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Q | Should you treat asymptomatic bacteriuria in an older adult with altered mental status?

> THE CASE

A 78-year-old woman with a past medical history of hypertension, hyperlipidemia, osteoarthritis, and osteopenia was brought to the emergency department (ED) by her daughter. The woman had fallen 2 days earlier and had been experiencing a change in mental status (confusion) for the previous 4 days. Prior to her change in mental status, the patient had been independent in all activities of daily living and instrumental activities of daily living.

Her daughter could not recall any symptoms of illness; new or recently changed medications; complaints of pain, constipation, diarrhea, urinary frequency, or hematuria; or changes in continence prior to the onset of her mother's confusion.

The patient's medications included amlodipine, atorvastatin, calcium/vitamin D, and acetaminophen (as needed). In the ED, her vital signs were normal, and her cardiopulmonary and abdominal exams were unremarkable. A limited neurologic exam showed that the patient was oriented only to person and could not answer questions about her symptoms or follow commands. She could move all of her extremities equally and could ambulate; she had no facial asymmetry or slurred speech. Her exam was negative for orthostatic hypotension.

Her complete blood count, comprehensive metabolic panel, and troponin levels were normal. Her electrocardiogram showed normal sinus rhythm with no abnormalities. X-rays of her right hip and elbow were negative for fracture. Computed tomography of her head was negative for acute findings, and a chest x-ray was normal.

■ **Her urinalysis** showed many bacteria and large leukocyte esterase, and a urine culture was sent out. She was hemodynamically stable and there were no known urinary symptoms, so no empiric antibiotics were started. She was admitted for further evaluation of her altered mental status (AMS).

On our service, she was given intravenous fluids, and oral intake was encouraged. She had normal levels of B12, folic acid, and thyroid-stimulating hormone. She was negative for HIV and syphilis. Acute coronary syndrome was ruled out with normal electrocardiograms and troponin levels. Her telemetry showed a normal sinus rhythm.

After 2 days, her vital signs and labs remained stable and no other abnormalities were found; however, she had not returned to her baseline mental status. Then the urine culture returned with $> 10^5$ CFU/mL of *Escherichia coli*, prompting a resident to curbside me (AP) and ask: "I shouldn't treat this patient based on her urine culture—she's just colonized, right? Or should I treat her because she's altered?"

THE CHALLENGE

Identifying and managing urinary tract infections (UTIs) in older adults often presents a challenge, further complicated if patients have AMS or cognitive impairment and are unable to confirm or deny urinary symptoms.

Consider, for instance, the definition of symptomatic UTI: significant bacteriuria ($\geq 10^5$ CFU/mL) and pyuria (> 10 WBC/hpf) with UTI-specific symptoms (fever, acute dysuria, new or worsening urgency or frequency, new urinary incontinence, gross hematuria, and suprapubic or costovertebral angle pain or tenderness).¹ In older adults, these parameters require a more careful look.

For instance, while we use the cutoff of $\geq 10^5$ CFU/mL to define “significant” bacteriuria, the truth is that we don’t know the colony count threshold that can help identify patients who are at risk of serious illness and might benefit from antibiotic treatment.²

After reviewing the culture results, clinicians then face 2 specific challenges: differentiating between acute vs chronic symptoms and related vs unrelated symptoms in the older adult population.

■ **Challenge 1:** There is a high prevalence of chronic genitourinary symptoms in older adults that can sometimes make it hard to distinguish between an acute UTI and the acute recognition of a chronic, non-UTI problem.¹

■ **Challenge 2:** There is a high prevalence of multimorbidity in older adults. For instance, diuretics for heart failure can cause UTI-specific symptoms such as urinary urgency, frequency, and even incontinence. Cognitive impairment can make it difficult to obtain the key components of the history needed to make a UTI diagnosis.¹

Lastly, there are aspects of normal aging physiology that complicate the detection of infections, such as the fact that older adults may not mount a “true” fever to meet criteria for a symptomatic UTI. Therefore, fever in institutionalized or frail community-dwelling older adults has been redefined as an oral temperature ≥ 100 °F, 2 repeated oral temperatures > 99 °F, or an increase in temperature ≥ 2 °F from baseline.³

So how to proceed with our case patient? The following questions helped guide the approach to her care.

Is this patient asymptomatic?

Yes. The patient presented with nonspecific symptoms (falls and delirium) with bacteriuria suggesting asymptomatic bacteriuria

(ASB). These symptoms are referred to as *geriatric syndromes* that, by definition, are “multifactorial health conditions that occur when the accumulated effects of impairments in multiple systems render an older person vulnerable to situational challenges.”⁴

As geriatric syndromes, falls and delirium are unlikely to be caused by one process, such as a UTI, but rather from multiple morbid processes. It is also important to note that there is no evidence to support a causal relationship between bacteriuria and delirium or that antibiotic treatment of bacteriuria improves delirium.^{2,5}

So, while we could have diagnosed a UTI in this older adult with bacteriuria and delirium, it would have been premature closure and an incomplete assessment. We would have risked potentially missing other significant causes of her delirium and unnecessarily exposing the patient to antibiotics.

