Longitudinal Morphometric MRI Study of Alzheimer's Disease

Koji OGOMORI[1], Koichi TAKANO[2], Yasuo KUWABARA[2],
Seigo NAKANO[3], Masashi TAKITA[4], Hideyuki NAWATA[1],
Rika YANO[1] and Ryoji NISHIMURA[1]

[1] *Department of Psychiatry*
[2] *Department of Radiology*
[3] *Department of Internal Medicine, Faculty of Medicine, Fukuoka University, Fukuoka, Japan*
[4] *Takita Memory Mental Clinic, Fukuoka, Japan*

Abstract: A longitudinal morphometric MRI study of Alzheimer's disease (AD) was conducted to determine the relationship between the progression of the symptoms and the progression of the brain atrophy. The Voxel-based Specific Regional Analysis System for Alzheimer's Disease (VSRAD), developed by Matsuda et al. was used as a method of morphometry to perform the statistical MR image analysis. Thirty-eight patients of AD patients were investigated with VSRAD. These patients were divided into two groups according to the progression of symptoms based on a clinical evaluation. One group was the progress group (20 patients), while the other group was the stable group (18 patients) for comparison. The relationship was investigated between the speed of the symptomatic progression and the change in each VSRAD indicator. Consequently, the entorhinal Z-score and the entorhinal atrophy rate showed a correlation with the speed of the symptomatic progression. The increase of the entorhinal Z-score in the follow-up was larger in the progress group than that in the stable group (0.65/1.28 years in the progress group and 0.05/1.26 years in the stable group.). These results suggest that a rapid symptomatic progression in an AD patient accompanies the rapid progression of atrophy in the entorhinal cortex.

Key words: **Alzheimer's Disease, MRI, Morphometry, Entorhinal cortex, Parahippocampal Gyrus**