

Examination of vocal disorders in progressive supranuclear palsy

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Abstract

Parkinsonism, gait disturbance, and fortune-telling fall characteristics were found in nine PSP patients. Stammering symptoms and significant freezing of gait were found in four of those cases. In all cases, no problems were detected by head MRI. In the SPECT, there was a significant reduction in blood flow to the cingulate gyrus front part and the frontal lobe in four patients in acknowledgment of stammering symptoms. A reduction in blood flow of the Broca field was found in one patient. However, there were not most of the bloodstream falls in the patients who were not seen of the letter of anarthria literalis in the same part. The pattern of the cerebral blood flow scintigraphy indicated that the four cases with stammering symptoms also seemed to have a rhapsody disorder with PSP-PAGE. Therefore, the four cases might have been in the subclinical stage of PSP-PNFA.

Keywords: PSP, stammering symptom, freezing of gait, MRI, SPECT, PSP-PAGE

Introduction

Progressive supranuclear palsy (PSP) is a neurodegenerative disease characterized by fortune-telling fall characteristics in addition to Parkinsonism and dementia. It is known that a variety of vocal disorders such as explosive speech or scanning speech develop in PSP. Because we encountered patients with PSP who had stammering symptoms, examination of vocal disorders was conducted.

Subjects and methods

The subjects were nine PSP patients; five men and four women. The age was 71 ± 6.8 (mean

$\pm$ SD). Parkinsonism mainly on the akinesia was found in all patients. Also, gait disturbance, and fortune-telling fall characteristics were present. Significant freezing of gait was found in patients 1-4. In utterances, there were stammering symptoms including repetition, enlargement and a block of the head rhyme. In patients 5-9, there was dysarthria, but no stammering symptoms or freezing of gait. We conducted reading aloud and sound analysis of free talk using a sound analysis system. Mini Mental State Examination (MMSE) and Frontal Assessment Battery (FAB) were performed. Head MRI and cerebral blood flow scintigraphy (SPECT) were also performed.

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Table 1. Brain MRI findings in 9 patients with progressive supranuclear palsy (PSP)

Patient	1	2	3	4	5	6	7	8	9
Stuttering	+	+	+	+	-	-	-	-	-
Atrophy in brain MRI	Cingulate gyrus (front part)	+	+	+	+	+	+	+	+
	Frontal lobe	+	+	+	+	±	±	±	+

Table 2. Brain SPECT findings in 9 patients with progressive supranuclear palsy (PSP)

Patient	1	2	3	4	5	6	7	8	9
Stuttering	+	+	+	+	-	-	-	-	-
Hypoperfusion in brain SPECT	Cingulate gyrus (front part)	++	++	++	+	+	+	±	±
	Frontal lobe	±	+	+	+	-	-	+	-
	cerebellum	-	+	-	-	-	-	-	-
	Parietal lobe	±	-	-	-	±	±	-	±
	Temporal lobe		±	±	+		±		±
	Occipital lobe			±					

Results

Sound analysis of the letter of anarthria literalis. In the patients showing stammering symptoms, long repetitions of the head rhyme were inserted at the beginning of the utterance. The insertion of the repetition was seen similarly in the middle of the utterance. However, this was relatively short. In other words, the insertion of an unnecessary sound observed as stammering was more remarkable at the beginning of the utterance than in the middle. In head MRI, atrophy was found in the mesencephalic tegmentum of all nine cases and in the cingulate gyrus front part and frontal lobe (Table 1). Patients 1-4 who presented with stammering symptoms received an examination for SPECT (Table 2). In two cases, the cingulate gyrus front part and the frontal lobe had a drop in blood flow. A drop in blood flow was also found in the frontal lobe and the Broca field in Patient 2 (Figure 1). On the other hand, no significant drop in blood flow was found in patients 5-9 who were not seen of the letter of anarthria literalis.

