

PharmaCE™

a continuing education program for *JPT* readers

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the journal of Pharmacy Technology's educational consultants are listed on page 1.



ACCREDITATION

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CEFTOBIPROLE

(see page 22)

Goal

To review the pharmacology, pharmacokinetics, pharmacodynamics, spectrum of activity, safety, efficacy, and clinical use of ceftobiprole.

Objectives

After reviewing this article, the reader should be able to:

1. articulate the spectrum of activity and cure rates associated with ceftobiprole for cSSSI, including diabetic foot infections;
2. develop an appropriate drug therapy dosing and monitoring regimen for a patient prescribed ceftobiprole for a cSSSI;
3. assess the safety and efficacy profile of ceftobiprole in comparison with other agents within the cephalosporin class of antibiotics;
4. describe the *in vitro* activity of ceftobiprole against penicillin-resistant MRSA, *Streptococcus pneumoniae*, and *Pseudomonas* spp.;
5. define and describe the challenges associated with maintaining judicious use of ceftobiprole through antibiotic stewardship programs and deescalation strategies.

Test Questions

1. Unlike other antibiotics in the cephalosporin class, ceftobiprole is a broad-spectrum cephalosporin with *in vitro* activity against:
 - (a) *Pseudomonas aeruginosa*.
 - (b) MRSA.
 - (c) *S. pneumoniae*.
 - (d) *Klebsiella pneumoniae*.
2. What is the appropriate dose, schedule, and infusion time for a patient with normal renal function being treated with ceftobiprole for a cSSSI?
 - (a) 500 mg intravenous piggyback every 12 hours over a 3 hour infusion
 - (b) 500 mg intravenous piggyback every 12 hours with bolus dosing
 - (c) 500 mg intravenous piggyback every 8 hours over a 2 hour infusion
 - (d) 500 mg intravenous piggyback every 8 hours with bolus dosing
3. Penicillin-resistant *S. pneumoniae* is a common pathogen treated with antimicrobials possessing gram-negative activity. Which of the following agents does not provide optimal coverage of this organism?
 - (a) ceftobriprole
 - (b) aztreonam
 - (c) piperacillin/tazobactam
 - (d) azithromycin
4. MRSA is a virulent pathogen that represents an increasingly significant public health concern. Which of the following statements *best* supports this fact?
 - (a) The incidence of MRSA infections is increasing nationwide.
 - (b) There are many recently developed drug entities with MRSA activity on the market.
 - (c) The incidence of MRSA is much more prevalent in the hospital than in the community.
 - (d) The virulence of a hospital-acquired MRSA infection is higher than that of a community-acquired MRSA infection.
5. Which of the following adverse effects are commonly associated with cephalosporin therapy?
 - (a) nausea, vomiting, seizures, and blindness
 - (b) nausea, taste disturbance, and Guillain Barré syndrome
 - (c) nausea, vomiting, taste disturbance, headache, and diarrhea
 - (d) nausea, heart attack, and pseudomembranous colitis
6. In the STRAUSS 1 trial, ceftobiprole showed noninferiority to which agent in the treatment of cSSSI caused by gram-positive bacteria?
 - (a) vancomycin
 - (b) daptomycin
 - (c) linezolid
 - (d) trimethoprim/sulfamethoxazole
7. Which of the following *best* describes ceftobiprole's activity against bacteria?
 - (a) time-dependent bacteriostatic activity
 - (b) concentration-dependent bacteriostatic activity
 - (c) time-dependent bactericidal activity
 - (d) concentration-dependent bactericidal activity
8. Which of the following statements *best* describes ceftobiprole's mechanism of action?
 - (a) It inhibits cell wall synthesis by binding to D-alanyl-D-alanine portion and inhibiting polymerization.
 - (b) It binds to 30S ribosomal subunit to inhibit protein synthesis.
 - (c) It causes DNA strand breakage, resulting in decreased protein synthesis.
 - (d) It binds to penicillin binding protein and inhibits cell wall synthesis.
9. Based on the results of the STRAUSS 2 trial, which of the following drug combinations was found to be noninferior to ceftobiprole for cSSSI, including diabetic foot infections?
 - (a) daptomycin and ceftazidime
 - (b) vancomycin and ceftazidime

Answer sheet appears on page 59.

- (c) linezolid and ceftazidime
 - (d) vancomycin and cefepime
- 10.** Inadequate initial antimicrobial therapy in patients with an active infectious disease process has been shown to worsen overall clinical outcomes. What other finding is most consistently found to be correlated with poorer clinical outcomes?
- (a) development of bacterial resistance
 - (b) shorter length of hospitalization
 - (c) decreased costs
 - (d) decreased mortality
- 11.** Trials involving ceftobiprole have been conducted for what indication other than cSSSI?
- (a) community-acquired pneumonia
 - (b) endocarditis
 - (c) hospital-acquired pneumonia
 - (d) meningitis
- 12.** Various cephalosporins have been found to have different in vitro MIC₉₀ (µg/mL) susceptibilities to *P. aeruginosa*. Per susceptibility testing results, which of the following statements is true?
- (a) The MIC₉₀ (µg/mL) for cefepime is 32.
 - (b) The MIC₉₀ (µg/mL) for ceftriaxone is 64.
 - (c) The MIC₉₀ (µg/mL) for imipenem is 16.
 - (d) The MIC₉₀ (µg/mL) for ceftobiprole is 32.
- 13.** According to the 2005 ATS/IDSA nosocomial pneumonia guidelines, which of the following drug combinations represent the best choice for the treatment of a patient diagnosed with ventilator-associated pneumonia?
- (a) vancomycin plus ceftriaxone plus levofloxacin
 - (b) linezolid plus tobramycin plus piperacillin/tazobactam
 - (c) ceftriaxone plus azithromycin
 - (d) ceftobiprole plus tobramycin