

Nationwide Organism Susceptibility Patterns to Common Preoperative Prophylactic Antibiotics: What Are We Covering?

Scott R. Nodzo, MD, Keely K. Boyle, MD, Nicholas B. Frisch, MD, MBA

Introduction: Many periprosthetic joint infections (PJI) are caused by organisms unsusceptible to first generation cephalosporins. We sought to evaluate the national susceptibility patterns of organisms to cefazolin/oxacillin, clindamycin, and vancomycin using antibiogram data.

Methods: Publicly available regional and state antibiograms were evaluated for antibiotic susceptibility patterns to commonly infecting gram-positive organisms. Antibiograms were created using the CLSI guidelines and breakpoints. Number of isolates tested in each antibiogram and percent of strains susceptible to oxacillin, clindamycin, and vancomycin were recorded. Oxacillin is used as a surrogate to cefazolin in antibiograms. A comparison of antibiotic susceptibilities was performed between organisms.

Results: Seven state and 41 regional antibiograms were reviewed (Figure 1). There were 105,335 *Staphylococcus aureus* isolates tested in which 48,783 (46.3%) were methicillin resistant (MRSA) strains. Oxacillin was a sensitive antibiotic in 99.2±4.8% of Methicillin sensitive *Staphylococcus aureus* (MSSA) isolates, 0±0% of MRSA isolates, 44.5±13.7% of coagulase negative staph organism isolates (CNS), and 30.6±10.5% of *Staphylococcus epidermidis* (SE) isolates. Clindamycin was a sensitive antibiotic in 75.8±8.4% of MSSA isolates, 60.2±13.2% of MRSA isolates, 60.3±11.4% of CNS isolates, and 56.2±6.5% of SE isolates. Vancomycin was a sensitive antibiotic in 99.9±0.4% of MSSA isolates, 99.8±0.4% of MRSA isolates, 99.8±0.5% of CNS isolates, and 99.6±0.7% of SE isolates. Figure 2 shows all organism and susceptibility patterns. Clindamycin was significantly less sensitive in MSSA isolates as compared to oxacillin and vancomycin ($p < 0.0001$). Oxacillin was significantly less sensitive in CNS, SE, and MRSA isolates as compared to clindamycin and vancomycin ($p < 0.0001$).

Conclusions: MSSA and MRSA represent 30-50% of infections in recent PJI studies. It is important to understand the limited susceptibility profile of first generation cephalosporins. The national clindamycin susceptibility pattern is limited compared to vancomycin and may not have a susceptibility profile suitable for use as a prophylactic antibiotic in cephalosporin allergic patients.