Successful treatment of Leuconostoc bacteremia in a neutropenic patient with tigecycline

Trupti Patel,1 Aoife Molloy,2 Robin Smith,1 Indran Balakrishnan1
1Department of Microbiology, Royal Free Hospital NHS Foundation Trust, London; 2Department of Infectious Diseases, Ealing Hospital, Ealing Hospital NHS Trust, Southall, UK

Abstract

Leuconostoc lactis is a recognised cause of infection in immunocompromised hosts. It is intrinsically resistant to multiple antibiotics and treatment options may be limited. We report a case of safe and effective use of tigecycline in the treatment of Leuconostoc catheter-related line sepsis in a neutropenic patient. To our knowledge, this is the first reported case of successful use of tigecycline for Leuconostoc bacteremia.

Case Report

A 52-year-old woman with granulocytic sarcoma affecting the anterior cranial fossa and frontal sinus was commenced on ADE (cytarabine, daunorubicin and etoposide) and Mylotarg (gemtuzumab) through a peripherally inserted central catheter (PICC) line as part of the AML 17 trial (http://aml17.cardiff.ac.uk/aml17/Default.aspx). She was known to have a beta-lactam allergy manifest as an erythematous rash.

On day 9 of chemotherapy, meropenem was empirically started for febrile neutropenia as per fever and neutropenia guidelines.1 Her fever resolved after 48 hours and meropenem was stopped after 7 days. On day 18 of chemotherapy she was still neutropenic and developed further fevers to 39°C. Her PICC insertion site appeared erythematous with an associated blister. Meropenem was restarted after 7 days of tigecycline, to which she had no adverse effects. She remained asymptomatic with sterile blood cultures and successfully continued her chemotherapy.

Discussion

Leuconostoc spp. are catalase-negative, gram-positive, facultatively anaerobic coccobacilli. They are environmental organisms often found on plants, dairy products, vegetables, wine and occasionally in human vaginal and stool samples.2 Although an uncommon human pathogen, cases of bacteremia, endocarditis, pneumonia, meningitis, osteomyelitis, peritonitis, brain and liver abscesses have been described.1,2

Leuconostoc spp. and other gram-positive antimicrobial-resistant organisms are increasingly recognised as important pathogens in neutropenic patients probably due, in addition to immunosuppression, to the use of indwelling intravascular devices, antibiotic prophylaxis and evolution of chemotherapy agents.3 Infection with Leuconostoc may cause fever, intravascular catheter-related sepsis, bacteremia, abdominal pain, gastroenteritis, colitis or meningitis in this group of patients.7

Other reported risk factors for infection include a history of surgery and prior vancomycin therapy.1,3 Common portals of entry described include intravascular catheters or the gastrointestinal tract.1,3 Removal of intravenous catheters alone has been shown to be curative in some patients without the need for antimicrobial therapy.7

There are no standardised criteria for interpreting the antimicrobial susceptibility testing of Leuconostoc spp. - therapy should be guided by the MIC of the isolate. Leuconostoc spp. are intrinsically resistant to glycopeptides, owing to the production of peptidoglycan precursors ending in D-Ala-D-Lac, but are usually susceptible to penicillin, ampicillin, aminoglycosides, clindamycin, minocycline and macrolides.1,7 In addition, linezolid and daptomycin have been used successfully to treat Leuconostoc bacteremia, although linezolid MICs of Leuconostoc spp. are usually higher when compared with those of streptococci.1,3 Moderate susceptibility is seen with cephalosporins, chloramphenicol, tetracycline and doxycycline.2 Although the organism has been shown to be resistant to cefoxitin, it is susceptible to cefotaxime in vitro.1,3 This may have been an alternative therapeutic option in our patient.

Tigecycline, a glycylcycline, is a broad spectrum synthetic derivative of minocycline which has a broad spectrum of activity against various gram-positive and gram-negative bacteria including multidrug-resistant strains, anaerobic bacteria and atypical organisms. It has proven to be useful in the treatment of hospi-
Conclusions

Although tigecycline has been demonstrated to be a safe and effective second-line option in microbiologically documented infections in neutropenic patients, there have been no trials to determine whether tigecycline is effective in neutropenic bacteremia and there are also theoretical concerns surrounding low serum concentrations (due to a large volume of distribution) and its mostly bacteriostatic activity.\textsuperscript{25} It is for this reason that tigecycline is not generally recommended for primary bacteremia but it is used for secondary bacteremia associated with complicated skin and soft tissue infections, intra-abdominal infections and community-acquired pneumonia.\textsuperscript{26}\textsuperscript{24} Despite these concerns, here we report the first successful use of tigecycline in the treatment of Leuconostoc bacteremia in a neutropenic patient.

References