Are antibiotics generally useful in older adults who you believe to be asymptomatic with a urine culture showing bacteriuria?

No. The goal of antibiotic treatment for a symptomatic UTI is to ameliorate symptoms; therefore, there is no indication for antibiotics in ASB and no evidence of survival benefit.² And, as noted earlier, there is no evidence to support a causal relationship between bacteriuria and delirium or that antibiotic treatment of bacteriuria improves delirium.^{2,5}

The use of antibiotics in the asymptomatic setting will eradicate any bacteriuria but also increase the risk of reinfection, resistant organisms, antibiotic adverse reactions, and medication interactions.¹

What is the recommendation for management of nonspecific symptoms, such as delirium and falls, in a geriatric patient such as this one with bacteriuria?

The Infectious Diseases Society of America (IDSA)’s 2019 *Clinical Practice Guideline for the Management of Asymptomatic Bacteriuria* recommends a thorough assessment (for other causes) and careful observation, rather than immediate antimicrobial treat-



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ment and cessation of evaluation for other causes.⁵ (IDSA made this recommendation based on low-quality evidence.) The group found a high certainty of harm and low certainty of benefit in treating older adults with antibiotics for ASB.

This recommendation highlights the key geriatric principle of “geriatric syndromes” and the multifactorial nature of findings such as delirium and falls. It encourages clinicians to continue their thorough assessment for other causes in addition to bacteriuria.⁵ Even in the event that antibiotics are immediately initiated, we would recommend avoiding premature closure and continuing to evaluate for other causes.

It is reasonable to obtain a dipstick if, after the observation period (1-7 days, with earlier follow-up for frail patients), the patient continues to have the nonspecific symptoms.¹ If the dipstick is negative, there is no need for further evaluation of UTI. If it's positive, then it's appropriate to send for urinalysis and urine culture.¹

If the urine culture is negative, continue looking for other etiologies. If it's positive, but there is resolution of symptoms, there is no need to treat. If it's positive and symptoms persist, consider antibiotic treatment.¹

CASE RESOLUTION

The team closely monitored the patient and delayed empiric antibiotics while continuing the AMS work-up. After 2 days in the hospital, her delirium persisted, but she had no UTI-specific symptoms and she remained hemodynamically stable.

I (AP) recommended antibiotic treat-

ment guided by the urine culture sensitivity report: initially 1 g of ceftriaxone IV q24h with transition (after symptom improvement and prior to discharge) to oral trimethoprim/sulfamethoxazole 160 mg/800 mg q12h, for a total of 10 days of treatment. I emphasized that we were treating bacteriuria with *persisting* delirium without any other etiology identified. The patient returned to her baseline mental status after a few days of treatment and was discharged home.

THE TAKEAWAY

Avoid premature closure by stopping at the diagnosis of a “UTI” in an older adult with nonspecific symptoms and bacteriuria to avoid the risk of overlooking other important and potentially life-threatening causes of the patient's signs and symptoms. **JFP**

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References

1. Mody L, Juthani-Mehta M. Urinary tract infections in older women: a clinical review. *JAMA*. 2014;311:844-854. doi: 10.1001/jama.2014.303
2. Finucane TE. “Urinary tract infection”- requiem for a heavy-weight. *J Am Geriatr Soc*. 2017;65:1650-1655. doi: 10.1111/jgs.14907
3. Ashraf MS, Gaur S, Bushen OY, et al; Infection Advisory Subcommittee for AMDA—The Society of Post-Acute and Long-Term Care Medicine. Diagnosis, treatment, and prevention of urinary tract infections in post-acute and long-term care settings: a consensus statement from AMDA's Infection Advisory Subcommittee. *J Am Med Dir Assoc*. 2020;21:12-24 e12. doi: 10.1016/j.jamda.2019.11.004
4. Inouye SK, Studenski S, Tinetti, ME, et al. Geriatric syndromes: clinical, research, and policy implications of a core geriatric concept. *J Am Geriatr Soc*. 2007;55:780-791. doi: 10.1111/j.1532-5415.2007.01156.x
5. Nicolle LE, Gupta K, Bradley SF, et al. Clinical practice guideline for the management of asymptomatic bacteriuria: 2019 update by the Infectious Diseases Society of America. *Clin Infect Dis*. 2019;68:e83-e110. doi: 10.1093/cid/ciy1121