



The Hyperglycaemic Hand: A Case Report of a Continuous Partial Epileptic Seizure Revealing an Underlying Non-Ketotic Hyperglycaemia

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Abstract

Some abnormal hand movements, unknown to the majority of hand surgery specialists can often lead to misdiagnosis, especially when they are secondary to a medical or psychiatric condition. We would like to present the case of a seizure localised to the hand secondary to a non-ketotic hyperglycaemia. It is extremely important to recognize this clinical presentation and to diagnose this condition as soon as possible in order to provide appropriate care and treatment. Timely diagnosis is a matter of paramount importance as it reduces the risk of introducing inappropriate treatment that could aggravate the clinical presentation. In conclusion, when assessing unexplained hand movements, it is important to test the blood glucose levels in an emergency setting in order to rule out non- ketotic hyperglycemia.

Keywords: Hand; Partial epileptic seizure; Non-ketotic hyperglycemia

Introduction

Some abnormal hand movements, unknown to the majority of hand surgery specialists, can often lead to misdiagnosis, especially when they are secondary to a medical or psychiatric condition. Some abnormal hand movements can be caused by a Bravais-Jacksonian epileptic attack, a tetanic crisis, an extrapyramidal syndrome, a chorea, a functional dystonia, a central spasticity, a psychogenic hand disease connected to a hysterical conversion disorder. We would like to describe the case of an epileptic seizure localized to the hand secondary to a non-ketotic hyperglycemia.

Patient

We would like to present the case of a 64 years old female patient, right-handed, retired secretary, non-smoking. She had a past medical history of insulin dependent Type 2 diabetes, complicated by a stage 4 chronic kidney disease, neuropathy and retinopathy. She had a body mass index of 35 kg/m². The patient had been off her insulin treatment for one month, as she believed that the insulin could be responsible for her overweight. She attended our trauma clinic in the Hand Surgery unit in an emergency setting and presented with painful cramps associated to involuntary movements of the left hand and wrist. These episodes lasted few seconds and were interspersed with symptom-free intervals of few hours. The frequency and the intensity of these episodes had increased in the previous 5 days. On examination (Video 1), the clinical presentation was complete, without progression from distal to proximal or vice versa. We observed dystonic and abnormal rhythmic movements involving exclusively the fingers and wrist flexors. These clinical manifestations would last few seconds and stop abruptly. No loss of consciousness was observed. The absence of a past medical history of upper limb injury and the clinical presentation made us establish a diagnosis of epileptic seizure. The patient was referred to the Neurology specialist to undergo further investigations in an emergency setting. The urine dipstick test showed a glycaemia of 6.88 g/L without ketosis. The MRI scan of the brain showed no anomalies. The electroencephalography showed a partial electro-clinical crisis of the right brain hemisphere. A brain perfusion SPECT scan performed 8 days after the first consultation showed an area of low perfusion in the left temporal and insular cortex and in the right thalamus. All the symptoms subsided completely within the 24 hr following the reintroduction of the insulin in the treatment plan and the restoration of the hydroelectrolytic balance. The glycaemia decreased to 1.93 g/L. The patient was diagnosed with partial seizures secondary to a non-ketotic hyperglycemia in Type 2 diabetes with low compliance to the insulin treatment.

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Video:

Discussion

Abnormal hand movements are a rare reason for consultation in hand surgery, especially in an emergency setting. These movements can have multiple clinical presentations and patients tend to consult the neurologist or the internal medicine specialist rather than the hand surgery specialist. When the patient is assessed in clinic, a psychogenic hand disorder needs to be ruled out. Epileptic attacks can be caused by brain tumors or metabolic imbalances, especially hypoglycaemia. Partial epileptic attacks localized to hands in patients suffering from non-ketotic hyperglycemia have already been described. The link between partial seizures and hyperglycemia was first described by Maccario in 1965. We would like to stress the importance of keeping in mind this case report during the process of differential diagnosis. As a matter of fact, when assessing partial seizures, most clinicians would suspect an underlying hypoglycaemia and treat the patient with I.V. dextrose solution, misdiagnosing and aggravating the underlying hyperglycemia. We would also like to stress that anticonvulsant

medications are ineffective in the treatment of epileptic attacks secondary to metabolic disorders [1]. Epileptic attacks secondary to non-ketotic hyperglycemia usually occur in patients around the age of 60 years old [2]. In the majority of the cases, these epileptic attacks are partial, motor and localized to a limb, to the face or to a hemibody and can be triggered by a specific movement [3]. The incidence of non-ketotic hyperglycemia related seizures is estimated between 25% and 40% [4]. In 50% of the cases, it is the first clinical sign of diabetes [1]. Sometimes, it is a sign of decompensated diabetes. On average, the glycaemia is above 3 g/L. The average time of diagnosis is around 1 hr and 16 min [2]. Clinical signs and symptoms may subside within the first 24 hr or persist several days after the introduction of the appropriate dose of insulin and I.V. fluids in the treatment plan [3]. If an effective glycaemic control is attained, the epileptic attack subsides and does not recur [2]. It is extremely important to recognize this clinical presentation and to diagnose this condition as soon as possible in order to provide appropriate care and treatment. Partial motor seizures are an early sign of metabolic imbalance. Late signs are severe and include more serious complications such as dehydration, altered state of consciousness and death [4]. Timely diagnosis is a matter of paramount importance as it reduces the risk of introducing inappropriate treatment [2] that could aggravate the clinical presentation, such as phenytoin, a common anticonvulsant inhibiting the action of insulin [3].

In conclusion, when assessing unexplained hand movements, it is important to test the blood glucose levels in an emergency setting in order to rule out non-ketotic hyperglycemia.

Conflicts of Interest

Philippe Liverneaux has conflicts of interest with Newclip Technics, Argomedical, Zimmer Biomet, Biomodex.