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Review Article

**THE APPROACH OF FAMILY DOCTORS TOWARD URINARY
TRACT INFECTION**¹Dr. Haytham Abdullah Amin Abo-sallamah**Abstract:**

The right diagnosis can help to make use of antibiotics much more specific. In this review we discuss the diagnosis method of UTI and management approach in primary care of the most popular type (uncomplicated acute UTI). Electronic databases; MEDLINE, EMBASE and The Cochrane Library databases were searched up to November 2018 to identify relevant studies discussing the approach of family doctors toward Urinary tract infection, using following Mesh terms: "urinary tract infection" OR "UTI" Combined with "management" OR "family physicians". Infections of the urinary tract are among the most constant factors for therapy in primary healthcare. Diagnosis exclusively based on medical signs is often wrong. Asymptomatic bacteriuria needs a therapy in special situations. The gold requirement for the medical diagnosis of a urinary system infection is the discovery of the pathogen in the existence of clinical symptoms. The pathogen is spotted and recognized by urine culture (using midstream urine). This additionally allows an estimate of the degree of the bacteriuria. Nevertheless, the minimal level of bacteriuria showing an infection of the urinary system has actually not been specified in scientific literature or standard by microbiological laboratories. Several labs define 10⁵ colony developing units (cfu)/ mL urine as the limit. However, this limit misses numerous pertinent infections. There are as a result various other recommendation that recommend the diagnosis of UTI from a matter of 10³ cfu/mL, depending upon the kinds of germs spotted. Analysis precision can be increased by utilizing dip sticks and clinical formulas.

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INTRODUCTION:

Urinary tract infections (UTIs) are some of the most typical microbial infections, impacting 150 million people annually worldwide [1]. UTIs create symptoms that are usually distressing for patients and can bring about serious complications. They are also typically over screened by means of acquiring urine cultures when not clinically indicated and, particularly when it comes to asymptomatic bacteriuria (ASB), overtreated [1]. In this age of enhancing antimicrobial resistance, antimicrobial stewardship has actually come to be a highly crucial action in the struggle to maintain the effectiveness of readily available antimicrobials.

Medically, UTIs are classified as uncomplicated or complicated. Uncomplicated UTIs generally affect people that are otherwise healthy and have no structural or neurological urinary system tract abnormalities; these infections are separated right into lower UTIs (cystitis) and upper UTIs (pyelonephritis) [2]. Several risk aspects are related to cystitis, consisting of female sex, a previous UTI, sexual activity, vaginal infection, diabetic issues, weight problems and genetic susceptibility [2]. Complicated UTIs are defined as UTIs related to elements that compromise the urinary system tract or host protection, including urinary blockage, urinary retention triggered by neurological ailment, immunosuppression, renal failure, kidney transplantation, pregnancy and the presence of international bodies such as calculi, indwelling catheters or various other water drainage gadgets [3]. Catheter-associated UTIs (CAUTIs) are associated with raised morbidity and mortality and are jointly the most typical reason for second blood stream infections. Risk variables for establishing a CAUTI include prolonged catheterization, female gender, older age and diabetes [3].

UTIs are triggered by both Gram-negative and Gram-positive bacteria, along with by certain fungus. The most common causative agent for both uncomplicated and challenging UTIs is uropathogenic *Escherichia coli* (UPEC). For the representatives involved in uncomplicated UTIs, UPEC is followed in prevalence by *Klebsiella pneumoniae*, *Staphylococcus saprophyticus*, *Enterococcus faecalis*, group B *Streptococcus* (GBS), *Proteus mirabilis*, *Pseudomonas aeruginosa*, *Staphylococcus aureus* and *Candida* spp [2]. For complicated UTIs, the order of prevalence for original agents, adhering to UPEC as many typical, is *Enterococcus* spp., *K. pneumoniae*, *Candida* spp., *S. aureus*, *P. mirabilis*, *P. aeruginosa* and GBS [3].

Infections of the urinary system tract are one of one of the most constant reasons for treatment in primary medical care. As a result of the raised advancement of resistance, new approaches are needed for the treatment of infections of the urinary tract. The right diagnosis can help to make use of antibiotics much more specific. In this review we discuss the diagnosis method of UTI and management approach in primary care of the most popular type (uncomplicated acute UTI).

METHODOLOGY:

Electronic databases; MEDLINE, EMBASE and The Cochrane Library databases were searched up to November, 2018 to identify relevant studies discussing the approach of family doctors toward Urinary tract infection, using following Mesh terms: “urinary tract infection” OR “UTI” Combined with “management” OR “family physicians”. In addition, the reference lists of identified articles were searched for more relevant studies to be involve in our review. Restriction language was applied to English published articles with human subject.

