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Non convulsive status epilepticus associated with ertapenem use

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Introduction: Carbapenems are broad spectrum beta-lactam antimicrobials especially useful in infections involving multi-drug resistant bacteria and nosocomial infections. Seizures involving carbapenems are a rare occurrence overall and usually reported with imipenem use rather than ertapenem. Neurotoxicity associated with ertapenem use in a renal transplant patient has not been previously reported. We report a rare case of nonconvulsive status epilepticus associated with the use of ertapenem in a renal transplant patient.

Case Description: A 67 year old Lebanese woman with a history of living-related right renal transplant in 1993 presented with progressively worsening altered mental status for the past three days. She had a baseline creatinin of 2.5 mg/dL at the time and was on chronic immunosuppressive therapy. Patient was discharged three days prior from an outside hospital with a diagnosis of a complicated urinary tract infection (UTI) from ESBL-producing *Escherichia coli* bacteria which was sensitive to gentamicin, carbapenems and amikacin. She was sent home on a 14 day course of intravenous ertapenem therapy. She had completed 7 days of ertapenem therapy at the time of presentation. Patient was continued on her home UTI treatment regimen with 500gm IV ertapenem daily upon admission. Next day of her admission, patient had a witnessed generalized tonic-clonic seizure. On the 3rd day of admission (10th day of ertapenem administration), patient developed nonconvulsive status epilepticus. Ertapenem was at that point discontinued. She remained in status epilepticus for the next 4 days and was monitored with continuous electroencephalography (EEG) in the intensive care unit. She was treated with IV Dilantin, phenobarbital and versed. She responded well to the treatment. Seizure activity eventually diminished over the next 48 hours with intermittent left temporal lobe spikes initially until complete resolution. Patient returned to baseline mentation 9 days after admission and was subsequently discharged to acute rehabilitation.

Discussion: Seizures due to ertapenem use are rare with a reported incidence of 1.8%. Ertapenem is thought to induce seizures and cause encephalopathy by binding to GABA receptors in the central nervous system and lowering the seizure threshold. Ertapenem is predominantly eliminated via renal excretion. Patients with reduced renal clearance are therefore at an increased risk of experiencing adverse events with ertapenem use. Our case highlights that ertapenem use can cause significant neurotoxicity in renal transplant patients and in patients with renal insufficiency. Seizure activity due to ertapenem if not identified early can progress to status epilepticus. Despite renal dose-adjustment, ertapenem has potential to cause seizures especially in such patients. Care must be taken in administration of ertapenem in patients with renal insufficiency and it must be stopped immediately if any clinical signs of neurotoxicity do occur.

Conclusion: Ertapenem has the potential to cause significant neurotoxicity and can induce status epilepticus in patients with prolonged use. Patients with renal insufficiency are especially vulnerable even after renal dose adjustments.

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