

patient's endocarditis and epidural abscesses/vertebral osteomyelitis were cured. The patient was treated within 8 weeks with no adverse effects (Cunha *et al.*, 2008).

A case report of vancomycin-resistant *E. faecium* pyelonephritis during pregnancy has been described. A 20-year-old 27-week-pregnant patient with a history of spina bifida, neurogenic bladder, and multiple hospitalizations for recurrent urinary tract infections was diagnosed with pyelonephritis. She was treated with daptomycin, 260 mg (4 mg/kg) daily for 14 days, on the basis of a urine culture that revealed *E. faecium* resistant to ampicillin, nitrofurantoin, and vancomycin. All cultures after treatment revealed no growth, and the patient as well as the neonate displayed no adverse effects. VRE urinary tract infections can be treated safely in pregnancy with nitrofurantoin, if the organism is susceptible. Other viable options in the treatment of VRE, including linezolid, doxycycline, and quinupristin–dalfopristin, have lower urinary concentrations or teratogenic risk or have limited findings regarding their safety in pregnancy. Daptomycin was selected in this case owing to its efficacy in the treatment of VRE, high urinary concentrations, pregnancy category B, and one case report indicating its successful use in pregnancy (Shea *et al.*, 2008).

7h. Prophylaxis

Very limited data are available on prophylactic use of daptomycin. A preclinical study in mice compared the efficacy of vancomycin, daptomycin, and tigecycline as prophylactic therapy against an MSSA or an MRSA surgical implant infection. In this mouse model, daptomycin and tigecycline prophylaxis were effective over a broader dosage range than vancomycin (Niska *et al.*, 2012). This is in contrast with a clinical study on the prevention of surgical site infections; however, the type of infection for these two studies also differed. A prospective double blinded randomized study of 178 patients undergoing lower extremity vascular procedures was performed to compare vancomycin with daptomycin in the prevention of surgical site infections. For infections within 30 days after the procedure, no difference was found for the drugs. Gram-positive related infections and MRSA infections occurred in 1 (1.18%) and 0 (0%) vancomycin patients, respectively, and in 9 (9.68%) and 1 (1.08%) daptomycin patients, respectively ($p < 0.02$ and $p = 1.00$). This suggests that vancomycin supplemental prophylaxis seems to reduce the incidence of Gram-positive infection compared with the addition of supplemental daptomycin prophylaxis (Stone *et al.*, 2009).

