Clinical isolates of methicillin-resistant Staphylococcus aureus (MRSA) with reduced susceptibility to teicoplanin in Northwest England

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Sir,

We describe two cases of post-operative wound infection caused by methicillin-resistant Staphylococcus aureus (MRSA), which developed in vitro resistance to teicoplanin (MICs 16–32 mg/L).

The first patient was a 34-year-old man who presented with a 3 year history of lower back pain due to spondylolitic spondylolisthesis with degenerative changes. He underwent surgery with spinal instrumentation but developed a post-operative wound infection. Tissue and swab cultures of pus from the wound grew both methicillin-susceptible S. aureus (MSSA) and MRSA, both of which were susceptible to teicoplanin (MICs ≤ 4 mg/L). He was treated with iv vancomycin for 4 weeks but developed unacceptably high trough levels and his therapy was changed to teicoplanin, given as three initial iv doses of 400 mg every 12 h, followed by 400 mg administered im od for 12 weeks. His wound improved, with less inflammation and discharge, and inflammatory markers returned to normal. However, signs of infection recurred 1 month after stopping teicoplanin, and a swab yielded MRSA that grew on a breakpoint screening plate containing teicoplanin at a concentration of 4 mg/L. Both this isolate and the initial MRSA isolate were characterized by phage typing as EMRSA-15, and had (with the exception of teicoplanin) identical anti-antibiograms, being resistant to erythromycin and ciprofloxacin but susceptible to fusidic acid, gentamicin, rifampicin, tetracycline and trimethoprim. The teicoplanin MICs for the pre- and post-treatment MRSA isolates were 1 and 2 mg/L respectively, while the corresponding teicoplanin MICs were 1 and 16 mg/L.

The second case was a 25-year-old woman with congenital spinal scoliosis who underwent surgery with spinal instrumentation. She developed post-operative wound infection from which a drain fluid and swab yielded MRSA together with normal flora. She was treated with iv vancomycin, plus oral rifampicin and ciprofloxacin, but developed high vancomycin trough levels on the 10th day of therapy. Treatment was changed to teicoplanin, given as three initial iv doses of 400 mg every 12 h, followed by 400 mg administered im od. The wound was debrided and 20 days after surgery the patient was discharged home, where she continued to receive teicoplanin im. Teicoplanin was given for a total of 12 weeks, during which time the patient improved clinically. However, she was readmitted 5 weeks after completing treatment, with progressive back pain, suspected to be due to infection. The wound was debrided and a swab taken intra-operatively yielded MRSA that grew on a teicoplanin breakpoint plate. Both MRSA isolates from this patient were EMRSA-15 and were resistant to erythromycin, ciprofloxacin and rifampicin but susceptible to fusidic acid, gentamicin, tetracycline and trimethoprim. The vancomycin MICs of the pre- and post-treatment MRSA isolates were 2 and 4 mg/L respectively, whereas the corresponding teicoplanin MICs were 4 and 32 mg/L.

We postulate that in both these cases, teicoplanin resistance developed during therapy with this agent. As in other patients reported previously, it appears that prolonged therapy with teicoplanin may be associated with emergence of resistance leading to treatment failure. In one of these earlier cases, in which teicoplanin resistance emerged during treatment of a diabetic foot infection, the low dose (200 mg) used was thought to have selected for the resistance. Low-level resistance to glycopeptides is not readily detected by disc testing. However, the routine use by our clinical microbiology laboratory of a breakpoint method enabled its ready detection in these cases, with subsequent confirmation provided by the reference laboratory. It is important to raise clinical awareness of acquired glycopeptide resistance in S. aureus, including MRSA, and to institute appropriate laboratory testing (MIC determination) of strains from patients on prolonged glycopeptide therapy, particularly those receiving teicoplanin.
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References


