J Headache Pain (2007) 8:245-247
DOI 10.1007/s10194-007-0405-8

BRIEF REPORT

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Cluster headache attacks and multiple sclerosis

Received: 20 March 2007
Accepted in revised form: 3 July 2007
Published online: 24 September 2007

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Abstract We report the case of a patient who developed typical cluster headache attacks and was diagnosed as having multiple sclerosis (MS) at the same time. The headache attacks resolved after i.v. treatment with methylprednisolone. MR imaging showed a pontine demyelinating lesion involving the trigeminal nerve root inlet area, on the same side as the pain. The association between cluster headache and MS has been rarely described before. This case suggests that in patients with cluster headache neuroimaging is often useful in order to exclude structural lesions.

Keywords Cluster headache • Multiple sclerosis • Blink reflex • Methylprednisolone

Introduction

Cluster headache is a rare but very disabling medical condition characterised by attacks of severe periorbital pain associated with autonomic symptoms. Generally, neuroimaging is normal in patients with CH. However, in 3–5% of patients, the disease is associated with intracranial structural pathologies, such as tumours, arteriovenous malformations, aneurysms, traumatic injuries and infections [1]. Sometimes the term "cluster-like" headache is used because the characteristics of the pain do not always completely fulfil the ICHD-II diagnostic criteria [2] for episodic or chronic CH [3]. However, even in patients fulfilling all diagnostic criteria, intracranial lesions may be discovered [4].

Cluster headache attacks as clinical overture symptoms of multiple sclerosis (MS) must be considered as exceptional. In the literature, we found only two case reports regarding CH associated with MS [5, 6]. This report describes the case of a 35-year-old male patient who was diagnosed as having MS in the setting of CH attacks. Magnetic resonance imaging (MRI) of the brain revealed a pontine demyelinating lesion, homolateral to the pain. The headache attacks resolved after i.v. treatment with methylprednisolone.

Case report

A 35-year-old male was admitted as an out-patient in January 2005 to the Neurological Department of the University of Turin (Italy). He complained for a two-week period of a

paroxysmal, stabbing pain, located in the left orbital region, associated with homolateral conjunctival injection, lacrimation, nasal congestion, rhinorrhoea, facial sweating, palpebral fissure narrowing and miosis. The pain lasted 40–60 min and occurred from 1 to 3 times in 24 h. One of the attacks constantly occurred at night, around 3:00 a.m. Mastication, deglutition and phonation did not trigger the onset of the pain. In addition, the patient complained of tactile hypoaesthesia, associated with dysaesthesia, in all three branches of the left trigeminal nerve territory. The tactile stimulation of the trigeminal cutaneous territory did not cause pain. NSAID drug intake was ineffective. Three years before, the patient had been admitted to an ophthalmology unit because of a sudden decrease of visual acuity, on the left side, associated with orbital pain, worsened by eye movements. The visual field examination showed a central defect. Neither CSF analysis nor visual evoked potentials were performed. The axial spin-echo T1-weighted MRI investigation showed a small area of enhancement in the intracanalicular section of the left optic nerve. There was no evidence of plaques, not only in the periventricular area, but in all areas of the white matter. A diagnosis of isolated, monosymptomatic optic neuritis was made. I.v. treatment with corticosteroids made the neuritis gradually subside. At admission, the neurological examination revealed a superficial hypoaesthesia, regarding all the branches of the left trigeminal nerve, with ipsilateral corneal reflex deficiency. Funduscopic examination of the left eye showed temporal paleness of the optic disc. Laboratory tests, including blood chemistry and both rheumatologic and immunologic screening tests, were normal. Brain MRI showed a demyelinating lesion in the left brachium pontis, where the main sensory nucleus of the V cranial nerve is located (Figs. 1 and 2). The blink reflex presented a deficient first ipsilateral R1 response to the left supraorbital nerve stimulation, with normal latency phase of the secondary bilateral R2 components. The right supraorbital nerve stimulation showed an ipsilateral normal R1 latency and a bilateral normal R2 latency. The CSF isoelectric focusing was positive for oligoclonal bands in the gamma regions. The patient was treated with i.v. methylprednisolone, at 1 g/day for 10 days. CH attacks gradually subsided in 7 days. The trigeminal hypoaesthesia progressively disappeared and was no longer noticeable after 15 days. Six months after the acute episode, the brain MRI appeared to be normal. After 2 years the patient is still asymptomatic both for headache and other neurological dysfunctions.

