Efficacy of the Prevention of Hippocampal Atrophy by Treatment with Donepezil in Alzheimer's Disease

A. Ishiwata¹, S. Mizumura², M. Yamazaki¹, H. Hanyu³, S. Kitamura¹, Y. Katayama¹
¹Neurology, Nippon Medical School, ²Radiology, Toho University, ³Geriatric Medicine, Tokyo Medical University, Tokyo, Japan

Objectives: We evaluated an efficacy of a prevention of the hippocampal atrophy in patients with Alzheimer's disease treated with donepezil.

Methods: A hundred and seventy patients with Alzheimer's disease (AD) according to NINCDS-ADRDA underwent MRI and Mini Mental State Examination (MMSE). All participants gave written informed consent to participate in this study. We assessed a severity of hippocampal atrophy by voxel-based morphometry using a three-dimensional T1-weighted MRI with both of donepezil-treated patients (n = 94, 44 males, age 79 +/- 6.4 yrs, mean +/- SD) and donepezil-untreated patients (n = 76, 36 males, age 78 +/- 6.2 yrs) when they underwent MRI. A Z-score map for a gray matter image of a subject was obtained by comparison with mean and standard deviation gray matter images of the controls for each voxel after anatomical standardization and voxel normalization to global mean using the following equation; Z-score=(control mean-[individual value])/(control S.D.).

Results: Both of the groups were classified into three groups according to the MMSE score (group A: MMSE 24-30 points, group B: MMSE 20-23 points, group C: MMSE 14-19 points). Mean Z-score's were calculated and compared between donepezil-treated and donepezil-untreated patients in each of those three groups. There was no significant difference between each group, however, treated patients in group C tended to show lower Z-score. The Z-score tended to increase while the MMSE score decreased with untreated patients, whereas Z-score showed little change with treated patients.

Conclusions: This suggested a possible protective effect of donepezil on more severe stage of AD.