Fahr's syndrome – apropos of a clinical case

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Abstract

Fahr's Syndrome is a rare degenerative neurological disorder, which can be of hereditary or sporadic origin, characterized by the presence of abnormal calcium deposits and associated cell loss in certain areas of the brain, namely basal ganglia and cerebral cortex. Associated symptoms include progressive deterioration of cognitive abilities (dementia) and loss of acquired motor skills, speech impairment, seizures or headache.

The authors present the Clinical Case of a 29 years old inpatient with a family history of hypocalcaemia, presenting a condition evolving for 5 days and characterized by prostration, refusing to eat, and generalized muscle stiffness, with progressive clinical impairment, associated to sudden aphasia secondary to hypocalcaemia. His study shows the existence of basal ganglia calcifications, and the conclusion this is a case of Fahr's Syndrome.

INTRODUCTION

Fahr's disease is a rare degenerative neurological disease, which may be hereditary or sporadic. It occurs in both sexes, and at any age, but is more frequent in the fourth decade of life. It is characterized by the presence of abnormal calcium deposits in the brain, associated with loss of cell mass, notably in the basal ganglions and cerebral cortex.[1,2]

This pathology is also called Idiopathic Basal Ganglia Calcification, as there is no apparent reason for the appearance of these calcifications in these regions of the brain.[3,4,5]

Clinical symptoms of this disease include progressive deterioration of cognitive function (Dementia) and/or motor function, speech alterations, convulsions, and migraines. As the disease progresses, paralysis may develop, associated with an increase in muscular stiffness and restricted movements, leading to spastic paralysis. Other additional symptoms may include slow writhing and involuntary movements (Athetosis) or Chorea, a related condition involving rapid, involuntary movements. In some individuals affected by the disease, there may be a progressive deterioration of the nerve fibers that transmit the impulses from the retina to the brain (Optic Atrophy), with consequent loss of visual acuity.[2,4,6,7,8]

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Fahr's Disease is hereditary, being transmitted in Autosomal Recessive form, though in some affected families there appears to be an Autosomal Dominant component. Sometimes the disease appears in sporadic form, with no apparent cause.[2,8]

Some authors are of the opinion that the disease is the result of an intrauterine infection not identified during pregnancy, and which affects the development of the fetus.[7]

In general, the diagnosis is based on clinical symptoms, generally associated with hypocalcaemia and the appearance of Basal Ganglion calcification in the imaging exams.

Fahr's Disease is an incurable disease which develops gradually over time, as the calcification process is progressive, irreversible and impossible to halt.

The treatment is symptomatic and individual, and is generally focused on the neurological and psychotic symptomology.[5,8]

Due to the involvement of the Nervous System, and the cerebral damage that occurs, the prognosis is poor, and Fahr's Disease is eventually fatal.[5,8]

CLINICAL CASE

Patient, aged 29 years, Male, Caucasian, who attended the Emergency Service on 21st February 2002 with clinical symptoms with around 5 days of evolution, characterized by prostration, refusal to eat, and generalized muscle stiffness, with progressive clinical worsening, associated with sudden onset aphasia.

The analytical study carried out in the ES is normal, and no alterations worth highlighting were detected, except for severe hypocalcaemia of 4.2 mg/dL, for which reason the patient was admitted for

further study and immediate therapy with intravenous Calcium Gluconate was started.

The family and personal history included references to hereditary hypocalcaemia, and the Mother, and Sister and an Uncle were being followed up by the Endocrinology Surgery of the Hospital de S. João do Porto for hypocalcaemia, presenting no cognitive or neurological alterations. The patient also mentioned the death of a maternal uncle due to "calcified brain", according to information from the family. The patient did not present any previous pathologies of note, but was habitually and irregularly taking Calcium. The family was not able to specify the reason for this therapy.

On objective examination, he was vigil, uncollaborative, prostrate, with eyes wide open, and with muscular fasciculations on the left side of the face.

The pupils are isochoric and reactive to light, without signs of meningeal irritation. The patient was aphasic and presented generalized muscle hypertonia, with positive Trousseau's sign. The plantar cutaneous reflex was positive on both sides.

The mucosa were normal colored and hydrated, without dyspnea or evidence of respiratory difficulty. The vital signs were as follows: Ax. Temp.: 36.5 ºC; BP: 101/53 mmHg; HR: 66 bpm; RR: 18 bpm.

The remainder of the physical examination did not show any alterations of note.

TABLE I

Complementary diagnostic tests

	ES	Hospitalization		
	21/2/2002	25/2/2002	6/3/2002	19/3/2002
Hb (g/dL)	14,8	13,3	13,3	12,7
Leukocytes (u/L)	9,900	9,700	9,300	9,300
Neutrophils	76,2 %	84,3%	80,4%	80,7%
Platelets (u/L)	83.000	183.000	222.000	210.000
Glucose (mg/dL)	98	105	95	110
Na+ (mEq)	140	140	183	142
K+ (mEq)	3,3	4,5	4,2	4,4
Urea (mg/dL)	36	32	43	40
Creatinine (mg/dL)	0,86	0,82	0,9	0,7
GOT (u/L)	64	60	36	44
GTP (u/L)	43	50	46	45
LDH (U/L)	125	115	99	87
Calcium (mg/dL)	4,2	7,1	8,0	8,9
Phosphorus (mg/dL)	4,1	4,7	4,7	3,8
Magnesium (mg/dL)	1,3	1,9	1,8	1,5
PTH (pg/mL)	—	175	—	—
1.25DHVitD (pg/mL)	—	32,0	—	—
Albumin (g/dL)	4,1	4,0	—	4,6
Aldosterone (pg/mL)	—	6,42	—	—

On admission, the following analytical studies were carried out, the results of which are shown in *Table 1*.

