

Bravais-Jacksonian Epilepsy Associated With Type 2 Diabetes Mellitus

Keywords: Bravais-Jacksonian epilepsy; Epilepsy; Type 2 diabetes; Mellitus diabetes; Seizure

Abstract

Introduction: Epilepsy associated with diabetes mellitus is very rare, and is seen mainly in type 1 diabetes. The focal forms are exceptional.

We report an unusual observation of Bravais-Jacksonian epilepsy (BJE) in type 2 diabetes mellitus.

Case report: A 50-year-old woman, who has been diabetic for a year but refuses treatment, was referred to us for high glycaemia (fasting blood glucose at 8.52 mmol/l and postprandial at 13 mmol/l) with recent onset abnormal movements in the upper left limb since a month. There were no degenerative complications of his diabetes. His HbA1C was at 8%. She was treated with metformin and intestinal alpha-glucosidase inhibitors with good evolution. The specialized neurological examination concluded with a BJE of the left arm. Brain imaging and EEG were normal. Epileptic seizures stopped after equilibration of diabetes.

Conclusion: Epilepsy remains exceptional and often difficult to diagnose and treat during type 2 diabetes mellitus. Our observation is, to the best of our knowledge, the first to signal such epilepsy associated with type 2 diabetes.

Introduction

The neurological manifestations during diabetes mellitus are varied and often the prerogative of old and unbalanced forms, however inaugural forms can be seen [1]. Peripheral neuropathies are by far the most common (60% of diabetics at some point in the course of the disease) whereas seizures are much rarer, and are mainly seen in type 1 diabetes [2-4].

In addition, a potential association between authentic epilepsy and diabetes mellitus is strongly evoked; it is particularly clear with type 1 diabetes and it has been demonstrated an epileptogenic physiopathogenic promoting role of anti-Glutamic Acid Decarboxylase (anti-GAD) autoantibodies, particularly in the genesis of temporal epilepsy [2,5,6]. These forms of epilepsy are classified as "autoimmune epilepsy" [6].

In diabetes mellitus type 2, epilepsy is much rarer, and is most often symptomatic (secondary to an underlying cause), unlike type 1 diabetes, where it is most often cryptogenic/primitive (85% versus 35%) [5].

We report an unusual observation of focal epilepsy type Bravais-Jacksonian in type 2 diabetes mellitus; an association that, to our knowledge, has not been reported before.

Case Report

A 50-year-old woman, who has been diabetic 2 for a year but refuses treatment, was referred to us for high glycaemias (fasting



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blood glucose at 8.52 mmol/l and postprandial at 13 mmol/l) with recent onset of abnormal movements in the upper left limb since a month.

There were no degenerative complications of his diabetes: 24-hour blood pressure profile, electrocardiogram, chest X-ray, creatinine and glomerular filtration rate, microalbuminuria and 24-hour urinary protein, ophthalmological examination and fundus were without anomalies. The Glycosylated Hemoglobin (HbA1C) was at 8%.

She was treated with metformin (2000 mg/d) and intestinal alpha-glucosidase inhibitors (150 mg/d) with a good evolution.

The specialized neurological examination concluded to Bravais-Jacksonian epilepsy of the left arm. Neurological imaging (cerebral CT, cerebral MRI and angio-MR) and electroencephalogram were without abnormalities. The electromyogram did not show signs of diabetic peripheral neuropathy in all four limbs.

She was initially treated with carbamazepine at a dose of 200 mg/day to stop seizures.

After three months, her glycemic control was satisfactory: fasting glucose at 5.2 mmol/l, 2 h postprandial glucose at 10 mmol/l and HbA1C at 6.5%. Carbamazepine was stopped and no recurrence of seizures was noted for now three years.

Discussion

It is estimated that approximately 25% of all diabetics will experience different types of seizures during their lifetime [7]. These convulsive seizures may have different clinical presentations: generalized tonic-clonic seizures [8-11], focal seizures often with motor expression and more rarely sensory or sensitive-sensory such as occipital seizures or "speech arrests" [12-15], and more exceptionally autonomic/vegetative crises [10]. Anecdotal cases of abdominal epilepsy have also been reported during diabetes mellitus [16].

These seizures occurring during diabetes mellitus are most often symptomatic secondary to metabolic disorders specific to diabetic disease such as: hyperglycemia even without ketosis (non-ketotic hyperglycaemia) [8,12,13,15,17,18], classic hypoglycaemia or exceptionally reactive hypoglycaemia hyperosmolarity or isolated hypomagnesemia [9,11,17,19-23].

More rarely, and in advanced forms of diabetes with chronic imbalance, seizures may be secondary to diabetic encephalopathy secondary to diffuse central nervous system microangiopathy (Mellitus-related encephalopathy) [10].

The association of diabetes mellitus with authentic epilepsy is much rarer, but seems far from a simple coincidence [7,24]. This association was reported with all types of diabetes mellitus: type 1 [2,4,25], type 2 [17,18,26], mitochondrial [27], Latent Autoimmune Diabetes of Adults (LADA) [28], juvenile-onset insulin-dependent diabetes and even neonatal (Permanent Neonatal Diabetes Mellitus) [29,30].

This association is more marked with type 1 diabetes where epilepsy is significantly more common than in the general population: risk multiplied by 2.8 to 3 [2,4]. This association is much rarer with type 2 diabetes; indeed only 3.35% of epileptic patients over 50 years of Ndiaye MM et al. were diabetic [26]. This prevalence, however, seems to be underestimated because in the Swedish study of 933 patients with unprovoked and newly diagnosed seizures, the odds ratio of having a seizure after the diagnosis of type 2 diabetes was 1.9 (95% CI 1.4-2.8), indicating a non-hazardous causal link compared to the general population [25].

The exact mechanism of this association is not yet well known it seems to be multifactorial, involving varying degrees of lesions of cerebral microcirculation, immunological abnormalities [13], metabolic disorders, genetic mutations and mitochondrial abnormalities [2,10,13,20,27].

In type 2 diabetics the most common clinical form of epilepsy is "Epilepsiapartialis continua" [17,18].

Epilepsy in type 2 diabetic patient remains difficult to diagnose and often represents a real diagnostic challenge for the clinician. Indeed, epilepsy may be the first manifestation of diabetes [18], and is often characterized by atypical presentations [10,15,16]. Thus, some authors recommend a systematic screening for type 2 diabetes in any patient with seizure occurring over the age of 50 [17,18].

In contrast, seizures in type 2 diabetic patients can be misinterpreted as epilepsy when they are simply symptomatic of a glycemic disorder that must be objectified, sometimes even through continuous glucose monitoring [11].

The seizures/epilepsies associated with diabetes mellitus are classically resistant to anticonvulsant therapy and respond better to insulin with rehydration [12,18], and insulin may be the only medication needed to treat effectively these cases [14].

Conclusion

Epilepsy is exceptionally associated with type 2 diabetes. It represents a real diagnostic and therapeutic challenge for the clinician, because of these often atypical clinical presentations, it's resistance to

anticonvulsants, and the differential diagnosis problem with simple symptomatic seizures secondary to glycemic disorder, not always easy to solve.

Our observation is, to our knowledge, the first reporting the association of a focal epilepsy type Bravais-Jacksonian to type 2 diabetes mellitus. The causal link is comforted by the concomitant appearance with the uncontrolled diabetes, normality of radiological and electrical neurological investigations, and the disappearance of seizures with the correction of glycemic parameters even after stopping the anticonvulsant treatment.

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