI)

2.1 Underlying Abnormality

Whether an underlying abnormality of the genitourinary tract is present must be considered when managing any patient with urinary infection. It is not feasible or cost effective to investigate all patients with a UTI. However, certain clinical situations, such as infections in otherwise healthy men, relapsing invasive infection, bacteraemic infection, or the presence of renal failure, are associated with a higher probability of an underlying abnormality and investigations to identify abnormalities which are potentially correctable are indicated.

Many genitourinary abnormalities may be associated with complicated UTIs (table I). Generally, these are congenital or acquired structural, functional, or metabolic abnormalities. These abnormalities promote infection through compromising adequate drainage of urine or by establishing a nidus, such as a struvite (infection) stone, from which bacteria cannot be eradicated.

Urinary infection in the setting of functional or structural abnormalities of the urinary tract will not be treated effectively unless the underlying abnormality which is promoting the infection is corrected. In patients where complicated UTI is diagnosed, correction of the underlying abnormality must be performed, wherever possible, as an essential component of management. In some instances, such as post-cystoscopy infection in a patient with a normal genitourinary tract or spontaneous passage of a single obstructing stone, the abnormality promoting infection may be transient. In other circumstances, such as a patient with spinal cord injury and neurogenic bladder with voiding maintained through intermittent catheterisation, the abnormality promoting infection cannot be modified.

2.2 Infecting Micro-Organisms

Micro-organisms isolated from individuals with complicated UTIs are more varied with respect to species and more likely to be antimicrobial-resistant than those isolated from other patients with urinary infections (table II). *Escherichia coli* is frequently isolated, particularly if it is a first infection. Other Gram-negative micro-organisms such as *Proteus mirabilis*, *Klebsiella* spp. and *Citrobacter* spp., as well as *Enterococcus* spp., *Pseudomonas* spp., and *Candida* spp. are also isolated.[2-5] The diversity of micro-organisms and greater likelihood of resistance is not *a priori* due...