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Review Article

**OUTPATIENT MANAGEMENT OF URINARY TRACT
INFECTIONS IN PRIMARY CARE**

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Abstract:

Introduction: Urinary tract infections (UTI) are considered one of the most common clinical problems seen in the emergency department. Patients with UTIs usually get acutely symptomatic and seek consultation in an emergency department during off-hours, when they cannot get an appointment with their primary doctor, or if they do not have access to primary physician. Those who present to an ED are usually sicker than those who present to an office-based practice. Infectious disease doctors usually become part of the managing team in management of UTIs only in atypical or complicated cases. Opposite to, emergency doctors whom manage a wider range of medical conditions severity, from uncomplicated cystitis to septic shock. There are many difficulties in managing UTIs in EDs including but not limited to short history, lack of longitudinal follow-up, and lack of culture and susceptibility results. EDs often provide medical care for patients without medical insurance in the US, and most patients have no other access to care or follow-up. The role of the emergency physician is to ascertain complicated versus uncomplicated infection, make disposition decisions concerning hospitalization and level of care, and choose appropriate empiric antimicrobial treatment based on the likely bacterial causes and the ever-changing patterns of antimicrobial resistance. Because UTI are not uncommon, it is highly important to consider the costs in the diagnostic evaluation and management. It could be neither practical nor advisable to send cultures for every case of uncomplicated cystitis.

Aim of work: In this review, we will discuss outpatient management of urinary tract infections in primary care

Methodology: We did a systematic search for the outpatient management of urinary tract infections in primary care using PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar search engine (<https://scholar.google.com>). All relevant studies were retrieved and discussed. We only included full articles.

Conclusions: Emergency doctors see UTIs in a wider spectrum of disease severity and patient populations. Atypical cases presentations are not uncommon, and many patients may lack the typical symptoms of UTI. The diagnosis is especially difficult in the elderly patients, and those patients with indwelling catheters, and in patients with acute urolithiasis. Many patients do not need an extensive diagnostic evaluation and can be safely treated as outpatients with oral antibiotics.

Key words: outpatient, management, urinary tract infections, primary care.

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INTRODUCTION:

Urinary tract infections (UTI) are considered one of the most common clinical problems seen in the emergency department. Patients with UTIs usually get acutely symptomatic and seek consultation in an emergency department during off-hours, when they cannot get an appointment with their primary doctor, or if they do not have access to primary physician. Those who present to an ED are usually sicker than those who present to an office-based practice. Infectious disease doctors usually become part of the managing team in management of UTIs only in atypical or complicated cases. Opposite to, emergency doctors whom manage a wider range of medical conditions severity, from uncomplicated cystitis to septic shock. There are many difficulties in managing UTIs in EDs including but not limited to short history, lack of longitudinal follow-up, and lack of culture and susceptibility results. EDs often provide medical care for patients without medical insurance in the US, and most patients have no other access to care or follow-up [1].

The role of the emergency physician is to ascertain complicated versus uncomplicated infection, make disposition decisions concerning hospitalization and level of care, and choose appropriate empiric antimicrobial treatment based on the likely bacterial causes and the ever-changing patterns of antimicrobial resistance. Because UTI are not uncommon, it is highly important to consider the costs in the diagnostic evaluation and management. It could be neither practical nor advisable to send cultures for every case of uncomplicated cystitis.² In this review, we will discuss the most recent evidence regarding outpatient management of urinary tract infections in primary care

METHODOLOGY:

We did a systematic search for the outpatient management of urinary tract infections in primary care using PubMed search engine (<http://www.ncbi.nlm.nih.gov/>) and Google Scholar

search engine (<https://scholar.google.com>). All relevant studies were retrieved and discussed. We only included full articles.

The terms used in the search were: outpatient, management, urinary tract infections, primary care.

