



ACUTE DELIRIUM FOLLOWING CIPROFLOXACIN ADMINISTRATION IN AN ELDERLY PATIENT WITH CHRONIC KIDNEY DISEASE

Kadakketh Geevarghese Alexander., Robin George Manappallil and Jishnu Jayaraj

Department of Internal Medicine, Baby Memorial Hospital, Calicut, Kerala, India

ARTICLE INFO

Article History:

Received 26th September, 2016
Received in revised form 15th
October, 2016
Accepted 19th November, 2016
Published online 28th December, 2016

Key words:

Ciprofloxacin, fluoroquinolones,
delirium, chronic kidney disease

Copyright © 2016 Kadakketh Geevarghese Alexander. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Second generation fluoroquinolones like Ciprofloxacin are used in the treatment of gram negative and a few gram positive bacterial infections. There have been a few reports of neuropsychiatric events with Ciprofloxacin use. Mental disturbances like delirium may occur in elderly hospitalized patients, probably due to change of environment and infections. This is a case of an elderly lady who presented with fever and burning micturition and was diagnosed to have urinary tract infection with acute on chronic renal failure. She became delirious after administration of Ciprofloxacin, and had complete resolution of symptoms after withdrawal of the drug. This case, therefore, highlights the consideration of antibiotics as a cause of acute delirium, especially in elderly patients with chronic kidney disease.

INTRODUCTION

Ciprofloxacin is a second generation fluoroquinolone which has been used against gram-negative organisms including *Pseudomonas* species and some gram-positive organisms like *Staphylococcus aureus*. It is commonly administered in the treatment of urinary tract infections, and skin and soft tissue infections. It is also one of the drugs of choice in typhoid fever. Delirium is an acute organic brain syndrome commonly seen in hospitalized elderly patients. A few cases of neuropsychiatric disturbances have been reported with Ciprofloxacin administration. The patient being described is an elderly female with multiple factors that can contribute to delirium; but was found to have Ciprofloxacin as the culprit for her delirious state.

CASE REPORT

A 75 year old lady presented with 2 days history of fever with chills and burning micturition. She is a diabetic (on insulin therapy), hypertensive (on amlodipine 5 mg twice daily and torsemide 5 mg once daily) and a known case of chronic kidney disease (not on dialysis). On examination, she was conscious and oriented. She was febrile (100^oF), with heart rate of 90 beats/ minute, blood pressure 130/90 mmHg and respiratory rate 18/ minute. Her systemic examinations were normal. Her complete blood count showed anaemia (Hb 9.8 g%) and leucocytosis (total counts 12000 cells/ cmm, N85 L15), deranged renal functions (urea 78 mg/ dL, creatinine 2.87 mg/ dL) and electrolyte imbalance (sodium 132 mEq/ L, potassium 5.6 mEq/ L). Her liver functions and calcium levels

were normal, and random blood sugar was 128 mg%. Her urine microscopy showed plenty of pus cells. Peripheral blood smear revealed microcytic hypochromic picture. ECG and chest Xray were normal and ultrasound abdomen was suggestive of chronic kidney disease.

She was started on intravenous Cefotaxime (1 gram q8h), which she received for 2 days. During this period she had 2 fever spikes. Her urine culture grew *Klebsiella* which was sensitive to Ciprofloxacin, and blood culture was sterile. Cefotaxime was stopped and changed to intravenous Ciprofloxacin 200 mg q12h. The following day morning, the patient was delirious. Her urea was 130 mg/ dL, creatinine 3.45 mg/ dL and blood sugar and electrolytes were normal. She was afebrile with stable vitals. There were no signs of meningeal irritation. Her MRI brain showed chronic infarct in the left medial and occipital lobes and right centrum semiovale, with no evidence of acute changes. Anti-thyroid peroxidase antibodies were negative. On reanalysis, the only new change done was the addition of Ciprofloxacin. In view of the possibility of drug induced delirium (as her symptoms started after receiving 3 doses of Ciprofloxacin), the antibiotic was stopped. After about 36 hours from the stoppage of Ciprofloxacin, patient started becoming oriented with reduction in delirium; and about 48 hours later she became completely normal. Tablet Cefuroxime was started at 250 mg twice daily, as it was also sensitive as per urine culture reports. She remained symptom free for the next 5 days, and was discharged with urea of 80 mg/ dL, creatinine 2.9 mg/ dL and normal electrolytes.

