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Lacosamide Induced Bradycardia

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Abstract Lacosamide (LCM)is an anti-epileptic drug associated with a serious cardiac event. Herein, we report a case of a 45-year-old male patient with lacosamide induced-bradycardia.

Keywords: *Lacosamide, bradycardia*

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1. Introduction

Lacosamide (LCM)is an anti-epileptic drug which acts mainly through enhancing the slow inactivation of voltage-dependent sodium channels [1]. It was approved initially, in 2008, by the U.S. Food and Drug Administration (FDA). However, Lacosamide is associated with a serious cardiac conduction disturbance [2,3]. Herein, we report a case of sinus bradycardia associated with lacosamide therapy.

2. Case Presentation

Our 45-year-old male patient with anoxic brain injury dependent on tracheostomy, and history of seizure disorder who was admitted for septic shock secondary to ventilator associated pneumonia. Patient also presented with acute kidney injury (AKI) secondary to obstructive uropathy which improved with Foley catheter replacement. IV fluids were administered, norepinephrine and vasopressin drips were started due to shock. Patient was given broad-spectrum antibiotics, including meropenem and vancomycin, due to his history of multidrug resistant bacteremia. On the second day of admission, bradycardia was noted on the monitor with the lowest being in the 40s per minute despite being on norepinephrine. Patient's acidemia did resolve before this episode with broad-spectrum antibiotic and aggressive hydration. There was no change in the patient's medication regimen, and he was not on sedation or opioids. No electrolyte abnormalities were noted at the time of the episode. For his seizure disorder, patient takes levetiracetam 1500 mg and lacosamide 200 mg twice daily. Neurology service was consulted for bilateral upper extremity twitching with concern due to seizure-like activity which was ruled out by electroencephalogram. However, lacosamide toxicity was suspected as a cause of bradycardia as patient developed AKI and LCM were not able to be excreted. However, following renal function recovery, it resulted in significant improvement of heart rate.

3. Discussion

Several adverse cardiac events have been reported with LCM. Mild events include dose-dependent PR interval pro-longation [4,6,7] and first-degree AV block [4,5,6]. More serious events include atrial fibrillation/flutter at relatively high dosages of LCM at 600 mg/day [2,4]. Single fatal cardiac arrests reported in each of two clinical studies of LCM in patients with diabetic neuropathy [4,7] were thought to be due to coronary artery disease. An instance of second-degree AV block observed in one study in a patient taking 600 mg/day of LCM [4], but a clear causal relation could not be established as that observation was made 5 days after the last dosage of LCM, with resolution on a subsequent visit. A case of transient third-degree AV block was recently reported in a patient with cardiac disease after high doses of LCM were given intravenously for nonconvulsive status epilepticus [6].

The reported case had a sinus bradycardia which improved with decreasing LCM dose.

In Summary, Lacosamide is associated with a serious cardiac event, cautious use and dose adjustment is needed when patient develops unexplained bradycardia. Moreover, baseline Electrocardiographic before and during LCM therapy may useful to avoid cardiac arrhythmias.

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