

How Scary Is This? Characterizing Antibiotic Use for Type III Tibia Fractures

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Purpose: Infection remains the most common and significant complication following high-energy fractures, and is a particular concern for open tibia fractures. The use of antibiotics is a key component of the treatment of these injuries and the prevention of subsequent infection. However, little is known about variation in the use of antibiotics or the confounding use of antibiotics by other treating teams for other trauma-related conditions. The goal of this analysis is to characterize antibiotic use during the index hospitalization for type III tibia fractures.

Methods: Participants (N = 509) with open Gustilo type III tibia fractures or traumatic tibial amputation were recruited across 31 Level I trauma centers and followed for 6 months following definitive soft-tissue closure. Analyses that follow were conducted using data for 433 participants with complete antibiotic use data at the index hospitalization. Trained research coordinators documented antibiotic use during the index hospitalization (defined as the procedure during which the definitive soft-tissue closure occurred). Participants were 74% male, 69% white, 88% polytraumatized, and had a mean age of 39.0 years.

Results: Overall, for the 433 participants, we document 2371 antibiotic courses during the index hospitalization. The mean, standard deviation (SD), median, minimum (Min), and maximum (Max) number of antibiotic courses per participant was 5.5 (SD 4.7, median 4, Min 1, Max 41). Similarly, mean number of classes of antibiotics per participant was 2.6 (SD 1.3, median 2, Min 1, Max 7). The percent of courses using the most common antibiotics are shown on the left-hand side of the table. The percent of courses receiving the most common antibiotic classes are shown on the right-hand side of the table.

Conclusion: These data show that even during a single hospitalization, trauma patients are receiving a wide range of antibiotics and antibiotic classes, with 4 antibiotics and 3 antibiotic classes appearing to be the norm. The consequences of exposure to multiple antibiotics on wound flora and the development of resistant strains are not known. The results emphasize the importance of developing and implementing improved microbial identification approaches that might be able to better inform clinician decision-making around antibiotic use.

Antibiotics:	Percent of Courses:	Antibiotic Classes:	Percent of Courses:
Acef	42.3	Cephalosporins	46.8
Vancomycin	14.4	Aminoglycosides	15.3
Gentamicin	9.4	Penicillins	5.2
Tobramycin	5.7	Quinolones	3.8
Piperacillin	3.5	Carbapenems	1.4
Clindamycin	3.2	Antifungal	0.3
Other	21.4	All Other IV	22.0
		All Others PO	5.3