

The effect of improving the cognitive impairment of Parkinson's patients by taking Donepezil, proved by quantitative brainwave (QEEG)!

Dongtan Sacred Heart Hospital, Professor Suk Yun Kang 's team(Department of Neurology) and Yonsei University College of Medicine, Professor Kyoungwon Baik uncover the EEG patterns of Parkinson's Disease with Mild Cognitive Disorder through iMediSync AI-brain mapping technology!

Purpose

- Mild cognitive impairment (MCI) is a common symptom (about 15-64% prevalence) in Parkinson's disease (PD). Parkinson's disease with mild cognitive impairment (PD-MCI) has a high risk of progression to dementia, but there are no drugs or treatment techniques to prevent it.
- In a previous study, the possibility of cholinergic deficiency as a pathologic cause of PD-MCI was confirmed, so the clinical improvement effect was evaluated by administering Donepezil(Aricept®)*, a treatment for Alzheimer's disease dementia.

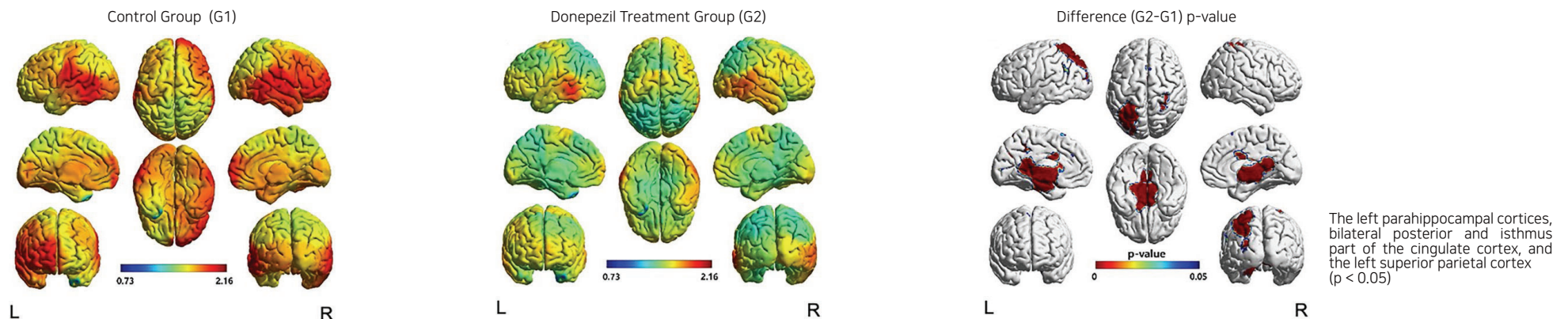
Subjects / Methods

For 48 weeks in Parkinson's disease patients with mild cognitive impairment, 21 patients of Donepezil(Aricept®) Treatment (10 male, 11 female / Mean age 69.1), 29 patients of Control (17 male, 12 female / Mean age 66.7) Outcome comparison was done with QEEG analysis and fMRI test, using AI-QEEG analyzing solution 'iSyncBrain'.

Results

No significant difference was observed in both the control group and the Donepezil group in the cognitive function evaluation scale such as K-MMSE, MoCA, CDR, and the UPDRS Parkinson's disease evaluation scale. On the other hand, only in the Donepezil group, the ratio of Theta(4~8Hz)/Beta2(15~20Hz) significantly decreased in the left parietal, parahippocampal, and both post-cingulate & isthmus sites.

[Source level - Theta/Beta2 Ratio (TB2R)]

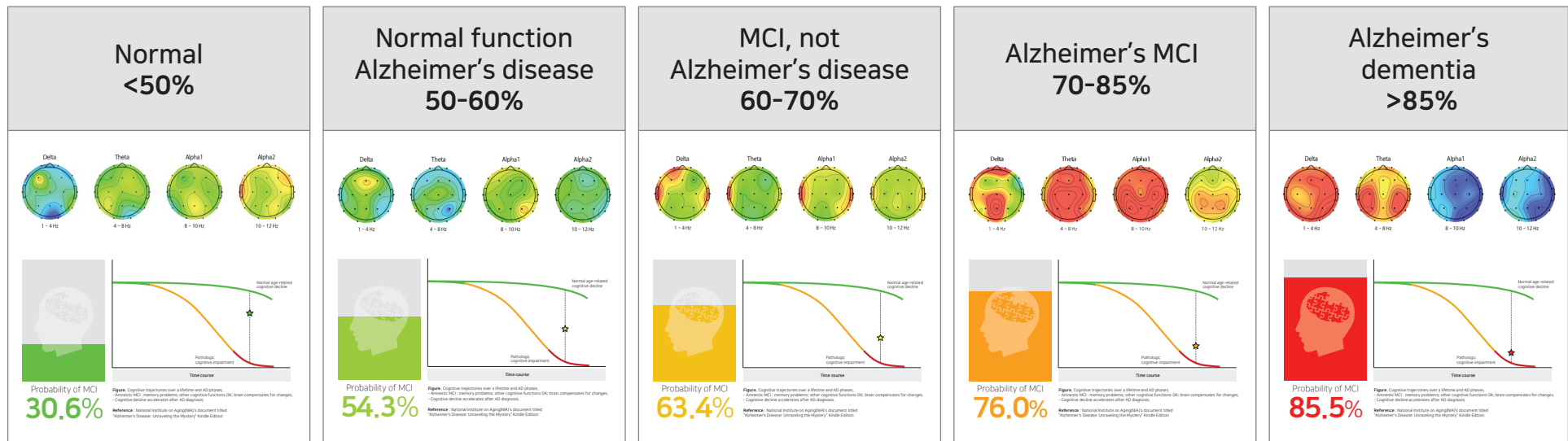


Discussion

- In the process of degenerative changes in the brain, an increase in slow waves (theta, slow alpha) is commonly observed, and in this case, a 'compensation phenomenon' through the activation of beta waves appears in healthy brain cells. However, as the degenerative change intensifies, this reward gradually decreases. Therefore, the relative ratio of Theta wave and Beta2 wave is a useful index to understand the progression of degenerative change.
- In this study, the group taking Donepezil (Aricept®) for 48 weeks did not find any significant changes in the existing cognitive function evaluation, but theta/Beta2 in the main areas of the brain circuit responsible for memory-related functions. The observation of a significant change in ratio reflects the positive effect on brain function activity.
- By observing these changes with QEEG, the use of quantitative EEG in Parkinson's disease with mild cognitive impairment (PD-MCI) is expected to help predict the progression to dementia.

MCI Classifier

QEEG-AI algorithm for early detection of mild cognitive impairment or preclinical Alzheimer's dementia



iSyncBrain MCI Classifier, Brainwave Analyzing Software