DISCUSSION

Delirium is an acute organic brain syndrome characterized by cognitive impairment, attention deficits, decreased level of consciousness, varied psychomotor activity and wake-sleep rhythm disorders.¹ Some of the common aetiologies for delirium include meningitis, septicemia, head injury, subarachnoid hemorrhage, neoplasms, alcohol withdrawal and drug intoxication.² There is a general consensus that the incidence of delirium increases with age and rates as high as 60% have been observed in elderly hospitalized patients.^{1,3} There are also reports of a possible link between urinary tract infection and delirium in elderly population; but the exact mechanism is unclear.^{4,6}

Ciprofloxacin, a second generation fluoroquinolone, has good coverage against gram-negative organisms (including *Pseudomonas* species), some gram-positive organisms (including *Staphylococcus aureus*) and atypical pathogens.⁷ Though uncommon, neuropsychiatric adverse effects in the form of reversible encephalopathy and delirium have been noticed with Ciprofloxacin administration.⁸⁻¹¹

The patient being reported is an elderly lady who became delirious after 2 days of hospital stay. Her primary complaint was urinary tract infection with an underlying chronic kidney disease. She had deranged renal parameters, which can lead to uremic encephalopathy. She had an acute onset delirium following 3 doses of Ciprofloxacin. According to Naranjo adverse drug reaction probability scale¹², her score was 5, suggestive of a probable association. She became asymptomatic after the withdrawal of Ciprofloxacin. This case, therefore, highlights the need to consider drugs like antibiotics as an important aetiology in cases of acute delirium, even though the patient may have multiple contributing factors.

REFERENCES

1. Lipowski ZJ. Update on delirium. *Psychiatric Clin N Am* 1992; 15:335-46.
2. Ropper AH, Samuels MA. Delirium and other acute confusional states. Adams and Victor's Principles of Neurology. 9th ed. McGraw Hill education 2009.pp 405- 406.

3. Inouye SK, van Dyck CH, Alessi CA, Balkin S, Siegel AP, Horwitz RI. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med.* 1990;113:941-948.
4. Balogun SA, Philbrick JT. Delirium, a symptom of UTI in the elderly: Fact or fable? A systematic review. *Canadian Geriatrics Journal.* 2014; 17(1):22-26.
5. Eriksson I, Gustafson Y, Fagerström L, Olofsson B. Urinary tract infection in very old women is associated with delirium. *Int Psychogeriatr.* 2011; 23(3):496-502.
6. Manepalli J, Grossberg GT, Mueller C. Prevalence of delirium and urinary tract infection in a psychogeriatric unit. *J Geriatr Psychiatry Neurol.* 1990;3(4):198-202.
7. King DE, Malone R, Lilley SH. New classification and update on the quinolone antibiotics. *Am Fam Physician.* 2000; 61(9):2741-2748.
8. Ali WH. Ciprofloxacin-associated posterior reversible encephalopathy. *BMJ Case Rep.* 2013 Apr 11; 2013. pii: bcr2013008636.
9. Al-Ghamdi SM. Reversible Encephalopathy and Delirium in Patients with Chronic Renal Failure who had Received Ciprofloxacin. *Saudi J Kidney Dis Transpl.* 2002; 13(2):163-70.
10. Farrington J, Stoudemire A, Tierney J. The role of ciprofloxacin in a patient with delirium due to multiple etiologies. *Gen Hosp Psychiatry.* 1995; 17(1):47-53.
11. McDermott JL, Gideonse N, Campbell JW. Acute delirium associated with ciprofloxacin administration in a hospitalized elderly patient. *J Am Geriatr Soc.* 1991;39(9):909-910.
12. Naranjo CA, Busto U, Sellers EM, Sandor P, Ruiz I, Roberts EA, et al. A method for estimating the probability of adverse drug reactions. *Clin Pharmacol Ther* 1981; 30:239-45.