DISCUSSION:

• Medical history

The medical diagnosis of an infection of the urinary system tract is essentially based upon the medical history. Particular information may either boost the possibility of an infection of the urinary tract (↑) or reduce it (↓). The following aspects have actually been developed from medical studies [4]:

- Dysuria, pollakisuria, nycturia (↑)
- Present or increased incontinence (↑)
- Macrohematuria (↑)
- Suprapubic pain (↑)
- “Offensive” smell, turbid urine (↑)
- Prior infections of the urinary tract (↑)
- Changed or new discharge, vaginal irritation (↓).

In addition, risk factors are known which increase the probability of UTI. These include [5]:

- Sexual intercourse within the preceding two weeks
- Contraception with a vaginal diaphragm or spermicide
- Contraception with DMPA (depot medroxyprogesterone acetate)
- Antibiotic administration within the preceding two to four weeks

- Special anatomical features or restrictions (for example, from vesicoureteral reflux, neuropathic bladder, mechanical or functional obstruction)
- Diabetes mellitus
- Urine testing

Urine testing is the second important element in diagnostic testing.

URINE COLLECTION:

Several studies have managed the requirement of gathering midstream urine and of cleansing the perineum and vulva or glans penis [6]. Nonetheless, these were mainly with fairly young and otherwise healthy women, so it is unclear whether they can be moved to regular scientific technique. A practical option would certainly be to make the approach of urine collection based on the clinical problem. For a preliminary urine investigation with a dip stick, fresh spontaneous urine can be taken instead of midstream urine and it is unnecessary to clean up the genital areas. On the other hand, additional research studies and pee culture need that the urine example ought to be collected and processed with as little contamination as possible.

PRACTICAL TEST METHODS:

The gold standard for a urine examination is to do a bacteriological urine culture, with identification of the pathogen, with quantification and sensitivity testing. To evaluate whether the patient has a UTI at all, orientating indirect techniques are commonly utilized in practice to spot the germs or swelling (dip sticks). The bacterial matter might be assessed by urine microscopy and immersion culture media.

DIP STICKS:

Urine dip sticks are one of the most frequently used instruments for analysis testing if there is medical evidence that a patient is struggling with UTI. Multistix are frequently used, which might have the ability to spot nitrite (a metabolic item of regular pathogens of the urinary tract), leukocyte esterase, healthy protein and blood (as a marker of swelling).

If nitrite is detected, this enhances the probability of a urinary system infection, with a likelihood ratio [LR] of 2.6 to 10.6. Nevertheless, the level of sensitivity is relatively low. On the other hand, the discovery of leukocyte esterase increases the probability to a minimal degree (LR 1.0 to 2.6). The detection of blood is unquestionably very sensitive; however the uniqueness is low. Research data are inconsistent concerning the value of protein discovery in

validating UTI.

URINE MICROSCOPY:

As a result of methodological restrictions, the sensitivity in finding UTI with <105 cfu/mL by gram stained microscopy is low. Some researchers have actually located that experienced employees can attain better analysis precision than with urine culture. However, the offered researches on microscopy are heterogenous and all review articles conclude that it is difficult to make general declarations [7].

IMMERSION CULTURE MEDIA:

These immersion tests use a plastic rod covered with culture medium- primarily a mix of CLED agar and MacConkey agar. They call for 24 h culture. The values for level of sensitivity and uniqueness obtained in the laboratory cannot be replicated under the conditions of primary care [8]. In the medical care setup, the sensitivity was found to be 73% (95% confidence interval [CI] 66- 80) and the specificity 94% (CI 88- 98). If a female patient has formerly had an unfavorable nitrite test, the level of sensitivity is minimized to 65% (CI 55- 74), with basically the same specificity (CI 90- 99). This treatment does not allow the reputable detection of <104 cfu/mL [6].

