



Paroxysmal Atrial Fibrillation Induced by Ciprofloxacin: A Rare Adverse Effect

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ABSTRACT

Despite their adverse effects, fluoroquinolones continue to be commonly prescribed antibiotics. Ciprofloxacin remains the safest with remarkably few adverse effects of all fluoroquinolones. Here, we present a rare case of paroxysmal atrial fibrillation induced by ciprofloxacin intake in a 72-year-old woman. She was treated with ciprofloxacin and ceftriaxone for urinary tract infection caused by *Klebsiella pneumoniae* and complicated with liver abscess. On the fifth day of ciprofloxacin intake, she suddenly complained of heart palpitations and epigastric pain. An electrocardiogram revealed supraventricular tachycardia type atrial fibrillation at 130 beats per minute. No QT interval prolongation was noted. Ciprofloxacin was stopped as it was the most incriminated to induce arrhythmia. A control electrocardiogram showed normal sinus rhythm. We continued ceftriaxone use solely for 3 weeks until the resolution of the liver abscess. Although rare, early detection of atrial fibrillation induced by ciprofloxacin may decrease the severity of complications and prevent death.

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Introduction

Despite their adverse effects, fluoroquinolones (FQ) continue to be commonly prescribed antibiotics to treat various infections including urinary tract, respiratory, skin, bone and joint infections (1). Mild adverse effects of FQ include gastrointestinal symptoms and central nervous system side effects such as headaches and dizziness (2). However, rare but serious adverse effects have been reported, including aortic aneurysm, aortic dissection (2), QT prolongation and torsades de pointes (TdP) (3). Ciprofloxacin, a broad-spectrum second-generation FQ antibiotic is the least frequently reported to induce TdP (4,5). By interfering with the potassium channels, it is able to prolong the cardiac QT interval and lead to TdP, which might be followed by ventricular fibrillation, cardiac arrest and sudden death (6). However, supraventricular arrhythmia induced by ciprofloxacin have been rarely reported. Here,

we present a rare case of paroxysmal atrial fibrillation (AF) induced by ciprofloxacin intake in a 72-year-old woman.

Case Report

A 72-year-old woman was hospitalized in the infectious diseases department for liver abscess complicated with sepsis. She had past medical history of insulin dependent diabetes mellitus and high blood pressure treated with captopril at a dose of 50 mg twice daily. She was treated elsewhere with ciprofloxacin and colistin for urinary tract infection caused by *Klebsiella pneumoniae*. The patient received this combination therapy for 3 days. On admission, she was treated with ceftriaxone, 2 g given intravenously once daily, and ciprofloxacin 500 mg given orally twice daily. On the second day of admission, she was afebrile, her blood pressure was 130/80 mmHg and her heart rates were 88 beats per minute. At night, she

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suddenly complained of heart palpitations and epigastric pain. An urgent laboratory investigation revealed a decreased in the C-reactive protein level from 200 mg/l to 149 mg/l, associated with normokalemia to 3.6 mmol/l and hypomagnesemia, which was supplemented. An electrocardiogram revealed supraventricular tachycardia type AF at 130 beats per minute. No QT interval prolongation was noted (Figure 1). Since the patient did not take any other medicine, besides her usual antihypertensive treatment, ciprofloxacin was stopped as it was the most incriminated to induce arrhythmia. No antiarrhythmic drug therapy was used. A control electrocardiogram, recorded two days later, showed normal sinus rhythm (Figure 2). We continued intravenous ceftriaxone use solely during hospitalization. No signs of recurrence of asymptomatic AF were noted and the patient remained in sinus rhythm for 10 days later. Within 3 weeks of antibiotic therapy, abdominal computed tomography scan showed a resolution of the liver abscess and the patient was discharged in a good general condition.

