

MAGNETIC RESONANCE SPECTROSCOPY IN MILD COGNITIVE IMPAIRMENT AS MARKER OF EARLY ALZHEIMER'S DISEASE

P.J. Modrego, N. Fayed

Zaragoza, Spain

pmodrego@salud.aragon.es

Objective: Mild Cognitive Impairment (MCI) of amnesic type is a common condition in the elderly at high risk of developing Alzheimer's disease (AD). The purpose of the study is to demonstrate that ¹H Magnetic Resonance Spectroscopy (MRS) of the brain may predict early conversion to dementia within the 2 year period after baseline assessment.

Methods: We recruited a cohort of patients fulfilling the criteria of amnesic MCI in the outpatients' clinics of a university hospital. We included only the patients who scored 5 points or lower in the Memory Impairment Screening (MIS). At baseline neuropsychological examination included the Mini-Mental test, CDR, Blessed Dementia Rating Scale, Geriatric Depression Scale, the clock drawing test, and the Rey Auditory verbal learning test. We also carried out standard blood tests including B12 vitamin, thyroid hormones and APOE genotype. 1.5T Magnetic Resonance Imaging was based on T1, T2, FLAIR sequences and ¹H-Spectroscopy of the brain exploring two areas: posteromedial parietal lobe and left medial occipital lobe. The patients were followed-up for a mean period of two years and the endpoint was the conversion to probable AD according the NINCDS-ADRDA criteria. Re-assessment was made every 6 months or earlier.

Results: Among 76 patients initially screened, 71 were followed-up. The mean age was 74.6 years, and 43 were female. 21 had one or two APOE4 alleles. None of them reverted to normality. After 2 year follow-up, 27 patients converted to probable AD. The NAA/r ratio in the posteromedial region predicted conversion at 74% sensitivity and 83.7% specificity (Area under the curve: 84; 95% CI: 0.73-0.92). The accuracy of classification was 80%, which climbed to 85% when MIS score and APOE genotype were included in the analysis. In the left occipital lobe the NAA/Cr ratio predicted it at 85% sensitivity and 61% specificity (AUC: 0.80; 95% CI: 0.69-0.89).

Conclusion: Although perhaps inferior to other techniques, MRS can be a useful tool to predict early conversion to dementia in amnesic MCI.