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LETTERS TO THE EDITOR

Epilepsy and Brugada syndrome☆,☆☆

Epilepsia y síndrome de Brugada

Dear Editor:

Brugada syndrome is an autosomal dominant genetic disorder caused by a mutation in the genes *SCN5A* (in 20% of the cases) and *SCN1A* (in 17% of the cases). *SCN5A* codes for the alpha subunit of the voltage-gated sodium channel.[1] These mutations affect phases 0 and 1 of the depolarisation potential.[2] Since this syndrome is a channelopathy, it has been associated with epileptic seizures in some cases. We present 2 patients with Brugada syndrome and epilepsy and review the available literature on this unusual association.

Patient 1

Our first patient was a 37-year-old man with a history of repeated episodes of syncope; his father had a pacemaker implanted due to cardiac arrhythmia of unknown causes. The patient visited the emergency department due to a series of self-limiting tonic-clonic seizures followed by confusional state. Blood tests yielded normal results. Brain CT and MRI scans displayed no alterations. The eletrocardiography (ECG) revealed an RSR' pattern in lead V1 with T-wave inversion and ST segment elevation in lead V2 (Fig. 1). Holter ECG showed sinus rhythm with frequent atrial extrasystoles. Ajmaline test results were compatible with Brugada syndrome. The echocardiogram revealed no abnormalities. Our patient was treated with an implantable cardioverter-defibrillator. Seizures were controlled with valproic acid dosed at 1500 mg/day. Our patient remains seizure-free to date.

Patient 2

Our second patient was a 49-year-old man with a history of arterial hypertension. His father had died suddenly at the age of 57 and a first-degree relative had experienced febrile seizures. While asleep, he experienced 2 self-limiting tonic-clonic seizures lasting a few minutes each, followed by confusion. Our patient was admitted to our hospital. The physical examination yielded normal results. The ECG revealed sinus tachycardia, a QRS complex with an RSR' pattern in lead V1, and coved ST segment elevation in lead V2: these patterns were compatible with Brugada syndrome (type 3 ECG pattern) (Fig. 2).

Brain MRI, blood test, Holter ECG, and echocardiography results were normal. The electroencephalography (EEG) revealed right fronto-temporal spikes that were more pronounced during sleep stages 3 and 4. Our patient tested positive on the flecainide test. Levetiracetam dosed at 2000 mg/day rendered the patient seizure-free.

Brugada syndrome is characterised by ECG alterations, indicating a predisposition to tachyarrhythmias and sudden death. Sudden death typically occurs around the age of 40, at night and while the patient is resting; fever and increased vagal tone have been suggested as potential trigger factors.[3] Brugada type 1 ECG pattern is characterised by incomplete right bundle branch block (RSR'), ST segment elevation >2 mm in leads V1-V3, and T-wave inversion; ST segment elevations have also been described in inferior leads.[4] The coved pattern (RSR' with the descending arm of the R' wave coinciding with the beginning of the ST segment) corresponds to Brugada types 2 and 3. However, these ECG changes are transient, random, and may not always appear in a routine ECG. Therefore, such sodium channel blockers as procainamide, ajmaline, and flecainide may be used to trigger these ECG patterns and diagnose the underlying syndrome. The *SCN5A* gene has been found to play a role in long QT syndrome (LQTS) by either reducing or increasing function of the sodium channel subunit[5] (function decreases in Brugada syndrome).

Heritable channelopathies are associated with paroxysmal dysfunction of excitable tissues (heart, brain, muscles). According to experimental models in mice, the SCN5A

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☆☆ This study has not appeared previously in print, nor has it been presented in any meetings or congresses.

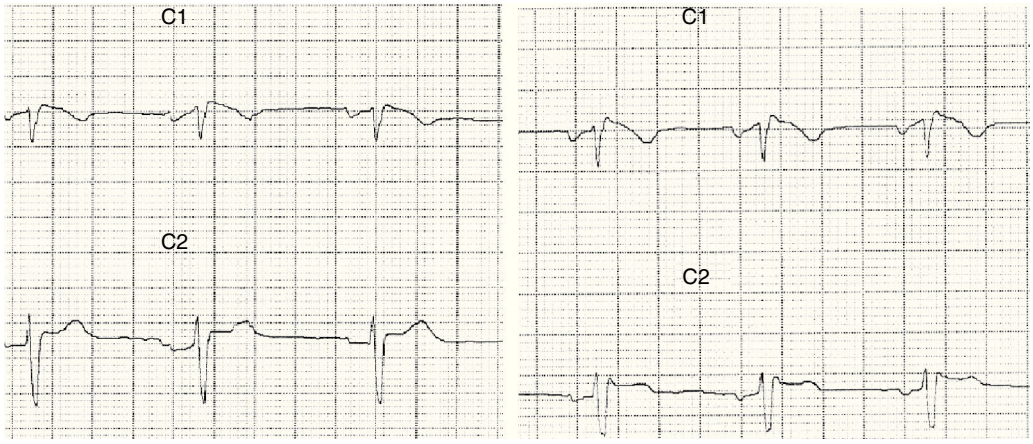

Figure 1 ECG leads V1-V2 showing a QRS complex with an RSR' pattern in V1 with T-wave inversion and ST segment elevation in V2.

