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## EVALUATION OF TYPE III OPEN FRACTURE MANAGEMENT WITH CEFAZOLIN PLUS GENTAMICIN VERSUS CEFEPIME

Infection is a high-risk complication of open fractures. The EAST guidelines recommend administering cefazolin (CFZ) and gentamicin (GEN) within one hour of injury to reduce the risk of infection in patients with a type III open fracture. In 2019, our institution implemented a protocol change to administer cefepime (FEP) monotherapy for all type III open fractures in replacement of CFZ plus GEN due to administration challenges and adverse effects associated with GEN. The goal of this study was to compare the efficacy and safety of CFZ plus GEN versus FEP in patients with type III open fractures and elucidate which organisms are drivers for infection.

This was a single-center, retrospective, quasi-experimental study of type III open fracture patients receiving at least one dose of prophylactic antibiotics with either CFZ/GEN or FEP between January 2016 and August 2021. Outcomes included incidence of documented infection at 90 days and six months, causative pathogens of open-fracture related infections, time to antibiotics, and antibiotic-associated adverse events.

This study included 165 patients, 83 of whom received CFZ/GEN and 82 received FEP. In the CFZ/GEN group, 25.3% of patients had a documented infection at 90 days, compared to 29.3% of patients in the FEP group ( $p=0.567$ ). At six months, documented infection rates were 27.7% and 39.1% in the CFZ/GEN and FEP groups, respectively ( $p=0.163$ ). Of those with documented infection and culture documentation, methicillin-resistant *Staphylococcus aureus* occurred in 5 patients in the CFZ/GEN group, compared to 3 patients in the FEP group ( $p=0.235$ ). *Pseudomonas aeruginosa* occurred less often, affecting 2 patients in each group ( $p=1.00$ ). Median time from arrival to initial antibiotic (FEP or CFZ) was similar and within one hour for both groups. However, median time from arrival to full antibiotic regimen to include GEN in the CFZ/GEN group was prolonged to 149 minutes, compared to 23 minutes in the FEP group ( $p<0.0001$ ). A sub-group analysis of documented infection at 90 days for those who received the full antibiotic regimen  $>1$  hour showed higher infection rates in the CFZ/GEN group compared to the FEP group (85.7% vs. 29.2%,  $p=0.0001$ ). Higher rates of acute kidney injury were seen in the CFZ/GEN group (26.5% vs. 13.4%,  $p=0.036$ ).

FEP and CFZ/GEN appear to have similar efficacy and safety. However, time from arrival to full antibiotic regimen administration was significantly shorter with FEP compared to CFZ/GEN regimens that require pharmacy admixture and may have led to lower rates of infection.