

Misdiagnosis and antibiotic prescribing practices related to asymptomatic bacteriuria in the elderly: a case series review

Michael Cooper¹, Beryl Oppenheim², Emily Petherick³, Emily Rousham³, Paula Saukko³

Royal Wolverhampton NHS Trust¹, Birmingham Community Healthcare Trust², Loughborough University³

Introduction

- Urinary tract infections are one of the most common reasons for antibiotic prescribing in the United Kingdom; however an estimated 40% of cases of UTI in older people are incorrectly diagnosed, resulting in very large numbers of courses of inappropriate antibiotics¹
- The main reason for this inappropriate use of antibiotics appears to be related to a lack of understanding of the role played by asymptomatic bacteriuria (ASB) in the elderly. The prevalence of ASB increases with age and may reach up to 50% in patients in long term care²
- Numerous publications and guidelines^{3,4} exist which indicate that antibiotic treatment is not indicated for ASB, however despite this many reports have shown that testing and treating for ASB is still widespread.
- The common practice of using routine dipstick screening of urine in the elderly on admission and during many non-infection related incidents such as falls, may exacerbate the use of antibiotics in this setting (Figure 1)

Aims

This study aimed to map the pathways of diagnosis and treatment of UTI in the elderly via hospital admissions in order to assess current practices in relation to guidance.

Methods

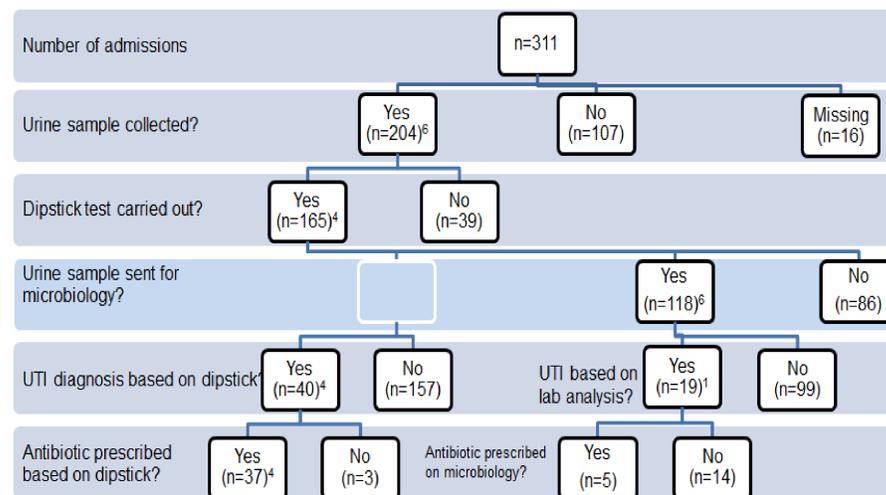
- A retrospective case series review of older patients at Birmingham Community Healthcare NHS Foundation Trust (BCHC) and Royal Wolverhampton NHS Trust (RWNHST) was performed.
- Patients aged ≥70 years admitted to hospital in 2015 were included.
- 500 records were randomly selected from the hospital database.
- Only the first admission for a patient was included. Readmissions and records with missing data were excluded.
- Data were extracted on patient signs and symptoms of UTI, urinalysis (dipstick), urine microbiology and treatment.
- Ethical approval was obtained from the NHS HRA (IRAS reference 202255)



Figure 1: Interactions between dipstick testing, urine microbiology and antibiotic prescribing

Results

- 311 sets of patient records were reviewed, 176 from BCHC and 135 from RWNHST
- 70.6% of patients were female and mean age was 83.6 years (median 83.1 years)
- 165 patients had a dipstick result recorded, with a further 55 patients having 2 or more dipstick results recorded
- The indications for dipstick testing were: routine policy (49.7%) clinical conditions (22.5%), 'other' or unstated (20.8%), falls (3.5%) and confusion (3.0%).
- 37/165 (24%) patients had an antibiotic prescribed on the basis of the dipstick result, of whom only 4 had documented symptoms or signs of a UTI
- The most commonly prescribed antibiotics for UTI in this group were trimethoprim (28) and co-amoxiclav (4)



^{Superscript} = Proportion of 'Yes' cases that also had 2 or more signs and symptoms of UTI recorded in notes

Figure 2: Flow chart showing sequence of urine sampling and antibiotic prescribing

Discussion

Urine dipstick testing for older adults is largely driven by routine admission procedures or undocumented reasons. The vast majority of patients receiving antibiotics for UTI did not have two or more signs or symptoms of infection.

The study highlights conflicting and unclear diagnostic pathways for UTI that likely contribute to over diagnosis. Urine tests are implemented routinely, rather than being used to confirm signs and symptoms of a UTI. In this patient group of elderly adults, routine dipstick testing and a reliance on urine microbiology may be unhelpful in guiding diagnostic decision-making which requires good clinical assessments.

Conclusion

- Asymptomatic bacteriuria in the elderly is common but the widespread practice of routine dipstick testing in such patients may be leading to overdiagnosis of UTI and unnecessary prescription of antibiotics
- Urgent efforts need to be made to reinforce existing guidance
- The use of dipsticks with markers for urinary tract infection in the elderly may need to be curtailed

References

1. Rowe AR, Manisha J. Diagnosis and management of urinary tract infection in older adults *Infect Dis Clin North Am* 2014 28(1):75-89.
2. Nicholle LE. Urinary tract infections in the older adult. *Clin Geriatr Med*. 2016 Aug;32(3):523-38.
3. SIGN 88. Management of suspected bacterial urinary tract infection in adults. Updated July 2012 <http://www.sign.ac.uk/sign-88-management-of-suspected-bacterial-urinary-tract-infection-in-adults.html>.
4. NICE Quality Standard . Urinary Tract Infections in Adults June 2015 <https://www.nice.org.uk/guidance/qs90/resources/urinary-tract-infections-in-adults-pdf-2098962322117>