Bacterial endocarditis treated with intramuscular teicoplanin

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ABSTRACT

Right-sided endocarditis caused by *Staphylococcus aureus* in parenteral drug abusers is potentially life-threatening, more so in the presence of pulmonary embolisation, and a course of parental antibiotics is required for at least four weeks. A combination of intravenous cloxacillin and aminoglycosides has proven efficacious for more than 90 percent of the patients. Intravenous vancomycin can also be used in cases of penicillin allergy or methicillin- resistant staphylococci. Intravenous teicoplanin, a glycopeptide with a similar antimicrobial profile to vancomycin, has been used with a somewhat lesser degree of success in these cases and is not recommended as first line therapy. We describe a 37-year-old man, a parenteral drug user, who had right-sided endocarditis, where in the absence of other alternatives, teicoplanin had to be administered intramuscularly and not intravenously.

Keywords: bacterial endocarditis, endocarditis, intramuscular teicoplanin, intravenous drug user, staphylococcal infection, *Staphylococcus aureus*, teicoplanin

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INTRODUCTION

Infective endocarditis is an uncommon disease these days but still retains a high mortality. Intravenous drug users (IVDU) are at constant risk of this infection, and the right side of the heart is particularly susceptible. *Staphylococcus aureus* is the most common organism isolated in this group of patients, and prompt, prolonged parenteral antibiotic treatment is required to ensure complete eradication of the causative pathogen. The treatment of choice is intravenous (IV) cloxacillin with aminoglycosides. IV vancomycin is an effective alternative to cloxacillin. The role of teicoplanin in such cases has yielded conflicting results, and is still not recommended as a first line therapy. We report a very unusual case of bacterial endocarditis in an IVDU, who was successfully treated with teicoplanin via the intramuscular (IM) route.

CASE REPORT

A 37-year-old man presented to the emergency department with fever and progressive breathlessness of ten days duration. He denied a history of orthopnoea and paroxysmal nocturnal dyspnoea, cough, chest pain, palpitations, haemoptysis or swelling of legs. He has been a pentazocine addict (both IV and IM drug abuser) for the past five years. The patient had already taken a week's course of oral amoxycillin and ciprofloxacin from a local doctor without any relief. On examination, he was febrile (38.8ºC), with a heart rate of 130/min, respiratory rate of 28/min and blood pressure of 100/70 mmHg. He had multiple venipuncture marks on both forearms and arms, with thrombosed veins, pedal oedema, and elevated jugular venous pulse. There were no peripheral signs of infective endocarditis. Systemic examination was unremarkable except for a pansystolic murmur (grade III/VI) in the right parasternal area, increasing with inspiration, and bilateral scattered crepitations in the chest.

On laboratory investigation, his haemoglobin level was 9.4 gm/dL, total leucocyte count 20,000/mm^3 (polymorphs 70%, lymphocytes 25%, monocytes 3% and eosinophils 2%), platelet count 2.0 × 105/mm^3 and erythrocyte sedimentation rate of 52 in the first hour (Westergren). Biochemistry tests revealed normal liver and renal functions. Urine microscopy did not show any abnormality. Bilateral fluffy non-homogeneous opacities were seen on the chest radiograph. His serology was negative for hepatitis B, hepatitis C and human immunodeficiency virus. Echocardiography showed an ejection fraction of 60%, with moderate tricuspid regurgitation and a vegetation measuring 9 mm × 8 mm on the tricuspid valve. All three blood cultures grew coagulase-positive *S. aureus* sensitive to methicillin, cloxacillin, aminoglycosides, teicoplanin and cefotaxime.

Empirically, IV cloxacillin and gentamycin was started while awaiting the culture and sensitivity reports, and were continued after the culture and sensitivity report. On day seven, his vascular site became thrombosed and no new access could be

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established, as all the superficial veins were thrombosed. The patient and his relatives did not give consent for central line (internal jugular, subclavian or femoral) insertion, despite explanations of the need for urgent parenteral treatment. Review of the literature revealed that teicoplanin, a glycopeptide with antimicrobial profile quite similar to vancomycin, could also be administered via the IM route. After six weeks of therapy with IM teicoplanin, a complete clinical and bacteriological cure was achieved.

DISCUSSION

Teicoplanin is a glycopeptide, with a similar antimicrobial spectrum to vancomycin. It has been successfully used in methicillin-resistant staphylococcus infections. It can be administered intravenously as well as intramuscularly, in a single bolus dose. Nephrotoxicity, ototoxicity and hypersensitivity reactions are the major side-effects. Rarely, transient neutropenia and thrombocytopenia have also been reported.[1] There have been numerous reports of infective endocarditis being treated with teicoplanin.[1-4] On the contrary, Fortun et al reported a high failure rate with teicoplanin, even in high dosages, and came to the conclusion that teicoplanin should not be used to treat serious staphylococcal infections, particularly endocarditis, until the minimum effective dosage is established.[5] High failure rates was seen in another study with teicoplanin, as compared to vancomycin, for the treatment of staphylococcal endocarditis.[6] In the absence of robust data to date, in a case of IVDU with endocarditis, teicoplanin as first line treatment is not justified and should not be used as such. However, in this index case, in the absence of other alternatives, we used teicoplanin with success. It is pertinent to mention here that there have been anecdotal case reports of bacterial endocarditis being effectively treated with oral linezolid, but this drug was not available at that time.

Teicoplanin has been used intramuscularly with success in cases of chronic osteomyelitis, skin and soft tissue infections, though the efficacy of IM teicoplanin is slightly less than when used intravenously.[7-9] To the best of our knowledge, after an electronic review of literature, this is the first case report where infective endocarditis in an IVDU was treated successfully with IM telcoplanin. To date, cloxacillin plus aminoglycosides is the most effective drugs, and still remain the drugs of choice in cases of infective endocarditis in IVDU.[10,11] But in cases where these cannot be used (penicillin allergy or methicillin-resistant *S. aureus*), IV vancomycin along with aminoglycosides is an effective alternative. In a complex clinical situation, as in this index case, IM use of teicoplanin or oral linezolid can be life-saving. However, it should be emphasised that IM use of teicoplanin or oral linezolid should not be used as a standard first line treatment.

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