CLASSIFICATION/DEFINITIONS

UTIs is could be categorized according to their location and the presence or absence of functional or structural abnormalities. Acute cystitis is an infection of the bladder and is referred to as a lower UTI. Pyelonephritis, an upper UTI. It is considered more severe and could occur in conjunction with acute cystitis. In clinical world, it is sometimes challenging to make a definitive distinction between these clinical syndromes during an ED assessment. Uncomplicated UTIs are characterize by episodes of acute cystitis or pyelonephritis occurring in healthy premenopausal women who are not pregnant without previous history of structural abnormalities or without any functional abnormalities in the urinary tract [3]

EPIDEMIOLOGY

UTIs are considered not uncommon, with about 1/2 of all women reporting having at least one infection. In 2010, there were more than three million ED visits with a primary diagnosis of a UTI.⁴ Of these, eighty five percent were females and about 1/2 of all UTI presentations to an ED were among patients aged eighteen to forty four. Overall, the acuity of presentations to Eds is higher than those seen by primary care providers. More than thirteen percent ED visits for UTIs in 2010 were for pyelonephritis, about 13 visits per 10,000 people.

MICROBIOLOGY

The microbes responsible for uncomplicated UTIs have been the same for decades, with *Escherichia coli* the main microbe in the most acute uncomplicated cystitis and most episodes of complicated UTIs and pyelonephritis.¹ *Staphylococcus saprophyticus* accounts for five to fifteen percent of UTIs, often occur in in sexually active younger women with

acute cystitis.⁵

Complicated UTIs and catheter-associated UTIs have a much wider range of associated microbes. Polymicrobial infections are seen more often. Resistant organisms, like extended-spectrum β -lactamase (ESBL), that produce enterobacteriaceae, *Pseudomonas aeruginosa*, or *Enterococcus faecium*, are more commonly seen in complicated infections.

CLINICAL PRESENTATION

The site and type of UTI can usually be decided by the clinical presentation, however some degree of uncertainty is not uncommon in the ED. Acute cystitis is known by dysuria and frequent or urgent urination and happens mainly in healthy objects, premenopausal, adult women who are not pregnant. These symptoms of urethral irritation could also occur in sexually transmitted infections (STIs), in vaginitis, and with exposure to chemical or allergic irritants [6].

Acute pyelonephritis includes the upper urinary tract and is usually linked to systemic symptoms, recognized by these symptoms fevers, chills, nausea, and flank pain. Patients often also have symptoms of acute cystitis (dysuria, frequency, and urgency). Some patients also complain about the pain associated with pyelonephritis in atypical locations, such as the epigastric region or right or left upper abdominal quadrants. Fever is commonly present, and its absence should heighten suspicion for the presence of other clinical conditions [7].

LABORATORY DIAGNOSIS

The clinical diagnosis is usually not easy, and testing of urine samples is often essential to make the diagnosis. This begins with cautious collection of urine for urinalysis and possibly a culture. The bladder is normally sterile—urine collected by suprapubic aspiration should not contain leukocytes or bacteria. This is invasive and rarely necessary in clinical practice. The most common way for collecting urine samples is a clean-catch midstream specimen [8]. In a prospective study of 105 women with UTI symptoms in the ED, there were no statistically significant differences in urinalysis findings or the rate of positive urine cultures when urine was obtained through a midstream clean catch or in-and-out catheterization [9]. Midstream clean-catch technique can be hard, but, especially for elderly patients and those with other impairments.

The diagnosis of a UTI can be made with urine cultures that show a significant bacteriuria.

Particularly, culture information is not readily available within the time frame of an ED visit, so diagnosis is based on rapid tests that predict bacteriuria. Several ways can be used to assess the urine in the clinical laboratory. These include but not limited to dipstick testing, microscopic examination, and urine flow cytometry. Studies on the using of these various ways are limited due to the fact that the criteria varies for defining UTIs [8,10].

IMAGING

There are no particular formal guidelines for the use of imaging studies for patients with UTIs. In most cases, especially in young females with uncomplicated infections, routine radiographic evaluation is not needed. Underlying structural abnormalities are not common, and focal complications rarely occur in this population. Imaging studies could add insight, but as to the cause of the symptoms in situations in which there is diagnostic uncertainty or in patients who have failed therapy or present with recurrent infections [11].