- **Treatment Regimens for Uncomplicated Acute Cystitis in Adult Women**

Trimethoprim-Sulfamethoxazole

Three RCTs released considering that 2000 contrasted trimethoprim sulfamethoxazole with one more agent in young women with acute uncomplicated cystitis [9]. Early clinical and bacterial treatment rates were 85% to 100% in these open-label trials. In the biggest trial, total clinical remedy (one month after treatment) was achieved in 79% of the trimethoprim sulfamethoxazole group, and early medical and microbiological remedy rates were 90% and 91%, specifically [9]. There was a dramatically higher medical cure rate among females in the trimethoprim sulfamethoxazole group who had a trimethoprim-sulfamethoxazole- vulnerable uropathogen, compared to those who had a trimethoprim-sulfamethoxazole- resistant uropathogen (84% vs 41%, specifically; P <.001). Hence, it is handy to understand the local rate of trimethoprim-sulfamethoxazole resistance amongst area uropathogens because efficacy rates will certainly differ based on the frequency of in vitro resistance. If the local resistance frequency cannot be approximated, specific threat variables, including use

of trimethoprim-sulfamethoxazole in the coming before 6 months or travel to an endemic area of resistance, can be utilized to expect resistance [10]. The incidence of damaging effects varied from 1% to 31% between the studies. One of the most regular negative impacts were queasiness, diarrhea, headache, and dizziness [11].

In summary, trimethoprim-sulfamethoxazole (160/800mg twice daily for 3 days) is a suitable choice for therapy if the resistance occurrence is less than 20% and if the local antibiogram or specific danger aspects do not forecast resistance.

NITROFURANTOIN:

Five RCTs compared nitrofurantoin with other antimicrobial agents for uncomplicated cystitis [9], [11-14]. Three of these trials were double-blind and contrasted a 7-day course of nitrofurantoin with various other antimicrobial agents [12-14]. In a current test of 338 females, a 5-day regimen was as efficient as the conventional 7-day program of nitrofurantoin [9]. Two meta-analyses comparing early medical remedy rates with nitrofurantoin and trimethoprim-sulfamethoxazole found no distinction in outcomes between these 2 agents [15]. Late medical remedy rates were also similar in a current Cochrane meta-analysis (threat ratio, 1.01; 95% CI, 0.94-1.09) [15]. There was no considerable distinction in negative occasions [15]. Nitrofurantoin monohydrate/macrocrystals (100 mg twice daily for 5-7 days) is an ideal selection for treatment due to its effectiveness similar with 3 days of trimethoprim-sulfamethoxazole and minimal resistance. A 5-day program can be taken into consideration instead of 7 days on the basis of IRCT searching for it comparable with 3 days of trimethoprim-sulfamethoxazole [9].

FOSFOMYCIN:

Six RCTs contrasted the efficiency of a 3-g single dosage of fosfomycin trometamol with various other antimicrobial agents for uncomplicated cystitis [23]. Generally, the medical cure of fosfomycin is equivalent with that of other first-line agents, but the bacterial efficiency is reduced. In the 2 large double-blind RCTs, the performance of a 3-g single dose of fosfomycin was compared with nitrofurantoin given for 7 days [12], [14]. In both tests, no significant difference was located for clinical treatment prices between the 2 treatment groups. Nonetheless, in the research by Stein, the microbiologic cure rate at the initial follow-up browse through was substantially lower with fosfomycin (78%) than with nitrofurantoin (86%; $P = .02$) [14]. A recent meta-

analysis compared the effectiveness and safety profile of fosfomycin vs other prescription antibiotics in patients with cystitis [16]. In the subgroup of tests entailing nonpregnant female patients, no difference was discovered pertaining to clinical and microbiological success or event of damaging events [16]. In recap, fosfomycin trometamol (3 g in a solitary dosage) is an ideal option for therapy for uncomplicated cystitis and has minimal resistance.

FLUOROQUINOLONES:

Ten RCTs since 2000 examined the effectiveness of fluoroquinolones for uncomplicated cystitis [23]. Nine trials consisted of ciprofloxacin, and 3 trials consisted of norfloxacin. Overall, both medical and microbiological effectiveness of fluoroquinolones are similar with that of other first-line agents. The top quality of a lot of the consisted of tests was high [23]. The most affordable microbial cure rate for ciprofloxacin (78%) was observed in a recent small Turkish research study where the ciprofloxacin level of sensitivity rate was only 59% [17]. No considerable distinction was found between the clinical treatment prices for single-dose fosfomycin and ciprofloxacin treatment (83% and 80%, specifically) [17]. High very early medical treatment rates for ciprofloxacin (98% and 93%) were observed in 2 big high-quality research studies in which 96% to 98% of the uropathogens were prone to ciprofloxacin [18], [19]. As a result, fluoroquinolones are thought about alternative antimicrobials for acute uncomplicated cystitis. Although extremely efficacious for uncomplicated cystitis if the uropathogens are susceptible, boosting resistance rates may interfere with performance of empirical use, and these agents are needed for treatment of various other much more invasive infections.

