

When is a UTI not a UTI?

Commentary by

TIM USHERWOOD BSc, MD, MB BS, FRACGP, FRCGP, FRCP, FAICD, DMS

What is the appropriate management for this woman with diabetes who has been found to have asymptomatic bacteriuria?

MedicineToday 2013; 14(7): 62-63

CASE SCENARIO

Jean, a 57-year-old woman with type 2 diabetes, has come in today to discuss her routine blood test results, which were organised last week by your registrar. Jean is taking metformin and an ACE inhibitor. Her blood pressure is well controlled at 126/78 mmHg. Jean's HbA_{1c} is within target range and her eGFR has been stable (50 to 55 mL/min/1.73m²) for the past two years. A renal ultrasound past year showed no obstruction or other abnormality. Jean's urinary albumin-creatinine ratio was normal when checked three months ago.

Last week, your registrar found nitrites and leucocytes in Jean's urine on dipstick

testing and sent a mid-stream urine sample for culture. The pathology report showed a pure culture of *Escherichia coli* with accompanying pyuria. Jean feels well, with no urgency, frequency, dysuria or nocturia.

How should Jean's results be interpreted and what is appropriate management?

COMMENTARY

'Asymptomatic bacteriuria' refers to the presence of a significant number of bacteria in an appropriately collected urine specimen from a person without symptoms or signs referable to urinary infection. The prevalence is approximately 1% in schoolgirls, rising to over 10% in healthy women aged 70 years or older living in the community.¹ Asymptomatic bacteriuria is rare in healthy men until the age of 60 years, after which the prevalence increases substantially.¹ Risk factors in both sexes include diabetes, residence in a long-term care facility, spinal cord injury, structural urinary tract abnormality, haemodialysis and catheter use. Additional risk factors in women are sexual activity and pregnancy.¹

E. coli is the most common organism isolated from urine but other species (usually normal bowel flora) can also cause



asymptomatic bacteriuria. Interestingly, individuals with asymptomatic bacteriuria frequently have positive urine cultures if retested subsequently; however, the turnover of strains is high, indicating a high rate of recolonisation of the urinary tract.²

Prospective studies have consistently shown that healthy women with asymptomatic bacteriuria are at increased risk of subsequent development of symptomatic urinary infection. However, asymptomatic bacteriuria is not associated with long-term adverse outcomes such as hypertension, chronic kidney disease or genitourinary cancer. Furthermore, treatment of asymptomatic bacteriuria in healthy nonpregnant women does not reduce the risk of symptomatic infection or prevent further episodes of asymptomatic bacteriuria.¹ On the other hand, it is well established that persons prescribed an antibiotic for urinary tract infection are at high risk of developing bacterial resistance to that antibiotic for up to 12 months. This not only increases the population carriage of organisms resistant to first-line antibiotics, but also predisposes to increased use of second-line antibiotics in the community.³

Asymptomatic bacteriuria is more common in people with diabetes (type 1

Professor Usherwood is Head and Sub-Dean, Department of General Practice, Sydney Medical School – Westmead, University of Sydney, NSW.

or type 2) and increases the risk of subsequent symptomatic infection (as in people without diabetes).⁴ However, a randomised controlled trial of antimicrobial therapy in diabetic women with asymptomatic bacteriuria has shown that although antibiotics were highly effective in reducing bacteriuria, they did not delay or decrease the frequency of symptomatic urinary infection and did not reduce the risk of pyelonephritis in up to 36 months of follow-up. Progression of diabetic complications was not slowed in participants who received antimicrobial therapy. The women in the antimicrobial-therapy group had almost three times as many days of antibiotic use compared with the women in the placebo group. Thus, there were no benefits from treating asymptomatic bacteriuria in the diabetic women, but there was a risk of harm from unnecessary antibiotic exposure.⁵

International guidelines recommend against screening for asymptomatic bacteriuria except in pregnancy and before certain urological procedures.^{1,6} There is strong evidence against screening for, or treatment of, asymptomatic bacteriuria in:

- asymptomatic children
- healthy men and nonpregnant women
- women with diabetes or with stress incontinence
- older people living in the community or in aged-care facilities
- people with spinal cord injury
- catheterised patients while the catheter remains *in situ*.

It is not clear why the registrar tested Jean's urine with a dipstick, as Jean reported no symptoms of urinary tract infection. Dipstick testing is not recommended in the assessment of diabetic kidney disease; the preferred initial test is quantification of the urinary albumin-creatinine ratio, preferably in a first-void sample.⁷ The dipstick showed nitrites (highly suggestive of the presence of Gram-negative bacteria) and leucocytes. All urine contains some leucocytes, but the laboratory report confirmed a high leucocyte count. Pyuria is common in

asymptomatic bacteriuria but is not an indication for antibiotic treatment.¹ Even though the unnecessary urine culture gave a pure growth of *E. coli*, treatment with an antibiotic would offer Jean no benefit and could be harmful. You make a note to discuss appropriate use of urine testing with your registrar. **MT**

REFERENCES

1. Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. *Clin Infect Dis* 2005; 40: 643-654.
2. Rodhe N, Löfgren S, Matussek A, et al. Asymptomatic bacteriuria in the elderly: high prevalence and high turnover of strains. *Scand J Infect Dis* 2008; 40: 804-810.
3. Costelloe C, Metcalfe C, Lovering A, Mant D, Hay AD. Effect of antibiotic prescribing in primary care on antimicrobial resistance in individual patients: systematic review and meta-analysis. *BMJ* 2010; 340: c2096.
4. Renko M, Tapanainen P, Tossavainen P, Pokka T, Uhari M. Meta-analysis of the significance of asymptomatic bacteriuria in diabetes. *Diabetes Care* 2011; 34: 230-235.
5. Harding GKM, Zhanel GG, Nicolle LE, Cheang M; Manitoba Diabetes Urinary Tract Infection Study Group. Antimicrobial treatment in diabetic women with asymptomatic bacteriuria. *N Engl J Med* 2002; 347: 1576-5783.
6. Cormican M, Murphy AW, Vellinga A. Interpreting asymptomatic bacteriuria. *BMJ* 2011; 343: d4780.
7. Johnson DW, Jones GR, Mathew TH, et al; Australasian Proteinuria Consensus Working Group. Chronic kidney disease and measurement of albuminuria or proteinuria: a position statement. *Med J Aust* 2012; 197: 224-225.

FURTHER READING

1. Ariathianto Y. Asymptomatic bacteriuria – prevalence in the elderly population. *Aust Fam Physician* 2011; 40: 805-809.
2. Cormican M, Murphy AW, Vellinga A. Interpreting asymptomatic bacteriuria. *BMJ* 2011; 343: d4780.

COMPETING INTERESTS: None.