Ertapenem Usage for Documented Infections at a Comprehensive Cancer Center

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Abstract

Background: Frequent and prolonged usage of broad-spectrum antibiotics like meropenem and 3rd generation cephalosporins have been associated with the emergence of multidrug-resistant organisms (MDROs). Published clinical data regarding the safety and efficacy of ertapenem (ET) for infections in cancer patients (pts) are scarce. The objective of this study was to describe our clinical experience in cancer pts receiving ET for microbiologically documents infections (MDIs).

Methods: In this retrospective review, we identified 100 pts who received ET for MDIs between Jan 2007 and Feb 2011. Failure to respond was defined as no change in or actual progression of clinical and radiologic parameters or persistently positive microbiologic cultures after at least 72 hrs of ED. Partial response was defined as improvement but not complete resolution of radiologic, clinical and microbiologic end points at the end of ET.

Results: Mean age was 51 yrs (23-79 yrs) with 55% females and 51% whites. Most pts had hematologic malignancies (54%) and/or had progressive cancer (71%). Most common MDIs were pneumonia (21%), bacteremia (13%), and UTI (14%). Most common organisms isolated were *E. coli* (21%), *Klebsiella* sp. (11%), *Haemophilus* (5%) and beta hemolytic streptococci (8%). Mean duration of ET inpatient (N=91) and outpatient therapy (N=29) was 2 days and 5 days, respectively. The switch to ET from other antibiotics was done in 64 pts with mean time to switch of 7 days (4-16 days) and was done to facilitate early discharge (20%) or for de-escalation (10%). ET success was seen in 94% while partial response and failure to respond were documented in 5% and 1% respectively. The failure to ET was seen in a pt with complicated MDR *E. coli* bacteremia who relapsed within a month of end of ET therapy.

Conclusion: Ertapenem for MDIs is a good alternative therapy for pts with cancer. It should be used in this instance as a de-escalation option or for outpatient therapy to facilitate discharge.

Introduction

Broad-spectrum carbapenems (imipenem and meropenem) are widely used as empiric monotherapy in febrile neutropenic patients [1]. Their use has been associated with the selection of multidrug-resistant (MDR) organisms such as *P. aeruginosa* and *S. maltophilia.* Ertapenem has a narrower spectrum and may exert less selective pressure [2]. Although not active against *P. aeruginosa*, it is active against most other important gram-negative pathogens, including quinolone-resistant *E. coli*, which have become frequent pathogens in comprehensive cancer centers such as ours due to the frequent use of quinolone prophylaxis [3]. Additionally, once-a-day dosing of ertapenem may facilitate de-escalation and early discharge of stable patients. Published data regarding the safety and efficacy of ertapenem in cancer patients (neutropenic or without neutropenia) are scarce. We describe our clinical experience with ertapenem in cancer patients treated at our institution. Our experience might help identify the clinical role of ertapenem in this special patient population.

Patients and Methods

In this retrospective review, we identified 100 patients who received ertapenem for documented infections, or for de-escalation and/or early discharge of stable patients. Patients who received ertapenem for <72 hours were excluded. The medical records of these patients were reviewed in order to extract descriptive clinical data, including patient demographics, type and source of infection, clinical, microbiologic, and radiographic features, and outcome.

✓Complete response was defined as resolution of signs/symptoms, radiographic, or microbiologic resolution at the end of ertapenem therapy

✓Partial response was defined as improvement (but not resolution) of the parameters described above, at the end of therapy.

✓Failure was defined as no change or actual worsening of clinical or radiographic parameters, or persistently positive microbiologic cultures on at least 72 hours of ertapenem therapy.

Results

Patient characteristics are listed in Table 1.

TABLE 1. Characteristics of the 100 Patients Treated with Ertapenem

Characteristic	Number
Cases	100
Median Age (range)	51 (23-79)
Sex (male/female)	45/55
Underlying malignancy	
Solid tumor	45
Hematologic malignancy	54
Other	1
Hematopoietic stem cell transplant	5
Graft-versus-host disease	2
Corticosteroid usage	23
Chemotherapy	34
Mechanical ventilation	4
Neutropenia	9
Diabetes Mellitus	26
COPD	6
Renal insufficiency	4

The median age of patients was 51 years, with 55% being women. Fifty-four percent had an underlying hematologic malignancy, but only 9% were neutropenic.

The indications for ertapenem therapy and the organisms isolated from patients with microbiologically documented infections are listed in Table 2 and Table 3 respectively.

TABLE 2. Indications for Ertapenem Therapy

Indication	Number of cases
Documented infection	48
Bacteremia	13
Pneumonia	21
Urinary tract infection	14
Empiric therapy	21
Fever without neutropenia	7
Fever with neutropenia	9
Other	5
Antimicrobial prophylaxis*	1
De-escalation	10
Pneumonia	4
Bacteremia	3
Urinary tract infection	2
Neutropenic enterocolitis	1
To facilitate discharge	20
Pneumonia	8
Urinary tract infection	5
Bacteremia/neutropenia	4
Other	3

* Patient had 3 previous episodes of bacteremia with quinolone and TMP/SMX resistant *E. coli*

TABLE 3. Organisms Isolated from Microbiologically Documented Infections

Organisms	Number
*Escherichia coli**	21
Haemophilus spp	11
Beta-haemolytic streptococci	8
Klebsiella spp.	5
Citrobacter species	4
Other gram-negative bacilli	4
Micrococcus spp.	3
Staphylococcus spp.	2
Other gram-positive cocci	4
Peptostreptococci	2
Other	3

*16/21 *E. coli* isolates (76 %) were quinolone-resistant; 4 patients had polymicrobial infections

The major indications for ertapenem therapy included documented infections in non-neutropenic patients, de-escalation from a broader-regimen after final microbial cultures in both neutropenic and non-neutropenic patients, and to facilitate patient discharge.

✓Although these patients were highly selected, therapy was successful in 99 of the 100 ertapenem recipients.

Conclusion

Ertapenem for MDIs is a good alternative therapy for patients with cancer.
It should be used in this instance as a de-escalation option or for outpatient therapy to facilitate discharge.

Summary

The main indications for ertapenem therapy in cancer patients include:

- The treatment of documented infections due to susceptible organisms
- De-escalation
- To facilitate discharge from the hospital

References

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