

High Resolution Diffusion-Weighted Image of Magnetic Resonance Imaging Detects the Hippocampus Lesion with Excellent Sensitivity

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Abstract

Transient global amnesia (TGA) is characterized by anterograde amnesia. It is presumed to be caused by hippocampal transient ischemia or metabolic dysregulation. Although diffusion-weighted imaging (DWI) on magnetic resonance imaging (MRI) can visualize the lesion, the diagnostic sensitivity is still under discussion. A 66-year-old female was diagnosed with TGA as indicated by clinical symptoms and radiological findings. In addition, high-resolution DWI clearly detected the hippocampal lesion than conventional DWI.

High-resolution DWI is useful to detect the hippocampal lesion in TGA patient. Following to the previous reports, this result supports high-resolution DWI would be recommended to TGA diagnosis.

Keywords: Transient global amnesia, high-resolution DWI, hippocampus.

1. INTRODUCTION

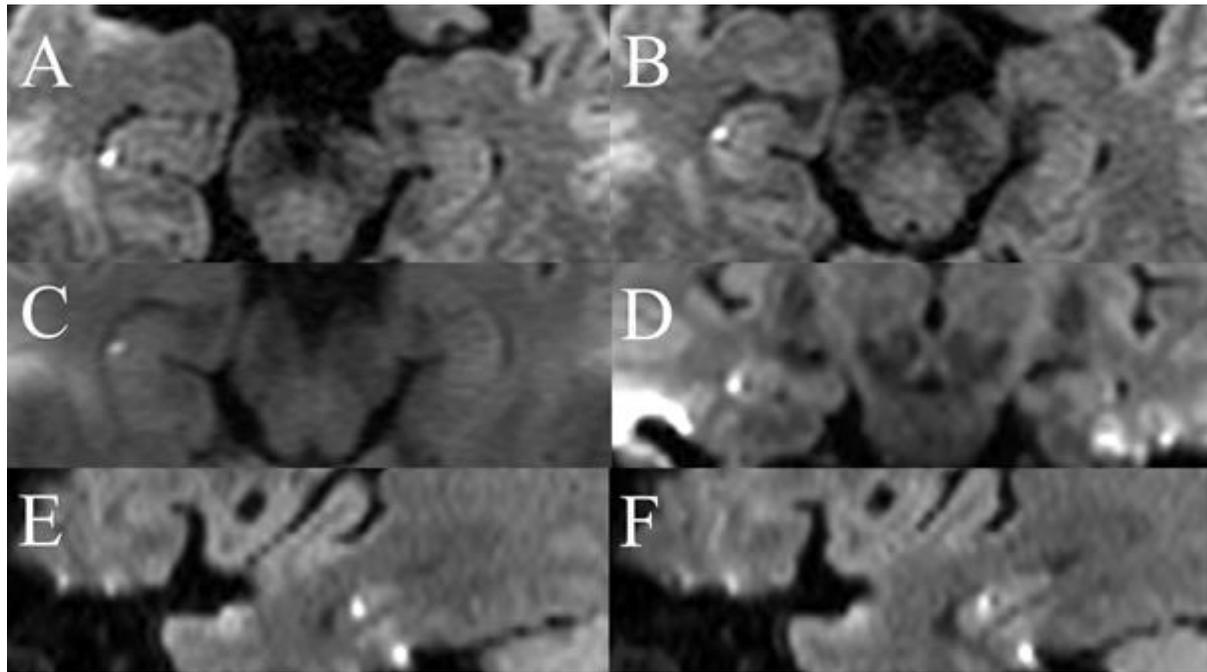
Transient global amnesia (TGA) is defined as a sudden-onset anterograde amnesia without other neurological deficits [1, 2]. It is usually observed in middle-aged population. During the symptomatic period, self-awareness is preserved with keeping daily activities performance. Most symptoms resolve within 24 hours [3, 4]. TGA is usually diagnosed based on clinical symptoms and course [5]. In contrast, radiological imaging criteria remain unclear for differential diagnosis. Detection of hippocampal signal changes using diffusion-weighted imaging (DWI) on magnetic resonance imaging (MRI) has been considered useful [6, 7]. However, subsequent case reports or case series papers show varying detection rates [8]. Based on previous reports, a recent review recommends evaluating hippocampal lesions using high-resolution DWI [9]. The author experienced one case of both high-resolution and conventional DWI were performed simultaneously in the same TGA patient. TGA lesion on hippocampal area was clearly visualized in high-resolution DWI. Detected lesion size was small, which makes lower sensitivities to visualize hippocampal lesion by conventional DWI.

2. CASE PRESENTATION

A 66-year-old female suffered TGA within half a

day, prior to the clinical examination. She had no neurological deficits, or disorientation at the first examination. Brain MRI revealed a hyperintense area in the right hippocampus on DWI. At the b value 1000 s/mm^2 with 5 mm slice thickness including 1 mm gap condition imaging, signal change was noted on only one slice (Figure 1C). Conversely, at b value 2000 s/mm^2 with 2 mm slice thickness without gap condition, radiological signal change was noted on 2 slices in axial (Figure 1A, B). In addition, signal changes indicative of hippocampal lesions were detected in 1 coronal slice (Figure 1D), and 2 sagittal slices (Figure 1E, F). The lesion manifested perpendicular to the long axis of the hippocampus. Furthermore, conventional DWI detected the lesion in only on one axial slice, suggesting a lesion size of approximately 5 mm in the longest dimension.

Head magnetic resonance imaging of diffusion-weighted imaging, obtained by 1.5 tesla. A, B and C show the sequential axial image of hippocampus including plane. D shows the coronal plane image. E and F show the sagittal plane image. A, B, D, E and F are obtained by the b value 2000 s/mm^2 with 2 mm slice thickness without gap condition. C is obtained by the b value 1000 s/mm^2 with 5 mm slice thickness including 1 mm gap condition.



3. DISCUSSION

Although pathophysiology of TGA is still unclear, transient ischemia or metabolic disorder in hippocampus are presumed to bring this temporally memory disturbance. Because of DWI can detect the cyto-edematous change, ischemic attack lesion is well visualized by that. The detection rate of TGA lesion in the hippocampus has been variable. Three tesla MRI studies [10, 11] show good detection rate rather than that by 1.5 tesla MRI studies [12, 13]. Recommended imaging conditions for high-resolution DWI include b 2000 s/mm^2 , 2mm slice thickness, and 3-plane acquisition. The optimal timing for image acquisition is 24 hours or more after TGA onset [9]. The imaging findings in this case appeared to support these recommendations. In head MRI examinations for TGA suspected case, acquiring high-resolution DWI images surround the hippocampus is desirable.

4. CONCLUSION

High-resolution DWI of MRI finely detects the hippocampal lesion on TGA

CONFLICT OF INTEREST

The author declares no conflict of interest

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