A practical thrice weekly Ertapenem dosage regime for chronic hemodialysis patients?

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Sir, – Ertapenem is a β-lactam antimicrobial with activity against gram-positive and gram-negative, aerobic and anaerobic bacteria. The recommended dose is 1 g daily. Based on the study by Mistry et al. [1] it is advised to reduce the dose to 0.5 g in patients with a glomerular filtration rate < 30 ml/min. Burkhardt et al. [2] studied 6 patients with acute renal failure (ARF) on the ICU, undergoing extended daily dialysis (EDD) for 6 hours, treated with 1 g of ertapenem daily. Recently, Wen et al. [3] described 2 patients with Stage 5 chronic kidney disease who experienced prolonged neurotoxicity during ertapenem therapy with these recommended doses. Recently, Matzke et al. [4] published a report of the KDIGO conference “Drug Prescribing in Kidney Disease: Initiative for Improved Dosing”. The conference addresses the need for more research on drug dosing for patients with kidney disease.

We postulated that ertapenem might be effective in ambulant patients with end-stage renal disease (ESRD) undergoing intermittent hemodialysis (IHD, 3 times a week for 4 hours) when given directly after dialysis [5]. To study this, we performed a pilot study where we treated dialysis patients with an infection, eligible for carbapenem therapy, and studied the pharmacokinetics of ertapenem.

10 (5m/5v) IHD patients (average weight 76 kg, average albumin 25.8 g/l) were included in our study and were treated with ertapenem in a regimen of 1,000 mg immediately after dialysis, 3 times a week [3]. The minimal inhibitory concentration was determined for all micro-organisms. We measured total ertapenem peak levels 45 minutes after administration and trough levels 44 (3.4 – 22.6 mg/l) and/or 68 hours (05 – 9.6 mg/l) after administration.

All ertapenem trough levels were above the individual MIC levels during the intradialytic intervals. Pharmacokinetics were described with a one-compartment model. The overall clinical success rate was 8 out of 10. No severe adverse effects were observed.

Based on our pilot study, we suggest that daily dosing of ertapenem is probably not needed in patients undergoing dialysis and potentially toxic due to accumulation. Our regimen (1,000 mg i.v. directly after dialysis) is a more patient-friendly (treatment as outpatient instead of inpatient) and probably safer regimen when compared with the regimen advised by Mistry et al. [1] and used by Wen et al. [3]. Burkhardt et al. [2] conclude differently for ARF patients on the ICU undergoing EDD. Different patients, different categories of renal failure, and different dialysis techniques all have their own dosing strategies. This confirms the need for more research as is expressed by Matzke et al. [4].

References


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