REFERENCES

- Abdel-Rahman SM, Benziger DP, Jacobs RF *et al.* (2008). Single-dose pharmacokinetics of daptomycin in children with suspected or proved gram-positive infections. *Pediatr Infect Dis J* **27**: 330.
- Abdel-Rahman SM, Chandorkar G, Akins RL *et al.* (2011). Single-dose pharmacokinetics and tolerability of daptomycin 8 to 10 mg/kg in children aged 2 to 6 years with suspected or proved Gram-positive infections. *Pediatr Infect Dis J* **30**: 712.
- Abraham G, Finkelberg D, Spooner LM (2008). Daptomycin-induced acute renal and hepatic toxicity without rhabdomyolysis. *Ann Pharmacother* **42**: 719.
- Akins RL, Katz BD, Monahan C, Alexander D (2015). Characterization of high-level daptomycin resistance in Viridans group Streptococci developed upon in vitro exposure to daptomycin. *Antimicrob Agents Chemother* **59**: 2102.
- Anastasiou DM, Morgan M, Ruane PJ *et al.* (2008). In vitro activity of daptomycin against multidrug-resistant *Staphylococcus aureus* and *S. aureus* with known virulence factors, including community-acquired methicillin-resistant isolates. *Diagn Microbiol Infect Dis* **61**: 339.
- Aoki I, Ishikawa K, Wakana A *et al.* (2015). Evaluation of the safety, tolerability, and pharmacokinetics of a single bolus injection of daptomycin in healthy Japanese subjects. *J Infect Chemother* **21**: 170.
- Arbeit RD, Maki D, Tally FP *et al.* (2004). The safety and efficacy of daptomycin for the treatment of complicated skin and skin-structure infections. *Clin Infect Dis* **38**: 167.
- Ardura MI, Mejias A, Katz KS *et al.* (2007). Daptomycin therapy for invasive Gram-positive bacterial infections in children. *Pediatr Infect Dis J* **26**: 1128.
- Arias CA, Torres HA, Singh KV *et al.* (2007). Failure of daptomycin monotherapy for endocarditis caused by an *Enterococcus faecium* strain with vancomycin-resistant and vancomycin-susceptible subpopulations and evidence of in vivo loss of the *vanA* gene cluster. *Clin Infect Dis* **45**: 1343.
- Bahte SK, Bertram A, Burkhardt O *et al.* (2010). Therapeutic serum concentrations of daptomycin after intraperitoneal administration in a patient with peritoneal dialysis-associated peritonitis. *J Antimicrob Chemother* **65**: 1312.
- Balli EP, Venetis CA, Miyakis S (2014). Systematic review and meta-analysis of linezolid versus daptomycin for treatment of vancomycin-resistant enterococcal bacteremia. *Antimicrob Agents Chemother* **58**: 734.
- Barber KE, Smith JR, Ireland CE (2015). Evaluation of ceftaroline alone and in combination against biofilm-producing methicillin-resistant *Staphylococcus aureus* with reduced susceptibility to daptomycin and vancomycin in an *in vitro* pharmacokinetic/pharmacodynamic model. *Antimicrob Agents Chemother* **59**: 4497.
- Barber KE, Werth BJ, Rybak MJ (2015). The combination of ceftaroline plus daptomycin allows for therapeutic de-escalation and daptomycin sparing against MRSA. *J Antimicrob Chemother* **70**: 505.
- Bardak-Ozdemir S, Turhan T, Sipahi OR *et al.* (2013). Daptomycin versus vancomycin in treatment of methicillin-resistant *Staphylococcus aureus* meningitis in an experimental rabbit model. *Antimicrob Agents Chemother* **57**: 1556.
- Bassetti M, Nicco E, Ginocchio F *et al.* (2010). High-dose daptomycin in documented *Staphylococcus aureus* infections. *Int J Antimicrob Agents* **36**: 459.
- Bauer J, Siala W, Tulkens PM, Van Bambeke F (2013). A combined pharmacodynamic quantitative and qualitative model reveals the potent activity of daptomycin and delafloxacin against *Staphylococcus aureus* biofilms. *Antimicrob Agents Chemother* **57**: 2726.
- Baxi SM, Chan D, Jain V (2015). Daptomycin non-susceptible, vancomycin-intermediate *Staphylococcus aureus* endocarditis treated with ceftaroline and daptomycin: case report and brief review of the literature. *Infection* **43**: 751.
- Bayer AS, Mishra NN, Sakoulas G *et al.* (2014). Heterogeneity of *mprF* sequences in methicillin-resistant *Staphylococcus aureus* clinical isolates: role in cross-resistance between daptomycin and host defense antimicrobial peptides. *Antimicrob Agents Chemother* **58**: 7462.
- Belmatoug N, Fantin B (1997). Contribution of animal models of infection for the evaluation of the activity of antimicrobial agents. *Int J Antimicrob Agents* **9**: 73.
- Bennett JW, Murray CK, Holmes RL *et al.* (2008). Diminished vancomycin and daptomycin susceptibility during prolonged bacteremia with methicillin-resistant *Staphylococcus aureus*. *Diagn Microbiol Infect Dis* **60**: 437.
- Benvenuto M, Benziger DP, Yankelev S, Vigliani G (2006). Pharmacokinetics and tolerability of daptomycin at doses up to 12 milligrams per