Case Report

A case report of rapid-onset hyponatremia induced by low-dose olanzapine

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Abstract

Hyponatremia has been reported with the use of psychotropic drugs. Olanzapine does not find much mention as a cause of hyponatremia in literature; however, it has been found to be the second most frequently reported atypical antipsychotic to cause it. We report a case of hyponatremia due to syndrome of inappropriate antidiuretic hormone secretion which occurred at a rapid onset following the administration of low-dose olanzapine during inpatient treatment of a patient with bipolar disorder. We would like to highlight our case for the need to be vigil about such fatal side complications apart from metabolic side effects of atypical antipsychotics.

Keywords: Hyponatremia, olanzapine, syndrome of inappropriate antidiuretic hormone secretion

Introduction

Hyponatremia is considered a side effect of various psychotropics including mood stabilizers and antidepressants.[1] The symptoms can range from anorexia, vomiting, lethargy to irritability, agitation, and confusion, which can be confused with mental illness. We would like to report a case of rapidly induced hyponatremia due to syndrome of inappropriate antidiuretic hormone secretion (SIADH) with low-dose olanzapine which occurred at our institution.

Case Report

Mrs. X is a 45-year-old unmarried female who is a known case of bipolar affective disorder of total duration of 15 years during which she had two manic episodes without psychosis, the last episode being 10 years back. She is off medication for the past 7 years as per her previous therapist's advice following absence of any psychiatric symptoms for 2 years after treatment of the second episode. She presented with symptoms of elevated mood, increased talk, overfamiliarity, and decreased need for sleep for 5 days following a financial stressor. There was no history of aggression or psychotic symptoms and the symptoms did not affect her work or conflicted with her family members or colleagues. There is no history of any medical illness, use of other medications, or substance-use disorders. She belongs to the low socioeconomic status, with a family history of mental illness in the first- and second-degree relatives, suggestive of a depressive disorder.

On mental status examination, she was adequately groomed with normal psychomotor activity. Her talk was increased in tone, tempo, and content, but there were no formal thought disorders. Her mood was euphoric and there were no ideas of guilt, depressive ideas/death wishes, or psychotic symptoms. Her abstract ability was impaired, and her insight was grade 2.

Her physical examination and vital signs revealed no abnormalities. Laboratory investigations on the day of admission including hemoglobin, total and differential count, platelet count, serum sodium and potassium, erythrocyte sedimentation rate, routine

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urine examination, renal and liver function tests, random blood sugar, and lipid profile were within the normal limits.

As per the 10th revision of International Statistical Classification of Diseases and Health Related Problems 10, a diagnosis of bipolar affective disorder, current episode hypomanic, was made. Given her history and a chance of her symptoms evolving to fully fledged manic episode, she was admitted and started on olanzapine 2.5 mg tablet HS and lorazepam 1 mg tablet HS. The patient slept the same night, but on the next day, she was found to be drowsy, not oriented in time and place with impaired attention, concentration, and immediate memory. There was no history suggestive of excessive fluid intake by the patient, vomiting, or diarrhea. She was afebrile, with normal vital signs. There were no signs of dehydrations and generalized/pedal edema. Her neurological examination did not reveal any lateralizing signs and examination of her other systems did not reveal any abnormalities. Her laboratory investigations were repeated and serum sodium was found to be 128 mEq/L with normal serum potassium and renal function tests. Other investigations were within the normal limits. Chest X-ray and computed topographic scan of the brain did not reveal any abnormalities. Further investigations revealed low serum osmolality (260 mOs/kg), elevated random urine osmolality (110 mOs/kg), and random urine sodium levels (55 mEq/L), based on which a diagnosis of SIADH was made. Antidiuretic hormone (ADH) level estimation was not available at our institution. After consulting with the physician, olanzapine was stopped and she was advised to follow normal diet and restricted fluid intake. Lorazepam 1 mg tablet was continued in the night. The patient's general condition improved over the next 2 days, with the patient attaining clear sensorium and normal serum sodium level on the 4th day. Lithium 300 mg once daily was started on the same day for the patient's hypomanic symptoms along with lorazepam. Lithium was gradually increased to 600 mg in two divided doses over the next 2 days for control of symptoms. She was discharged on the 8th day after becoming euthymic with the same medications. Her serum sodium was normal on the day of discharge. Rechallenge test was not attempted in the patient.

Discussion

Our patient developed hyponatremia following the administration of olanzapine which can be used in the acute treatment of bipolar mania. It occurred at a rapid onset and following the administration of low-dose olanzapine. The Naranjo algorithm showed a score of 4, revealing a possible causality. Our patient was not on any medications prior to her admission and lorazepam was not found to be associated with hyponatremia. The patient did not show any signs of polydipsia during her stay and other investigations did not suggest that she had other causes of SIADH including brain and chest tumors. Other risk factors for hyponatremia in psychiatric patients including chronic obstructive pulmonary disease, diabetes, hypertension, and elevated creatinine levels were absent in this patient.[2]

Olanzapine-induced hyponatremia does not find much mention in medical literature. Olanzapine has been found to be useful in polydipsia and hyponatremia in schizophrenic patients.[3,4] However, olanzapine is reported to be the second most frequently reported atypical antipsychotic associated with hyponatremia as per the World Health Organization global individual case safety report database system (VigiBase) maintained by the Uppasala Monitoring Centre.[5] Lareb, The Netherlands Pharmacovigilance centre, reported three cases and MEDLINE search showed two case reports of hyponatremia associated with olanzapine.[6-8] In an animal study by Kiss *et al.*, olanzapine has been shown to be capable of SIADH.[9] Dudeja *et al.* have also reported a possible olanzapine-induced hyponatremia caused due to SIADH.[10] Dopamine inhibits ADH release, and dopamine antagonist such as haloperidol and domperidone via its D2 receptor antagonism has been shown to block this effect.[11,12] ADH response when presented with hypertonic stimuli has also been found to be increased with dopamine receptor antagonism.[13] It is possible that olanzapine, which can also block dopamine receptor D2, can have this effect of ADH release. Meulendijks *et al.* in their systematic review of literature of hyponatremia caused by antipsychotics including olanzapine found that the occurrence of hyponatremia is not dose dependent.[14] Minimizing the dose of antipsychotic has also not been found to improve sodium levels in hyponatremic patients also.[15] The management of hyponatremia includes stopping the offending drug and water restriction while correction of sodium levels and use of ADH antagonists such as demeclocycline and lithium depend on clinical symptoms and severity of hyponatremia.[16]

We would like to conclude that doctors should remain vigil about this side effect of olanzapine and that it can occur at a rapid onset and at a low dose as in our case report.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given her consent for her images and other clinical information to be reported in the journal. The patient understand that her names and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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