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CASE REPORT

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Ciprofloxacin Associated Renal Issue: A Case Report

JERRY ANDREWS[1], BARBARA STEWART[1], MUTHU SATYADAS[1]

ABSTRACT

Ciprofloxacin is a very commonly prescribed antibiotic with a wide range of associated adverse events. Cases of renal issues have been reported in literature. We describe a case of an elderly male who suffered from renal insufficiency probably related to ciprofloxacin administered for Pseudomonas infection. Serum therapy was initiated and culprit drug was replaced resulting in satisfactory improvement.

KEYWORDS: Ciprofloxacin, Renal Insufficiency, Acute Renal Failure

INTRODUCTION

Ciprofloxacin is a quinolone that is used extensively in clinical practice. The most common adverse effects are gastrointestinal disorders and conditions of the central nervous system.[1,2] Renal insufficiency secondary to this drug is listed as a rare adverse effect. Several cases of renal insufficiency have been reported in the literature due to interstitial nephritis[3,4] and also due to precipitation of kidney crystals.[5-10] We report the case of renal insufficiency in an elderly male with no relevant history of drug allergy.

CASE REPORT

The patient was a 69-year-old male, an ex-smoker and with no drug allergies. His medical history showed arterial hypertension, type 2 diabetes, chronic renal insufficiency, and severe COPD with multiple admissions. His background therapy included warfarin, pravastatin, azithromycin, paracetamol, amiodarone, furosemide, enalapril, bisoprolol, hydralazine, and calcium/vitamin D3. The patient had been seen several times in the past year due to COPD. The patient was admitted due to HF decompensation and a 4-day course of low-grade fever. Blood cultures were performed and were negative, and given increased expectoration and changes in purulence, a sputum test was carried out, which was positive for Pseudomonas aeruginosa. Given this first isolation and clinical stability, treatment with ciprofloxacin 750 mg every 12 hours for 21 days was started, and the patient was discharged the day after treatment was started. Upon discharge, no other new treatment was started, and the patient followed his background medication. After nine days, the patient returned due to clinical worsening. Lab tests showed: urea 103 mg/dL, creatinine 4.70 mg/dL, estimated glomerular filtration by CKP-EPI (GFR) < 15 mL/min/1.73 m2, C-reactive protein 0.71mg/dL, and hemoglobin 10 g/dL, with the remaining values within the normal range. The previous lab tests showed urea 27.4 mg/dL, creatinine 1.02 mg/dL and estimated GFR 71 mL/min/1.73 m^2. As acute renal insufficiency with renal failure was suspected a renal ultrasound was performed, which ruled out an obstructive cause, and a urine sediment test, which was normal, with pH 8. For this reason, it was decided to admit the patient and start serum therapy initiated with bladder catheterization and close monitoring of diuresis. As it was suspected that ciprofloxacin was the cause of renal insufficiency, it was decided to stop the antibiotic and continue treatment with intravenous ceftazidime. The patient's progress was satisfactory, and within 10 days the laboratory values had almost returned to normal, with urea 76.6 mg/dL, creatinine 1.25 mg/dL and GFR 56 mL/min/1.73 m^2.

DISCUSSION

Acute community-acquired renal insufficiency is caused in 70% of cases by pre-renal causes and in 17% of cases due to obstructive causes.[12] The most common cases of acute renal insufficiency occur due to renal hypoperfusion and toxic causes, such as antibiotics and iodinated contrasts. Ciprofloxacin may cause acute renal insufficiency. Cases of acute IN have been reported as caused by ciprofloxacin[3,4] with this being

