USELFULNESS OF MR PROTON SPECTROSCOPY IN ASSESSMENT OF THE DIAGNOSTIC OF THE DEMENTIA

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Objective:
The objective of this study was to find the determinants of the degenerative processes in the ageing brain, with the particular emphasis on Alzheimer-type dementia, using MR proton spectroscopy (1HMRS).
Material/Methods:
The sample consisted of 155 person investigated who were divided into four groups: the control group Y (44 person, the mean of age of 64,6 years) and 3 groups of patients diagnosed with dementia. Group A (47 persons, the mean of age of 65,5 years) with Alzheimer-type dementia, group N (46 patients, the mean of age of 64,8 years) with vascular dementia and group M (15 patients, the mean of age of 65,3 years) with mixed type dementia. Imaging (MRI) and spectroscopy (1HMRS) examinations were performed using MR Signa Horizon 1.5T system (GEMS) with the use of a standard volume head coil. A single voxel spectroscopy (SVS) was used, with VOI located in the following areas: frontal [1], paraventricular [2], parietooccipial [3] and the hippocampus [4]. Qualitative analysis of the spectrum was made (the profil analysis) as well as quantitative analysis and the relative concentration ratios (RCR) were calculated for selected metabolites (NAA, Cho, mI, Cr); the Cr concentration was assumed as the internal standard. Detailed analysis of each group was made followed by the comparison with group Y.
Results:
1HMRS spectra in the patients with Alzheimer-type dementia reveal characteristic changes: increase in mI/Cr RCR and decrease in NAA/Cr and NAA/mI RCRs, which were statistically significant almost for all the locations. There is clear change in the spectrum profile: the lowered NAA peak and elevated mI. In the RCRs of the patients with angiogenic dementia no characteristic changes were found either in the quantitative or qualitative spectrum analyses. On the other hand, the appearance if Lip and Lac peaks allowes coming to the conclusion indicating the angiogenic character dementia. In the case of mixed type dementia no characteristic changes were found in the quantitative analysis. However, in the qualitative analysis in the patients in the group an elevated mI peak always occurred the appearance of Lip and Lac peaks with elevated mI peak allows coming to the conclusion indicating the mixed character of dementia.
Conclusions:
On the base of the results obtained it may be concluded that both the data of the analysis of the RCRs for the selected metabolites (NAA, Cho, Cr, mI) and spectra allow the diagnosis of Alzheimer-type dementia.