Ertapenem Utilization: "CRE"ating Solutions for Decreasing Hospital Stay and Stewardship

Debra Willner, PharmD, Bismarck Bisono-Garcia, MD, Carlos Flores, MD, Victoria Bengualid, MD
Department of Pharmacy, Divisions of Internal Medicine and Infectious Diseases; implemented by the Antimicrobial Stewardship Committee

Contact Information:
Debra Willner, BA, PharmD
Address: SBH Health System
4422 Third Avenue
Bronx, NY 10457
Email: dwillner@sbhny.org
Telephone: 718-960-5005

Background

- Ertapenem can provide benefits for various reasons when compared to meropenem. The first potential benefit would be a decrease in length of stay, given its once daily administration
- Home infusion services will not accept patients who are receiving antibiotics dosed multiple times per day
- The second benefit would be regarding stewardship; ertapenem does not possess activity against non-lactose fermenting gram-negative bacilli, and is therefore has the narrowest spectrum of activity amongst the carbapenems
- Antimicrobial-resistant pathogens have become a global concern that is increasing in severity associated with increased morbidity and mortality and a large healthcare cost
- Currently, SBH Health System has meropenem and ertapenem available within the carbapenem class
- Since November 1st 2017, an ID attending has been recommending switching patients to ertapenem for ESBL and polymicrobial infections due to narrower spectrum of activity and to ease discharge and decrease length of stay

Objectives

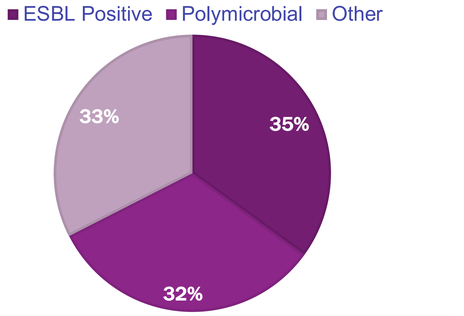
- Analyze ertapenem utilization's impact on antimicrobial resistance
- Evaluate patients treated with ertapenem to determine whether utilization decreased hospital length of stay

Methods

Obtain a list of patients from SBH EMR who received ertapenem from November 1st, 2017-November 1st, 2019 → Evaluate the total length of stay for ertapenem patients and calculate the hospital days that were saved → Evaluate for appropriateness and efficacy; review post-ertapenem microbiology results → Develop a plan for improved utilization of ertapenem and for expediting discharge in order to decrease hospital length of stay

Results (N=70)

Pathogens

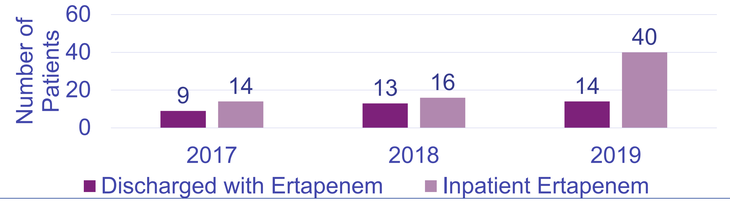


Inpatient Carbapenem Use

Indication	Days of Inpatient Meropenem (total days, range)	Days of Inpatient Ertapenem (total days, range)
SSTI	34 (0-11)	155 (0-20)
UTI	59 (0-10)	114 (1-14)
Osteomyelitis	57 (0-17)	70 (1-12)
Pyelonephritis	11 (0-4)	21 (0-10)
Other	25 (0-7)	62 (2-21)
Total	**186 (0-17)**	**422 (0-21)**

Indication	Number of Patients (number of patients, %)	Patients Discharged on Ertapenem (number of patients, % from indication)	Days of Discharged Ertapenem (total, range)
SSTI	23 (33%)	15 (65%)	**410 (0-42)**
UTI	19 (27%)	3 (16%)	8 (0-5)
Osteomyelitis	15 (21%)	13 (87%)	**421 (0-41)**
Pyelonephritis	6 (9%)	4 (67%)	50 (0-24)
Other	7 (10%)	2 (29%)	48 (0-35)
Totals	70	37 (53%)	**937 (0-42)**

Annual Trend in Ertapenem Cases



Readmission Data (N=36)

Patients Admitted within 90 Days (number of patients, % of total patients)	36 (51.4%)
Patients with Positive Cultures at Readmission (number of patients, % from total readmissions)	20 (55.6%)
Meropenem Resistant Readmission Cultures (number of patients)	4* *all *Acinetobacter baumanii; not identified previously*

Discussion

- Switching and discharging patients on ertapenem saved 937 hospital days over the 2 years evaluated
- Most of the patients discharged on ertapenem were receiving treatment for SSTI and osteomyelitis
- Of 36 patients readmitted, only 4 had meropenem-resistant organisms identified in cultures
  - All were *Acinetobacter baumanii* and none of the pathogens were the same as the original pathogen treated with ertapenem
- Careful evaluation of inpatient UTIs and pyelonephritis is required to increase
- Previously, the cost of ertapenem was significantly greater than meropenem- $65 vs $5, respectively. However, recently the prices have become comparable, removing another potential barrier for utilization of ertapenem

Future Implications

- Evaluate long-term stewardship implications of utilizing ertapenem
- Identify barriers that prevented patients from timely discharge and develop a multidisciplinary plan to facilitate discharges

References

1. CDC. Antibiotic Resistance Threats in the United States, 2019. Atlanta, GA: U.S. Department of Health and Human Services, CDC; 2019.
2. Codjoe F, Donkor E. Carbapenem Resistance: A Review. Medical Sciences. 2017;6(1):1-28. doi:10.3390/medsci6010001.