INTRODUCTION

Cognitive disorders are one of the most frequent symptoms of multiple sclerosis (MS). It is not known yet the damage of which parts of the brain has the main role in the cognitive disorders. The mechanisms of cognitive disorders in different types of MS are also obscure.

The aim of our study was to evaluate the ratio of cognitive disorders in patients with different MS types and various disability levels and to assess the correlation between cognitive disorders and the changes of the regional cerebral metabolic rate of glucose (rCMGlu) in the brain grey matter measured by positron emission tomography with 18-fluorodeoxyglucose (PET-FDG).

Patients and methods. 71 MS patients and 25 healthy controls were examined. 59% of the patients had relapsing-remitting MS (RRMS), 41% – progressive MS (PMS). The mean age was 35,14±3 y.o., the mean disease duration – 8.2±2.5 years, the mean Expanded Disability Status Scale (EDSS) score – 3.8±1.9. The disability was measured with EDSS and functional systems score. The neuropsychological examination included: short-term and long-term memory, concentration, counting and cognitive performance tests. PET-FDG study of rCMGlu was made.

RESULTS

The high incidence of cognitive disorders (92%) in the patients with MS and the cases of the rapid cognitive disorders progression in the patients with low disability level improve the difference and independence of the pathogenesis of the cognitive disorders and other neurological symptoms.

The fact that the reduction of grey matter functional activity is more marked in the patients with MS, despite of the equal disability score (3±EDSS=6), improves the role of the type of MS in the development and progression of cognitive disorders.

Cognitive disorders are more severe in the patients that had onset of MS with movement disorders, then in those that had MS onset with optic or sensitive symptoms.

The relative increase of rCMGlu in some areas, that was revealed in both groups of patients, is a probable evidence of the compensatory activation of some parts of the brain tissue. But in the patients with PMS these compensatory mechanisms were not enough to improve the results of cognitive tests, hence it can be suggested that in the PMS patients there is a failure of compensation.

The most marked rCMGlu reduction was observed in precentral gyrus, frontal cortex, right cingulate gyrus, left parietal cortex, postcentral gyrus. In the patients with PMS the reduction of rCMGlu was also revealed in insula and basal ganglia.

DISCUSSION

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Conclusion. Cognitive disorders can be an independent characteristic of the disease severity and should be evaluated regularly even if there is no aggravation of focal neurological symptoms. Cognitive disorders are associated with the functional changes in different parts of the brain cortex and it depends on the type of MS.