

Treating urinary tract infection in older adults

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Urinary Tract Infection in Older Adults

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Abstract

Urinary Tract Infections (UTI's) are common in women, but increase in both sexes with age. UTI's are common in older people and account for the most frequent reasons for emergency hospital admission. Diagnosis of UTI in older people can be complex, as they often do not exhibit signs and symptoms normally associated with UTI in adults, and may not be able to provide an accurate history. Gaining a urine sample can also be complicated, due to cognitive difficulties and incontinence. This article will consider the current guidelines for the diagnosis and treatment of UTI in older people.

Prevalence

Urinary tract infections (UTI's) are most common in women, with 10-20% experiencing a symptomatic UTI at some point in their lifetime. However, UTI's increase in prevalence with age in both sexes, with an estimated 10% of men and 20% of women aged over 65yrs having symptomatic bacteriuria (National Institute for Health and Care Excellence, (NICE), 2015). UTI's occurring in older men are complicated and related to abnormalities within the urinary tract (NICE, 2015). Urinary tract infections are one of the most common infections which affect the elderly (Rao and Patel, 2009). UTI was one of the most frequent reasons for emergency admission to hospital (NHS England, 2014) and UTI's account for the second largest group of healthcare-associated infections in the UK, accounting for 19.7% of all hospital acquired infections (Department of Health, 2007).

Definition of terms related to UTI

In older people (aged 65yrs and over), asymptomatic bacteriuria is common, although not associated with an increased morbidity (Boscia et al, 1986). The diagnosis of UTI becomes more complicated in older people, who are more commonly asymptomatic. Table 1 provides the definitions of terms relating to urinary tract infection.

Table 1 Definitions of terms relating to urinary tract infection (adapted from: Ninan., Walton and Barlow, 2014).

Term	Definition
Bacteriuria	The presence of bacteria in the urine
Asymptomatic Bacteriuria	The presence of bacteria in the urine without typical symptoms or signs of a UTI.

Urinary tract Infection	Infection caused by invasion of the urinary tract by microorganisms, with symptoms and signs that can be attributed to such an infection.
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Risk factors

Many conditions common in the older population contribute to dysfunction of the urinary tract and asymptomatic bacteriuria. Bacteria are able to enter the urinary tract by the ascending route from the perineum. Where most people are able to eliminate the bacteria with a flow of urine, this is weakened in older people (Benton, Young and Leeper, 2006). Conditions such as prostate enlargement and bladder prolapse can limit urine flow rate, where aging, physical impairment and mental decline can result in incomplete bladder emptying (Benton, Young and Leeper, 2006).

Signs and symptoms

The typical signs and symptoms of a UTI include;

- Urine that appears cloudy
- Bloody urine
- Strong or foul smelling urine odour
- Frequent or urgent need to pass urine (or an increased frequency)
- Pain or burning on passing urine (dysuria)
- Pressure in the lower pelvis
- Low grade fever
- Night sweats, shaking or chills

However the presentation of UTI can vary from patients with limited clinical symptoms to those with urinary sepsis. Infection within the urinary tract can affect the lower and upper parts of the urinary tract. UTI's in the upper tract commonly present with symptoms suggestive of pyelonephritis, such as fever, rigors and loin pain, where those within the lower tract present with symptoms such as dysuria, increased urinary frequency, usually in the absence of fever or lower back pain (SIGN, 2012 and Kelly-Fatemi, 2015). Sepsis resulting from a UTI, can be diagnosed where these clinical symptoms are accompanied by signs of systemic infection such as tachycardia and tachypnoea (Om Prakash and Alpana, 2009).

UTI's can also be classified as "complicated and uncomplicated". Uncomplicated infections are most common in women, without structural or function abnormalities of the urinary tract, history of renal disease, or contributing co-morbidity such as diabetes. Complicated UTI's are associated with patients who have underlying disease that can interfere with the immune system and therefore are at increased risk of infection. UTI's occurring in men are generally classified as complicated due to the longer urinary tract and higher risk of abnormalities (NICE, 2015 and Kelly-Fatemi, 2015).