Figure 1. (a) shows irregular rhythm with a normal QT interval. (b) and (c) show regular rhythm with the presence of P wave and P' waves (arrows) buried in the T wave of the preceding beat = Atrial tachycardia. (d) shows premature ventricular contraction (arrow)

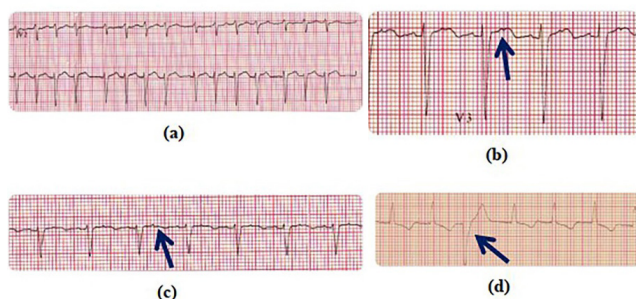
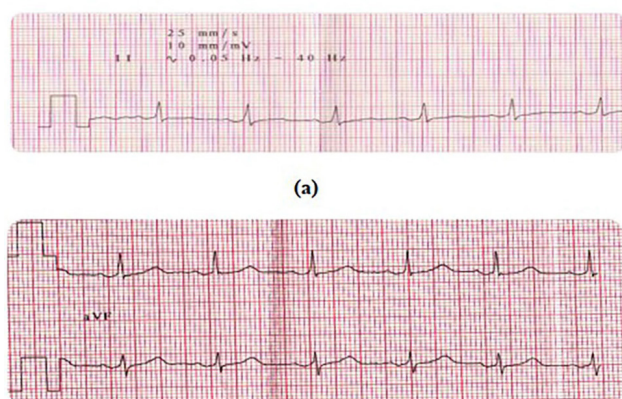


Figure 2. Electrocardiogram showing normal sinus rhythm with a normal QT interval at admission (a) and after the discontinuation of ciprofloxacin treatment (b).



Discussion

We reported a rare case of paroxysmal atrial fibrillation induced by ciprofloxacin intake which appeared on the

fifth day after initiating the treatment. Only few studies reported cases of supraventricular tachycardia induced by ciprofloxacin: large cohorts from the Drug Safety Research Unit Prescription-Event Monitoring Database found six cases of AF reported with ciprofloxacin among 11 477 patients within 42 days after starting the treatment (7). Sideri reported 18 cases of children who received ciprofloxacin treatment in the intensive care unit, among whom reversible supraventricular tachycardia was noted in one patient on the fifth day of ciprofloxacin treatment (8). Bolognesi reported a case of paroxysmal AF following administration of ciprofloxacin in a 61-year-old male, which appeared on the third day of treatment (9). In fact, dysrhythmic cardiovascular events for ciprofloxacin were reported from pre-marketing clinical investigations including palpitation, atrial flutter, dysrhythmia, ventricular ectopy and syncope at an incidence of less than 1% in 2799 patients (7).

Ciprofloxacin remains well tolerated antibiotics with a high oral bioavailability explaining its commonly used, and its cardiovascular toxicity has been largely questioned. The risk factors for drug-induced arrhythmia are baseline QT interval prolongation, rapid intravenous drug infusion, digitalis therapy, bradycardia, organic heart disease and electrolyte imbalances (2). Our patient had none of those previously listed risk factor. However, her advanced age might be an additional factor that precipitates the onset of cardiac arrhythmia. Previous studies reported that AF is the most common rhythm disorder in older adults, affecting currently 5% of all people aged ≥ 70 years and approximately 9% of those aged > 80 years (10). An early diagnosis and management of AF is mandatory since it is associated with a significant increase in the long-term risk of stroke, heart failure, impaired quality of life and all-cause mortality (11). This might be explained by interfering with the QTc interval and the increased risk of TdP (4,12).

When AF is diagnosed, electrical or medical defibrillation is performed in order to reset normal heart rhythm (13). However, when arrhythmia is induced by medication, the suggested drug should be discontinued immediately (14). Our patient remained in sinus rhythm without signs of recurrence after the discontinuation of the ciprofloxacin treatment.

In conclusion, we presented a rare case of paroxysmal AF induced by ciprofloxacin intake. Clinicians should be aware of the potential adverse effects of ciprofloxacin including supraventricular tachycardia, since its early diagnosis and management are mandatory in order to reduce complications and prevent death.

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