Relato de CASO

Cefepime encephalopathy and normal renal function

Encefalopatia Induzida por Cefepime em um Paciente com Função Renal Normal

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Abstract

Background: Several cases of cefepime neurotoxicity have been reported. Herein reported is a case of cephalosporin-associated neurotoxicity in a patient with normal renal function. Case report: A 64-year-old woman with a history of post-transplantation chronic myeloid leukemia was admitted to hospital due to hyporexia, fever, productive cough and mild dyspnoea. Initial blood screen revealed pancytopenia and a normal renal function. Intravenous cefepime was empirically started and after 40 hours the patient developed sudden mental confusion. Neurological examination was normal. Cranial computed tomography and brain magnetic resonance scans were normal. Electrocencephalography showed triphasic waves of diffuse slowing without ongoing epileptic activity. Lumbar puncture was normal. Cefepime neurotoxicity was promptly considered and antibiotics were switched to piperacillin and tazobactam. After five days, the patient recovered completely with remission of myoclonus. Conclusions: Awareness should be given to possible central nervous system complications induced by cefepime, especially in the elderly, even without renal failure.

Keywords: cephalosporins; cefepime; encephalopathy.

Resumo


Palavras-chave: cephalosporinas; cefepime; encefalopatia.

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I confirm that the study has received the patient consent for publication. There are no competing interests to declare. We declare no financial support.

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Introduction

Cefepime is a fourth-generation cephalosporin active against both gram-positive and gram-negative infections. Several cases of cefepime neurotoxicity have been reported with an estimated prevalence of about 3%. The main predisposing factors are pre-existing central nervous system (CNS) abnormalities and renal impairment with excessive dosing of the antibiotic. Except for three previous reports, cefepime-associated neurotoxicity has been described in patients with renal failure or overdose due to prolongation of the half-life. Herein reported is the fourth case of cefepime-associated neurotoxicity in a patient with normal renal function presenting with encephalopathy and myoclonus.

Case Report

A 64-year-old woman with a history of chronic myeloid leukemia treated with bone marrow transplantation. During the post-transplant immunosuppressive period, the patient presented with herpetic and cytomegalovirus infections. After a year and a half of transplantation, the patient was readmitted to hospital due to hyporexia, fever and productive cough and mild dyspnea. Initial blood screen revealed pancytopenia (platelet count of 8,000/mm³, hemoglobin count of 8.9 mg/dL and neutrophil count of 1190 cells/mm³) and a normal renal function (urea and creatinine levels at, respectively, 49 mg/dL and 1 mg/dL). Creatinine clearance was at 60 ml/kg/min. Intravenous cefepime (2 g every 8 hours) was empirically started and after 40 hours the patient developed a sudden confusional state with generalized myoclonus. She became unresponsive while alert and had intermittent obtundation. She did not answer questions or follow commands. Except for brisk generalized tendon reflexes, the neurological examination was normal. Cranial computed tomography scan and brain magnetic resonance imaging were normal. Electroencephalography showed triphasic waves of diffuse slowness without ongoing epileptic activity. Lumbar puncture yielded 1 white blood cell/dL, 65 proteins/dL and 60 mg/dl of glucose levels. Culture, gram-stain and venereal disease research laboratory were negative. Blood and cerebrospinal fluid Herpes simplex polymerase chain reactions were negative. Cefepime neurotoxicity was promptly considered and antibiotics were switched to piperacillin and tazobactam. Acyclovir was also empirically started due to the possibility of herpetic encephalopathy. After five days, the patient recovered completely with remission of myoclonus. She progressively recovered from her pneumonia and was discharged after further neurological observation.

Discussion

Our case illustrates that cefepime neurotoxicity, herein illustrated by encephalopathy with myoclonus, can occur even at presence of normal renal function. Three case reports have already described cefepime-related CNS complications in patients with normal renal function. Although we looked for other causes of encephalopathy, such as electrolyte disorders, and other metabolic alterations, infections, cerebral hypoxia, tumors, stroke, alcohol withdrawal, and use of other epileptogenic medications, only cephalosporins were temporally related to the appearance of the clinical picture.

The mechanisms involved in the development of cefepime neurotoxicity have not been clearly understood and no consistent hypothesis was found in literature to explain its pathophysiology in patients with normal renal function. We should be aware of the possible CNS complications (non-convulsive status epilepticus or encephalopathy) induced by cefepime and other cephalosporins, especially in the elderly, critically ill patients, even without renal failure.

References