and apparently unrelated aetiologically with the patient's clinical symptoms.

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Bilateral striopallidodentate calcinosis. A presentation in the form of facial dystonia and frontotemporal dementia

Calcificación estrío-palido-dentada bilateral. Presentación en la forma de distonia facial y demencia frontotemporal

Dear Editor:

In 1860, Delacour was the first to report vascular calcifications in the basal ganglia in a male who presented rigidity, weakness in his lower limbs, and tremor.[1] Although known as Fahr's disease, this is a misnomer, since this latter author reported a case of calcinosis in the basal ganglia that does not correspond to what we currently understand this term to mean. Since the calcifications exhibit a preference for the basal ganglia and dentate nucleus, it would seem to be more appropriate to refer to it as bilateral striopallidodentate calcinosis (BSPDC).[2]

Calcification of the basal ganglia has been associated with more than 30 diseases, including infections, metabolic disorders, and genetic syndromes.[3,4] The incidence of calcifications in the basal ganglia in neuroimaging studies is 0.6%,[5] although most of them are very small and generally confined to the globus pallidus. They present clinically as extrapyramidal, cerebellar, and cognitive manifestations, with an inherited autosomal dominant variant in most cases and another, sporadic variant.

Sixty-six year old female, hypertensive, with bradycardia-tachycardia syndrome for which she had a definitive pacemaker. She had not undergone thyroid surgery nor had she received treatment with dopaminergic antagonists. No family history of dementia or extrapyramidal disorders.

The patient presents a bilateral hemifacial spasm for the last 5 years associated with jaw-closing dystonia that was treated with botulinic toxin with clear improvement of symptoms for 4 months. Over the course of the last 3 years, the patient has developed cognitive impairment with apathy, withdrawal, executive dysfunction, and emotional lability with loss of personal care.

Neurological examination: cortical functions: conscious and oriented. No aphasia, apraxia or agnosia. Cranial nerves: normal. Motor: normal tone; symmetrical, conserved strength. OTR: ++/++++. Plantar reflex: bilateral flexor. Frontal release reflexes: positive grasping and palmomental reflexes. Conserved sensitivity and cerebellum. Normal gait. Jaw-closing dystonia and bilateral asynchronous hemifacial spasm.

Neuropsychological evaluation: mild attention disorder and temporospatial disorientation, mild impairment of reading comprehension, mild deficit of episodic memory and long-term information recall. Frontal dysfunction with perseveration in graphic sequences, highly concrete thinking, limited working memory and sequencing errors in written expression.

Analyses: no alterations of interest in the blood test, coagulation, vitamin B12, folic acid, glucose, electrolytes, kidney function, liver enzymes, thyroid hormones, antinuclear antibodies, and blood proteins. Total and free parathyroid hormone, total calcium, calcium ions, and phosphorus were all normal. Genetic study for Huntington's disease, negative. X-rays of hands and feet: absence of subchondral bone cysts. Cranial CT (Figure 1): cortico-subcortical retraction with slight frontal predominance. Bilateral calcinosis at the level of the basal ganglia, thalamus, and dentate nuclei of the cerebellum.

The brain is especially well-protected against different toxins thanks to the existence of the blood-brain barrier. However, subcortical nuclei are vulnerable to several different minerals; thus, the accumulation of copper causes Wilson's disease; the accumulation of iron produces Hallevorden-Spatz's disease; the accumulation of organic mercury is the cause of Minamata's disease, and the accumulation of manganese, Parkinsonism. Different disorders produce calcification of the basal ganglia; however, the reason as to why these systemic processes bring about focal deposit in the basal ganglia is unknown. The finding of calcification in the basal ganglia in

