

Oseltamivir-Induced Neuropsychiatric Symptoms in a Patient with Chronic Kidney Disease

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ABSTRACT

Oseltamivir, a Neuraminidase Inhibitor (NAI) frequently prescribed for influenza treatment and prevention, has been linked to several neuropsychiatric side effects, such as delirium, delusions and aberrant behavior. The neuropsychiatric side effects due to the administration of oseltamivir are mainly seen in children and adolescent patients. Case reports of neuropsychiatric problems in older individuals related to oseltamivir are sporadic. We report herein a case of an oseltamivir-related neuropsychiatric event in an older female adult in India, which was retrieved after stopping the drug.

Keywords: Oseltamivir, Neuropsychiatric disorder, Antiviral, CKD, COPD

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INTRODUCTION

A widely used antiviral drug given for the treatment and prevent influenza virus infections is oseltamivir, a NAI. Even though it's typically regarded as safe and effective, there are increasing reports of neuropsychiatric adverse effects related to its use. These symptoms can be minor to severe and include self-harming inclinations, delirium, hallucinations and abnormal behavior. Healthcare providers must be aware of the possibility of oseltamivir-induced neuropsychiatric side effects to monitor and manage patients on this medicine in an efficient manner that optimizes treatment benefits and minimizes risks to patient safety and well-being. Oseltamivir's label was updated by the US Food and Drug Administration in 2006 with a warning about the possibility of Neuropsychiatric Adverse Events (NPAEs).^{1,2} In India, the incidence is low when compared to other countries like Japan, In Japan the incidence rate is very high i.e.; around 100 cases with abnormal behavior were reported.³ By raising awareness of these potential complications, healthcare providers can make informed decisions regarding the use of oseltamivir and promptly address any adverse reactions that may arise. In our case report, we are discussing an old female patient with CKD on hemodialysis developed with neuropsychiatric symptoms after administration of oseltamivir.¹

CASE DESCRIPTION

A 74-year-old female patient with known Hypertension and CKD on hemodialysis was admitted to the hospital with complaints of COPD exacerbation and hypokalemia. The patient had a history of fever, cough, wheezing and decreased food intake for 5 days. She was very active before the hospital admission and had no history of neuropsychiatric disorders.

She had complaints of breathing difficulty and cough with white sputum since 5 days before hospital admission. Her symptoms became worse with the onset of a high fever, accompanied by aches and pains all over the body and loss of appetite.

Upon admission, the patient started on oseltamivir, ceftriaxone, hydrocortisone along with nebulization therapy for the management of suspected influenza and bacterial respiratory infection, respectively. The dosages of both medications were adjusted based on the HD dosing. Blood cultures were also sent, it was sterile. CT brain was also taken for ruling out haemorrhage; it showed a chronic lacunar infarct in the left thalamus and right internal capsule. Chest Xray was also normal. However, within 48 hr of initiation of oseltamivir therapy, she developed acute onset delirium, hallucinations exhibiting unusual behaviours such as removing her own infusion tube. The neuropsychiatric symptoms were severe and rapidly progressing, leading to significant distress and agitation. Then the patient shifted to intensive care unit i/v/o hypoxia and altered sensorium. On the 6th day the patient's fever subsided and the respiratory symptoms alleviated. The oral oseltamivir was discontinued at that point. Her neuropsychiatric symptoms began to improve within a few days and she became



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more alert, oriented and the hallucinations resolved. There were no further episodes of delirium or neuropsychiatric symptoms observed during the remainder of her hospital stay. The patient was discharged with stable parameters.

DISCUSSION

Oseltamivir, a neuraminidase inhibitor commonly used for the treatment and prophylaxis of influenza, has been associated with various neuropsychiatric adverse effects, including delirium, hallucinations and abnormal behavior. While these side effects are relatively rare, they can occur, particularly in elderly patients or those with underlying medical conditions.^{1,4}

In this case, a 74-year-old female with CKD on hemodialysis developed acute onset delirium and hallucinations shortly after initiation of oseltamivir therapy. The rapid resolution of symptoms following the withdrawal of oseltamivir strongly suggests a causal relationship between the medication and the neuropsychiatric manifestations observed. Up to 10% of the drug passes through the blood-brain barrier, responsible for the neuropsychiatric side effects of the drug.^{5,6} Oseltamivir carboxylate can penetrate the blood-brain barrier from the blood, but a study has shown that active drug flow by anion transporters restricts cerebral release. As a result, differences in the activity of anion transporters can justify interpersonal differences in the experience of drug-related psychiatric side effects.^{7,8}

Clinicians should be vigilant for neuropsychiatric adverse effects when prescribing oseltamivir, especially in vulnerable patient populations.⁹ Prompt recognition and discontinuations of the offending agents are crucial for the management of oseltamivir-induced neuropsychiatric symptoms. Alternative treatment options should be considered and patients should be monitored closely for resolution of symptoms and any potential recurrence upon rechallenge with oseltamivir or related medications.^{10,11}

CONCLUSION

This case underscores the importance of considering oseltamivir-induced neuropsychiatric adverse effects in patients presenting with acute onset delirium or hallucinations, particularly in the elderly or those with underlying medical conditions. Timely recognition, withdrawal of the offending agent and supportive care are essential for the management of such complications, leading to favorable clinical outcomes and improved patient safety.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

ABBREVIATIONS

NAI: Neuraminidase inhibitor; **CKD:** Chronic Kidney Disease; **COPD:** Chronic obstructive pulmonary disease.

SUMMARY

Oseltamivir, a widely used antiviral drug for treating influenza, has been linked to neuropsychiatric adverse effects, including self-harming inclinations, delirium, hallucinations and abnormal behavior. These side effects are relatively rare but can occur, particularly in elderly patients or those with underlying medical conditions. In a case report, a 74-year-old female with hypertension and CKD on hemodialysis developed acute onset delirium and hallucinations shortly after initiation of oseltamivir therapy. The rapid resolution of symptoms following the withdrawal of oseltamivir suggests a causal relationship between the medication and the neuropsychiatric manifestations observed. Up to 10% of the drug passes through the blood-brain barrier, responsible for the neuropsychiatric side effects of the drug. However, active drug flow by anion transporters restricts cerebral release, so differences in the activity of anion transporters can justify interpersonal differences in the experience of drug-related psychiatric side effects. Clinicians should be vigilant for neuropsychiatric adverse effects when prescribing oseltamivir, especially in vulnerable patient populations. Prompt recognition and discontinuation of the offending agent are crucial for the management of oseltamivir-induced neuropsychiatric symptoms. Alternative treatment options should be considered and patients should be closely monitored for resolution of symptoms and potential recurrence upon rechallenge with oseltamivir or related medications.

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