



Moxifloxacin Induced Acute Delirium with Visual Hallucinations

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Abstract

A few reports accuse and implicate moxifloxacin as a contributor to delirium state. Here, we report the A 60-year-old female patient, who developed acute delirium with visual hallucinations following treatment with moxifloxacin for atypical pneumonia.

Key Words: Moxifloxacin, delirium, hallucination

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Introduction

Quinolones are broad spectrum antibiotics used for the treatment of several infectious diseases. Although they are frequently used due to their high bioavailability and safety, these antibiotics are reported to be associated with neuropsychiatric symptoms like agitation, confusion, delirium, depression, hallucinations and vertigo [1]. There have been published cases reporting the presumed association between delirium or psychosis and quinolones like ciprofloxacin and gatifloxacin.

Yet, only a few reports accuse and implicate moxifloxacin as a contributor to delirium state. Herein, we report the case of a patient, who developed acute delirium with visual hallucinations following treatment with moxifloxacin for atypical pneumonia. Moxifloxacin withdrawal was followed by a cessation of symptoms. To the best of our knowledge, this is the second case in the medical literature reporting a moxifloxacin induced delirium state. In patients undergoing treatment with Quinolones such as moxifloxacin, possible moxifloxacin associated neuropsychiatric symptoms should come to mind to help in making early treatment decisions.

Case

A 60-year-old female patient was admitted to the Emergency Department of our hospital with complaints of high fever, cough, nausea, and vomiting lasting three days. She had visited an outside clinic setting with similar complaints two days prior to her visit to our center and was diagnosed with an upper respiratory tract infection. She was started on a treatment regimen of 1000mg amoxicillin Clavunate per orally for 14 days. Non resolution of her symptoms three days after starting treatment and a spike in her temperature (39.5 degrees Celsius on admission) led her to our Emergency Ward.

The patient was transferred to our Infectious Diseases Unit for further investigations and definitive diagnosis. On admission to the Infectious diseases outpatient clinic, she looked pale, distressed and weak. Her vitals were as follows; Body Temperature; 39,5 degree Celsius, Respiratory Rate (RR/min): 16 /min. Heart Rate: 100/min. Blood Pressure; 120/80 mmhg. Arterial oxygen Saturation was recorded to be (SaO2) 99%. Current medical History revealed persistent fever over 39 degrees Celsius for 3 days. Auscultation of the lungs was consistent

with inspiratory crackles in the left lower chest. All other physical examination findings were unremarkable. Chest X-ray was normal. Initial laboratory studies were notable for leukocytes: 7.000/mm³, Hb: 12.2 g/dL, Hct: %33.9; thrombocytes: 146.000/mm³; erythrocyte sedimentation rates: 61 mm/hour, C-reactive protein: 178 mg/L (0-8), AST: 58 U/L(5-40), ALT: 89 U/L (5-40), BUN:25 mg/dL, Creatinine: 0.9 mg/dL, Na: 131 mmol/L (134-145) K: 3.6 mmol/L(3.5-5.5). Due to the spiking fever, a decision was made to hospitalize the patient for further investigations and treatment. 400 mg moxifloxacin IV was Initiated as empirical treatment. During admission blood, urine, sputum and throat cultures that were performed were found to be negative. Computed tomography (CT) scan of the thorax performed as a result of discordance between physical Examination (PE) and previous radiological findings revealed pneumonic consolidation and infiltration in the left lower chest compatible with atypical pneumonia.

An improvement in the clinical state of the patient was observed on the second day of moxifloxacin treatment. Her fever and respiratory symptoms had shown regression. However, within one hour receiving moxifloxacin in the second day, the patient started demonstrating apathic behaviors, inability to remember her family members, irrelevant talk, pressured speech, loose associations and visual hallucinations.

Triggered by the suspicion of a possible moxifloxacin induced psychotic state, her antibiotic treatment was altered with 500 mg claritromycin+1 gr ceftriaxone twice a day intravenously.

The Neuro-Psychiatric department was consulted for further evaluation. Except for her altered mental status all other neurological examination findings were normal. Magnetic Resonance Imaging (MRI) of the brain and Cerebrospinal Fluid (CSF) findings, bacterial and fungal cultures of CSF were all normal. All other laboratory investigative findings including Rose Bengal, VDRL tests and toxic screens of the urine were unremarkable. Electroencephalography (EEG) findings revealed a normal baseline but evaluated as an inadequate study due to non cooperation by the patient. A pre diagnosis of delirium associated with an organic cause or drug reaction was made. Further tests conducted to rule out possible infectious agents were Cold Agglutinin and Legionella pneumophila antigen tests, Mycoplasma IgM, IgG and Chlamydia IgA. The patient was started on 25mg Quetiapine per orally which is a tiny dose as 1/16 of effective antipsychotic dosage because of the delirium

state. After excluding other causes of this state, a Naranjo score of 6 was obtained which suggests a “probable” cause that it was induced by moxifloxacin.

Three days after the withdrawal of moxifloxacin treatment, her psychotic behaviors ceased. Consequently, the use of moxifloxacin was thought to have triggered her delirium state with hallucinations.

After the 14 day antibiotic treatment (2 days moxifloxacin 400 mg once a day intravenously+12 days claritromycin 500 mg perorally and ceftriaxone 1 gr twice a day intravenously), the patient was clear of all previous symptoms and follow-up visits at the infectious diseases department were scheduled. After two weeks, her PE and laboratory findings test results were found to be normal.

Discussion

The main cause of psychotic and delirium states is known to be psychological, with other causes such as organic and drug usage previously reported [2]. Understanding the origin of course is vital in determining and planning treatment. Neuroleptic treatment is widely utilized in these cases, but the doses used in this state should be proportionally designed in accordance with the origin. The use of high dose neuroleptic treatment is effective in non-organic based cases whereas it may totally worsen the clinical picture and medical condition of the patients with organic origin [2].

The reason why fluoroquinolones have been widely used in several infectious diseases is that they have high bioavailability and are known to be safe [3]. Nevertheless, neurotoxicity can also be observed after using these agents. The mechanism of neurotoxic effects of fluoroquinolones is not exactly known but some hypotheses have been proposed in this respect. Among these hypotheses, two of them have been surpassing one of which alleges that drugs, when interacting with the GABA receptor, have an inhibitory effect in terms of CNS symptoms. The other hypothesis claims that fluoroquinolones have an inducing excitatory effect via direct activation of NMDA, adenosine receptors [4].

Psychological states associated with ciprofloxacin and gatifloxacin are commonly seen in published reports [5-8]. However, there is only one case reported on moxifloxacin causing a delirium state in the literature [9]. Moxifloxacin, which is being utilized more commonly as a

response to improved activity against gram positive bacteria and anaerobes, is known to be similar to the fourth generation fluoroquinolones. A Medline search of the current literature revealed only one case of moxifloxacin induced delirium state. This was a 70 year old female patient who was treated for urinary tract infection [9]. Our case, the second to be reported in the medical literature presented with pneumonia.

Although commonly reported, medication induced psychotic and delirium states have frequently been underestimated, thus warranting thorough studies and investigations into the exact mechanisms behind the neuropsychiatric side effects of fluoroquinolones, especially moxifloxacin.

In our case the importance of a careful and complete medical and neurological evaluation of neuropsychiatric states is highlighted. In addition, multidisciplinary approaches will be instrumental in helping to reveal the exact diagnosis of organic brain syndromes.

Conflict of Interest Statement

We have no competing interests to declare.

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