

Cefazolin-Only Protocol Decreases Time to Antibiotic Administration in Open Fractures

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Purpose: Open fractures have a well-documented increased risk of infection. Time to antibiotics in patients with open fractures have been shown to affect outcomes. Currently, the Trauma Quality Improvement Program guidelines recommend that patients with open fractures receive antibiotics within 1 hour of arrival to the emergency department (ED). Our facility instituted a single antibiotic agent, cefazolin-only protocol in an effort to decrease the time to antibiotic prophylaxis in open fractures. This study was designed to determine the effect on time to antibiotics and incidence of infection after implementation of a single antibiotic agent protocol.

Methods: A retrospective review of all patients arriving to a Level I trauma center with an open long bone fracture (humerus, ulna, radius, femur, tibia, fibula) from April 2016 to March 2020 were included. Patients transferred in from other hospitals and those who died in the ED were excluded. Prior to April 2018, our institution administered gram-positive antibiotics for Gustilo type I and II open fractures, with the addition of gram-negative coverage for type III fractures. Beginning in April 2018, all patients with open fractures, regardless of the Gustilo classification, were to receive 2 g cefazolin on arrival, with necessary changes made by the orthopaedic service after consultation. Patients with a documented penicillin allergy received 900 mg clindamycin. Patients arriving prior to the protocol change (April 2016-March 2018) were compared to those arriving after the change (April 2018-March 2020) on demographics, injuries, time to antibiotics, and postoperative complications. A subgroup analysis of patients with type III fractures was performed, as this would be the population most affected by the change and most susceptible to complications.

Results: A total of 684 patients were included in analysis: 354 arrived prior to the protocol change and 330 arrived after. Demographics were similar between groups. Patients arriving after the protocol change had a decreased time to antibiotic initiation (56 vs 133 minutes; $P < 0.001$). Nonunion rates were lower (5% vs 9%; $P = 0.049$) in the post-protocol group. Surgical site infections and returns to the operating room were comparable between the two groups (10% vs 10%, $P = 0.95$; 12% vs 16%, $P = 0.13$, respectively). When comparing only type III fractures, time to antibiotics was decreased by 56 minutes (104 vs 48 min; $P < 0.001$) with no increase in nonunion, returns to the operating room, or surgical site infections.

Conclusion: Use of a single gram-positive agent as the initial antibiotic in patients with open fractures reduces the time to antibiotic administration and does not lead to an increase in infection-related complications.