Piperacillin-Tazobactam Is a Safe and Effective Alternative to Cefazolin and Gentamicin for the Prophylaxis of Type 3 Open Fractures

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Purpose: Historically type 3 open fractures have been initially treated with a combination of cefazolin and gentamicin (CG) to combat the polymicrobial contamination associated with these injuries. There has been little research looking at the efficacy of alternative antibiotics for prophylaxis of these devastating injuries. Historically type 3 open fractures at our institution were treated with a combination of CG, but approximately 5 years ago we began treating type 3 open fractures with piperacillin-tazobactam (PT) upon arrival to the emergency department, continuing for 72 hours. The purpose of this study is to determine if PT is a safe and effective alternative to CG for the prophylaxis of type 3 open fractures.

Methods: IRB approval was obtained to perform a retrospective chart review of type 3 open fractures to the femur and tibia presenting to our Level I trauma center. All patients were treated by a fellowship-trained orthopaedic trauma surgeon. For comparison, 1 calendar year was selected for each cohort. For inclusion in the study, patients had antibiotic prophylaxis delivered upon presentation to the emergency department, continuing for 72 hours postoperatively. Additionally, all patients had at least 1-year follow-up. The primary outcome was the presence of infection necessitating an additional surgical procedure. Secondary outcomes included superficial wound infections.

Results: 107 total patients who sustained type 3 open injuries were included. Of the 107 patients, 55 received CG (51.4%), and 52 received PT (48.6%). There were 6 type 3B fractures in the CG group (10.9%) compared to 8 in the PT group (15.4%) (P = 0.97). The remaining fractures were all type 3A as we had no type 3C fractures in our cohort. There were 4 complications requiring surgical intervention in the CG group (7.3%) compared to none in the PT group (0%) (P = 0.04). Of the 4 complications 3 were femoral shaft fractures and 1 was a tibial shaft fracture, and all 4 additional surgeries were to treat osteomyelitis. There were 7 superficial wound infections (12.7%) in the CG group and 6 in the PT group (11.5%) (P = 0.85).

Conclusion: PT is a safe and effective antibiotic choice for the management of type 3 open fractures of the tibia and femur with no increased risk in complication rate when compared to the gold-standard therapy of CG.