The possible role of anti-methicillin-resistant *Staphylococcus aureus* antimicrobial agents in spontaneous bacterial peritonitis

Marco Fiore,¹ Lorenzo Andreana²

¹Infectious Disease Unit, University Hospital of Trieste; ²Department of Emergency Medicine, Ospedale di Palmanova, Italy

Dear Editor,

We read with great interest the case report by Falcone *et al.* on the treatment of Spontaneous Bacterial Peritonitis (SBP) due to methicillin-resistant *Staphylococcus aureus* (MRSA) with high vancomycin minimum inhibitory concentration (MIC) value.¹ The authors treated a SBP (microbiological results of ascites fluid showed MRSA) in a cirrhotic patient with a documented allergy to tetracycline with daptomycin (6 mg/kg/day) for 12 days.

Tigecycline, a glycycline licenced for the treatment of intra-abdominal infections (IAI),² unlike daptomycin, that is effective against MDR Gram-positive bacteria, including MRSA and vancomycin-resistant enterococci (VRE) was contraindicated because of the documented allergy to tetracyclines.

The authors state that the linezolid can not be used in the majority of patients with cirrhosis and bacterial infections because of myelotoxicity and thrombocytopenia. Indeed thrombocytopenia is a long term (over two weeks of therapy) reversible adverse effect;³ however duration of SBP antibiotic treatment is unclear;⁴ treatment for 5 days has shown success and longer treatment is recommended if blood cultures are positive.⁵

Furthermore, daptomycin is associated with higher all-cause mortality and trend for higher relapse rate than linezolid.⁶ Daptomycin displays a dose-dependent response against VRE with high-dose daptomycin (10-12 mg/kg/day) producing most bactericidal activity,⁷ and a daptomycin dosage of 8 mg/kg/day or greater may be safe in patients with complicated gram-positive infections.⁸ So in other life-

threatening setting such as infective endocarditis, patients had successful outcomes with high-dose daptomycin therapy.⁹

Finally, several reports have linked increases in vancomycin MICs to increases in daptomycin MICs and thus high-dose daptomycin should be in place of standard dosing.^{10,11}

In conclusion, according to current evidence the low-dose daptomycin used in the case report does not seem to be the best therapeutic choice for the treatment of gram-positive SBP.

References

1. Falcone M, Russo A, Pacini G, et al. Spontaneous bacterial peritonitis due to methicillin-resistant *Staphylococcus aureus* in a patient with cirrhosis: the potential role for daptomycin and review of the literature. *Infect Dis Rep* 2015;7:6127.
2. Eckmann C, Montravers P, Bassetti M, et al. Efficacy of tigecycline for the treatment of complicated intra-abdominal infections in real-life clinical practice from five European observational studies. *J Antimicrob Chemother* 2013;68:ii25-35.
3. Wu VC, Wang YT, Wang CY, et al. High frequency of linezolid-associated thrombocytopenia and anemia among patients with end-stage renal disease. *Clin Infect Dis* 2006;42:66-72.
4. Esposito S, Esposito I, Leone S. Considerations of antibiotic therapy duration in community- and hospital-acquired bacterial infections. *J Antimicrob Chemother* 2012;67:2570-5.
5. Alaniz C, Regal RE. Spontaneous bacterial peritonitis: a review of treatment options. *Pharm Therapeut* 2009;34:204-10.
6. Balli EP, Venetis CA, Miyakis S. Systematic review and meta-analysis of linezolid versus daptomycin for treatment of vancomycin-resistant enterococcal bacteremia. *Antimicrob Agents Chemother* 2014;58:734-9.
7. Hall AD, Steed ME, Arias CA, et al. Evaluation of standard- and high-dose daptomycin versus linezolid against vancomycin-resistant *Enterococcus* isolates in an in vitro pharmacokinetic/pharmacodynamic model with simulated endocardial vegetations. *Antimicrob Agents Chemother* 2012;56:3174-80.
8. Kullar R, Davis SL, Levine DP, et al. High-dose daptomycin for treatment of complicated gram-positive infections: a large, multicenter, retrospective study. *Pharmacotherapy* 2011;31:527-36.
9. Kullar R, Casapao AM, Davis SL, et al. A multicentre evaluation of the effectiveness and safety of high-dose daptomycin for the treatment of infective endocarditis. *J Antimicrob Chemother* 2013;68:2921-6.
10. Patel JB, Jevitt LA, Hageman J, et al. An association between reduced susceptibility to daptomycin and reduced susceptibility to vancomycin in *Staphylococcus aureus*. *Clin Infect Dis* 2006;42:1652-3.
11. Murray KP, Zhao JJ, Davis SL, et al. Early use of daptomycin versus vancomycin for methicillin-resistant *Staphylococcus aureus* bacteremia with vancomycin minimum inhibitory concentration >1 mg/L: a matched cohort study. *Clin Infect Dis* 2013;56:1562-9.

Correspondence: Marco Fiore, Infectious Diseases Unit, University Hospital of Trieste, Piazza Ospitale, 1, 34134 Trieste, Italy. Tel.: +39.040.399.2594 - Fax: +39.040.399.2652. E-mail: marco.fiore@hotmail.it

Key words: Daptomycin; tigecycline; linezolid; spontaneous bacterial peritonitis.

Contributions: the authors contributed equally.

Conflict of interest: the authors declare no potential conflict of interest.

Received for publication: 1 November 2015.

Accepted for publication: 9 December 2015.

This work is licensed under a Creative Commons Attribution NonCommercial 3.0 License (CC BY-NC 3.0).

©Copyright M. Fiore and L. Andreana, 2015
Licensee PAGEPress, Italy
Infectious Disease Reports 2015; 7:6286
doi:10.4081/idr.2015.6286