Case Study

Ceftizoxime Induced Delirium In A Patient With CKD

Alok Kumar¹, Dorchhom Khrime², Vivek Ruhela³

¹Associate Professor and Head Department of Nephrology Shri Guru Ram Rai Institute of Medical and Health Sciences Patel Nagar Dehradun.
²Professor Department of Medicine Shri Guru Ram Rai Institute of Medical and Health Sciences Patel Nagar Dehradun.
³Assistant Professor Department of Nephrology Shri Guru Ram Rai Institute of Medical and Health Sciences Patel Nagar Dehradun.

ARTICLE INFO

Abstract

Cephalosporin induced delirium and neurotoxicity is a recognized entity in CKD patients. Cefepime, ceftriaxone and ceftazidime had been reported with drug induced encephalopathy. Our patient is first documented case of ceftizoxime induced delirium. A 65 years old male presented with dysuria, fever and urinary retention. His TLC was raised and he had urea of 108 mg% and s. creatinine of 3.1 mg %. He was started on 1 gm ceftizoxime thrice a day. He developed delirium 3 days after therapy. His renal function was stable. Ceftizoxime was discontinued. He showed improvement after 36 hours of discontinuation of ceftizoxime. His recovery following withdrawal of drug suggested that he had delirium due to ceftizoxime.
INTRODUCTION:
Cephalosporins and quinolones had been associated with delirium and various types of neurotoxicity in patients with Chronic kidney disease (CKD) or acute kidney injury (AKI). Mostly Cefepime had been implicated in development of delirium in patients with renal failure. There are some case reports of ceftazidime, ceftriaxone and cefuroxime induced encephalopathy in patients with renal insufficiency. The commonest features described in literature are decreased level of consciousness, myoclonus, confusion, aphasia, seizures and agitation. There has been no published case till now on pubmed or google search of ceftizoxime associated delirium in literature. We present here first case of ceftizoxime induced delirium in a patient of CKD with Urinary tract infection.

CASE
65 years old male was admitted in medicine ward with dysuria, fever and urinary retention. He had temperature of 100 °F, pulse of 102/ minute. His BP was 150/82 mm Hg. He was well oriented to time, place and person. He was catheterized and started on Injection pantoprazole 40 mg I/v daily, ceftizoxime 1 gm 8 hourly and tablet paracetamol 500 mg thrice daily. He was a known case of hypertension on amlodipin 5 mg daily. It was continued in same dose. His Hb was 12.8 gm% and TLC was 14,000/mm3 with neutrophils of 81% and Lymphocytes of 19%. He had urea of 108 mg% and s. creatinine of 3.1 mg %. His S. Na⁺, S.K⁺ and S.Ca ++ were 137,4.1 and 9.2 meq/L. His ultrasound showed benign prostatic hypertrophy and kidney size was small. He developed drowsiness, tremulousness after 2 days. Nephrology unit was consulted. He was confused, disoriented to time place and person and irritable. His deep tendon jerks were exaggerated and plantar response was non elicitable. There was no focal neurological deficit. A possibility of uremic encephalopathy was kept. His dosage of ceftizoxime was reduced to 500 mg twice a day in view of his e GFR was 18.6 ml/ minute/1.73 m2. His repeat urea and serum creatinine were 106 mg% and 2.9 mg%. His TLC was 10,500/mm3. He had s. Na⁺ and s.K⁺ of 137m eq/L and 4.4 m eq/L. His blood gas analysis showed no evidence of acidosis. His MRI cranium was obtained and it was normal. In view of stable renal function uremic encephalopathy was unlikely to be cause of his delirium. His EEG was also recorded which was normal. Therefore a possibility of ceftizoxime associated encephalopathy was kept in this case. After reports ceftizoxime was discontinued in evening. He was started on meropenem 500 mg twice a day. Patient was examined on next day. He had less tremulousness and irritability but disorientation persisted. He showed significant improvement 36 hours discontinuation of ceftizoxime. He was alert and oriented to place and person but not to time. He regained normal mental status on next day. He was discharged after 5 days with urea of 91 mg% and, S. creatinine of 2.5 mg% and normal mental status.

DISCUSSION
Ceftizoxime is third generation cephalosporin administered intravenously or intramuscularly. it has a wide spectrum of in vitro activity against Gram-positive and Gram-negative bacteria, is particularly active against Enterobacteriaceae like other third generation cephalosporins. Ceftizoxime has similar efficacy like several other cephalosporins in lower respiratory tract infections and in complicated urinary tract infections. Antibiotics like cephalosporins and quinolones and antivirals like acyclovir had been described with development of delirium in patients with CKD. Most of the case reports of neurotoxicity are described with use of cefepime, ceftazidime and ceftriaxone. Ciprofloxacin and levofloxacin induced delirium in patients with renal insufficiency has been described in literature. Delirium is well recognized side effect of drugs which can lead to increased morbidity and mortality in hospitalized patients. CKD patients had various risk factors for development of encephalopathy like fluid and electrolyte imbalances, metabolic and environment disturbances. Besides this there is alteration in pharmacokinetics and pharmacodynamics of drugs in CKD. But drug dosing is not done properly in hospitalized patients. A study found inadequate adjustments for renal impairment in 19–67% of hospitalized patients. Mechanism of cephalosporin induced neurotoxicity includes inhibition of GABA-A release, increasing
glutamate levels, and inducing release of endotoxins and TNF-alpha, which is involved in septic encephalopathy.\[1\] Our patient developed delirium 2 days after use of ceftizoxime. Neurotoxicity has been described 2-6 days after use of cephalosporins.\[2\] Patient was started on ceftizoxime 1 gm thrice a day which is substantially high at e GFR of 18.6 ml/minute/1.73 m2. Dose recommendation at this level of e GFR is 500 mg to 1 gm twice a day.\[3\] Our patient developed delirium 3 days after administration of ceftizoxime. He recovered 2 days after discontinuation of drug. Clinical course of patient suggests that he had delirium due to ceftizoxime. He had risk factors like renal failure and environmental and metabolic derangements. A systematic review also found that mean time for recovery of patients with cefepime induced neurotoxicity was 2 days.\[3\] Our case is first case where delirium due to ceftizoxime had been documented.

**CONCLUSION**

Cephalosporin induced delirium is challenging diagnosis for a clinician. Clinicians should keep high index of suspicion in any neurotoxic adverse effect with use of any cephalosporin in patients with renal insufficiency. Any cephalosporin has potential of inducing neuropsychiatric side effects in setting of renal failure. As our patient developed delirium due ceftizoxime which was not reported earlier. It is advisable to use dosage of ceftizoxime according to GFR to reduce the chances of neurological adverse events.

**REFERENCE**

1. Al-Ghamdi SM. Reversible Encephalopathy and Delirium in Patients with Chronic Renal Failure who had Received Ciprofloxacin. Saudi J Kidney Dis Transpl 2002;13:163-70
How To Cite This Article:

**Source of Support:** Nil

**Conflict of Interest:** None declared

Your next submission with British BioMedicine Institute will reach you the below assets

- Quality Editorial service
- Swift Peer Review
- E-prints Service
- Manuscript Podcast for convenient understanding
- Global attainment for your research
- Manuscript accessibility in different formats (Pdf, E-pub, Full Text)
- Unceasing customer service

Track the below URL for one-step submission
http://www.britishbiomedicine.com/manuscript-submission.aspx