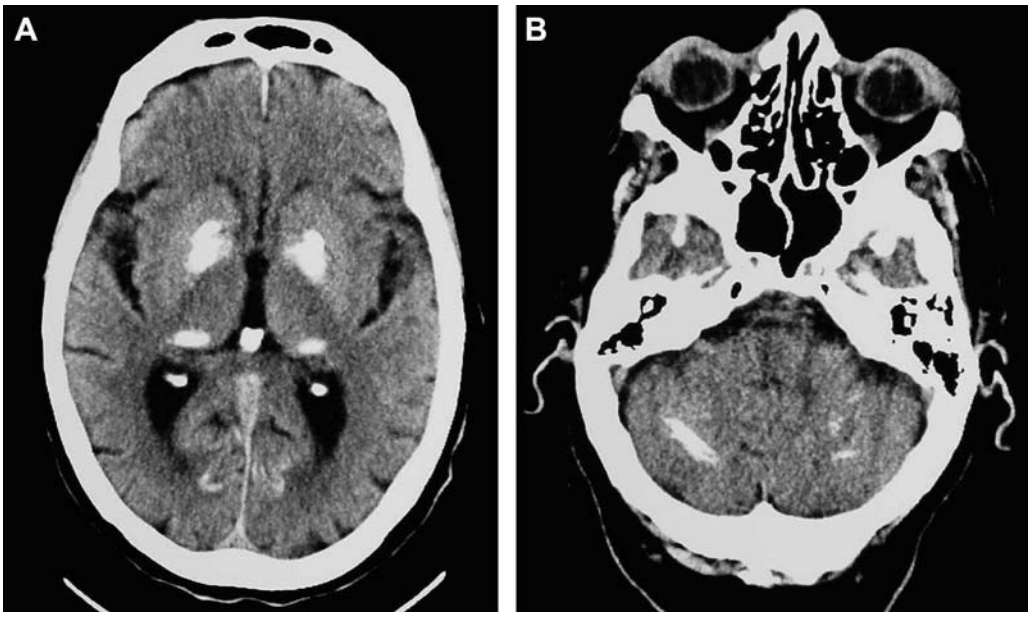

Figure 1 Cranial CT. A) Calcification in the basal ganglia and thalamus. B) Calcification at the level of the cerebellar dentate nuclei.

neuroimaging study requires that hypoparathyroidism be ruled out, since it is the most common explanation for this finding (70-80%).[6]

A registry with many BSPDC patients has revealed that only 68% of the cases were symptomatic and 32% were asymptomatic.[7] The most common clinical manifestation is movement disorders, present in 55% of the cases. Of these disorders, 57% were Parkinsonism, 19% chorea, 8% tremor, 8% dystonia, 5% athetosis, and 3% consisted of orofacial dyskinesia.

Our patient had a negative clinical family history and one sibling who had been studied for peripheral vertigo did not present calcifications in the basal ganglia on the cranial CT performed, although a hereditary basis cannot be ruled out entirely.

In a neurological study of patients with BSPDC, frontal executive function tests revealed alterations.[8] The cognitive impairment reported by other authors include slowed thinking, poor concentration and attention, and impaired verbal and non-verbal memory with normal language, abstraction, and praxis;[9,10] as a result, frontal subcortical dementia is thought to be the dementia most commonly detected in these.

The presence of frontal subcortical dementia associated with calcification of the basal ganglia forces us to rule out other diseases such as Nasu-Hakola's disease in which there are subchondral bone cysts.[11] Frontal dementia with calcifications in the basal ganglia has also been described; it is a sporadic form of pre-senile dementia with neurofibrillary tangles, but without senile plaques in Japanese patients and that receives the acronym DNTC.[12] The course of BSPDC is unfavourable, moving toward progressive worsening. Response to different treatments is poor or temporary.[13] The selective elimination of the calcium deposits in the brain without affecting those in bones and other tissues appears to be an impossible task.

