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Occipital epilepsia partialis continua induced by non-ketotic hyperglycaemia☆,☆☆

Epilepsia parcial continua con foco occipital inducida por hiperglucemia no cetósica

Dear Editor:

Numerous neurological manifestations of glycaemic alterations have been described, with hypoglycaemia being a well-known cause of epileptic seizures.[1] It is less well known that neurological symptoms may present as the initial manifestation of hyperglycaemia,[2] with epilepsia partialis continua being a characteristic form; these patients usually present focal motor seizures, unlike those with hypoglycaemia.[3] Hyperosmolar non-ketotic hyperglycaemia is the type of hyperglycaemia most frequently associated with these symptoms, and is occasionally the initial manifestation of undiagnosed diabetes mellitus.[4] The specific pathophysiological mechanism underlying this association is not fully understood, and ketosis may protect against seizures in patients with hyperglycaemia.[4] We present the case of a patient with occipital epilepsia partialis continua in the context of non-ketotic hyperglycaemia, resolving with metabolic control. This case underscores the need to consider this entity, which, though rare, has considerable therapeutic and prognostic implications.

The patient was a 61-year-old man with hypertension, dyslipidaemia, and type 2 diabetes mellitus, which had previously been well controlled. He was being treated with telmisartan, simvastatin, fenofibrate, metformin, acetylsalicylic acid, and omeprazole. He had no history of seizures or any other relevant history. He began to present simple visual hallucinations of sparkling lights; onset was sudden and episodes were of variable duration (seconds to hours). Visual hallucinations affected both eyes and the entire visual field, and persisted when the eyes were closed. He reported reversal of vision metamorphopsia when the symptoms initially presented, although this resolved spontaneously. The patient presented no visual field deficits, headache, or any other focal neurological sign. These symptoms had progressed for 20 days before the patient consulted the department; the frequency of the episodes ranged from 5 to 20 per day, with no defined temporal or circadian pattern.

Neurological examination revealed no focal neurological deficits. A complete blood count revealed a glucose level of 382 mg/dL, with 14% glycated haemoglobin. The only other alteration detected was known hypertriglyceridaemia. Results for ketone bodies were negative. The patient displayed EEG asymmetry, with abnormal occipital alpha waves in the right hemisphere (Fig. 1). The brain MRI study revealed T2 hyperintensity and diffusion restriction in the right occipital cortex, with T2 hypointensity in the adjacent subcortical region (Fig. 2). We also performed a head and neck MRI angiography and a transcranial and supra-aortic trunk Doppler ultrasound study, with no relevant findings. Insulin therapy was started and the visual symptoms resolved within hours and have not recurred to date (15 months of follow-up), with the patient presenting optimal glycaemic control. Findings from subsequent EEG and MRI studies were normal (Figs. 1 and 2).

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☆☆ This study was presented as a poster at the 15th Annual Meeting of the Madrid Association of Neurology, held in October 2017.

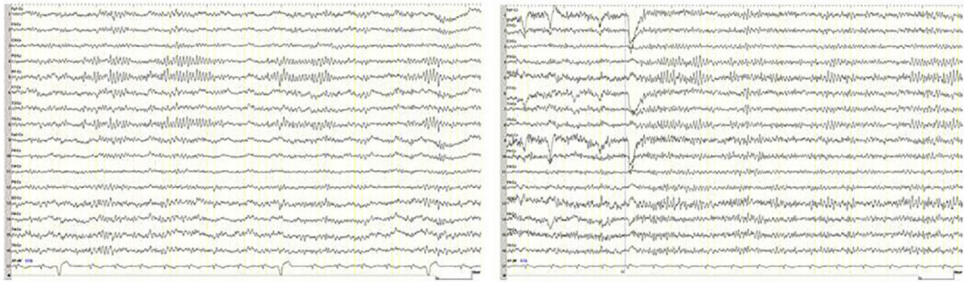

Figure 1 EEG traces obtained before and after onset of insulin therapy. The first trace shows asymmetrical alpha activity, which is absent in the second.

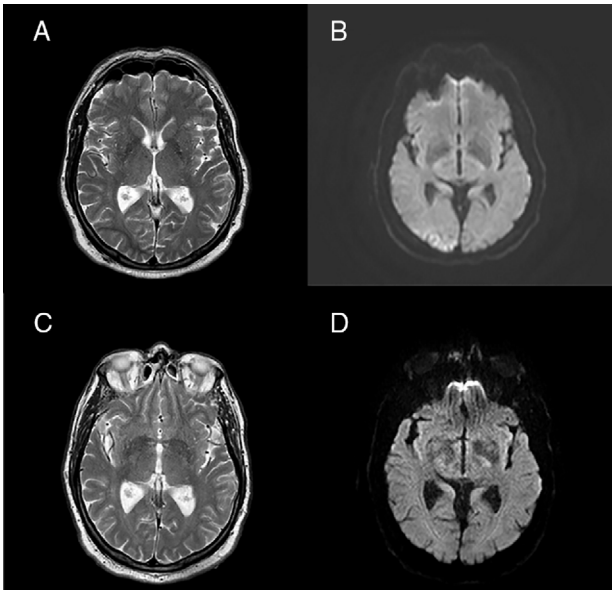

Figure 2 Brain MRI study. (A) T2-weighted sequence showing hyperintensity in the right visual cortex and adjacent subcortical hypointensity. (B) Diffusion-weighted sequence showing an area of restricted diffusion in the right visual cortex. (C and D) T2- and diffusion-weighted sequences obtained after onset of insulin therapy, showing total resolution of the alterations.

