Comparative Effectiveness of Ampicillin in the Treatment of Enterococcus faecalis Bloodstream Infections in Patients with Cancer

John Patrick (J.P.) Sanchez, PharmD[1]; German Contreras, MD[2]; Truc T. Tran, PharmD[2]; Shelby Simar, MPH[2,3]; Blake Hanson, PhD[2,3]; Kayleigh R. Marx, PharmD[1]; Marcus Zervos, MD[4]; Katherine Reyes, MD, MPH[4]; Jose M. Munita, MD[2]; Samuel A. Shelburne, MD, PhD[2,5]; Cesar A. Arias, MD, MSc, PhD[2,3]; Samuel L. Aitken, PharmD, MPH[1,2]

[1]Division of Pharmacy, The University of Texas MD Anderson Cancer Center;
[2]Center for Antimicrobial Resistance and Microbial Genomics (CARMiG), UTHealth McGovern Medical School;
[3]Department of Epidemiology, Human Genetics & Environmental Sciences, UT Health Science Center-Houston;
[4]Division of Infectious Diseases, Henry Ford Health System; [5]Department of Infectious Diseases, Infection Control, and Employee Health, The University of Texas MD Anderson Cancer

THE UNIVERSITY OF TEXAS MD Anderson Cancer Center

Mailing Address: 1515 Holcombe Blvd, Division of Pharmacy Unit 90 Houston, TX 77030
Email Address: JPSanchez@mdanderson.org
Work Phone: 281-794-1697
Fax Number: 713-792-5256

1 Abstract

Introduction

E. faecalis isolates are usually susceptible to ampicillin, an agent used as monotherapy or as part of a combination therapy as definitive therapy in deep-seated enterococcal infections. Although ampicillin-based regimens are the standard of care for enterococcal infections, the efficacy of ampicillin based regimens for *E. faecalis* bloodstream infections in patients with cancer has not been evaluated.

Research Question

To compare the clinical outcomes of cancer patients with *E. faecalis* bacteremia treated with ampicillin-containing versus non-ampicillin-containing antibiotic regimens.

Study Design

- This is a prospective, multicenter, observational cohort study of cancer patients who were diagnosed with *E. faecalis* bacteremia.
- Patients were placed in two separate groups based on whether or not they received ampicillin at any point during their treatment.
- Whole genome sequencing was used to confirm the organism identification as *E. faecalis*

Inclusion Criteria

- Adults ≥ 18 years of age with a cancer diagnosis.
- Monomicrobial *E. faecalis* bloodstream infection between December 2015 and December 2018

DOOR Outcomes

- 1: Death
- 2: Alive, admitted, infected, with acute kidney injury (AKI)
- 3: Alive, admitted, infected
- 4: Alive, admitted, with AKI
- 5: Alive, admitted
- 6: Alive

Statistical Analyses

- DOORs analyzed with Inverse probability of treatment weighted (IPTW) ordered logistic regression used to verify effect of variables on DOORs.

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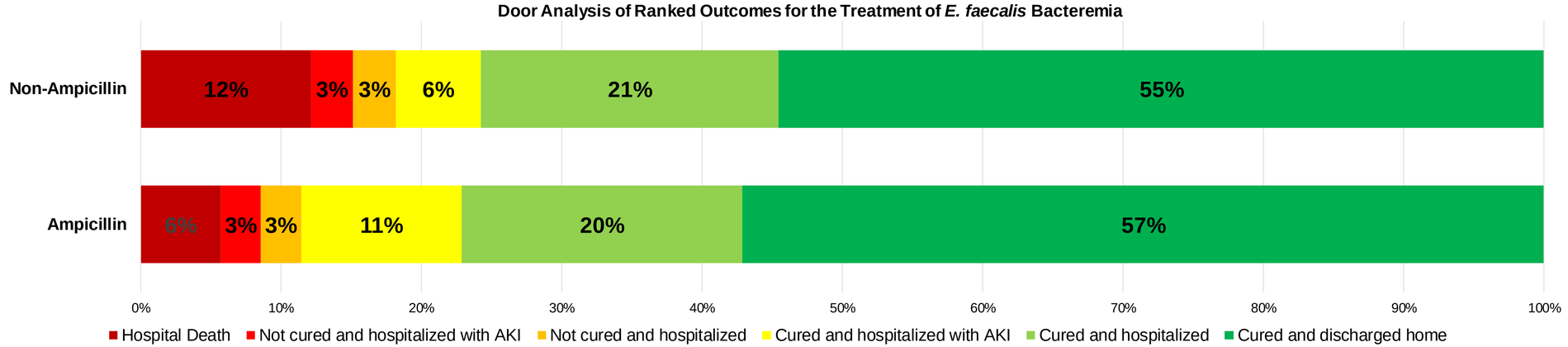
2 Results

3 Figure 1. DOOR Analysis at Day 14



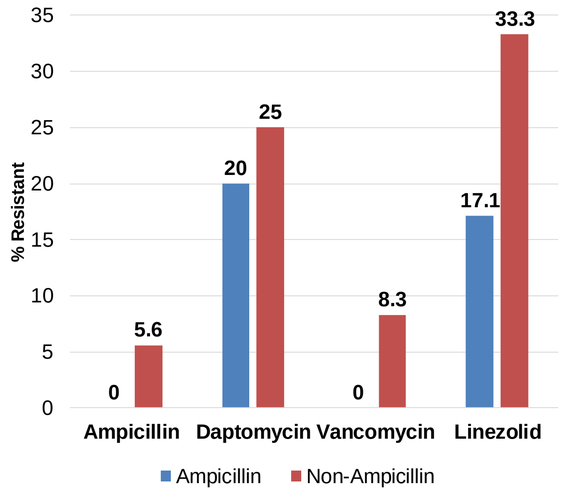
4 Table 1. Baseline Demographics

	Ampicillin (N=35)	Non-Ampicillin (N=36)
Age (years), mean, standard deviation (SD)	62.6 (13.2)	61.7 (16.7)
Hematologic Cancer, n (%)	19 (54.3)	17 (47.3)
Previous Bone Marrow Transplant, n (%)	6 (17.1)	6 (16.7)
Previous Hospitalization Within Last Year, n (%)	25 (71.4)	30 (83.3)
Absolute Neutrophil Count, (k/mm^3) median (IQR)	3.4 (0.1 – 8.8)	4 (0 – 7.4)
Pitt Bacteremia Score, median (IQR)	0 (0 – 1)	0 (0 – 1)

5 Table 2. Antimicrobial Treatment Characteristics

	Ampicillin	Non-Ampicillin
Administration, n (%)		
Daptomycin	20 (57.1)	19 (52.8)
Vancomycin	21 (60)	25 (69.4)
Linezolid	17 (48.6)	18 (50)
Days of Therapy, Median (IQR)		
Ampicillin	5 (1 – 5)	-
Daptomycin	2 (1 – 2)	4 (2 – 13)
Vancomycin	2 (1 – 3)	4 (1 – 9)
Linezolid	1 (1 – 2)	2 (1 – 3)

6 Figure 2. Resistance On Index Culture



7 Table 3. Outcomes

	IPTW-adjusted Odds Ratio (95% Confidence Interval)	*P*-value
Benefit-Risk	1.14 (0.45 – 2.92)	0.78
All-cause 14 day mortality	0.60 (0.09 – 3.77)	0.58
All-cause 30 day mortality	0.42 (0.09 – 1.94)	0.27

8 Conclusion

- Ampicillin-based regimens did not show any difference in patient-centered outcomes in cancer patients being treated for *E. faecalis* bacteremia when compared to non-ampicillin-based regimens

Future Directions

- Larger comparisons of ampicillin-based and non-ampicillin-based regimens to further assess ampicillin's effect on patient outcomes
- Qualifying potential negative effects (ex. future resistance) with continued broad spectrum treatment of *E. faecalis* bloodstream infections

Disclosure

- The authors have no relevant interest to disclose related to the contents of this investigation