Discussion

It is known that PSP has five types, including Richardson's syndrome, PSP-P, PSP-PAGF (pure akinesia with gait freezing), PSP-CBS (corticobasal syndrome), and PSP-PNFA (progressive non-fluent aphasia) [1]. It was thought that four cases with the stammering symptoms were of the PSP-PNFA or PSP-PAGF types. Furthermore, it was necessary to consider the apraxia of speech (AOS). At first we tried to think about the difference between PSP-PNFA and AOS. In contrast, it may be said that AOS consists of partial symptoms of PNFA. On the other hand, only partial symptoms of AOS were present in our four cases. Based upon the foregoing, it was thought that we were accompanied with a language symptom in PSP-PAGF including prosody disorders such as stammering, rhythm disorder and lack of variety. We examined an involved site and the bloodstream fall part according to the type. The SPECT showed that there was a significant drop in blood flow in the front part of the cingulate gyrus and the frontal

lobe in four patients with stammering symptoms. However, a slight drop in blood flow was seen in the same areas of patients who did not show the stammering. The pattern of four drops in blood flow that resulted in stammering symptoms was similar to the pattern of the involved site of PSP-PNFA and AOS [2,3].

References

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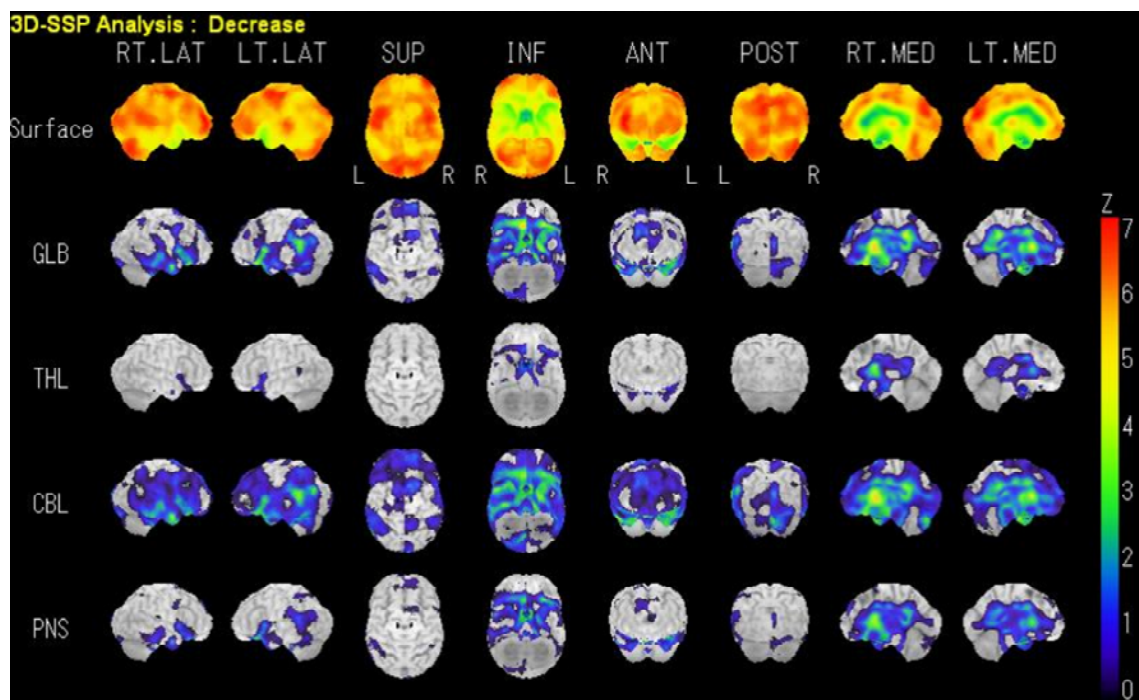


Figure 1. Brain SPECT in Patient 3 with PSP and stuttering. Hypoperfusion in the front part of the cingulate gyrus and the frontal lobe was noted.