Antiepileptic drugs were not administered at any time.

Occipital epileptic seizures are rare in patients with hyperglycaemia[5]; in recent years, they have been linked to characteristic MRI findings, such as subcortical hypointensities on T2-weighted sequences and diffusion restriction in the occipital cortex.[6–8] The pathophysiological mechanism underlying this association remains unknown, although it has been suggested that abnormal iron deposition may play a role.[6] The resolution of clinical, radiological, and EEG signs after onset of diabetes treatment is essential to diagnosis, avoiding unnecessary complementary tests and the introduction of chronic antiepileptic treatment and the associated consequences.

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Encephalopathy secondary to lamotrigine toxicity☆

Encefalopatía secundaria a intoxicación por lamotrigina

Dear Editor:

Voluntary ingestion of drugs with suicidal intent is more frequent in patients with epilepsy or psychiatric disorders than in the general population.[1] In this way, drugs prescribed for those conditions are susceptible to cause intoxication.

Lamotrigine, a broad-spectrum antiepileptic drug (AED), is approved for treating epilepsy (both in monotherapy and in polytherapy) and also bipolar disorder, due to its action as a mood stabiliser.[1] It is widely used due to its good tolerability.[1] However, given its high toxicity index compared to other AEDs,[2] we must be familiar with its pharmacological profile and other possible adverse effects.

We present the case of a 38-year-old man with personal history of arterial hypertension and migraine. In the previous year and a half, the patient had experienced sudden episodes of loss of consciousness without prodrome or abnormal movements. A brain magnetic resonance imaging scan and long-term video-EEG revealed no pathological findings, despite the clinical events observed. However, he was receiving treatment with lamotrigine at 150 mg/12 hours, with limited treatment adherence. He presented no history of using or abusing drugs.

These episodes led to medical leave from work, and given the increasing number of events and the possibility of having to stop work permanently, the patient attempted suicide by taking lamotrigine (total dose of approximately 1000 mg). His family found him on the floor, nearly unconscious, and he was transferred to hospital.

Upon arrival, 8 hours after the last time he was seen without symptoms, he presented arterial blood pressure values of 148/70, tachycardia at 110 bpm, oxygen saturation of 95%, axillary temperature of 36.2 °C, and a blood glucose level of 182 mg/dL. The edges of the tongue were bitten and the patient presented nausea and vomiting. Neurological examination revealed somnolence, bradypsychia, and partial orientation; a Glasgow Coma Scale score of 13 points (eye opening: 3; verbal response: 4; motor response: 6); reactive, mildly miotic pupils; dysarthria with no language alterations and intelligible speech; ability to follow instructions; no visual field alterations; and vertical nystagmus in all gaze positions, with a horizontal component. He presented no limitations when performing extrinsic eye movements or involvement of other cranial nerves, and showed preserved muscular balance and sensitivity in the limbs; ataxia predominantly affecting the upper limbs; generalised hyperreflexia with spontaneous and sustained bilateral ankle clonus and bilateral Hoffman sign; bilateral flexor plantar reflex; and no neck rigidity or other sign of meningeal involvement. The patient also presented mild oppressive headache of parietal predominance. The general examination identified no other abnormalities.

Emergency studies revealed metabolic acidosis, with lactate at 8.9 mmol/L; isolated leukocytosis (21 700 cells/mm^3); normal renal and liver function; calcium and magnesium ions within normal levels; and normal urinalysis results, with negative results in the urine toxicology test. A brain CT scan and baseline EEG study yielded no pathological results, and a lumbar puncture revealed an opening pressure of 22.5 cm H_2O and cerebrospinal fluid with no alterations.

Awaiting results for the concentration of lamotrigine in the blood (sample extracted 8-12 hours after ingestion), we started fluid replacement therapy to promote renal excretion in the event of intoxication and maintained clinical and haemodynamic monitoring until the drug was eliminated. Telemetry showed no alterations in cardiac conduction or repolarisation, and an isolated episode of fever (37.8 °C) with no infectious focus. The patient progressively improved, remaining asymptomatic after 48 hours. Results for blood lamotrigine concentration were 17.2 mg/L, leading us to diagnose metabolic encephalopathy secondary to lamotrigine intoxication.

Lamotrigine is a phenyltriazine derivative that acts by inhibiting voltage-gated calcium and sodium channels. It also reduces neuronal glutamate release, which affects the serotonergic pathway, inhibiting serotonin reuptake.[1]

It presents a bioavailability of 98% and reaches peak concentration (C_{max}) in the 1-3 hours after ingestion.[1] The half-life of lamotrigine is approximately 33 hours (22-36 h), with considerable variations between individuals[3]; half-life may decrease by as much as 25% in chronically treated patients as the drug induces its own metabolism.[1] During its degradation it undergoes hepatic inactivation, with the metabolite finally being excreted by the kidneys. The recommended therapeutic range for patients with epilepsy is 1-4 mg/L. However, adverse reactions are rare in patients with concentrations < 10 mg/L, and this value has been proposed as the upper bound of the therapeutic range, according to response.[3]

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