Does Initial Antibiotic Choice for Open Fractures Affect Outcomes?

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Purpose: The best choice for antibiotic prophylaxis of open fractures is unknown. We present a secondary analysis from the PREP-IT trials to evaluate outcomes following different antibiotic prophylaxis regimens.

Methods: We included 3331 adult patients with an open fracture treated at 34 hospitals in North America. The 3 most common antibiotic regimens were compared. Our primary outcome was surgical site infection (SSI) within 90 days of injury. Secondary outcomes were 1-year reoperation for infection or fracture healing. The analysis used logistic regression and an instrumental variable analysis leveraging site-level variation to account for confounding. Subgroup variation was evaluated by stratifying the sample by Gustilo-Anderson classification (type I and II vs III).

Results: Cefazolin monotherapy (58%), ceftriaxone (10%), and cefazolin plus gentamicin (6%) were the most common regimens. Compared to cefazolin, neither ceftriaxone nor cefazolin plus gentamicin showed any difference for all measured outcomes when stratified by fracture type. There was a trend toward increased SSI with ceftriaxone in type I and II fractures.

Conclusion: No significant differences in SSI or 1-year reoperation were observed between cefazolin monotherapy and other common open fracture antibiotic prophylaxis regimens. Ceftriaxone may not be favorable for type I and II fractures. Other perioperative factors may have a larger influence on outcomes than prophylactic gram-negative coverage.

Subgroup	Adjusted for Fracture Type	
	OR (95% CI)	P Value
Gustilo-Anderson Type I or II (n=1861)		
Cefazolin only	Ref (1.00)	
Ceftriaxone	2.73 (0.96 – 7.79)	0.06
Cefazolin and gentamicin	0.94 (0.01 – 17602)†	0.99
Gustilo-Anderson Type III (n=1470)		
Cefazolin only	Ref (1.00)	
Ceftriaxone	0.91 (0.45 – 1.81)	0.78
Cefazolin and gentamicin	0.25 (0.03 – 2.02)	0.19

† large range is the result of a small number of events