Chryseobacterium gleum bacteraemia: first reported cases from Qatar

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Abstract

Chryseobacterium gleum is a Gram-negative aerobic bacillus. It commonly colonizes mechanical devices, causing device-associated infections like central line–associated bloodstream infection and ventilator-associated pneumonia. We describe two cases of C. gleum bacteraemia in patients admitted to our intensive care unit in Qatar, one of which resulted in death. Long hospital stays and indwelling devices are risk factors for C. gleum bacteraemia. Because C. gleum is inherently resistant to β-lactam antibiotics, rapid identification and antimicrobial susceptibility testing are essential for guiding therapy.

Keywords: Antibiotic resistant, bloodstream infection, Chryseobacterium gleum, hospital acquired infection, infection control

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Introduction

Chryseobacterium gleum (formerly Flavobacterium gleum) [1], is a Gram-negative, nonfermenting, catalase-positive and indole-positive aerobic bacillus [2]. It commonly found on moist hospital surfaces, like washbasins and dressing trolleys [3]. Inadequate infection control makes it a risk for hospital-acquired infection and its transmission between patients [4] because they can colonize mechanical devices, causing device-associated infections like central line–associated bloodstream infection (CLABSI) and ventilator-associated pneumonia [3,4].

Chryseobacterium gleum is infrequently isolated and has been reported in several countries including India, Hungary, Croatia, Qatar, Taiwan and Saudi Arabia [5–10]. Chryseobacterium gleum spp. are resistant to several antibiotics such as aminoglycosides, chloramphenicol, tetracycline, clindamycin, teicoplanin and erythromycin [1,12]. In addition, these strains chromosomally encode class A carbapenemases and class B metallo-β-lactamases which confer resistance to all β-lactams [13].

Case report

Case I
A 75-year-old woman with a history of end-stage renal failure undergoing haemodialysis through fistula, diabetes mellitus and hypertension was admitted to our hospital complaining of acute abdominal pain. She was found to have acute mesenteric artery thrombosis and multiple splenic hypodensities by computed tomographic scan. She had concurrent Klebsiella pneumonia bacteraemia managed with piperacillin/tazobactam. Her course was complicated by a splenic abscess, which was initially treated with the antibiotic piperacillin/tazobactam; however, she experienced cardiac arrest, was resuscitated and was then moved to the intensive care unit (ICU). During her stay, splenic abscess drainage was done by the intervention radiologist, and culture grew Parabacteroides distasonis which was sensitive to metronidazole and resistant to amoxicillin/clavulanic acid; it was treated with metronidazole. Five days later, the patient experienced septic shock. Blood culture of a peripheral line grew Chryseobacterium gleum. It was sensitive only to ciprofloxacin.
Our patients had line-related bacteraemia with no other source. Reports of C. gleum pneumonia in a 6-month-old baby with nephrotic syndrome [10]. Reports of C. gleum infection are summarized in Table 1. Our patients had line-related bacteraemia with no other source of infection. We performed an outbreak investigation because both cases happened simultaneously; however, their MIC profiles showed some differences (Table 2). This organism is capable of producing Ambler class B carbapenem-hydrolyzing β-lactamase, which might cause treatment failure when β-lactam antibiotics are used as a first-line treatment. The organism shows different sensitivity profile to fluoroquinolones and cotrimoxazole.

### Case 2

A 73-year-old man was admitted to our hospital in December 2018 with septic shock that had resulted from a perianal abscess complicated with Fournier gangrene which was treated with antibiotics. His hospital course was also complicated by Clostridium difficile infection. In January 2019, during his ICU admission, he again experienced septic shock. Blood culture from central and peripheral lines showed C. gleum infection. In January 2019, during his ICU admission, he again experienced septic shock. Blood culture from central and peripheral lines showed C. gleum infection in a patient with malnutrition and hepatic lesion [8]. A case published in 2016 from Saudi Arabia reported C. gleum pneumonia in a 6-month-old baby with nephrotic syndrome [8]. Reports of C. gleum infection are summarized in Table 1. Our patients had line-related bacteraemia with no other source of infection. We performed an outbreak investigation because both cases happened simultaneously; however, their MIC profiles showed some differences (Table 2). This organism is capable of producing Ambler class B carbapenem-hydrolyzing β-lactamase, which might cause treatment failure when β-lactam antibiotics are used as a first-line treatment. The organism shows different sensitivity profile to fluoroquinolones and cotrimoxazole.

### Discussion

Chryseobacterium gleum is an unusual human pathogen that has been reported as a cause for hospital-acquired infection. Most of publications available in the literature refer to long hospital stays or indwelling devices. The organism has also been reported in cystic fibrosis patients [14]. One study in Qatar in 2015 identified C. gleum from a respiratory sample from a patient with cystic fibrosis [6]. A 2015 report from Croatia described a case of C. gleum infection in a patient with malnutrition and hepatic lesion [8].

### Conclusion

Critically ill patients in ICUs are at risk of healthcare-associated infection due to the emerging pathogen C. gleum. Long hospital stays or indwelling devices. The organism has also been reported in cystic fibrosis patients [14]. One study in Qatar in 2015 identified C. gleum from a respiratory sample from a patient with cystic fibrosis [6]. A 2015 report from Croatia described a case of C. gleum infection in a patient with malnutrition and hepatic lesion [8]. A case published in 2016 from Saudi Arabia reported C. gleum pneumonia in a 6-month-old baby with nephrotic syndrome [10]. Reports of C. gleum infection are summarized in Table 1. Our patients had line-related bacteraemia with no other source of infection. We performed an outbreak investigation because both cases happened simultaneously; however, their MIC profiles showed some differences (Table 2). This organism is capable of producing Ambler class B carbapenem-hydrolyzing β-lactamase, which might cause treatment failure when β-lactam antibiotics are used as a first-line treatment. The organism shows different sensitivity profile to fluoroquinolones and cotrimoxazole.
stays and the presence of indwelling devices are risk factors for *C. gleum* bacteraemia. Proper infection control practices and outbreak investigations are essential to prevent the spread of infections related to this organism. Because *C. gleum* is inherently resistant to β-lactam antibiotics, rapid identification and antimicrobial susceptibility testing are essential for guiding therapy.

**Conflict of interest**

None declared.

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