Case Report:

Atypical Antipsychotic olanzapine induced diabetic ketoacidosis

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Abstract

Atypical antipsychotic agents have been associated with hyperglycemia and diabetic ketoacidosis. We are reporting a case report of olanzapine associated with diabetic ketoacidosis.

Key words: Diabetic ketoacidosis, atypical antipsychotic, olanzapine

Introduction

Atypical antipsychotics have become the mainstay of management of schizophrenia and other psychotic disorders because of their low risk of extrapyramidal symptoms. However, diabetes, neuroleptic malignant syndrome, pancreatitis, weight gain have been reported with use of atypical antipsychotic agents (1). Several reports have linked with hyperglycemia, including new onset diabetes and worsening of existing diabetes to the use of atypical antipsychotic agents including clozapine, olanzapine, risperidone and quetiapine. The mechanism for this adverse reaction is not clearly understood but has been postulated due to insulin resistance caused by weight gain or direct actions on insulin target tissues (1). We describe the case of a patient with schizophrenia who initially was non-diabetic and after starting olanzapine presented to us with diabetic ketoacidosis (DKA).

Case presentation

A 35 year old male patient known case of schizophrenia presented to the emergency department with nausea, vomiting and abdominal pain for 2 - 3 days. The patient had been on haloperidol monotherapy for treatment of schizophrenia until 15 days before admission in the psychiatry department, when olanzapine (10 mg/d) was added because his psychiatric symptoms were not controlled with haloperidol alone. He had no family history of diabetes and never before had any blood test suggestive of hyperglycemia.

After adding olanzapine his psychiatric symptoms gradually improved. At the time of admission in psychiatry department his blood sugar level was normal (fasting blood sugar: 89 mg/dl, post prandial blood sugar: 134 mg/dl). Patient developed nausea, vomiting and abdominal pain 12 - 13 days after initiation of olanzapine therapy (10 mg/day). Now this time laboratory data showed severe hyperglycemia (random blood sugar: 625 mg/dl) with metabolic acidosis (pH: 7.27, HCO3: 10 meq/l) Urinary ketones were 3+ and urinary sugar were 4+. While blood counts, Liver function and kidney function tests were normal. Patient was managed on the line of diabetic ketoacidosis with intravenous insulin infusion and fluid replacement and after 18 hrs the patient’s blood sugar fell to 250 mg/dl. After 18 hours NPH insulin at bed time and three premeal regular insulin were initiated and insulin infusion was stopped. His nausea vomiting and abdominal pain resolved overnight, olanzapine was discontinued and gradually insulin requirement decreased and then after 20 days insulin was stopped because of low blood sugar level. The patient was shifted on other antipsychotic drug and was followed up for next two months and his blood sugar level was quite normal.

Discussion

The newer atypical antipsychotic medications were introduced first with clozapine in 1990, these medications have been widely used. Beginning in 1994, case reports began to
appear in literature expressing possible association between clozapine and diabetes mellitus (2,3). Beginning in 1998, reports surfaced associating olanzapine with diabetes (4-8). Cases have also been reported concerning diabetes and risperidone.

Few studies thus far have attempted to quantify the association between atypical antipsychotic agents and diabetes mellitus.

Ely SF et al., (9) reported 17 deaths due to DKA in psychiatric patients treated with second generation antipsychotic medications. The most frequent atypical antipsychotic medications found were quetiapine and olanzapine followed by risperidone.

In a matched case-control study by Lambert BL et al., (10), a total of 3663 cases were matched to 14523 non-diabetic controls. The study concluded that exposure to olanzapine or clozapine is associated with a 34-41% increase risk for developing type 2 diabetes.

Henderson et al., (11) reviewed the records of patients presenting with diabetic ketoacidosis, using an electronic database between 1995 and 2001. During the 7 year period, 18.4% of schizophrenia patients were diagnosed with diabetes mellitus, compared to 6.6% in the general hospital population (p < 0.001). The incidence of diabetic ketoacidosis for each of atypical antipsychotic drugs over the 7 year period was as follows: clozapine, 2.2%; olanzapine, 0.8%; and risperidone, 0.2% (no incidence with ziprasidone or quetiapine).

In a case report by Varma MK et al., (12), a 35 year old woman with a history of bipolar affective disorder treated with olanzapine presented with severe diabetic ketoacidosis. She had no prior history of diabetes or risk factors for diabetes.

If there is an association between atypical antipsychotic drugs and diabetes, why could that be? Although these new medications are known to cause weight gain an important risk factor for type 2 diabetes but not all of the reported cases had weight gain. Recent research on the mechanism by which atypical antipsychotics induce diabetes mellitus has revealed a role for muscarinic 3 receptor in the modulation of insulin, ghrelin and cholecystokinin (CCK) via vagus nerve. Also interactions between gastric inhibitory polypeptide (GIP) and other vagal inputs could be of importance for the postprandial metabolic effects of atypical antipsychotics (13,14).

In conclusion, since olanzapine is becoming more and more popular as a first line agent in the treatment of psychosis as well as in mood disorders, proper guidelines should be established for monitoring blood glucose levels and determination of risk factors for diabetes mellitus. Hence, it is very important for clinicians that all patients started on olanzapine require regular monitoring of their blood sugar levels. Clinicians should take at most precaution in pre-existing patients with diabetes before starting olanzapine. If olanzapine is suspected to being a causal factor for hyperglycemia, we can reduce that risk by withdrawal of olanzapine or switching over to some other medicine without worsening the psychiatric condition of the patient.

References


