

Prehospital Antibiotic Prophylaxis for Open Fractures: Practicality and Safety

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Purpose: Early antibiotic administration has been associated with a significant decrease in infection following open fractures. However, antibiotics are most effective within an hour of injury when many patients are still being transported for care. There is limited evidence that antibiotics may be safely administered for open fractures when being transported by helicopter. No such data exist for ground emergency medical services (EMS) transport of patients with open fractures. Our purpose was to determine if ground transport paramedics could identify open fractures and safely administer antibiotic prophylaxis during transport.

Methods: We performed a prospective observational study between January 1, 2014 and May 31, 2015 of all trauma patients being transferred to a Level I trauma center by a single ground EMS agency. After a single training session, paramedics assessed patients during transport for the presence of an open extremity fracture. If such a fracture was noted the patient was then indicated for antibiotic prophylaxis with 2 g IV cefazolin. Exclusion criteria included penicillin allergy, higher priority patient care tasks, and remaining transport time insufficient for administration of antibiotics. The identification of an open fracture and administration of antibiotics were recorded in the electronic patient care report. Patient demographics, associated injuries, priority level (1 = life-threatening injury, 2 = potentially life-threatening injury, 3 = non-life-threatening injury), and timing of transport and antibiotic administration were also recorded.

Results: Paramedics identified 60 patients during the study period for whom they suspected an open fracture. The patient's clinical status and transport time allowed for administration of antibiotic prophylaxis for 26 patients (43.3%). Administration of antibiotics did not differ by priority level ($P = 0.818$), with 39% ($N = 9$) of priority 1, 48% ($N = 12$) of priority 2, and 42% ($N = 5$) of priority 3. 16 of 60 patients (26.7%) initially identified as open fractures were later determined to have open soft-tissue injuries that did not communicate with an underlying fracture. 19 patients (31.7%) had isolated fractures, 34 patients (56.7%) had between 2 and 8 fractures, and 7 (6.7%) had only soft-tissue injuries. There were no allergic reactions to antibiotic administration. There were no documented injuries to paramedics related to antibiotic administration.

Conclusion: Paramedics were able to administer prehospital antibiotic prophylaxis for a substantial portion of the identified patients without any complications for patients or providers. Given the limited training provided prior to implementation of the antibiotic prophylaxis protocol, it is likely that further development of this initial training will lead to even higher rates of prehospital antibiotic administration for open fractures.