

Introduction

Owing to the established path of bacterial entry and contamination-associated mechanisms, grade III open orthopedic fractures represent a substantial infection risk in the forms of skin and soft tissue infection (SSTI) and osteomyelitis. The EAST Guidelines recommended covering Staphylococcus aureus and adding aminoglycoside gram negative pathogens and add methicillinresistant S. aureus coverage with vancomycin. This study sought to compare the safety and efficacy of these two regimens.

Objectives

Primary

- Rate of treatment failure within 1 year following Gustilo-Anderson grade III fracture, defined as need for one of the following to treat SSTI or osteomyelitis:
 - Antibiotic treatment
 - Infection-related hospitalization
 - Surgical debridement

Secondary

- Rate of SSTI composite at 30 days post-injury
- Rate of treatment failure composite for osteomyelitis
- Rate of acute kidney injury within 7 days of starting vancomycin-containing or gentamicin-containing regimen

Methods

Single-center, retrospective electronic health record review of patients admitted to a Level I Trauma center from January 1, 2016 to October 31, 2021

Inclusion Criteria

- Gustilo-Anderson grade III fracture
- Receipt of ceftriaxone + vancomycin or cefazolin + gentamicin prophylaxis regimen

Exclusion Criteria

- Managed at transferring hospital ≥ 24 hours
- Expired within 7 days of injury
- Skull or mandible fracture
- Traumatic digit amputation

Antibiotic Prophylaxis for Grade III Open Fractures: A Retrospective Comparison of Ceftriaxone plus Vancomycin versus Cefazolin plus Gentamicin Carlee R. Shifko, PharmD; Daniel Jenniches, PharmD, BCCCP; Kyle Holmberg, DO; Derek Andreini, MD; Allan Philp, MD; Daniel

T. Altman, MD; Derek N. Bremmer, PharmD, BCIDP Allegheny General Hospital; Pittsburgh, PA

Results

Table 1. Baseline Demographics

	Ceftriaxone + Vancomycin (n = 53)	Cefazolin + Gentamicin (n = 65)	p-value
Age, years*	50.6 ± 19.1	42.6 ± 17	0.02
Height, cm*	176.5 ± 10.5	173.5 ± 10.3	0.1
Weight, kg*	92.9 ± 17.9	89.8 ± 25.2	0.4
Male, n (%)	40 (75%)	41 (63%)	0.2
Smoking, n (%)	18 (34%)	9 (45%)	0.3
Diabetes, n (%)	6 (11%)	3 (5%)	0.3

*Continuous variables expressed as mean ± standard deviation

Table 2. Surgical Management of Fractures

	Ceftriaxone + Vancomycin	Cefazolin + Gentamicin	p-value
Time to antibiotics, hours [†]	1.2 ± 2.4	0.5 ± 1.6	0.08
Time to first debridement, hours* [†]	9.5 ± 15.5	6.8 ± 5.1	0.24
Time to closure, hours* [†]	133.9 ± 312.3	186.8 ± 710.1	0.59
Total number of debridement procedures* [‡]	1 (1, 2) Max: 3	1 (1, 1) Max: 6	0.98
Total number of revisions* [‡]	1 (1, 2) Max: 3	1 (1, 1) Max: 4	0.24

*Clinical definitions at discretion of orthopedic resident physicians [†]Time variables expressed as mean ± standard deviation [‡]Count variables expressed as median (Q1, Q3)



Carlee Shifko, PharmD Allegheny General Hospital 320 E North Ave Pittsburgh, PA 15212 carleeshifko@gmail.com

Cettriaxone + Vancomycin	Cetazolin + Gentamicin
	26%
19%	
p = 0.4	

- Type II error may have occurred; larger studies are needed