

Ictal Neuropsychological Assessment in a Patient with Transient Global Amnesia

Case Report

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Transient global amnesia (TGA) is a temporary amnesic syndrome characterized by anterograde amnesia and variable retrograde amnesia without other focal neurological deficits. Neuropsychological tests during attack in TGA have been rarely reported. We report a 62-year-old man with TGA who was evaluated with detailed neuropsychological tests during attack. Ictal neuropsychological tests showed encoding failure in verbal and visual memory with frontal/executive dysfunction. (2013;3:76-78)

Key words: *Transient global amnesia, Neuropsychological test, Memory

Introduction

Transient global amnesia (TGA) is a syndrome which is recovered within 24 hours after anterograde and retrograde amnesia appear suddenly without other focal neurological symptoms or signs. Its pathological mechanism has not yet been proved enough but several factors, such as migraine, focal ischemia, venous flow abnormalities, and epilepsy, have been suggested to be involved.^{1,2}

As it is improved within matter of hours, it is difficult to carry out neuropsychological tests during the period of amnesia. There are a few reports about it.³⁻⁷ The memory impairment of acute period is usually about episodic memory and indicates the serious anterograde and retrograde amnesia. The disabilities in performance ability and recognition can appear. We report a patient with TGA who was evaluated with detailed neuropsychological tests during attack.

Case

A 62-year-old man was brought to the hospital with sudden memory loss and abnormal behaviors. He remembered having breakfast with his family members at 8 am on that day but didn't what food he ate. He continuously asked questions about where he was while calling with his wife at noon, what he was doing and what clothes he wore. And as he couldn't remember what happened in the morning, he was brought to the hospital with his family members. On the way into the hospital, he repeatedly asked why they were going to hospital, and why they were together with him.

When hospitalized, he couldn't remember the route between the hospital and his house or the accompanying persons, and how to get to the hospital. He didn't have any diseases such as hypertension, diabetes mellitus, hyperlipidemia or migraine and didn't drink or smoke. He had had no history of any external wound or infection. His vital signs were normal and there was nothing wrong in his physical examination. Following the neurological examination, his consciousness was proved clear. There were no problems in motor system, sensory system and cranial nervous.

Four hours after the onset of the disease, Korean version of mini-mental state examination (K-MMSE) and Seoul Neuropsychological Screening Battery (SNSB) tests were carried out. He has master's degree. He got 27 score in K-MMSE losing each point in time orientation, place orientation and delayed recall test.

SNSB showed the low score in the immediate recall, delayed recall and recognition of verbal and visual memory. And it showed that there were problems in semantic word fluency and color word stroop test (Table 1). Diffusion-weighted MRI performed on the day of the onset of the disease showed the high signal abnormalities in the bilateral hippocampus (Fig. 1). The next day he remembered he was hospitalized but didn't remember the fact that he went through the neuropsychological tests and brain MRI.

Discussions

This case study showed the impairment of frontal executive functions such as the verbal fluency and color reading including memory

impairment by carrying out neuropsychological test to the patients clinically diagnosed to have TGA during the attack. It is not only difficult to carry out the neuropsychological test during the attack but it also needs good understanding of the test result.

TGA shows the disorientation, memory impairment and repetitive questioning due to encoding failure during the attack.⁴⁻⁷ While memory impairment usually takes place in TGA, another cognitive disabilities in capacities such as frontal executive function, concentration, and visuospatial function can coincide with it.^{1,9} This case also showed one point was lost in each time and place orientation and neuropsychological tests showed the impairments in memory registration, immediate and delayed recalling and recognition.

The neuropsychological tests seemed to be performed during the

attack due to the result of the test and as the patient couldn't remember he went through the test. There were also the impairments in the frontal executive function such as semantic verbal fluency and color reading in color in the neuropsychological test. This case showed more widespread neuropsychological impairment than the simple memory loss in TGA.

Memory impairment usually happens in episodic memory and there is almost no impairment in semantic memory.¹⁰ It can be explained by that both memories are separated functionally. Even though semantic memory impairment rarely happens, it is difficult to detect because it is usually not serious and it can be recovered rapidly during the attack. Therefore, unless the neuropsychological test is carried out during the attack, it is not detected.^{4,7,10} The memory impairments both retrograde and anterograde ones can appear and they can also show the impairments in both verbal and non-verbal memory.^{1,4,9}

The retrograde amnesia can appear in various types. Mostly the memory one hour before the attack remains eternally impaired.^{1,10} Similar to the previous reports, this study also showed the impairments in immediate and delayed recall and recognition for verbal and non-verbal memory.

The finding that the phonemic fluency is normal in verbal fluency but there is impairment in semantic fluency is considered the result to reflect partly the impairment in semantic memory. Retrograde memory impairment was not serious but it was expected to take place by 8 in the morning, four hours before the noon, the estimated time of the onset of the disease. To evaluate about the memory impairment more accurately, the more detailed neuropsychological evaluation tool than SNSB is needed.

We could confirm there is other cognitive dysfunctions except memory disturbance through the neuropsychological test during the

Table 1. Ictal neuropsychological tests of the patient

Cognitive domain/item	Raw score (% ile score)
Attention	
Digit span: forward/backward	8/4
Language & related functions	
Fluency/comprehension/repetition	Normal/Normal/Normal
Naming, Korean-Boston Naming Test	14
Calculation, +/-/×/÷	3/3/3/3
Right-left orientation	Normal
Praxis	Normal
Visuospatial function	
Rey Complex Figure Test	34
Memory	
Seoul Verbal Learning Test	
Immediate recalls, 1st/2nd/3rd/total	4/4/4/12 (0.15%)
Delayed recall	0 (0.02%)
Recognition score	12 (<0.01%)
Rey Complex Figure Test	
Immediate recall	4 (0.19%)
Delayed recall	0 (0.01%)
Recognition score	14 (<0.01%)
Frontal/Executive functions	
Contrasting program	20
Go-no go test	20
Fist-edge-palm	Normal
Controlled Oral Word Association Test	
Animal/supermarket items	17/12 (35.57/6.35%)
ㄱ/ㄴ/ㅇ	12/10/12
Korean-Color Word Stroop Test	
Word reading	112
Color reading	79 (5.64%)

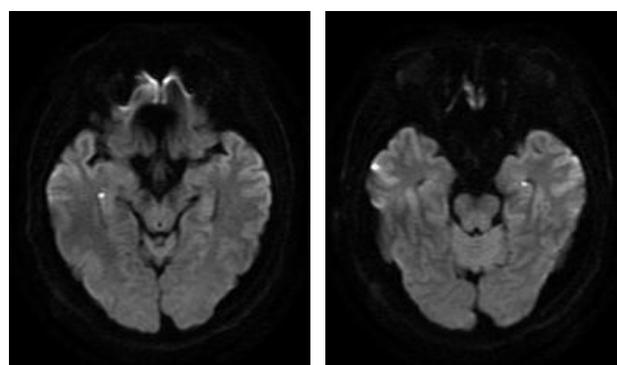


Figure 1. Brain MRI of the patient. Diffusion-weighted axial images show focal high signal intensities in the bilateral hippocampus.

attack of TGA. This can be considered the good example to broaden the understanding of the dysfunctions of the brain during the attack.

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