The relationship between cognitive function and magnetic resonance spectroscopy findings in Parkinson disease patients

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Purpose: Cognitive impairment (CI) is one of the most notable disabilities of Parkinson's disease that is associated with lower quality of life. Early detection of CI is, therefore, very important for these patients. The purpose of this study was to examine the relationship between cognitive function and the metabolic data from magnetic resonance spectroscopy (MRS) of the patient suffering from Parkinson's disease.

Methods and Materials: We recruited 45 patients with Parkinson's disease and subjects were divided into three groups based on scales for outcome from Parkinson cognition (SCOPA-COG) test. Patients were classified as non-cognitive impairment (NCI; n=15), mild cognitive impairment
(MCI; n=15) and dementia (PDD; n=15). All subjects underwent MRI and 1H-MRS techniques and metabolic changes such as NAA/Cr and NAA/Cho ratios, which were measured in the left hippocampal area of the brain.

Results: The mean and standard deviation of the NAA/Cr ratio in the three cognitive groups (NCI, MCI, PDD) were (2.51±0.037), (2.50 ± 0.033) and (2.47± 0.025), respectively. ANOVA test showed a significant difference in the three groups. Furthermore, the Scheffé test showed a significant difference between patients in the MCI and PDD groups (p=0.01). There was no significant difference between the non-cognitive impairment and mild cognitive impairment groups (p=0.54). No significant difference was found in NAA/Cho ratio (p=091).

Conclusion: A decreasing NAA/Cr ratio has an influence on cognitive function and the development of severe cognitive dysfunction in Parkinson-suffering patients. Furthermore, H-MRS determinant can be useful to evaluate cognition in Parkinson patients.