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Changes in butyrylcholinesterase activity in patients with Alzheimer disease treated with acetylcholinesterase inhibitors

Alteración de la actividad de la butirilcolinesterasa en pacientes con enfermedad de Alzheimer tratados con inhibidores de la acetylcolinesterasa

Dear Editor:

One of the therapies used to treat patients with Alzheimer disease (AD) is acetylcholinesterase inhibitors (AChEI), such as donepezil, galantamine, and rivastigmine.[1] These drugs act by incrementing cholinergic activity in the brain. When a person undergoes general anaesthesia, the effects of non-depolarizing muscle blockers such as atracurium are antagonized with neostigmine, an AChEI that does not cross the blood-brain barrier and that acts by increasing acetylcholine in the synaptic cleft of the muscle plate. Therefore, if that patient suffers from AD and is on treatment with another AChEI such as donepezil, he/she may exhibit a resistance to the action of this type of muscle blocker.[2,3] However, in addition, neostigmine acts by inhibiting the activity of plasma cholinesterase,[4,5] pseudocholinesterase, or butyrylcholinesterase (BuChE), which also hydrolyzes acetylcholine (even though not specifically used for this process). Likewise, BuChE is active for the hydrolysis of succinylcholine (a depolarizing muscle blocker) and scant or no activity of BuChE, whether due to a genetic or hepatic abnormality or secondary to drug therapy, may cause prolonged apnoea processes. Donepezil also prolongs the action of succinylcholine[6] by decreasing BuChE activity.[2] Rivastigmine[1,7] also reduces BuChE activity. AD is currently being treated with BuChE inhibitors (BuChEI), such as cymserine.[7]

After the case report in Article 2, we have observed another 10 patients with AD who did not suffer any genetic alterations or liver disease and who were being treated with an AChEI. BuChE activity was determined in both a routine pre-operative work-up, as well as after surgery under general anaesthesia during which the two types of muscle blocking agents were administered. The figures corresponding to BuChE activity were as follows: 1,416 U/L (this patient had been on therapy with galantamine for 10 months); 1,761 U/L (donepezil); 2,606 U/L (rivastigmine, 18 months); 2,767 U/L (donepezil, 2 years); 2,927 U/L (donepezil, 1 year); 4,023 U/L (donepezil, 5 years); 4,279 (rivastigmine); 6,064 U/L (donepezil, 4 months); 7,048 U/L (galantamine), and 8,215 U/L (donepezil) (normal BuChE values range from 3,500 to 8,500 U/L). Only two of the individuals had a prior BuChE determination; in one, the figure had fallen from 14,102 U/L 5 years earlier to 4,023 U/L, and in the other case, it had gone from 4,342 U/L 2 years previously down to 2,767 U/L. It is evident that not all patients had low values for this enzyme, despite treatment with AChEI.

Nevertheless, in the patients who presented low BuChE values after treatment with these drugs, the response to succinylcholine was prolonged; thus, the mean duration of muscle block after administration of this medication in the first five patients (BuChE < 3,500 U/L) was 10 minutes, whereas in the latter five (normal BuChE figures) it was 4 minutes. Moreover, at normal dosages of atracurium, they did not present adequate muscle relaxation and the dosage of the drug had to be raised. The mean dose of atracurium administered in the first five patients (BuChE < 3,500 U/L) was 52 mg and the mean dose in the other five (BuChE > 3,500 U/L) was 31 mg. Only those patients in whom BuChE figures were normal displayed adequate response to the two types of muscle blockers.

In a study conducted in rats, Ibebunjo et al.[8] observed that chronic treatment with an AChEI, such as tacrine, tended to decrease the effect of resistance to relaxation due to d-tubocurarine (a non-depolarizing blocker). Although it may not be possible to extrapolate this to humans, it might be one of the reasons why not all patients being treated with these drugs respond appropriately to muscle blockers.

Moreover, it is known that between 15% and 20% of the AD population do not metabolize AChEI normally;[9] half this group metabolize them very quickly and, hence require high treatment doses, whereas the other half are poor AChEI metabolizers and may suffer adverse effects even at low doses. We do not know if the slow AChEI metabolizers are the same ones that present altered BuChE activity and present an abnormal response to muscle blockers, nor what their treatment action and side effects are.

Given that the case series is small, it is not possible to draw any conclusions, but it is possible for the AChEI currently used for the treatment of AD to alter BuChE activity, although we do not know why this alteration appears in only some of the patients in our study and not in all of them. Despite these limitations, we believe that it is important to determine the activity of this enzyme not only in those people being treated with these drugs who are going to have surgery under general anaesthesia, but it would also be of interest to quantify it in AD patients during