• Treatment of UTI in Other Patient Populations

A lot of researches on UTI treatment were carried out in grown-up, nonpregnant, nondiabetic females with uncomplicated cystitis. The approach to UTI in men and females with diabetes mellitus is based upon far more limited proof. We recognized only 1 RCT and 1 empirical research because 2000 addressing male UTI and only a single observational research study in diabetic person women [20-22]. The RCT of male UTI located that 2 weeks of treatment sufficed for dealing with febrile UTI that includes the prostate, while the observational test located that treatment for guys with UTI in the outpatient setup for 7 days or much less was connected with comparable early reappearance prices as much longer period treatment [20], [21]. These 2 studies together suggest that

treatment longer than 7 to 14 days may not be helpful in males with acute UTI; nonetheless, neither study effectively attended to the inquiry, and the very little duration of treatment has actually not been well developed. In summary, the duration of therapy for acute UTI in men must be restricted to 7 to 14 days, and in our technique, based on our competence, we deal with for 7 days.

The optimum duration and type of therapy for females with diabetic issues and acute cystitis is likewise not defined. The empirical study by Schneeberger et al discovered that diabetic person women, in comparison with nondiabetic women, got a much longer program of treatment, had a higher reoccurrence rate within 30 days, and were more likely to be hospitalized for UTI in the postmenopausal group ($P < .01$ for all contrasts) [22]. From this observational research, we cannot figure out whether diabetic women are truly at greater threat for frequent UTI or whether their medical professionals believe them to be at higher risk and therefore are most likely to prescribe antimicrobial treatment. Nonetheless, specialist opinion is that diabetic females providing with acute cystitis must be handled likewise to females without diabetes mellitus. This suggestion does not relate to diabetic person females with even more major discussions or with proof of irregular nullifying [23].

CONCLUSION:

Infections of the urinary tract are among the most constant factors for therapy in primary healthcare. Diagnosis exclusively based on medical signs is often wrong. Asymptomatic bacteriuria needs a therapy in special situations. The gold requirement for the medical diagnosis of a urinary system infection is the discovery of the pathogen in the existence of clinical symptoms. The pathogen is spotted and recognized by urine culture (using midstream urine). This additionally allows an estimate of the degree of the bacteriuria. Nevertheless, the minimal level of bacteriuria showing an infection of the urinary system has actually not been specified in scientific literature or standard by microbiological laboratories. Several labs define 10^5 colony developing units (cfu)/mL urine as the limit. However, this limit misses numerous pertinent infections. There are as a result various other recommendation that recommend the diagnosis of UTI from a matter of 10^3 cfu/mL, depending upon the kinds of germs spotted. Analysis precision can be increased by utilizing dip sticks and clinical formulas.

Acute uncomplicated cystitis is an usual condition that can frequently be successfully detected and dealt

with. Immediate antimicrobial therapy with trimethoprim sulfamethoxazole, nitrofurantoin, or fosfomycin is indicated for acute cystitis in grown-up women. Increasing resistance rates amongst uropathogens have actually made complex treatment of acute cystitis. Individualized evaluation of threat elements for resistance and routine tolerability is required to pick the optimum empirical routine. Thus, the most important step in therapy is identification of the reasons causing the problem.

Referral to a professional is recommended for the instances: all lower urinary system signs in males, UTIs in the paediatric age group, extreme symptoms, medical treatment failer, reoccurring UTIs and a few other careful signs and symptoms.

REFERENCE:

1. Stamm WE, Norrby SR. Urinary tract infections: disease panorama and challenges. *J Infect Dis.* 2001;183 (Suppl 1):S1–S4.
2. Foxman B. Urinary tract infection syndromes: occurrence, recurrence, bacteriology, risk factors, and disease burden. *Infect Dis Clin North Am.* 2014;28:1–13.
3. Chenoweth CE, Gould CV, Saint S. Diagnosis, management, and prevention of catheter-associated urinary tract infections. *Infect Dis Clin North Am.* 2014;28:105–119.
4. Little P, Turner S, Rumsby K, et al. Developing clinical rules to predict urinary tract infection in primary care settings: sensitivity and specificity of near patient tests (dipsticks) and clinical scores. *Br J Gen Pract.* 2006;56:606–612.
5. Foxman B, Geiger AM, Palin K, Gillespie B, Koopman JS. First-time urinary tract infection and sexual behavior. *Epidemiology.* 1995;6:162–168.
6. Gatermann S, Fünfstück R, Handrick W, et al. In: *Harnwegsinfektion - Mikrobiologisch-infektologische Qualitätsstandards.* Mauch M, Podbielski A, Hermann M, editors. München, Jena: Urban & Fischer; 2005. pp. 8–21.
7. Whiting P, Westwood M, Bojke L, et al. Clinical effectiveness and cost-effectiveness of tests for the diagnosis and investigation of urinary tract infection in children: a systematic review and economic model. *Health Technol Assess.* 2006;10:iii–iv. xi–xiii, 1–154.
8. Winkens R, Nelissen-Arets H, Stobberingh E. Validity of the urine dipslide under daily practice conditions. *Fam Pract.* 2003;20:410–412.
9. Gupta K, Hooton TM, Roberts PL, Stamm WE. Short-course nitrofurantoin for the treatment of acute uncomplicated cystitis in women. *Arch*

