Heed the warning – Staphylococcus aureus in urine can mean something serious!

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Introduction

- *Staphylococcus aureus* bacteraemia can cause serious infections with multiple sites of involvement – such as infective endocarditis and spondylodiscitis. It is crucial to identify and treat *Staphylococcus aureus* bacteraemia early.
- *Staphylococcus aureus* is an unusual uro-pathogen. Its detection in urine should prompt evaluation for concomitant bacteraemia, especially in the absence of urinary tract devices.
- We present the case of a patient who presented with a fall and was found to have *Staphylococcus aureus* bacteriuria who was subsequently found to have infective endocarditis.

Case presentation

- 75-year-old Chinese Male
- **Past medical history:**
  Diabetes Mellitus, Hypertension, Hyperlipidaemia, Retinopathy secondary to Diabetes Mellitus
- **Presented with a fall**

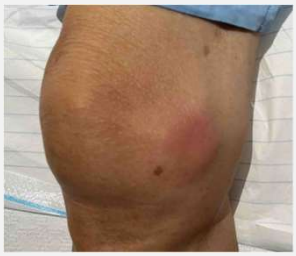
Washing feet with soap and water
↓
Generalised weakness
↓
Fell unto a seated position
↓ 2 days later
Neck pain
Bilateral upper arm and shoulder pain
Right knee pain

- Work-up for precipitants of fall included full blood count, inflammatory markers and urine studies.
  - Total white blood cells 18.4 x10^9/L
  - CRP >380mg/L
  - Procalcitonin 3.84 ug/L
  - Urine WBC <1 – urine cultures >100,000 CFU/mL of *Staphylococcus aureus*
- However, patient had no fever. He complained of joint pains related to his previous job and his fall.

Examination

- Afebrile and vitals within normal limits
- Hand examination:

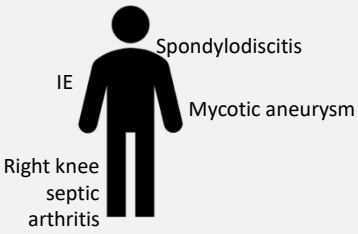

  - Painful erythematous nodules
  - Entire hand was exquisitely tender to palpation
- Right knee was swollen with mild effusion
  - Focal region of erythema over medial aspect of right knee



Investigations

- 2 sets of blood cultures sent – both positive for Methicillin-susceptible *Staphylococcus aureus* (MSSA)
- Transthoracic echocardiogram – no vegetations
  - Transoesophageal echocardiogram - echogenic, tubular mass attached on the atrial aspect of the mitral valve measuring 0.35cm
- Right knee tap cultures – MSSA
  - Underwent right knee washout
- MRI cervical, thoracic and lumbar spine for neck pain - Early spondylodiscitis between C5-C7 with small prevertebral collection and surrounding soft tissue changes. Heterogeneous increased marrow signal between the T4-6 vertebra with irregular endplates in keeping with spondylodiscitis. There is a prevertebral collection measuring approximately 1.7 cm in thickness, most prominent between the T3-T6 levels but seen to extend superiorly up till the cervical spine.
- CT thorax, abdo, pelvis – Saccular aneurym which measures 3.3x2.6 cm with its neck measuring 1.3 cm. Interval new penetrating ulcer seen along medial aspect of proximal descending aorta.

Despite not having a fever, patient had multiple sites of involvement of MSSA



Progress

- He completed 8 weeks of intravenous Cefazolin, with improvement in inflammatory markers, pain over hands and right knee swelling.
- He did not undergo surgery for mycotic aneurysm due to location of the aneurysm – which puts him at high risks for stroke.
- He remains well 2 months after stopping antibiotics but has residual right knee stiffness which affects his ambulation.

Conclusion

- *Staphylococcus aureus* in urine could indicate *Staphylococcus aureus* bacteraemia – although the mechanism is not clear[1].
- There is no consensus on what should be done after *Staphylococcus aureus* is detected in urine[2].
- However, this author recommends that – in suitable patients – e.g. no evidence of contamination of urine cultures – consider performing at least 2-3 sets of blood cultures when *Staphylococcus aureus* is identified in urine.
- Careful examination of patients – e.g. peripheral stigmata of infective endocarditis – ensures that targeted investigations – e.g. trans-oesophageal echocardiogram – are performed.
- No fever ≠ No infection

References

1. Schuler F, Barth PJ, Niemann S, Schaumburg F. A Narrative Review on the Role of *Staphylococcus aureus* Bacteriuria in *S. aureus* Bacteremia. *Open Forum Infect Dis*. 2021;8(6):ofab158. Published 2021 Mar 30. doi:10.1093/ofid/ofab158
2. Mason CY, Sobti A, Goodman AL. *Staphylococcus aureus* bacteriuria: implications and management. *JAC Antimicrob Resist*. 2023;5(1):dlac123. Published 2023 Jan 11. doi:10.1093/jacamr/dlac123