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A case on hemiballismus due to uncontrolled diabetes

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ABSTRACT

Uncontrolled diabetes gives rise to severe systemic complications that affect different systems of our body. Among those complications, hemiballismus is a rare manifestation that occurs due to hyperglycemia and can be reversible in most cases by decreasing elevated sugar levels to normal range. Here, we present a case of a patient with diabetic history since 10 years ago, who presented with uncontrolled jerky movements on one side of his body since 15 d, and he recovered after appropriate therapy. Medication adherence in diabetic patients and regular monitoring of blood sugar levels are important.

1. Introduction

"Ballism" refers to large amplitude choreic movements of the proximal parts of the limbs including flinging and flailing movements, and ballism is most frequently "unilateral" in which it is referred as "hemiballismus"[1]. It is often due to lesion in contralateral sub thalamic nucleus or its connections or multiple infarcts in the contralateral striatum[1,2]. Basal ganglia is majorly involved in promotion, inhibition and sequencing of movements. It also maintains muscle tone and body posture. Damage to basal ganglia may cause hyperkinesias, akinesia or bradykinesia. General clinical manifestations of hemiballismus include irregular body movements, violent writhing, nausea, vomiting[3], and general treatments for hemiballismus include neuroleptics (haloperidol, metachlopromide, olanzapine), dopaminedepleting agents (tetrabenazine, reserpine), GABAergic drugs (clonazepam, gabapentin)[4]. Diagnostic tests include physical examination and CT scan[5]. Diabetes is a disease that impairs glucose metabolism, finally resulting in hyperglycemia, and this chronic illness is associated with chronic inflammation and can give rise to a wide range of "systemic complications". Complications in the neurovascular system may involve the brain, spinal cord, cranial nerve, autonomic nervous system, or peripheral nerve[1-3,6,7]. Patients with peripheral neuropathy often complain of feeling numbness, pain, or tingling sensations in their hands and feet, which can be easily diagnosed as diabetic complications by the attending physician[5,8]. However, hemiballismus is not same with other neurological complications, for it is more complex and challenging for physicians to diagnose as one of diabetic complications. If the neuronal part of the brain is involved, patients may present with choreiform spectrum[4,9], and hemiballismus is one of the spectrums of choreiform, which can be a manifestation of hyperglycemia due to uncontrolled diabetes[2,3,4,6,7]. It is rare, and its prevalence is uncertain. A case of hemiballismus with long standing uncontrolled diabetes is reported.

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2. Case report

A 65-year-old male was admitted to emergency department after experiencing uncontrollable, irregular jerking movements of left side of his body for 15 d. The patient was apparently normal before 15 d, and the present complaints started as tingling sensation of finger tips of left hand which extended to whole left hand, left side of face, and left lower limb by next day. The patient also experienced blurring of vision before this symptom. However, he was unable to hold things with left hand. Suffering type-2 diabetes mellitus and hypertension for 10 years, he was not on regular medication. His medications include gliclazide+metformin, bisoprolol, tenegliptin, tetrabenazine, sodium valproate. On examination, the patient's vital signs were stable. Results of language test, and cranial nerve examinations were normal. Involuntary movements of left upper limb are more frequent than that of left lower limb. The symptoms were continuous, and irregular jerking movements of his left hand has increased rapidly and extended to entire left side of body. Laboratory examinations have done, and the result showed the total bilirubin 1.1 mg/dL and electrolytes including sodium: 136 mmol/L, potassium: 3.5 mmol/L and chloride: 101 mmol/L), blood urea 43 mg/dL, serum creatinine 1.1 mg/dL, hemoglobin 11 g/dL, albumin 4.3 mg/dL. All of the performed laboratory results were within the normal range. The random glucose levels were elevated to 170 mg/dL (Normal range 120 mg/dL). CT scan was performed and showed infracted with groins in left cerebral hemisphere in left occipital lobe, chroniclacunar infractions in B/L capsule ganglionic region which confirmed the diagnosis as hemiballismus. The case was discussed with a neurologist and based on the presented symptoms and underlying uncontrolled diabetes, hemiballismus due to poorly controlled diabetes was suspected. He was then admitted for blood glucose stabilization, as well as monitoring his symptoms.

3. Discussion

Hemiballismus is one of the most common spectrum of the choreiform abnormal movement disorder[1,3]. It is mainly caused by focal and diffuse systemic process, and focal includes infection of central nervous system, stroke, neoplasm[4,6-9], vascular malformations, tuberculoma, and demylinating plaques. Diffuse systemic process includes nonketotic hyperglycemia, hyperparathyroidism, autoimmune disorders, Wilsons disease, and thyrotoxicosis[1-3]. Other causes include usage of drugs like levodopa, oral contraceptives. Among these causes non-ketotic hyperglycemia is the second most common cause for the development of hemiballismus. In this patient, poor glycemic control was observed, and as a result of enormously increased blood glucose levels, hyper viscosity of blood eventually leads to some extent of ischemia at the level of basal ganglia, finally leading to decreased production of gama amino butyric acid and acetyl choline at the basal ganglia[1,3,5,8,9].

As a result, it causes disruption of normal impulse transmission and circuit occurs. Dopamernegic activity increases enormously due to loss of inhibitory action, there by resulting in continuous irregular jerking movements of limbs[8,9]. The underlying cause for hemiballismus in this patient is uncontrolled diabetes, hence physicians opted treatment mainly aiming at maintain normal blood glucose levels and to control hyperkinetic movements (uncontrolled jerking movements)[9]. As the patient has elevated random blood sugar levels, ant-diabetic therapy (metformin, gliclazide, tenegliptin), antihypertensive (bisoprolol) continued to be used, which has been used for past 10 years. Tetrabenazine and sodium valproate were given to treat present symptoms of hemiballismus. Tetrabenazine acts as a high affinity inhibitor of monoamine uptake at the presynaptic neurons thereby increasing degradation of monoamine (dopamine)[4]. Sodium valproate acts by altering properties of voltage dependent sodium channels thereby increasing levels of gama amino butyric acid in brain[3]. The therapy continued for 10 d, then the symptoms were relieved and on discharge the patient was asked to continue the administration of given drugs (tetrabenazine, sodium valproate)[4,7] for 2 weeks. Then exactly after one year, the patient presented with same complaints and was provided the same therapy for 1 week, then symptoms were relieved. As the patient complained with similar symptoms frequently, strict medication adherence and proper diabetic diet should be followed in order to prevent further complications[7]. The patient has poor medication adherence, which has lead to severe complications of hyperglycemia that is "hemiballismus" on recurrent episodes, hence medication adherence and regular monitoring of blood sugar levels are important to prevent complications of hyperglycemia.

Conflict of interest statement

The authors report no confclit of interest.

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