Comments

We reported the case of a patient suffering from cluster headache attacks and diagnosed as having MS, according to the McDonald criteria [7]. This case raises several questions. The first question is: Is there a causal relation between the two pathologies, or is the association just a coincidence? In our opinion, there is evidence in favour of a relation between the

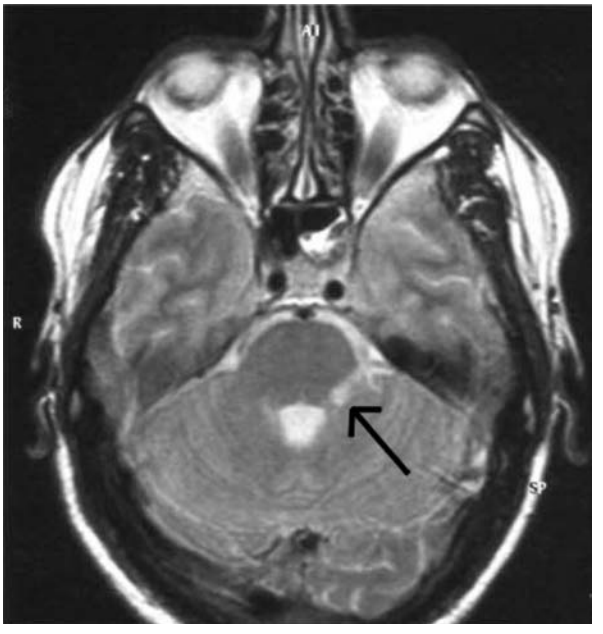

Fig. 1 T2 weighted axial MRI showing a demyelinating lesion in the left brachium pontis

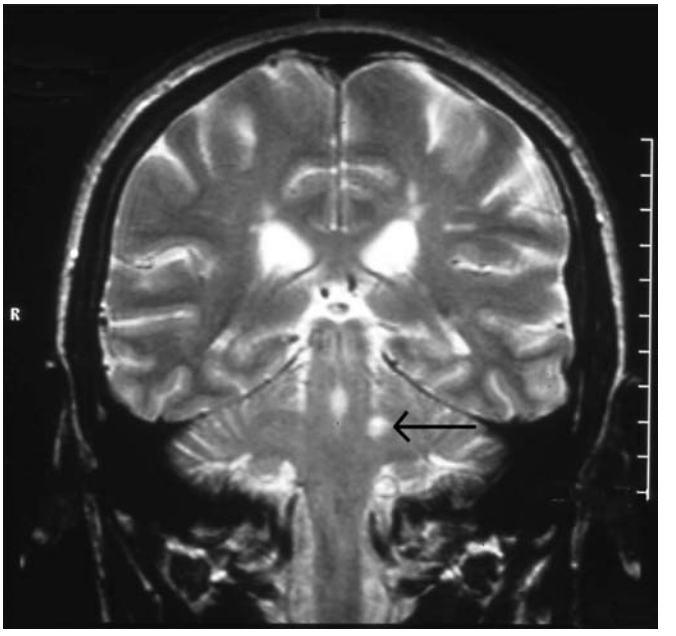

Fig. 2 T2 weighted coronal MRI showing a demyelinating lesion in the left brachium pontis

two pathologies: the MRI of the demyelinating lesion showed that it was located exactly in the trigeminal nerve root inlet area, thus involving the trigeminovascular circuit. In addition the anomalies of the blink reflex are also consistent with the presence of a lesion in the pontine trigeminal nucleus [8].

If we hypothesise a causal relationship between the demyelinating lesion and CH is acknowledged, the following question is: Through which physiopathogenetic mechanisms did the demyelinating lesion lead to CH onset? Trigeminal neuralgia is a well known MS complication. Clear evidence shows that it is generally due to a demyelinating lesion of the trigeminal sensitive fibres, located in the nerve root or, less frequently, in the brainstem. Sometimes, a partial rhizotomy of the trigeminal sensitive root becomes necessary to keep pain under control. In these cases, electron microscopy studies revealed demyelinisation located in the proximal part of the root, with gliosis. Experimental studies show that such an alteration of demyelinated axons may support both a spontaneous impulsive activity and an ephaptic diffusion of excitation [9]. Finally, it is of interest to note that our case report is in accord with the study of Matharu and Goadsby showing the persistence of CH attacks after complete surgical section of the trigeminal sensory roots and supporting the notion that cluster headache may be generated primarily from within the brain [10].

In our patient's case, the demyelinating lesion is located on the trigeminal nerve. This might generate the series of events which is thought to give rise to CH through the trigeminovascular system activation. The associated autonomic signs could be mediated by central autonomic reflexes, also involved in CH pathogenesis. The demyelinating lesion might have stimulated the trigeminovascular system through the same trigeminal (or cervical superior) afferent fibres of the posterior cranial fossa, thus triggering the pathophysiological processes that ended in a secondary CH form.

Guidelines suggest performance of a brain neuroimaging study if a secondary CH is suspected. If we take into consideration that CH seldom occurs, but on the other hand secondary CH is more and more frequently signalled in the literature, we suggest that in patients with cluster headache neuroimaging is often useful in order to exclude structural lesions.

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