Case Report

Multifocal dystonia induced by levofloxacin

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Abstract

Objective: Dystonia is a hyperkinetic movement disorder characterised by typically patterned, sustained or intermittent muscle contractions. Quinolones with γ-aminobutyric acid (GABA) type-A receptor antagonist properties can impair inhibition and act as excitatory compounds in central nervous system circuits, resulting in abnormal hyperkinetic movement disorders like dystonia. **Material and methods:** 45-year-old male with diabetes mellitus on oral anti-diabetic medications presented with multiple abscesses over right elbow, left shoulder and both legs along with fever and altered sensorium. His blood culture report revealed staphylococcus bacteraemia (MSSA). He was treated initially with intravenous antibiotics (cefuroxime and gentamycin), which resulted in nephrotoxicity. Meanwhile, the pus culture and sensitivity taken from right lower limb ulcer report showed growth of Psuedomonas species with resistance to third generation cephalosporins but sensitive to fluroquinolones. Hence, intravenous levofloxacin was added to cefuroxime at a dose of 500mg daily. From the next day onwards patient started having abnormal movements characterized by speech stuttering, neck flexion on attempted oral communication and dystonic movements of both upper and lower limb. Levofloxacin was discontinued and patient noted progressive improvement in the duration and severity of the dystonic episodes. It had completely disappeared over 24-48 hours after discontinuation. **Results and conclusion:** Levofloxacin has a <0.001% rate of severe neurologic reactions, mostly reported as convulsions. A diverse reversible hyperkinetic movement phenomenology has been reported in relation to levofloxacin- tremor, chorea and dystonia. The pathophysiology of dystonia is thought to be due to dysfunction of inhibitory basal ganglia and cortical circuits.The present case describes a rare but important side effects associated with the use of levofloxacin.

Keywords: Dystonia, adverse drug reaction, levofloxacin

Introduction

Dystonia is a hyperkinetic movement disorder characterized by typically patterned, sustained or intermittent muscle contractions producing abnormal, often repetitive, movements, postures, or both, often precipitated or worsened by voluntary action and associated with overflow muscle activation (Albanese et al., 2013). Quinolones, such as levofloxacin, have γ-aminobutyric acid (GABA) type-A receptor antagonist properties, and can thus impair inhibition and act as excitatory compounds in central nervous system (CNS) circuits (Tsuji et al., 1988). Levofloxacin have been rarely reported to cause abnormal hyperkinetic movement disorders. We report a case of reversible multifocal dystonia associated with intravenous levofloxacin therapy in a patient with gentamycin induced acute kidney injury.

Methods/Case Study

A 45-year-old man who is known diabetic on oral anti-diabetic medications presented with multiple abscesses over right elbow, left shoulder and both legs appeared 2 days back along with fever and altered sensorium. He was treated for alcohol dependence syndrome 1 year back, but relapsed. Last intake was 8 days back. He was admitted and blood culture report revealed staphylococcus bacteraemia (MSSA).His echocardiogram showed vegetation over Anterior mitral leaflet. Intravenous antibiotics (cefuroxime and gentamycine) were started along with source reduction by draining the abcesses. After 10 days of the treatment investigations revealed a raise in serum creatinine. Nephrotoxicity due to gentamicin was thought of and the medication was stopped. Meanwhile, the pus culture and

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sensitivity taken from right lower limb ulcer report showed growth of Psuedomonas species with resistance to third generation cephalosporins but sensitive to fluroquinolones. Hence, intravenous levofloxacin was added to cefuroxime at a dose of 500mg daily. From the next day onwards patient started having abnormal movements characterised by speech stuttering, neck flexion on attempted oral communication and dystonic movements of both upper and lower limb. These episodes were particularly severe with stress or anxiety. Myoclonic jerks were elicitable with tactile stimulation. Patient denied a preceding urge to move or talk. Patient denied oscillopsia, diplopia, ear clicking, tinnitus, dysphagia or hallucinations.

There was no history of prior exposure to dopamine-blocking medications or quinolones. No other medication had been recently added or withdrawn except intravenous levofloxacin, and there was no recent dose change on his usual medications. There was no family history of abnormal movements.

Results

On examination, the patient was alert. There were no other associated abnormal movements including chorea or tremors. There were no upper motor neuron orcerebellar signs. Patient had ongoing fever which was present even before starting levofloxacin probably related to infective endocarditis.

Laboratory studies disclosed stable values in complete blood count, normal electrolyte , mildly elevated serum creatinine (1.6 mg/dl) and normal LFT except for an AG reversal. His S CRP level was on decreasing trend. EEG and CT brain showed no abnormalities. His USG abdomen showed normal echo pattern of liver and his S NH3 level was normal. He remained euglycemic throughout this period.

Levofloxacin was discontinued and patient noted progressive improvement in the duration and severity of the dystonic episodes. It had completely disappeared over 24-48 hours after discontinuation. Furthermore, there were no more episodes in the following 1 month.

Discussion

Fluoroquinolones are very often used antibiotics which was found to have CNS excitatory effects through a dose-dependent, GABA-A receptor antagonist mechanism. Quinolones applications are associated with neurological adverse reactions such as dizziness, headache and insomnia. Very rarely they also can induce serious neurological reactions including abnormal movements, alteration of consciousness and epileptic spells (Christ, 1990). Levofloxacin has a <0.001% rate of severe neurologic reactions, mostly reported as convulsions (Carbon, 2001).

A diverse reversible hyperkinetic movement phenomenology has been reported in relation to levofloxacin- tremor, chorea and dystonia (Yasuda et al., 1999; Lizarraga et al., 2015). To the best of our knowledge, multifocal dystonia has not been reported in association with levofloxacin till date. There is a report of acute-onset multifocal dystonia associated with the use of gemifloxacine in a 36 year-old female, quickly resolved with intravenous administration of promethazine 50 mg (Sharma et al., 2009).

The pathophysiology of dystonia is thought to be due to dysfunction of inhibitory basal ganglia and cortical circuits. Through GABA antagonism, quinolones could potentially predispose to abnormal inhibition and trigger dystonic movements (Hallet, 2004). Levofloxacin is excreted primarily unchanged in urine. Therefore, dose adjustments are required in individuals with impaired renal function (Fish and Chow, 1997). Renal impairment might have precipitated neurotoxicity in our case. Similar to other reported cases of quinolone-associated hyperkinetic movements, dystonia disappeared completely after discontinuation of levofloxacin.

Conclusion

The present case describes a rare but important side effects associated with the use of levofloxacin. Hence, it is necessary for the clinicians to be aware of this kind of alarming neurological side effect with the use of quinolone group of antibiotics especially in the setting of renal impairment.

Conflicts of interest: Nil

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