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Aseptic meningitis after Measles-Mumps-Rubella (MMR) vaccine

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ABSTRACT

We present a 17-months girl who received one subcutaneous dose of Measles-Mumps-Rubella (MMR) vaccine during a mass immunization campaign on August 2001, on Trujillo, Peru. Four weeks following the vaccination campaign, she presented progressive neurological damage in the medulla oblongata and its cranial nerves caused by an aseptic meningitis located in the pontine cistern. Two years later on, she began with neurological improvement, and at present, almost five years after the vaccination, she persists still with serious neurological sequel.

Key words: *Aseptic meningitis, MMR vaccine, medulla oblongata, pontine cistern.*

RESUMEN

Presentamos a una niña de 17 meses de edad quien recibió una dosis subcutánea de vacuna combinada de sarampión-paperas-rubéola durante una campaña de inmunización masiva en agosto del 2001, en Trujillo Perú. Cuatro semanas después de la campaña de vacunación, presentó daño neurológico progresivo en la médula oblongada y sus nervios craneanos causado por una meningitis aséptica, localizada en la cisterna pontina. Dos años después empezó con mejoría neurológica y actualmente, casi cinco años después de la vacunación, persiste aún con serias secuelas neurológicas.

Palabras clave: *Meningitis aséptica, vacuna MMR, médula oblongada, cisterna pontina.*

INTRODUCTION

In about 90% of all patients,[1,2] the Measles-Mumps-Rubella (MMR) vaccine is safe and effective, and in the rest of cases, it can produce general (rash, fever, hematological abnormalities, arthritis, orchitis and respiratory symptoms, among another symptoms)[1,3] or neurological (meningitis, meningo-encephalitis and deafness) complications,[4] which are generally benign or temporary.

In the present report, we describe to a clinical case of post-vaccinal aseptic meningitis located in the pontine cistern, which affected to the medulla oblongata and its cranial nerves. This neurological complication, unlike previously case reports, was severe.

CASE REPORT

On August 2001, a 17-month-old girl received one subcutaneous dose of MMR vaccine (trimovax, Aventis Pasteur, SA). Four weeks later, she presented progressive impairment of audition, deglutition and of voice. Besides this, respiratory insufficiency, facial hypomimia, ataxic gait, periods of arterial hypertension and tachycardia.

Three months after admission to the Hospital, she required of gastrotomy and tracheotomy which was connected to a mechanical ventilator. On physical examination, the patient's appearance was appropriate for her age, and she was lucid. The ocular fundi revealed normal papillae, bilateral peripheric facial palsy, bilateral deafness, aphonia, severe dysphagia, severe paresis of IX, X, XI and XII cranial nerves. Fasciculations in the tongue, generalized hypotonia and ataxic gait. Superficial and deep sensory were normal. Absence of signs of meningeal irritation. Her blood pressure was 110/70 mm Hg (normal average, 90/55 mmHg), cardiac frequency 160 beating per minute (normal average, 110) and respiratory frequency 22 per minute (she was connected to a mechanical ventilator). The auditory evoked response showed absence of waves in both ears. Examination of cerebrospinal fluid was reported as normal.

On June 2002, magnetic resonance imaging (MRI) scans showed a mass laminate within the pontine cistern (Fig. 1).

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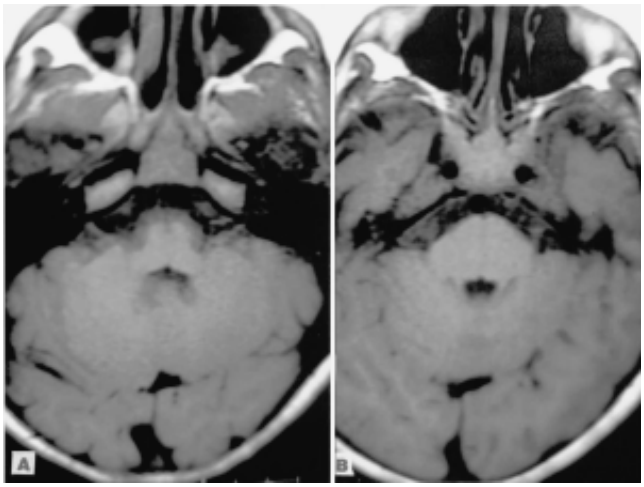

Figure 1. *MRI scans without contrast material obtained almost 10 months after the onset of the neurological complication. Both of them studies shows a mass laminate due, possibly, to meningeal thickening or chronic leptomeningitis in the pontine cistern and almost stuck to the medulla oblongata and pons.*

She received multiple medications and she suffered pneumonia in four occasions.

Based on the above-mentioned observations, we think that an aseptic meningitis located, especially in the pontine cistern, was the causing of this neurological complication, which affected to the leptomeningeal and perforating vessels, but specially to the perforating branches.[5] Thus, in acute stage, the tegmentum of the medulla oblongata, pons and its cranial nerves[6] were damaged by ischemia.

On July 2003, almost two years after the vaccine, she began with periods of respiratory automatism, and progressive improvement in her facial expression, dysphagia, muscular tone and gait. The tracheotomy and gastrotomy were closed. At present, 4.6 years after the onset of aseptic meningitis caused by MMR vaccine, she walks and run with clumsiness. Likewise, she presents moderate dysphagia and dysarthria, fasciculations and hypotrophy in the tongue, and a decreased acuity to sounds (moderate hypoacusis). She sleeps occasionally with aid of a ventilator.

DISCUSSION

The neurological complications in our patient were presented after a mass immunization campaign with a trivalent vaccine (MMR vaccine), which was carried out on August 2001 on Trujillo, Peru. In the manner of another case reports,[4,7,8] the aseptic meningitis occurred about 30 days following the administration of the vaccine, and the first symptoms were suggestive of bilateral injury to VII, VIII, IX, X, XI and XII cranial nerves as well as also the cerebellum. That is, the post-vaccinal meningitis was initiated at the cerebello-pontine angles. In relation to the periods of arterial hypertension and tachycardia, we think that it was due to ischemia of the left A1/C1 cell group in the medulla oblongata.[9,10] Because this aseptic meningitis located in the pontine cistern affected to the perforating branches originated from the intracranial vertebral arteries,[5] and the inflammatory process (hyperplastic reactions in their walls) damaged basically to the tegmentum of the medulla oblongata and its cranial nerves. On the contrary, we believe that the spontaneous neurological improvement observed at the present time, was secondary to progressive recanalization of the capillaries and arterioles into the intraparenchymal territory of the medulla oblongata. However another perforating arteries may be with stenosis or occlusion, and therefore, to produce ischemic and ischemic penumbra areas into the medulla oblongata and its cranial nerves.

For these reasons, and based in our wide experience with omental transplantation to the encephalon,[11,12] and spinal cord with its roots,[13] we believe that an omental transplantation on the medulla oblongata might improve all the more, the function of residual neurons in the medulla oblongata and its cranial nerves in ischemia and ischemic penumbra. Because the omentum is the best tissue for developing vascular connections with underlying and adjacent brain areas.

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