Older people with serious UTI do not exhibit the usual signs of fever, as their immune system is unable to produce a response to infection due to the effects of aging (Robichaud and Blondeau, 2008 and Boscia et al, 1986). Older people often exhibit none of the common signs of infection, or express discomfort. UTI's in older people can be mistaken for early dementia or Alzheimer's disease or as a sign of disease progression. Symptoms of a UTI in older people can include:

- Confusion, or delirium-like state
- Agitation
- Hallucinations
- Other behavioural changes
- Poor motor skills or dizziness
- Falling

(Robichaud and Blondeau, 2008)

Diagnosis

A full clinical assessment should be made which includes a review of the patient's medical history (particularly history of previous urinary tract infections), a physical examination, assessment of pulse, blood pressure, temperature and record of patient's reported symptoms (SIGN, 2012). In patients who are unable to provide a history, signs and symptoms of a UTI should comprise three of the following: dysuria, urgency, frequency of urination, or suprapubic tenderness (Scottish Intercollegiate Guidelines Network (SIGN), 2012, NICE, 2015 and Ninan., Walton and Barlow, 2014).

Urinalysis and urine culture

Urinalysis is a frequently performed clinical procedure, which is easy to undertake and a relatively inexpensive way to detect UTI's (Krogsboll., Jorgensen and Gotzsche, 2015). Although different tests can be done on urine, a routine urinalysis often includes: colour, clarity, odour, specific gravity, pH, protein, glucose, red and white blood cells, nitrites and leukocyte esterase. Healthcare professionals must be aware of how to interpret results fully.

Leukocyte esterase and nitrites are the main indicators of a potential urine infection on urinalysis. Nitrites result from the reduction of urinary nitrates to nitrites by bacteria, although a positive urinalysis test is useful a negative result does not rule out a UTI (Mundt and Shanahan, 2011 and Little et al, 2009). Leucocyte esterase is produced by neutrophils and may signal pyuria associated with UTI (Mundt and Shanahan, 2011 and Little et al, 2009). Although urinalysis provides an effective screening tool it should not be used in isolation to guide treatment, due to false positives and false negatives that can occur if the sample is contaminated or left to stand for too long (Ninan., Walton and Barlow, 2014 and Simmerville., Maxted and Pahira, 2005). If infection is suspected from the patient's presentation then further testing such as Microscopy, Culture and Sensitivities (MC&S) may be required.

Urine sample collection

The accuracy of any test can be influenced by bacterial contamination on collection of the specimen, therefore urine samples should be collected by a method that minimises contamination from the genital mucosa and perineal skin. The effectiveness of meatal cleansing to minimise contamination remains debatable. However evidence suggests that general hygiene with water is sufficient prior to specimen collection as the use of disinfectants (including soap) can prohibit the growth of micro-organisms if introduced into the specimen providing a false negative result (Cunha et al, 2013 and (Simmerville., Maxted and Pahira, 2005). Diagnosis of UTI in older people is difficult as they are more likely to have asymptomatic bacteriuria. The prevalence of bacteriuria can be so high that urine culture ceases to be useful as a diagnostic test (SIGN, 2012 and Little et al, 2009)

Approximately 50mls of urine are required for urinalysis and patients should be encouraged to catch the middle part of a void (midstream) for a clean catch. Where a patient is catheterised the specimen should be obtained from the catheter sample port. Over the course of a 24 hour period, the composition of urine will change continuously, so the sample must be transported and stored as per local guidelines.

