Case Report

Azithromycin-induced QT prolongation in elderly patient

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Abstract. The authors present a case of an elderly patient with idiopathic dilated cardiomyopathy who developed a significative prolongation of the QT interval after two days of treatment with azithromycin for a community-acquired pneumonia. QT prolongation is associated with a high risk of serious ventricular tachyarrhythmias. Three days after discontinuation of azithromycin, QT interval returned to the normal value. (www.actabiomedica.it)

Key words: QT prolongation, azithromycin, elderly

Introduction

Macrolide antibiotics are widely used for a broad variety of infections such as upper respiratory tract infections and community acquired pneumonia. Prolongation of the QT interval, torsade de pointes, polymorphic ventricular tachycardia, sudden death are well described as adverse reactions and are common to all macrolides. Azithromycin is usually better tolerated than other macrolides and has minimal side effects. We describe a case of an elderly patient with idiopathic dilated cardiomyopathy who developed a severe QT-interval prolongation as an adverse effect of azithromycin, and review the past reports of QT prolongation precipitated by macrolides.

Case report

A 65-year-old man with a history of idiopathic dilated cardiomyopathy presented with a two-day history of fever, productive cough, and shortness of breath. He denied drug abuse, and other symptoms including chest pain or palpitations. A stress echocardiogram, that was performed seven months earlier, showed global hypokinesis and dilatation of left ventricle with no evidence of ischaemia. Upon presentation, the patient's blood pressure was 126/72 mmHg, heart rate 90 bpm, respiratory rate 26 pm, temperature 38.1°C, and SpO_2 was 93% at room air. He presented left basal crackles but no signs of right ventricular failure. Chest X-ray revealed new left basal opacity. White blood cell count was 16.1/mm^3, 93% of which were neutrophils. Arterial blood gas showed pH of 7.49, pCO_2 35 mmHg, pO_2 61 mmHg, HCO_3 26 mmol/L, SaO_2 93% at room air. The patient assumed heart failure medications (Ace-inhibitors, beta-blockers, diuretics, spironolactone), which remained unchanged during the admission. Electrocardiogram on admission revealed normal sinus rhythm at 100 bpm, QT 380 msec, QTc 390 msec. The patient was admitted with community-acquired pneumonia and started on intravenous ceftriaxone 1 g daily and intravenous azithromycin 0.5 g followed by oral 0.25 g daily. Six hours after receiving the second dose of antibiotics, the patient developed mild palpitation, which resolved in seconds. Vital signs were stable. Electrocardiogram showed normal sinus rhythm, rate 60 bpm, QT 680 msec, QTc 660 msec, an enlargement and an increased voltage of QRS complexes (Fig. 1). Serum electrolytes were normal. The patient was intravenously administered 2 g of magnesium sulfate

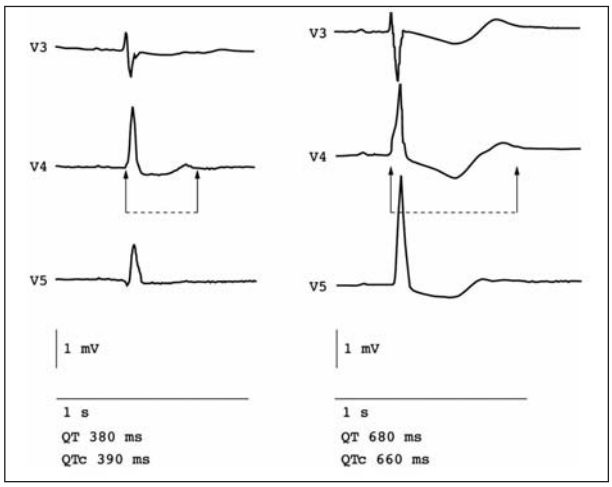

Figure 1. QT interval before and after azithromycin treatment

and placed on telemetry. Azithromycin was suspected to have induced QT prolongation and was discontinued, while ceftriaxone was continued. Myocardial infarction was excluded by serial negative troponin I measurements and serial electrocardiograms. Sputum and blood cultures performed on admission remained negative. The patient's fever and cough improved with ceftriaxone followed by oral cefpodoxime. Three days after the discontinuation of azithromycin, QT and QTc returned to 460 msec and 430msec, respectively. No recurrence of QT prolongation has been shown to date.

Discussion

Azithromycin is an azalide, a subclass of macrolide antibiotics derived from erythromycin, and is reported to be better tolerated than the other macrolides (1). It is a relatively new macrolide and now widely used both intravenously and orally for community-acquired pneumonia, bronchitis, Helicobacter pylori infection, and other infections. Reports of azithromycin-induced QT prolongation are limited, although QT prolongation is one of the known side effects of other macrolides (2-4), which could lead to torsade de pointes (polymorphic ventricular tachycardia) and sudden death. In animal studies, high serum levels of azithromycin induced QT prolongation, but azithromycin is thought to have less proarrythmic potential than erythromycin or clarithromycin (5). To our knowledge, three past case reports of QT prolongation induced by azithromycin in humans are referred. Samarendra et al reported a case of QT prolongation induced by combined use of amiodarone and azithromycin (6). Arellano-Rodrigo reported torsade de pointes and cardiorespiratory arrest induced by azithromycin in a patient with congenital long QT syndrome (7). Strle and Maraspin reported a modest Q-Tc interval prolongation without clinical consequences after a course of azithromycin administered for solitary erythema migrans in patients without pre-existing cardiac disorders (8).

Our patient might have had underlying conduction abnormalities associated with primary dilated cardiomyopathy with a baseline QTc of 390 msec. Since QTc became 660 msec around 30 hours after the beginning of the antibiotic therapy, it was highly likely that azithromycin precipitated the prolongation of QT interval; electrocardiogram abnormality occurred without any relevant clinical consequences. Ceftriaxone, which has not been reported to precipitate QT prolongation either as a single agent or in combination with other drugs, was continued and QT prolongation resolved after discontinuation of azithromycin. We found no other cause of QT prolongation. In summary, we have described a case of significant QT prolongation associated with the use of azithromycin, which occurred in a patient with pre-existing dilated cardiomyopathy. We should be aware of this potentially lethal side effect of azithromycin, which is now one of the most commonly used antibiotics in daily patient care.

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