



## Ofloxacin Induced Visual Hallucinations in Pediatric Patient

Manisha Bisht\* and Anil Kumar

Department of Pharmacology, Himalayan Institute of Medical Sciences, India

### Abstract

Drug induced psychosis is a well known adverse drug effect; however fluoroquinolones are amongst the lesser recognized causes of neuropsychiatric manifestation. Increasing awareness regarding these drugs induced neurological manifestations can decrease the undue patient anxiety, mismanagement and facilitate the treatment of these reversible adverse effects with simple dosage adjustment or drug withdrawal. In this case report, we are describing a case of visual hallucination occurring in 5-year-old girl having no other risk factor, following two doses of ofloxacin syrup. The symptoms resolved spontaneously after drug withdrawal. This case report highlights the need of vigorous Pharmacovigilance program especially in developing countries like India for recognizing these rare adverse drug effects to facilitate the better patient management.

**Keywords:** Ofloxacin; Hallucination; Adverse drug reaction

### Introduction

Ofloxacin, is a synthetic broad spectrum fluoroquinolones antibiotic which acts mainly by inhibiting bacterial DNA gyrase enzyme. It is active against a wide range of gram-negative and gram-positive microorganisms. It is usually well tolerated with a reported adverse drug reaction rate of 11% and discontinuation rate of 1.4% - 4% [1]. Most common adverse effects involve the Gastrointestinal (GIT) system, followed by Central Nervous System (CNS). Most common CNS symptoms are headache, dizziness, and drowsiness. In the literature, many neuropsychiatric symptoms like agitation, confusion, delirium, depression, hallucinations, vertigo and insomnia have been reported in adults with other fluoroquinolones. In this case report we are describing a 5-year-old girl who developed visual hallucinations following use of ofloxacin syrup prescribed for diarrhea. The rarity of this adverse effect in otherwise perfectly normal child without any predisposing factors and unusual intimidating visual hallucination prompted the authors to report this case. This is the second case reported worldwide in literature to our knowledge of visual hallucinations occurring in a five year old child.

### OPEN ACCESS

#### \*Correspondence:

Manisha Bisht, Department of  
Pharmacology, Himalayan Institute of  
Medical Sciences, India,  
E-mail: manishabisht@yahoo.co.in

Received Date: 04 Mar 2017

Accepted Date: 02 Jun 2017

Published Date: 04 Jun 2017

#### Citation:

Bisht M, Kumar A. Ofloxacin Induced  
Visual Hallucinations in Pediatric  
Patient. *Ann Pharmacol Pharm.*  
2017; 2(6): 1062.

**Copyright** © 2017 Manisha Bisht. This  
is an open access article distributed  
under the Creative Commons Attribution  
License, which permits unrestricted  
use, distribution, and reproduction in  
any medium, provided the original work  
is properly cited.

### Case Presentation

A 5-year-old girl presented with a history of visual hallucinations of objects like scooter, helicopter and ants moving all over the room in front of her. She also complained of bright light flashing all over. The parents did not see any such objects. The child had a history of fever and loose motions since two days, for which she was initially prescribed ibuprofen -paracetamol combination following which her fever subsided but the diarrhea was not relieved. So she was prescribed ofloxacin on second day by a pediatrician. The child had received two doses of the ofloxacin in the dose of 5 ml (50 mg) twice a day. The child did not receive oral rehydration solution or other medications for diarrhea. After the treatment there was decrease in the frequency of diarrhea. The same night, the child woke up screaming, telling that she could see large ants crawling all over the bed and in the room. She also alleged that she could see a scooter and helicopter flying in the room with bright headlights. There was no previous history of similar nightmares. This episode lasted for 2 hours and the child was brought to the hospital. After examination the child was reassured and made to sleep and the symptoms subsided. The child was not on any chronic drug treatment. She had no past and family history of any psychiatric ailment. Clinical examination of all the organ systems was unremarkable. There was no abnormality in general examination with pulse and BP within normal range. The laboratory profile was normal except TLC 10800/mm<sup>3</sup> with P70 L29, E1, B0. Development was normal for age. The next morning, the child woke up without any symptoms of visual hallucinations but could remember the whole episode. A provisional diagnosis of ofloxacin-induced hallucinations was made and the parents were advised to stop the ofloxacin. The child

remained asymptomatic and she was discharged the next day.

## Discussion

The visual hallucinations in our pediatric patient occurred after the consumption of two doses of ofloxacin. The dose of Ofloxacin that was administered was within the normal range. The laboratory parameters and neurological examination were also normal at the time of symptoms. The patient was afebrile during the episode of hallucinations and there was no history of any additional risk factor associated with psychosis. The symptoms resolved spontaneously after reassurance and discontinuation of drug therapy with no residual abnormality. There was no recurrence of symptoms. According to Naranjo's adverse drug reaction probability scale (score- 6) and WHO-UMC Causality Category this adverse reaction was found to be "probable" due to the drug.

CNS disturbances comprise second most commonly reported adverse effects of fluoroquinolones. Their frequency ranges from 0.2%-11% for individual agents while the overall frequency is 1%-2% [2]. (A) Most common CNS symptoms are headache, dizziness, and drowsiness. Rarely restlessness, sleep disorders, agitation, vision changes, convulsions were reported. Majority of the cases were reported in patients with concomitant predisposing factors, such as epilepsy, head injury, metabolic disturbances, anoxia, or concomitant drugs therapy. To our best knowledge this is the first case where visual hallucinations are reported in a child with no predisposition and abnormality in central nervous system.

