BDNF AS A POTENTIAL BIOMARKER OF DISEASE ACTIVITY IN PATIENTS WITH MULTIPLE SCLEROSIS

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Brain-derived neurotrophic factor (BDNF) is a neurotrophin that is expressed by immune cells directly in demyelinated areas of brain lesions in multiple sclerosis (MS). Also, BDNF plays an important role in the processes of neuroplasticity and prevents damage to axons and neurons after pathological lesions. In recent studies, more and more data are appearing on the possibility of using BDNF as a promising biomarker for the diagnosis of MS [1, 2, 3]. Determination of serum BDNF levels in MS patients may be an indicator of disease activity, which may allow early identification of patients with a more severe course of the disease.

The aim of the study is to investigate serum BDNF levels in patients with relapsing-remitting multiple sclerosis (RRMS) and the relationship between BDNF, activity, and duration of the disease.

Materials and methods: 72 patients (44 women and 28 men) aged 19 to 65 (mean age 41.3±1.2) with RRMS were examined. The level of BDNF in blood serum was determined for all subjects by enzyme-linked immunosorbent assay (ELISA). The degree of severity of MS was determined according to the extended scale of disability according to J. Kurtzke (EDSS). The control group consisted of 30 healthy persons comparable in age and sex.

Results: Patients were divided into 3 groups depending on the duration of the disease: the 1st group included 27 patients with a duration of the disease up to 5 years, the 2nd group consisted of 23 patients (the duration of the disease was 5-10 years), the 3rd group consisted of patients with a history of the disease for more than 10 years. The average score on the EDSS scale in the 1st group was 2.42 (range 1.0-4.5), in the 2nd group it was 3.07 (range 1.5-7.0), in the 3rd - 4.14 (range 2.5-6.0). The number of exacerbations per year in the 1st group was 1.59 (range 0-5), in the 2nd - 1.96 (range 0-4), and in the 3rd - 2.91 (range 1-6). The average values of the BDNF level in the 1st group were 93.2±11.7 pg/ml, in the 2nd group - 137.8±26.7 pg/ml, in the 3rd group - 143.8±34, 3 pg/ml. The average values of the BDNF level in the control group were 335.8±20 pg/ml.
Conclusion: BDNF levels were significantly lower in MS patients compared to controls. Patients with longer disease history had higher levels of BDNF, which may be related to more exacerbations and probably active inflammation. Determination of the concentration of BDNF can be used as a promising biomarker of MS for diagnosing the disease, monitoring, and predicting the disease's progression rate.

References: