Southern Illinois University Edwardsville School of Pharmacy

Gram-Negative Bacteremia: Frequency of an IOTA (Intravenous to Oral Transition of Antimicrobial Therapy)

Victoria Wilson, PharmD Candidate
Sara Gardner, PharmD Candidate
Beth Cady, PharmD, BCPS

Background

- Each year, nearly 250,000 patients in the United States develop a particular type of bloodstream infection called a "gram-negative bacteremia."[1]
  - This infection develops when bacteria colonize an initial site of infection, overcome host barriers including the immune response, and spread to the bloodstream. Gram-negative bacteremia has a high mortality rate, particularly in vulnerable populations.[2]
- Several studies suggest that conversion to oral antibiotics for gram-negative bacteremia has similar outcomes to strictly IV regimens, particularly from a urinary source of infection.[3]
  - In these studies, the prominent pathogens causing the urinary infection and subsequent bacteremia were *Escherichia coli* and *Klebsiella pneumoniae*.
- Due to lack of definitive guidance, clinicians may be hesitant to advocate for an early transition from IV to oral antibiotic therapy in patients with gram-negative bacteremia.
  - Benefits of transitioning patients from IV to oral therapy are well-recognized; taking oral antibiotics may reduce length of hospital stay and improve patients' quality of life.

Purpose

Determine the frequency at which these patients are transitioned to oral antibiotic therapy for this type of infection.

Methods

All *E. coli* and *Klebsiella pneumoniae* bacteremia from 01/01/2019 – 5/31/2022

Analysis: **100 encounters**

Excluded (72):
Polymicrobial infections
Sources other than urinary
Inability to take oral meds
Lack of susceptibility to oral meds

References

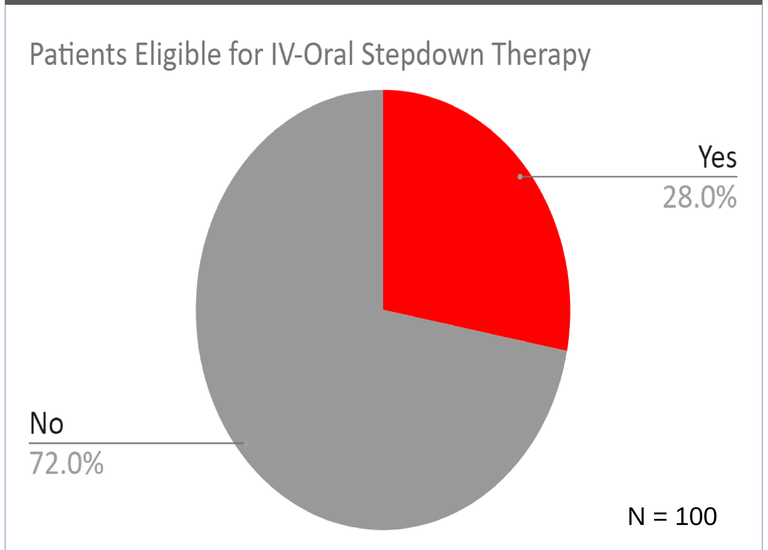
1. Kutob L.F, Justo J.A, Bookstaver P.B, Kohn J, Albrecht H, Al-Hasan M.N.Effectiveness of oral antibiotics for definitive therapy of Gram-negative bloodstream infections.Int J Antimicrob Agents. 2016; 48: 498-503
2. Holmes CL, Anderson MT, Mobley HLT, Bachman MA. Pathogenesis of Gram-Negative Bacteremia. Clin Microbiol Rev. 2021 Mar 10;34(2):e00234-20. doi: 10.1128/CMR.00234-20. PMID: 33692149; PMCID: PMC8549824.
3. Sutton JD, Stevens VW, Chang NN, Khader K, Timbrook TT, Spivak ES. Oral β-Lactam Antibiotics vs Fluoroquinolones or Trimethoprim-Sulfamethoxazole for Definitive Treatment of Enterobacterales Bacteremia From a Urine Source. JAMA Netw Open. 2020;3(10):e2020166. doi:10.1001/jamanetworkopen.2020.20166

Methods (cont.)

Inclusion criteria for chart evaluation:

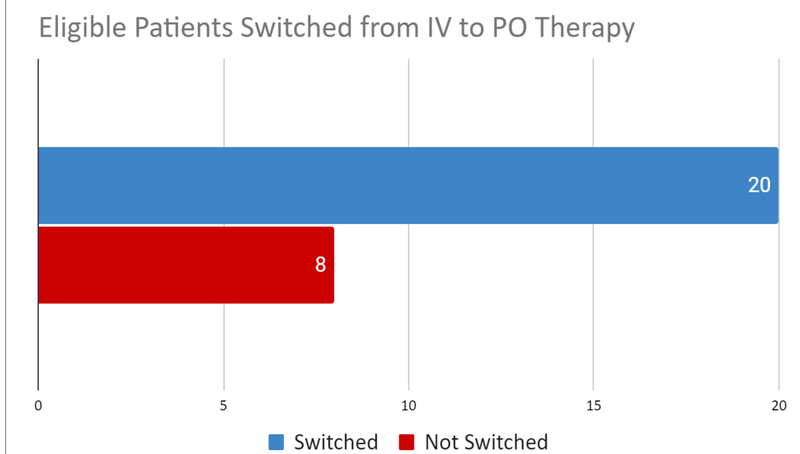
- Age ≥ 18 years old
- Monomicrobial infections
- Urinary sources
- Susceptibility to oral medications
- IV therapy for 24 hours
- Negative repeat blood cultures, if collected
- Clinical improvement defined by downtrending white blood cell count, afebrile for 48 hours, blood pressure/heart rate/respiratory rate within normal limits

Results



Pathogen	Eligible and Switched	Eligible and Not Switched	Not Eligible
E. coli	20	8	56
K. Pneumoniae	0	0	16

Results (cont.)



Reasons for not switching

Resistant to FQ	Contraindication to FQ	Concomitant infection	Unknown
2	3	1	2

Conclusion

- 71% of patients who met the inclusion criteria were switched from IV to oral antibiotics in the presence of monomicrobial *E. coli* from a urinary source with clinical improvement.
- Zero patients with *Klebsiella pneumoniae* were eligible to switch.
- According to our results, there appears to be an opportunity to transition more patients from IV to oral with a gram-negative bacteremia.
- Future research opportunities: more patients, evaluation of which oral medication was used, whether the patient received an ID consult, and implementation for an alert to switch in Theradoc.

Disclosures

Authors of this presentation have nothing to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation

Further questions: victowi@siue.edu & sagardn@siue.edu.