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the main etiology of renal insufficiency by this drug. It has been reported in both patients with drug overdoses[12] as well as in patients using normal therapeutic doses. Interstitial nephritis is often caused by drugs such as antibiotics and nonsteroidal anti-inflammatory drugs, and is characterized by a skin rash, eosinophilia, and eosinophiluria, with these findings being inconsistent; however, if they are present, they support the diagnosis. Histological confirmation by means of renal biopsy shows interstitial inflammatory infiltrate that, rather than a toxic effect, is thought to be due to an immunoallergic process. Another less common cause of ciprofloxacin-induced renal insufficiency is crystal nephropathy. It is associated with renal insufficiency with elevated creatinine and urea values, with no oliguria or laboratory results showing rhabdomyolysis. The presence of urinary acidification has been reported in affected patients. Crystals can be identified both in the histology and urinary sediment. The treatment used to reverse this condition is drug discontinuation and the start of conservative treatment with serum therapy; in most cases this resolves the condition and values return to baseline laboratory values between the first and second week. The case herein shows increased creatinine and urea values without eosinophilia, with maintained diuresis. Crystals in urine sediment were not observed and nor could they be histologically verified; however due to urine alkalosis, and due to clinical and analytical evolution, this case is consistent with the few cases in the literature of renal insufficiency secondary to precipitation of ciprofloxacin crystals.

CONCLUSION

Commonly prescribed drugs can also lead to renal insufficiency. These adverse events may be precipitated by underlying conditions and factors like age and lifestyle. In such scenarios, it is important to carry out relevant tests and investigations timely to avoid major complications.

REFERENCES

1. Bailey JR, Trott SA, Philbrick JT. Ciprofloxacin-induced acute interstitial nephritis. Am J Nephrol. 1992;12:271–3.
2. Lo WK, Rolston KV, Rubenstein EB, Bodey GP. Ciprofloxacin-induced nephrotoxicity in patients with cancer. Arch Intern Med. 1993;153:1258–62.
3. Hottkins R, Fenves AZ, Stephens MK. Acute renal failure secondary to oral ciprofloxacin: A presentation on three cases and a review of the literature. Clin Nephrol. 1989;32:75–8.
4. Farid S, Mahmood M, Abu Saleh OM, Hamadah A, Nasr SH, Garrigos ZE, et al. Clinical manifestations and outcomes of fluoroquinolone-related acute interstitial nephritis. Mayo Clin Proc. 2018;93:25–31.
5. Khan M, Ortega LM, Bagwan N, Nayer A. Crystal-induced acute kidney injury due to ciprofloxacin. J Nephropathol. 2015;4:29–31.
6. Goli R, Mukku KK, Raju SB, Uppin MS. Acute ciprofloxacin-induced crystal nephropathy with granulomatous interstitial nephritis. Indian J Nephrol. 2017;27:231–3.
7. Kammoun K, Jarraya F, Makni S, Ben Mahmoud L, Kharrat M, Ben Hmida M, et al. Ciprofloxacin-induced crystal nephropathy. Iran J Kidney Dis. 2014;8:240–2.
8. Yarlagadda SG, Perazella MA. Drug-induced crystal nephropathy: An update. Expert Opin Drug Saf. 2008;7:147–58.
9. Stratta P, Lazzarich E, Canavese C, Bozzola C, Monga G. Ciprofloxacin crystal nephropathy. Am J Kidney Dis. 2007;50:330–5.
10. Sedlacek M, Suriawinata AA, Schoolwerth A, Remillard BD. Ciprofloxacin crystal nephropathy—a new cause of acute renal failure. Nephrol Dial Transplant. 2006;21:2339–40.
11. Liano F, Pascual J, The Madrid Acute Renal Failure Study Group. Epidemiology of acute renal failure: A prospective, multicenter community-based study. Kidney Int. 1996;50:811–8.
12. Hajji M, Jebali H, Mrad A, Blel Y, Brahmi N, Kheder R, et al. Nephrotoxicity of ciprofloxacin: Five cases and a review of the literature. Drug Saf Case Rep. 2018;5:17.

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AUTHOR AFFILIATIONS: (*Corresponding Author)
1. MD (Medicine), Consultant physician, Getzville, New York, United States- 14068
2. MD (Anesthesiology), Hope Hospital, Jaipur, India

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Contact Corresponding Author at: editor[dot]ihrj[at]gmail[dot]com