- Intern Med. 2007;167(20):2207-2212.
10. Burman WJ, Breese PE, Murray BE, et al. Conventional and molecular epidemiology of trimethoprim-sulfamethoxazole resistance among urinary *Escherichia coli* isolates. *Am J Med.* 2003;115 (5):358-364.
 11. Spencer RC, Moseley DJ, Greensmith MJ. Nitrofurantoin modified release versus trimethoprim or co-trimoxazole in the treatment of uncomplicated urinary tract infection in general practice. *J Antimicrob Chemother.* 1994;33(suppl A):121-129.
 12. Stein GE. Comparison of single-dose fosfomycin and a 7-day course of nitrofurantoin in female patients with uncomplicated urinary tract infection. *Clin Ther.* 1999;21(11):1864-1872.
 13. Irvani A, Klimberg I, Briefer C, Munera C, Kowalsky SF, Echols RM. A trial comparing low-dose, short-course ciprofloxacin and standard 7 day therapy with co-trimoxazole or nitrofurantoin in the treatment of uncomplicated urinary tract infection. *J Antimicrob Chemother.* 1999;43(suppl A):67-75.
 14. Van Pienbroek E, Hermans J, Kaptein AA, Mulder JD. Fosfomycin trometamol in a single dose versus seven days nitrofurantoin in the treatment of acute uncomplicated urinary tract infections in women. *Pharm World Sci.* 1993;15(6):257-262.
 15. Zalmanovici Trestioreanu A, Green H, Paul M, Yaphe J, Leibovici L. Antimicrobial agents for treating uncomplicated urinary tract infection in women. *Cochrane Database Syst Rev.* 2010;(10): CD007182.
 16. Falagas ME, Vouloumanou EK, Togiag AG, et al. Fosfomycin versus other antibiotics for the treatment of cystitis: a meta-analysis of randomized controlled trials. *J Antimicrob Chemother.* 2010;65(9):1862-1877.
 17. Ceran N, Mert D, Kocdogan FY, et al. A randomized comparative study of single-dose fosfomycin and 5-day ciprofloxacin in female patients with uncomplicated lower urinary tract infections. *J Infect Chemother.* 2010;16(6):424-430.
 18. Hooton TM, Scholes D, Gupta K, Stapleton AE, Roberts PL, Stamm WE. Amoxicillin-clavulanate vs ciprofloxacin for the treatment of uncomplicated cystitis in women: a randomized trial. *JAMA.* 2005; 293(8):949-955.
 19. Hooton TM, Roberts PL, Stapleton AE. Cefpodoxime vs ciprofloxacin for short-course treatment of acute uncomplicated cystitis: a randomized trial. *JAMA.* 2012;307(6):583-589.
 20. Ulleryd P, Sandberg T. Ciprofloxacin for 2 or 4 weeks in the treatment of febrile urinary tract infection in men: a randomized trial with a 1 year follow-up. *Scand J Infect Dis.* 2003;35(1):34-39.
 21. Drekonja DM, Rector TS, Cutting A, Johnson JR. Urinary tract infection in male veterans: treatment patterns and outcomes. *JAMA Intern Med.* 2013;173(1):62-68.
 22. Schneeberger C, Stolk RP, Devries JH, Schneeberger PM, Herings RM, Geerlings SE. Differences in the pattern of antibiotic prescription profile and recurrence rate for possible urinary tract infections in women with and without diabetes. *Diabetes Care.* 2008;31(7):1380-1385.
 23. Larissa Grigoryan, MD, PhD; Barbara W. Trautner, MD, PhD; Kalpana Gupta, MD, MPH. Diagnosis and Management of Urinary Tract Infections in the Outpatient Setting. *JAMA.* 2014;312(16):1677-1684.