Synchronized Babinski and Chaddock Signs Preceded the MRI Findings in a Case of Repetitive Transient Ischemic Attack

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Abstract

We herein report a 53-year-old female with repeated transient ischemic attack (TIA) symptoms including 13 instances of right hemiparesis that decreased in duration over 4 days. Two separate examinations using diffusion weighted image (DWI) in magnetic resonance imaging (MRI) revealed normal findings, but we observed that both Babinski and Chaddock signs were completely synchronized with her right hemiparesis. We were only able to diagnose this case of early stage TIA using clinical signs. This diagnosis was confirmed 4 days after the onset by the presence of abnormalities on the MRI. DWI-MRI is generally useful when diagnosing TIA, but a neurological examination may be more sensitive, especially in the early stages.

Key words: Babinski sign, Chaddock sign, TIA, diffusion weighted image


Introduction

Transient ischemic attack (TIA) is a clinical syndrome that consists of sudden focal neurologic signs and a complete recovery usually within 24 hours (1). Because TIA can sometimes develop into a cerebral infarction, an early diagnosis is important in avoiding the development of a cerebral infarction (2-4). Magnetic resonance imaging (MRI) is a powerful tool in the diagnosis of TIA, especially when diffusion weighted image (DWI) is performed, as this sequence will reveal abnormalities in 44% of TIA cases (5-7). However, a negative DWI finding may be misleading during the differential diagnosis for TIA. We herein report a case of repeated transient right hemiparesis (13 instances) with no abnormalities noted on two successive DWI scans, where only the complete synchronization of the Babinski and Chaddock signs with her TIA symptoms allowed us to make the early diagnosis.

Case Report

A 53-year-old woman suddenly developed right hemiparesis, and she was admitted to our hospital 30 minutes after the onset. She had smoked 10 cigarettes daily for 23 years, and quit at 43 years of age. She used estradiol at a dose of 0.5 mg/day for hormone replacement therapy. Her mother had died from a cerebral infarction at 80 years of age. She had neither hypertension nor diabetes mellitus. A physical examination revealed that she was slightly overweight with a BMI of 27.6. She was alert during the neurological examination, but displayed mild dysarthria as well as a right hemiparesis (Fig. 1A, arrow). Her facial muscles and sensory nerves showed no abnormalities. A motor examination revealed 2/5 strength in her right upper and lower extremities, as outlined by the Medical Research Council of Great Britain (MRC). Her deep tendon reflexes were diminished in her bilateral patellar and achilles due to a lumbar deformation, but Babinski and Chaddock signs were positive on the right side (Fig. 1B, arrow). Hoffmann, Trömmer and Warten-
Figu1. Transient right hemiparesis synchronized with Babinski and Chaddock signs. The appearance of right hemiparesis (A, arrow) corresponded with positive right Babinski signs (B, arrow). The disappearance of right hemiparesis (C, arrow) corresponded with the disappearance of right Babinski signs (D, arrow).

berg reflexes were negative bilaterally. Her National Institutes of Health stroke scale (NIHSS) score was 9. A laboratory examination showed a slight polycythemia with a red blood cell count of 532×10^4/mL, a white blood cell count of 9,200/mL and a platelet cell count of 53.7×10^4/mL. Her triglycerides were elevated to 161 mg/dL. Autoantibody tests were negative, including those for antinuclear, rheumatoid factor, anti-Sm, anti-SS-A, anti-SS-B and anti-cardiolipin. Her D-dimer level was 1.16 μg/mL, and the results for soluble fibrin monomer complex, β-thromboglobulin, thrombin-antithrombin and, protein C and S were normal. A chest X-ray and the ambulatory Holter electroencephalogram readings were normal, and ultrasound echocardiography revealed neither shunt disease nor the presence of thrombi in any cavities. Carotid ultrasonography showed no plaque or stenosis. Although DWI-MRI at 1 hour after the onset was unremarkable, we suspected TIA and administered aspirin at a dose of 100 mg/day as well as edaravone (free radical scavenger). Magnetic resonance angiography (MRA) showed no stenosis or other abnormality.

At 1 hour after the onset, her right hemiparesis disappeared (Fig. 1C, arrow), the moment right Babinski and Chaddock signs became negative (Fig. 1D, arrow) and her NIHSS improved to 0. However, at 9 hours after the initial onset, right hemiparesis appeared again and right Babinski and Chaddock signs became positive without the appearance of the Hoffmann, Trömner, and Wartenberg reflexes. At this time, DWI-MRI continued to show normal findings. This second TIA-like phase disappeared 30 minutes later, at the same time that the Babinski and Chaddock signs on the right simultaneously became negative. These attacks repeated for a total of 13 instances with decreasing duration (Fig. 1A-D). When the cranial MRI was performed at 4 days after the onset, high signal intensity at the left corona radiata appeared on DWI; thus, we were able to definitively diagnose the cerebral infarction (Fig. 2). Following standard therapy and rehabilitation, she discharged 18 days after the onset with only slight weakness. She had no additional recurrences of TIA or infarction while being treated with atorvastatin calcium hydrate (10 mg) and aspirin (100 mg/day).

Discussion

We herein report a patient with repetitive TIA as indicated by right hemiparesis and Babinski/Chaddock signs. We suspected the cause of the cerebral infarction was hormone replacement therapy because polycythemia improved after the hormone replacement therapy was stopped (8, 9). We diag-
or may be more prompt reactions than these associated root of the Babinski and Chaddock signs may be different
Wartenberg reflexes did not synchronize in this case, the
corticospinal tract. Because the Hoffmann, Trömner and
may mean that these signs are the prompt reactions of the
dal tract lesions, but the complete mechanism has not yet
quency.
A hemodynamic insufficiency of the lenticulostriate artery
the presence of a perforating artery could also be the cause.
MRI-DWI scans could not detect the infarction; alternately,
symptoms may be the reason why two consecutive early
occurred a total of 13 times. The short duration of the TIA
est duration was about 1 hour, although right hemiparesis
hours and 3.2 hours, respectively (5). In our case, the long-
dWI-positive patients than for DWI-negative patients; 7.3
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