

Hemichorea-Hemiballismus as A Complication of Hyperosmolar Hyperglycemic State: A Case Report

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This case report describes a rare movement disorder Hemichorea – Hemiballismus (HC-HB) which was seen as a complication of Hyperosmolar Hyperglycemic State (HHS) which in itself a rare complication of Type II Diabetes Mellitus (Type II DM) in a 72 years old female. It is seen among individuals with poorly controlled long standing Diabetes Mellitus. One of the studies has described the pathogenesis as impaired function of GABAergic inhibitory neurotransmission in the striatum leading to disinhibition of the basal ganglia- thalamo- cortical circuit leading to abnormal involuntary movements. Treatment is focused mainly on good control of sugar that leads to rapid resolution of the movements.

Keywords: diabetes mellitus, hemiballismus-hemichorea, hyperosmolar hyperglycemic state.

Hyperosmolar hyperglycemic state previously termed as hyperosmolar hyperglycemic non-ketotic coma is one of the serious metabolic derangements that occur in patients with Type II DM. It is a life threatening emergency which is less commonly seen than Diabetic Ketoacidosis (DKA). It usually occurs in individuals with type II DM. HC-HB is one of the rare complications of HHS which is mostly

reported in elderly females and among Asian descent. Hemichorea is an involuntary random appearing movement that is rapid and non-patterned confined to one side of the body. Hemiballismus is a violent form of chorea comprised of wild, flinging, large amplitude movements on one side of the body.

Case Report

This is a case of a 72-year-old female who

presented to the emergency department of B&B Hospital with the complaints of irritable and aggressive behaviour since few days. She had decreased appetite and was not feeding well since several days and her home monitoring of blood glucose by glucometer showed more than 600 mg/dL on regular basis. There was no history of fever, loss of consciousness, abdominal pain, nausea and vomiting. She had multiple comorbid conditions which included Type II Diabetes Mellitus, Hypertension, Chronic Kidney Disease, COPD, Ischemic Heart Disease and Hypothyroidism.

On examination the patient was irritable, aggressive and abusive but oriented to time, place and person. She was dehydrated. Her vitals were stable and a detailed clinical examination including her neurological examination did not show any abnormal findings. When investigated she was found to have a random blood sugar of 1225mg/dL with absence of ketonuria. Arterial blood gas showed a pH of 7.38. Blood biochemistry revealed Urea of 111.5 mg/dL, Creatinine of 1.90mg/dL, Sodium of 121mmol/L, Potassium of 4.5mmol/L, Calcium of 8.1mg/dL, Magnesium of 3.1mEq/L and Phosphorus of 4.4mg/dl. The plasma osmolality was 358mosmol/ml. CT scan of head showed age related changes.

She was diagnosed as a case of Hyperosmolar Hyperglycemic State. Management was started with correction of dehydration with 0.9% saline, and continuous intravenous infusion of regular insulin with monitoring of blood sugar. As the patient started feeding normally and her

blood sugars came to an acceptable level, insulin infusion was converted to Human pre-mixed insulin (30 percent of regular and 70 percent of NPH insulin) on the third day of admission. The next day she started having multiple episodes of involuntary body movements which were repetitive, rotatory movements confined to the left upper and lower limbs. The movements coincided with the rise in blood sugar levels. Her serum electrolytes were being monitored regularly and MRI of brain was done which showed age related changes. The movement was diagnosed as Hemichorea – Hemiballismus, a rare movement disorder seen as a complication of Hyperosmolar Hyperglycemic State. Patient was put back on short acting insulin infusion. Haloperidol was started. With a good control of blood sugar there was rapid resolution of the movements, haloperidol was tapered off and the patient discharged with subcutaneous Human pre-mixed insulin. She was on regular follow up and the abnormal body movements did not recur again.

Discussion

Hemichorea - Hemiballismus due to hyperglycemia was first described by Bedwell in 1960.¹ There have been no epidemiological studies but the prevalence of this disorder is less than 1 in 100,000. Women are more frequently affected than men (women: men= 30:17). It is usually seen in old age.² Most of the cases reported are from the Asian countries.

The typical triad includes unilateral (or bilateral) involuntary movements,

contralateral (or bilateral) striatal abnormalities on neuro imaging and hyperglycemia in patients with known or previously unrecognized diabetes mellitus. Our patient, however, did not exhibit any striatal abnormalities on neuro imaging. Carlos Cosentino and group, in their case series, have shown that not all patients with HC-HB associated with hyperglycemia have striatal abnormalities in neuroimaging.³ The involuntary movements begin acutely or subacutely often worsening over several days. The involuntary abnormal movements can be classified from mild chorea to severe ballism based on their type and severity.³

The pathogenesis is thought to be due to hyperglycemia induced impaired cerebral autoregulation causing hypoperfusion and activation of anaerobic metabolism and depletion of gamma aminobutyric acid (GABA) in the basal ganglia neurons, which is the major inhibitory neurotransmitter in the basal ganglia.⁴ Hyperglycemia is also thought to cause perfusion changes in the contralateral striatum and ischemic excitotoxicity of GABAergic neurons.⁵

CT images of these patients may show evidence of striatal hyperdensity. MRI may reveal striatum hyperintensity on T1w and hypo or isointense on T2w.⁶

All subjects have hyperglycemia prior to the Hemiballismus-Hemichorea. Type II DM and less frequently type I Diabetes Mellitus are associated with this disorder. The mainstay of treatment is aggressive glycemic control. The movements slowly improve after the glucose correction. But the neuroleptics like haloperidol are often

used to expedite symptomatic resolution.⁷

Conclusion

Hemichorea – Hemiballismus is a rare complication of Hyperglycemic Hyperosmolar State which in itself is an uncommon complication of Diabetes Mellitus. Any patient with abnormal body movements giving history of uncontrolled diabetes should be suspected for Hemichorea-Hemiballismus. It is a reversible condition and carries a good prognosis with control of hyperglycemia. Therefore prompt recognition and treatment is essential.

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