Central nervous system disturbances due fluoroquinolones can either occur from direct effects or from drug -drug interactions. Structure activity relationship revealed that bulky substituted side chains at the R7 position of the fluoroquinolones nucleus, especially pyrrolidine or piperazine, appears to have the greatest influence in the CNS effects of these compounds [3]. This substitution increases the degree of inhibition of gamma aminobutyric acid (GABA<sub>A</sub>) receptor, which in turn is associated with CNS adverse effects. Many studies have suggested that, GABAergic inhibition is selectively but consistently reduced in the prefrontal cortex in various psychiatric disorders [4]. Similar mechanism of inhibition of GABA receptors is also attributed to neurotoxic effects of  $\beta$ -lactam antimicrobials. There is poor correlation between inhibition of GABA<sub>A</sub> receptors and clinically observed CNS adverse effects. Apparently relative blood brain barrier penetrability and extensive initial partitioning into the CNS plays a crucial role in influencing the relative frequency and severity of CNS toxicity amongst the different fluoroquinolones. Some studies have reported potential interaction between fluoroquinolones and no steroidal anti-inflammatory drug leading to seizures [5]. The proposed mechanism of this potential interaction is potentiation of the competitive inhibition of GABA<sub>A</sub> receptors by fluoroquinolones in the presence of no steroidal anti-inflammatory drug. In this case also the child was taking ibuprofen paracetamol combination for fever which may be potential factor in precipitating the acute hallucinations in the child.

Acute hallucinations and psychosis have been reported by other fluoroquinolones like ciprofloxacin, le ofloxacin and norfloxacin [6-8]. Majority of these events have occurred in elderly or patients with associated predisposing risk factor. Till date only one case of acute hallucination in pediatric population has been reported but the child had a positive history of epilepsy [9]. To our best knowledge this is the first case of acute hallucination in otherwise perfectly normal

child without any predisposing factors. The aim of reporting this case report is to increase the awareness in the pediatricians regarding the occurrence of rare manifestation of hallucination with the use of fluoroquinolones. Increased awareness regarding these drugs induced neurological manifestations can decrease the undue patient anxiety and chances of confusing it with psychosis and facilitate the management of these reversible adverse effects with simple dosage adjustment or drug withdrawal. Until recently fluoroquinolones use in pediatric population was limited due to fear of arthropathy. Therefore the adverse reactions of fluoroquinolones in pediatric population are still evolving due to increased use of these agents in this population.

On literature search in internet, it was observed that many case reports of acute hallucinations with fluoroquinolones are reported from India. This requires further evaluation whether there is any racial and ethnic predisposition for fluoroquinolones induced psychosis or it is a mere coincidence. This emphasizes the need of robust Pharma co vigilance program in India for developing national database to recognize the incidence of a particular adverse drug event. The reporting of adverse drug reporting is still neglectful in India, emphasizing the need to design the strategies to develop adverse drug reaction reporting culture [10].

## Conclusion

Fluoroquinolones are extensively used for the treatment of various infections and their use in pediatric population is also increasing; hence it is important to remain vigilant in recognizing the adverse effects of these drugs especially in children. Awareness regarding these reversible CNS adverse effects of FQs can prevent misdiagnosis, unnecessary investigation and improper medication.

## References

1. Fish DN. Fluoroquinolone adverse effects and interactions. *Pharmacotherapy* 2001;21:252-72.
2. Lipsky BA, Baker CA. Fluoroquinolone toxicity profiles: a review focusing on newer agents. *Clin Infect Dis*. 1999;28(2):352-64.
3. Domagala JM. Structure-activity and structure-sideeffect relationships for the quinolone antibacterials. *J Antimicrob Chemother*. 1994;33(4):685-706.
4. Tanaka S. Dysfunctional GABAergic inhibition in the prefrontal cortex leading to "psychotic" hyper activation. *BMC Neuroscience*. 2008;9:41.
5. Radandt JM, Marchbanks CR, Dudley MN. Interactions of fluoroquinolones with other drugs: mechanisms, variability, clinical significance and management. *Clin Infect Dis*. 1992;14:272-84.
6. Moorthy N, Raghavendra N, Venkatarathnamma PN. Le ofloxacin-induced acute psychosis. *Indian Journal of Psychiatry*. 2008;50(1):57-8.
7. Rataboli PV, D'Souza RS, Dhume VG. An unusual hallucination with norfloxacin. *J Assoc Physicians India*. 1996;44(7):504.
8. Dang A, Kamat R, Padmanabh RV. Ciprofloxacin induced nightmares in an adult patient *Indian J Psychiatry*. 2008;50(4):305-6.
9. Chauhan U, Shanbag P, Kashid P. Ofloxacin-induced hallucinations. *Indian J Pharmacol*. 2013;45:189-90.
10. Bisht M, Singh S, Dhasmana DC. Effect of Educational Intervention on Adverse Drug Reporting by Physicians: A Cross-Sectional Study. *ISRN Pharmacology*. 2014:259476.