Short communication

Creutzfeldt - Jakob presenting with isolated visual symptoms: the Heidenhain variant

I. del Barrio-Manso,a,* Á. Toribio-García,b M. Cordero-Coma,b L. Tuñón,c E. Baragañoc

a Servicio de Oftalmología, Hospital de Infanta Cristina, Parla, Madrid, Spain
b Servicio de Oftalmología, Hospital de León, León, Spain
c Servicio de Neurología, Hospital de León, León, Spain

ARTICLE INFORMATION

Article history:
Received on May 19, 2010
Accepted on Sept. 19, 2010

Keywords:
Creutzfeldt-Jakob disease
Heidenhain variant
Spongiform encephalopathy
Prion protein
Visual acuity loss
Visual function

A B S T R A C T

Clinical case: We report the case of a 67 year old female complaining of decreased vision and diagnosed with the Heidenhain variant of sporadic Creutzfeldt-Jakob disease. Her past medical history was unremarkable. She died less than three months after the onset.

Discussion: The Heidenhain variant of sporadic Creutzfeldt-Jakob disease should be suspected in patients suffering from early visual disturbances, unremarkable ophthalmic examination, and subsequent rapid decline of their cognitive function. A complete neurological exam including electroencephalogram recordings and magnetic resonance is mandatory. These patients share a common genotype (PRNP codon 129 MM) associated with a clinically typical disease course.

Received on May 19, 2010
Accepted on Sept. 19, 2010

© 2010 Sociedad Española de Oftalmología. Published by Elsevier España, S.L.
All rights reserved.

Creutzfeldt-Jakob con debut oftalmológico: la variante Heidenhain

RESUMEN

Caso clínico: Presentamos el caso de una mujer de 67 años con disminución de agudeza visual bilateral que fue diagnosticada de enfermedad de Creutzfeldt-Jakob esporádico en su variante Heidenhain. No presentaba antecedentes de interés. La paciente falleció tres meses después del inicio del cuadro.

Discusión: La variante Heidenhain de la enfermedad de Creutzfeldt-Jakob esporádico debe sospecharse en todo paciente aquejado de alteraciones visuales y examen oftalmológico inespecífico, que experimente deterioro cognitivo posterior. Es necesario un examen neurológico completo que incluya electroencefalograma y resonancia magnética. Estos pacientes comparten un mismo genotipo (codón 129 MM en gen PRNP) asociado a un curso clínico característico.

© 2010 Sociedad Española de Oftalmología. Publicado por Elsevier España, S.L.
Todos los derechos reservados.
Introduction

The Creutzfeldt-Jakob disease (CJD) is an infrequent and fatal transmissible prionic encephalopathy, characterized by sponge-like changes in the tissues of various areas of the central nervous system (CNS), which expresses clinically as a rapidly progressive dementia depending on the areas of the CNS that are affected. \(^1\) The Heidenhain variant is characterized by beginning with isolated visual alterations which could persist for weeks in the absence of cognitive deterioration. \(^2\)

Clinical case

This paper presents the case of a woman, aged 67 and living in the city of León, without relevant personal history, who referred a condition with three weeks of evolution involving progressive loss of bilateral visual acuity (VA). The first ophthalmological exploration revealed a VA of 0.3 in the right eye and of 0.1 in the left eye, with ocular tension, biomicroscopy, ocular motility and funduscopic exploration giving normal results. The patient exhibited alteration in visual fields and slight alteration in the color test (figs. 1 and 2). Additional tests were made, comprising nuclear magnetic resonance, (NMR) cerebral (fig. 3A), visual evoked potentials (VEP) and electroretinogram (ERG), which gave non-specific results. During the following month, the patient exhibited behavior alterations, hallucinations, cognitive deterioration, pseudoathetotic movement and spasms, with rapidly progressive evolution. In the light of this, additional NMR, electroencephalogram (EEG) and individual photon emission computed tomography (SPECT) were requested.

Figure 1 – Campimetry 120°. (A) left eye, (B) right eye. Nasal peripheral visual field loss is observed in both eyes with right hemianopsia at central 20°.

Figure 2 – Farnsworth color test with non-specific alterations. A) right eye. B) left eye.
Figure 3 – A) cerebral NMR taken upon admission of the patient: non-specific dot-shaped hypertense lesions in T2 in the basal ganglions. B) NMR taken one month later. The image includes artefacts due to patient movements despite sedation. Subtle changes can be observed in intensity increases of the basal ganglia signal.

Figure 4 – Anatomopathological images of cerebrum cortex tissue. A) Staining with hematoxiline-eosine: loss of neuronal population with sponge-like appearance, astrogliosis and appearance of proteic aggregates. B) Immunohistochemistry: presence of prion protein (PrP) with perivacuolar pattern.

Discussion

CJD is a sub acute sponge-like disease caused by infectious proteinaceous particles without nucleic acids known as prions. The annual prevalence is 1-2 cases per million inhabitants. The disease does not exhibit a preference for any sex and the majority of cases affect patients in the group of 50-75 years de age.

The onset of CJD is related to the conversion of the PrP cell protein (encoded by the PRNP gene of the short arm of chromosome 20), into an abnormal PrPsc isoform, producing changes in the structure of the said proteins, which give rise to aggregates causing neuronal death and vacuoles.
Clinically, CJD is characterized by a rapidly progressive condition of dementia, ataxia and spasms which generally cause of death in less than one year from the onset of symptoms.

Heidenhain’s variant is characterized by the initial presentation of a visual dysfunction which can express in different ways such as metamorphopsia, dischromatopsia, optical hallucinations or even cortical blindness. It predominates throughout the course of the disease with marked neuropathological changes at the occipital lobe, although also at the level of the basal ganglions and the limbic system, and with a considerably faster progression. These patients seem to share a genotype (homozygote for methionine in codon 129 of the PrP gene) which is associated with the clinical course which is characteristic of this variant.

The initial diagnostic is complicated due to the absence of other symptoms and the normal results of other explorations and tests. Precisely, the lack of correlation between the level of visual loss and the physical exploration findings caused us to suspect said disease.

In this case, the disease appeared with visual symptoms but without other alterations and involved in less than two months to produce the death of a patient, with characteristic expressions of this variant and with EEG, NMR and existence of protein 14-3-3 in CSF, compatibles with CJD.

Despite this difficult initial diagnostic, it is important for the ophthalmologist to take it into account because these patients will be initially referred to the ophthalmology practice for assessment. Said entity must be suspected in patients with sustained visual alteration, with normal ophthalmological exploration except possible non-specific defects in visual fields and color tests, in which case the possibility of requesting EEG and protein 14-3-3 in CSF analysis must be considered.

In addition, and as prions are resistant to usual sterilization procedures, we must be aware of their importance when utilizing tonometers and contact lenses because, as some studies maintained, the cornea is a tissue with potential for transmission and infections. The optimum solution would be to have disposable contact tonometers for ophthalmological explorations but, in this is not possible, a thorough sterilization must be carried out, maintaining the cone for five minutes dipped in at least 50 ml of a 1 ml solution of MilliQ purified water (uhpH2O).

The risk of possible contagion of this disease, not only in explorations but also in surgery, should lead as to consider the possibility of introducing disposable, single use surgical material.

Therefore, said entity must be taken into account in our day-to-day practice because, even though it is very infrequent, it involves important implications.

Conflict of interest

The authors declare that they have no conflict of interest.

REFERENCES