Diagnosis and Management of Urinary Tract Infection and Pyelonephritis

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KEYWORDS

• Urinary • Pyelonephritis • Cystitis

Urinary tract infections (UTIs) are one of the most common bacterial infections encountered in outpatient settings[1,2] In 2005, 1.8 million patients in emergency departments (EDs) were diagnosed with UTI, and nearly 5% of all patients in EDs had a genitourinary (GU) complaint.[3] More than 50% of women experience 1 UTI in their lifetime, and approximately 10% of women have a UTI annually.[4] Familiarity with the most recent literature and clinical practice guidelines, and local patterns of resistance, is crucial for practicing emergency physicians (EPs). Targeted and appropriate therapy can significantly reduce the morbidity and mortality associated with this spectrum of illness, and may also reduce the development of antimicrobial resistance in uropathogens. This article reports the epidemiology and risk factors of UTIs, and clarifies the diagnostic tools and therapeutic measures that best streamline practices and effectively treat patients with UTIs. This article concentrates on the adult woman with upper and lower tract infections, unless otherwise indicated. Treatment options are discussed in light of bacterial resistance in the twenty-first century.

DEFINITIONS

UTIs are divided into 2 major categories: lower tract infections and upper tract infections. Broadly defined, they can be considered an inflammatory response of the

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urinary tract to microorganisms. UTIs range from asymptomatic cases to life-threatening septic shock. They can be community acquired or catheter associated.

Asymptomatic bacteriuria (ABU) is the presence of significant bacteria with or without pyuria on urinalysis without signs or symptoms that are referable to a UTI. The usual cutoff is a single organism isolated in a quantity of at least 100,000 colony forming units (CFU) per milliliter.[5] Screening and treatment is not generally recommended, with the exception of women who are pregnant or men who are going to undergo a transurethral prostate resection.[6,7]

Cystitis, or lower UTI, is an acute bacterial infection of the urinary bladder and urethra, whereas pyelonephritis is an infection of the upper urinary tract structures, including the ureters or kidneys. Differentiation of the 2 is based on history and examination.

Uncomplicated UTI occurs in young, healthy, nonpregnant women with structurally and functionally normal urinary tracts.[8] Complicated UTI is UTI occurring in anyone else: all men, and women who have a structural or functional GU abnormality or an underlying predisposing medical condition that increases the risk of infection and recurrence or that reduces the effectiveness of antimicrobial therapy (**Box 1**). Both cystitis and pyelonephritis can be defined as either uncomplicated or complicated according to these parameters.

EPIDEMIOLOGY AND RISK FACTORS

UTIs are common, particularly in women, with 11% of women reporting a UTI in any given year, and more than 50% of women having at least 1 infection during their lifetime.[4] Other groups at increased risk for UTI, as well as complications of UTI, include infants, pregnant women, the elderly, and individuals with diabetes, human immunodeficiency virus (HIV)/AIDS, spinal cord injuries, indwelling catheters, or urologic abnormalities.[1]

There is much misunderstanding among patients surrounding risk factors for, and prevention of, UTIs. Proven risk factors for UTI in young women are prior episodes of cystitis, recent sexual activity, and use of spermicidal agents during intercourse.[9] The odds of a UTI increase by a factor of 60 during the initial 48 hours after sexual intercourse.[10,11] Commonly recommended treatments to reduce incidence of UTI, such as increased hydration and prompt postcoital voiding or douching, are not supported by evidence.[12] Cranberries, cranberry tablets, and cranberry juice may have a benefit in preventing recurrent UTIs; the evidence is best in sexually active adult

Box 1
Patient characteristics qualifying UTI as complicated

- Pregnancy
- Diabetes
- Male gender
- Immunosuppression
  - Immunosuppressive agents, acquired immune deficiency syndrome (AIDS), others
- Functional genitourinary abnormality
  - Indwelling urinary catheter, neurogenic bladder, others
- Structural genitourinary abnormality
  - Renal stones, fistula from intestinal tract to bladder, polycystic kidney disease, renal transplant, other