Obtaining samples from older adults can be difficult, as they may be cognitively impaired, have physical limitations and/or suffer with incontinence. Products such as collection pads and condom catheters for men are available to aid in taking a urine sample from older patients who are unable to provide a midstream specimen. For men the best option is an external condom device (sheath system). For women, the best option is a urine collection pad which can be placed into an incontinence pad, such as the Newcastle Urine Collection Pack®. These specialist pads do not have the absorbent gel component found in disposable incontinence pads, and therefore do not contaminate the sample. Both options provide a significantly less contaminated sample than using a sample from a clean/disinfected bed pan or urinal (Latour et al, 2011). In-out catheterisation should be the last resort for obtaining a sample.

Treatment

For patients with symptoms of urinary tract infection and bacteriuria the main aim of treatment is relief of symptoms. The unnecessary use of antibiotics for asymptomatic bacteriuria can be associated with an increased risk of adverse clinical events including Clostridium difficile infection (CDI) or methicillin resistant Staphylococcus aureus (MRSA) infection, and the development of antibiotic-resistant UTIs (Zalmanovici Trestioreanu et al, 2015). In patients with an indwelling urethral catheter, antibiotics do not generally eliminate asymptomatic bacteriuria (Health Protection Agency and British Infection Association. , 2011).

The treatment of UTI's should be in line with local guidelines or based on the results of microbiology testing (Kelly-Fatemi, 2015). The SIGN guidelines (2012) recommend the use of a three-day course of trimethoprim, or nitrofurantoin for non-pregnant women. For men with uncomplicated symptoms a seven-day course of nitrofurantoin should be considered. Prophylactic use of antibiotics is not recommended in men or any patient with an indwelling catheter, except on the advice of a specialist (Kelly-Fatemi, 2015).

Urinary tract infections are often over-diagnosed and over-treated in older people (Rao and Patel, 2009 and McMurdo and Gillespie, 2000). With a suggested 40% of hospitalised older people misdiagnosed (Woodford and George, 2009). Therefore the recommendations for older patients are:

- Not to start antibiotics for asymptomatic bacteriuria
- To always send a sample for culture prior to commencing antibiotic therapy
- To check previous culture and sensitivity results before prescribing
- Ensure the correct antibiotic course length is prescribed
- Ensure that patients complete the full course of treatment even if symptoms resolve.

(Kelly-Fatemi, 2015)

Conclusion

Urinary tract infections are common in the older population (aged 65yrs and over), but the assessment and treatment can be complicated. In older people, asymptomatic bacteriuria is common, although not associated with an increased morbidity. Although urinalysis provides a useful and inexpensive diagnostic tool, older people need a comprehensive assessment prior to treatment to prevent the over-use of antibiotics and the potential clinical complications that can occur. Although obtaining a urine sample can be complicated by incontinence or cognitive difficulties, healthcare practitioners should consider the options for obtaining a clean/uncontaminated sample of urine from those who are unable to provide a "clean-catch" mid-stream sample. Treatment must follow local guidelines and policies and patients and/or their carers, must be encouraged to complete a course of treatment even if they feel symptoms have resolved.

References:

- Benton, TJ., Young, RB and Leeper, SC. (2006). Asymptomatic Bacteriuria in the Nursing Home.. *Annals of Long-Term Care*, 14(7), pp. 17-22.
- Boscia, JA., Kobasa, WD., Knight, RA., Abrutyn, E., Levison, ME., Kaplan, AM and Kaye, D. (1986). Lack of association between bacteriuria and symptoms in the elderly.. *American Journal of Medicine*, Volume 81, pp. 979-82.
- Cove-Smith, A and Almond, MK. (2007). Management of urinary tract infections in the elderly.. *Trends Urol Gynaecol Sex Health*, Volume 12, pp. 31-34.
- Cunha, M., Santos, E., Andrade, A., Jesus, R., Aguiar, C., Marques, F., Enes, F., Santos, M., Fernandes, R and Soares, S. (2013). Effectiveness of cleaning or disinfecting the urinary meatus before urinary catheterisation: a systematic review.. *Rev Esc Enferm USP*, 47(6), pp. 1407-13.
- Department of Health. (2007). *Saving Lives high impact intervention No.6 Urinary catheter care bundle.*, London: Department of Health.
- Health Protection Agency and British Infection Association, (2010). *Management of infection guidance for primary care for consultaion and adaptation*, London: Health Protection Agency.
- Health Protection Agency and British Infection Association. (2011). *Diagnosis of UTI: quick reference guide for primary care*, London: Health Protection Agency.
- Kelly-Fatemi, B. (2015). Urinary tract infection: management in elderly patients.. *The Pharmaceutical Journal*, 295(7870).
- Krogsboll, LT., Jorgensen, KJ and Gotzsche, PC. (2015). *Screening with urinary dipsticks for reducing morbidity and mortality (Review): The Cochrane Collaboration*, London: John Wiley and Sons Ltd.
- Latour, K., Pludedemann, A., Thompson, M., Catry, B., Price, C., Heneghan, C and Buntinx, F, (2011). *Alternative sampling methods for collection of urine specimans in older adults: Horizon Scan Report 0028*, Oxford: Primary Care Diagnostic Horizon Scanning Centre Oxford and the diagnostic research unit of the Academic Center for General Practice (University of Leuven, Belgium) .

- Little, P., Turner, S., Rumsby, K., Warner, G., Moore, M., Lowes, JA., Smith, H., Hawke, C., Turner, D., Leydon, GM., Arscott, A and Mullee. M. (2009). Dipsticks and diagnostic algorithms in urinary tract infection: development and validation, randomised trial, economic analysis, observational cohort and qualitative study. *Health Technology Assessment* , 13(19), pp. 1-96.
- McMurdo, MET and Gillespie, ND. (2000). Urinary tract infection in old age: over-diagnosed and over-treated.. *Age Ageing* , Volume 29, pp. 297-8.
- Mundt, LA and Shanahan, K. (2011). *Textbook of Urinalysis and Body Fluids*. 2nd Edition ed. London: Wolters Kluwer/Lippincott Williams & Wilkins.
- National Institute for Health and Care Excellence. (2015). *Urinary tract infections in adults: NICE quality standard 90*, London: National Institute for Health and Care Excellence.
- NHS England. (2014). *Emergency admissions for ambulatory care sensitive conditions- characteristics and trends at a national level*, London: NHS England.
- Ninan, S., Walton, C and Barlow, G. (2014). Investigation of suspected urinary tract infection in older people.. *British Medical Journal*, Volume 348.
- Om Prakash, K and Alpana, R. (2009). Approach to a Patient with Urosepsis.. *Journal of Global Infectious Disease* , 1(1), pp. 57-63.
- Rao, GG and Patel, M.(2009). Urinary tract infection in hospitalized elderly patients in the United Kingdom: the importance of making an accurate diagnosis in the post broad-spectrum antibiotic era.. *J Antimicrob Chemother*, Volume 63, pp. 5-6.
- Robichaud, S and Blondeau, JM. (2008). Urinary Tract Infections in Older Adults: Current Issues and New Therapeutic Options.. *Geriatrics and Aging*, 11(10), pp. 582-588.
- Scottish Intercollegiate Guidelines Network (SIGN). (2012). *Management of suspected bacterial urinary tract infections in adults*, Glasgow: Scottish Intercollegiate Guidelines Network (SIGN).
- Simmerville, JA., Maxted, WC and Pahira, JJ. (2005). Urinalysis: A Comprehensive Review. *American Family Physician*, 71(6), pp. 1153-1161.
- Woodford, HJ and George, J. (2009). Diagnosis and management of urinary tract infection in hospitalized older people.. *Journal of the American Geriatric Society* , Volume 57, pp. 107-14.
- Zalmanovici Trestioreanu, A., Lador, A., Sauerbrun-Cutler, M and Leibovici, L. (2015). *Asymptomatic Bacteriuria*, London: Cochrane.