Imaging studies are especially of importance in detecting patients who may have lesions requiring surgical correction. Early and expedited imaging studies are also recommended in patients who present with UTIs associated with severe sepsis/septic shock. Source control is an important part of therapy in patients with severe sepsis/septic shock [12]. The clinical diagnosis of complications associated with UTI that needs surgical intervention could be challenging, and imaging studies can be critical in revealing these conditions.

Plain-film abdominal radiography (KUB) is helpful for the rapid assessment of urinary stent position. Bedside renal ultrasound is performed commonly by several emergency physicians. Ultrasound could show complications, like hydronephrosis, renal or extrarenal abscesses, and distal hydroureter (eg, ureterovesical or uteropelvic junction).

Compared to CT scan, renal ultrasound is not a good test for the identifying of ureteral stones or the evaluation of upper and midureter dilatation [13].

UROLITHIASIS AND UTI

Patients with ureteral stones are usually managed in EDs because they are in severe pain. The diagnosis of UTI associated with urolithiasis could be difficult, especially when a patient does not have overt signs of infection. A variable degree of pyuria is often encountered in acute presentations of urolithiasis. Whether this finding reflects nonspecific inflammation or true infection is, but, unclear [14].

MANAGEMENT

Uncomplicated Cystitis

The Infectious Diseases Society of America (IDSA) published a recent guideline in 2011 for the management of uncomplicated cystitis and pyelonephritis [3] the suggestions are more emphatically recommend nitrofurantoin, fosfomycin, and trimethoprim-sulfamethoxazole as first-line treatments. They also emphasize the concept of collateral damage to intestinal and vaginal flora from broad-spectrum antibiotics, highlighting the overuse of fluoroquinolones. The basic principles that guide recommendations for management of cystitis are that antimicrobials should be active against the likely pathogens, should achieve adequate concentrations in the urine, and should have least effect on normal flora and that shorter courses are linked with lower cost and fewer adverse events. Though cystitis is often a self-resolving infection and cure rates with placebo are as high as twenty five percent, antimicrobial resistance is associated with greater likelihood of treatment failure.

Global resistance of coliform bacteria to trimethoprim-sulfamethoxazole has made nitrofurantoin and fosfomycin first-line drugs. They are effective against *E coli*, are well tolerated, and have few ecologic effects. Nitrofurantoin is less active against other pathogens, however, and inactive against *Proteus* and *Pseudomonas aeruginosa* and, thus, should not be used for empiric therapy for complicated UTIs, in which these organisms are more common.

UTI versus STI

Another common condition of diagnostic doubt in EDs is making the differentiation between UTI and genital STI. Both are common in healthy subjects of reproductive age, and there is much overlap in the clinical syndromes of dysuria and associated symptoms. In men, the clinical syndromes of prostatitis and epididymitis are known to be caused by either typical uropathogens [15].

Pyelonephritis

Patients suffering from pyelonephritis are usually very sick when they present to an ED. Many are in severe pain, febrile, tachycardic, vomiting, and dehydrated, often meeting criteria for sepsis. However, a majority can be effectively managed as outpatients if symptomatically improved after a period of observation and treatment in an ED that includes intravenous hydration, antibiotics, antipyretics, and antiemetics. When patients fail to improve in the ED, bedside ultrasound should be

considered to rule out ureteral obstruction, perinephric abscess, or other complication [16].

Empiric antibiotic recommendations for pyelonephritis are many from those for cystitis for a couple of reasons. Pyelonephritis is usually associated with systemic symptoms and progression to severe sepsis. It is important to choose therapy that achieves adequate levels not only in the urine but also in renal tissue and blood due to the real possibility of bacteremia. For many reasons, fluoroquinolones are usually the first-line choice, despite concerns about greater likelihood of selecting resistance among intestinal flora [17].

CONCLUSIONS:

Emergency doctors see UTIs in a wider spectrum of disease severity and patient populations. Atypical cases presentations are not uncommon, and many patients may lack the typical symptoms of UTI. The diagnosis is especially difficult in the elderly patients, and those patients with indwelling catheters, and in patients with acute urolithiasis. Many patients do not need an extensive diagnostic evaluation and can be safely treated as outpatients with oral antibiotics.

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