

ID: 49 **STUDY OF MINIMUM INHIBITORY CONCENTRATION OF CEFAZOLIN FOR METHICILLIN SENSITIVE STAPHYLOCOCCUS AUREUS AND CORRELATION WITH OXACILLIN SUSCEPTIBILITY**

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**Background** Cefazolin, a first generation cephalosporin, has been used for the treatment of Methicillin Sensitive *Staphylococcus aureus* (MSSA) infections since the 1970s. There have now been reported cases of failed therapy with cefazolin. High-level  $\beta$ -lactamase producing strains of *S. aureus* can inactivate the susceptible  $\beta$ -lactam (cefazolin) at a rate high enough to overcome its antibacterial effect. These strains typically have a high Minimum Inhibitory Concentration (MIC) for cefazolin when a large inoculum is used. About 20% of MSSA isolates have been shown to have a substantial inoculum effect suggesting that cefazolin treatment might be associated with clinical failure in serious MSSA infections. The minimum inhibition concentration (MIC) for cefazolin is not provided on all standard sensitivity panels and susceptibility is extrapolated from the report on oxacillin. The goal of this study was to analyze

the MIC of cefazolin for MSSA isolates to determine the correlation of cefazolin susceptibility and in vitro susceptibility of oxacillin. We also evaluated the MIC of alternative antibiotics as part of this study for use in patients that might be allergic to penicillin.

**Method** Thirty two isolates of MSSA were randomly selected from repositories of isolates at Memorial Medical Center hospital's microbiology department from 2015. The isolates were from patients with a wide variety of diagnoses, including bacteremia, osteomyelitis and wound infections. *S. aureus* ATCC 29213 was used as controls. MICs were determined by a Kirby Bauer method for cefazolin and Epsilometer test for other antibiotics that were studied. Inocula were standardized using optical density measurements, with determinations of CFU/ml to determine the inoculum concentrations. In addition to cefazolin, we obtained the MIC for daptomycin, oxacillin, ceftaroline and telavancin as well.

**Results** Of the thirty two MSSA isolates tested, 100% were susceptible to cefazolin. The mean zone of inhibition (ZOI) was 29.18 with standard deviation of 3.67 for cefazolin (29–35 mm ZOI with ATCC strains of MSSA). All the isolates were susceptible to Oxacillin with mean MIC of 0.7735 with standard deviation of 0.30. Daptomycin, ceftaroline and telavancin were 100% susceptible with mean MIC of 0.27, 0.25, and 0.07, respectively. All isolates were studied for the alternate antibiotics and no resistance was noted.

**Conclusion** The MIC of cefazolin for MSSA determined by in vitro susceptibility to oxacillin was entirely in the susceptible range with 100% correlation. Daptomycin, ceftaroline and telavancin are suitable alternative antibiotics for treatment of patients with infections due to MSSA in whom anti-staphylococcal penicillins cannot be used due to penicillin allergic, intolerance, and/or non-availability since there is not much resistance to these antibiotics in MSSA.