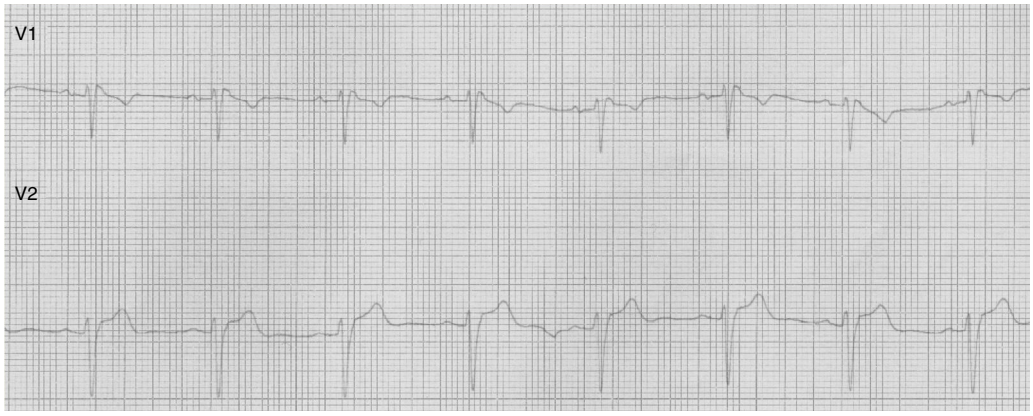

Figure 2 ECG leads V1-V2 showing a QRS complex with an RSR' pattern in V1 and coved ST segment elevation in V2.

protein is expressed in the limbic lobe and may play a relevant role in neuronal activation.[6] The *SCN5A* gene is particularly active in astrocytes, which means that any alterations in that gene may confer susceptibility to recurrent seizure activity.[7] In our second patient, symptoms and findings may point to nocturnal frontal lobe epilepsy, which has an autosomal dominant component linked to ion channel alterations. According to the literature, Brugada syndrome should be considered in healthy patients with nocturnal seizures and urinary incontinence.[8]

Molecular defects affecting sodium channels may be temperature-dependent; the literature reports one case with fever and 2 with conduction disorders.[9,10]

Potassium channelopathies constitute another type of channelopathy associated with epilepsy and heart disorders[11]: KCNH2 channel dysfunction causes type 2 LQTS and KCNQ1 channel dysfunction leads to type 1 LQTS.

Recognising conduction disorders in epileptic patients poses a true clinical challenge; the same is true for seizures in patients with conduction disorders. Symptom exacerbation and ECG changes after treatment with antiepileptics that act by blocking sodium channels are clues that may contribute to the diagnosis of sodium channelopathies.

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Balo concentric sclerosis: A presentation mimicking ischaemic stroke☆

Esclerosis concéntrica de Balo: una presentación que simula un ictus isquémico

Dear Editor:

Balo concentric sclerosis (BCS) is a rare type of inflammatory/demyelinating disease first described by Joszef Balo in the early 19th century.[1] Balo reported several cases of neurological deficits with a fulminant progression in which autopsy studies revealed demyelinating lesions arranged in concentric rings. At present, this entity is easier to diagnose and treat in its early stages thanks to MRI.[2] However, the pathophysiology of BCS is still to be determined and there is no consensus on the most suitable treatment in acute stages or in the long term.

We present the case of a young patient with BCS who was first suspected of having ischaemic stroke; MRI was the key to diagnosing BCS.

Our patient was a 42-year-old woman who arrived at our hospital's emergency department after code stroke activation due to a 2-hour history of weakness and hypoaesthesia in the right hand. She had a history of hypertriglyceridaemia and was an active smoker (consuming one pack of cigarettes daily). At the age of 32, she started hormone replacement therapy with a vaginal ring due to early menopause. She had no family history of interest. Upon arriving at the emergency department, her vital signs, including blood pressure, heart rate, temperature, oxygen saturation, and glucose levels, were normal. The initial neurological examination revealed paresis of the right upper limb with preserved reflexes; our patient scored 2 on the NIHSS. An emergency CT scan displayed a hypodense lesion in the left corona radiata. A neurosonology study (transcranial and supra-aortic trunks) revealed no stenosis or large-vessel occlusion. The ECG showed sinus rhythm and results from a blood test were normal. The patient was initially diagnosed with probable ischaemic stroke; reperfusion treatment was ruled out in view of the scarce focal neurological signs and the signs of established lesion. As a result, she started treatment with antiplatelet drugs and statins and was admitted to the stroke unit of our hospital.

The initial aetiological study included transoesophageal echocardiography, which revealed patent foramen ovale. A complete blood count, including an immunological test, a test for tumour markers, serology tests, and a coagulation study, revealed no relevant findings. However, our patient's condition worsened progressively, reaching a 0/5 muscle strength rating in the right upper limb and ipsilateral central facial palsy. A brain MRI scan performed 4 days after admission revealed signal alterations arranged in layers in T2-weighted and diffusion sequences (Fig. 1A and B): the edge of the lesion showed apparent diffusion coefficient (ADC) restriction (Fig. 1C) whereas the centre displayed increased ADC (Fig. 1C), which is typical of BCS. The suspicion of a demyelinating/inflammatory disease required a lumbar puncture; the only relevant finding was presence of IgG oligoclonal bands. We started treatment with a bolus of 1 g methylprednisolone daily. The patient was responding favourably to treatment by the third day and was discharged after 5 days of treatment due to symptom resolution.

Twelve months later, she remained asymptomatic. Two follow-up MRI scans at 6 and 12 months revealed a decrease in the size of the lesion, which no longer had a layered appearance. The absence of new lesions rules out dissemination. We decided not to administer immunomodulatory drugs but rather to conduct follow-up clinical and radiological studies.

BCS is a rare form of demyelinating disease whose clinical presentation and lesion distribution may vary.

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