As a result of these studies, the existence of high Parathormone (PHT) levels was observed, with normal Phosphorus and Vitamin D3 levels.

Of the remaining tests carried out, the ECG presented Sinusal Rhythm of 97 bpm and long QT. The Chest X-ray was normal.

Cerebral CT *(Fig. 1)* showed: "…Profuse bilateral calcifications of the basal ganglions and white frontal--subcortical substance…".

Cerebral MRI *(Fig. 2 and 3)* showed: "…areas of bilateral lesion with hypersignal evolving the caudate nuclei, putamen and thalamus and frontal subcortical regions. The imaging alterations are included in the table of anomalies of the calcium and phosphorus metabolism, therefore hypotheses of Fahr's disease and hypo- or hyperparathyroidism were considered …".

Scintigraphy of the thyroid and parathyroids did not present any alterations, and MRI of the thyroid and parathyroid was normal.

At this point, in view of the clinical symptoms, the patients' family history, and the results of the tests carried out, the hypotheses of hypoparathyroidism or primary hyperparathyroidism were excluded, leaving a case of Hereditary Hypocalcaemia - Fahr's Syndrome.

The following therapy was instituted: Calcium Gluconate 1 amp 12/12 h iv, Magnesium Lactate 500 mg 2x/day po, Calcium Carbonate 2 gr 3x day po, Calcitriol 0.25 mg/day po.

In an initial phase, the patient showed progressive

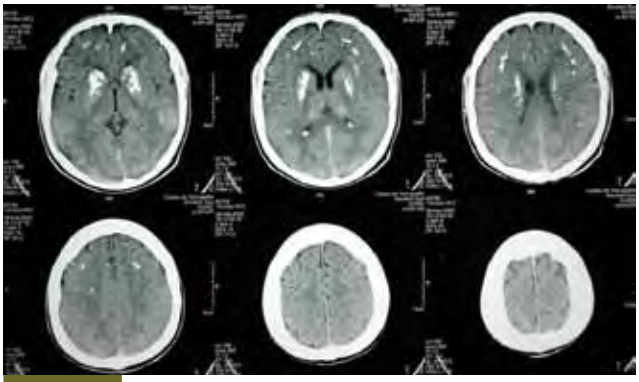

FIG. 1

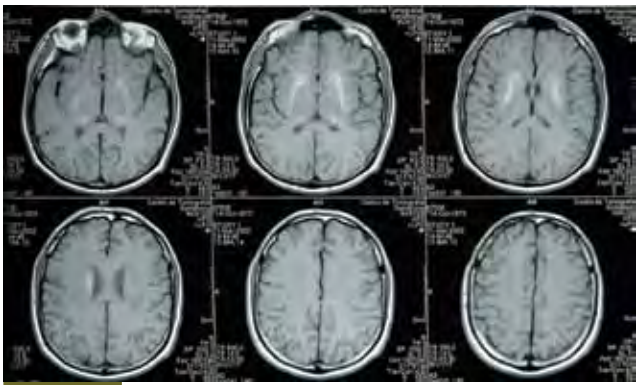

FIG. 2

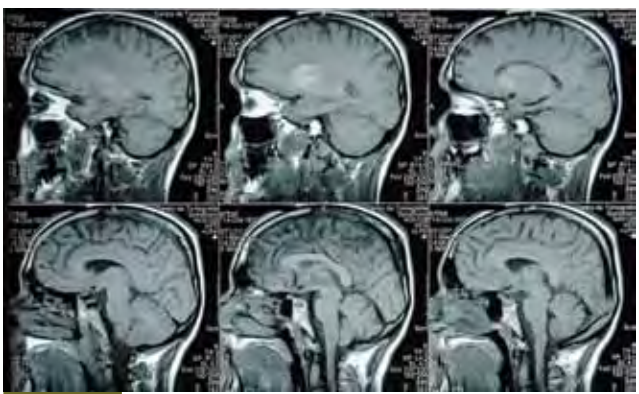

FIG. 3

deterioration in his general state, with incontinence of the sphincters and inability to swallow, requiring nasogastric intubation to supply nutrition.

After the correction and normalization of the serum Calcium levels, the patient showed progressive clinical improvement, becoming conscious, collaborative, oriented in space and time, without neurological deficits or any other complications during the hospitalization period.

At the end of 26 days of hospitalization, the patient was discharged and advised to attend External Medical Surgery, for monitoring and follow-up.

The patient remained stabilized and asymptomatic, returning to his normal activity without further complications. The therapy was adjusted regularly, based on the analytical results.

Even so, and despite the therapy with calcitriol, magnesium and calcium carbonate (6 gr per day), he had continually low serum calcium levels of around 7 to 7.5 mg/dL.

The patient remained in regular follow-up for around three and a half years, at an External Hospital Clinic, with persistence of chronic hypocalcaemia, despite the use of calcium supplements. In September 2005, the patient abandoned the visits and was notified and called to attend the External Clinic of the Hospital, but he did not respond.

COMMENTS

Fahr's Disease is a rare, hereditary disease with a higher incidence in the fourth decade of life, but also occurs in younger ages. In this clinical case, the patient's diagnosis was delayed, probably to his irregular use of calcium. The form in which the disease was manifested was a result of the symptoms of low serum calcium levels, and the diagnosis was made during the study of the cause of hypocalcaemia, besides considering the patient's family history.

A reserved prognosis is given, because given the persistence of low serum calcium levels and the need for therapy with high doses of calcium, this would lead to its progressive deposits in the brain, with consequent progressive deterioration in cognitive state and the appearance of neurological deficits. ■

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