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**NEUROSPECIFIC MARKERS - NEW OPPORTUNITIES IN
THE DIAGNOSIS OF BACTERIAL MENINGITIS**
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**НЕЙРОСПЕЦИФІЧНІ МАРКЕРИ – НОВІ МОЖЛИВОСТІ В
ДІАГНОСТИЦІ БАКТЕРІАЛЬНИХ МЕНІНГІТІВ**
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***Резюме.** У роботі представлені результати дослідження рівнів нейроспецифічних маркерів NSE, протеїну S-100, GFAP та MBP у цереброспінальній рідині хворих на менінгококовий та пневмококовий менінгіти в динаміці хвороби. Визначено наявність уражень нейронів, астрогліальних клітин та мієлінових нервів у всіх хворих та визначена можливість використання цих показників з діагностичною та прогностичною метою.*

Background: Diagnostic role of neuro specific proteins in assessing the degree of damage to the cells of the central nervous system currently confirmed. It proved that levels of neuron specific proteins in cerebrospinal fluid corresponds to the degree of the CNS cell damage in patients with stroke, injury, Alzheimer's disease, etc. However, the role and the diagnostic value of CSF neuron specific protein in patients with acute bacterial meningitis is almost unknown.

The aim. To evaluate the diagnostic and prognostic value of CSF neurospecific markers in patients with bacterial meningitis.

Material/methods: Were analyzed 54 cases of acute bacterial meningitis. Among them – 26 with pneumococcal and 28 – meningococcal etiology of the disease. We have identified levels of

neurospecific protein S-100, NSE, MBP, GFAP in the CSF of patients with acute pneumococcal and meningococcal meningitis in 1 day of admission to the hospital and 10-12 days of treatment. The etiology of the disease was confirmed by PCR of cerebrospinal fluid. As a control group examined patients with influenza and meningism. The level of NSE, GFAP, MBP and S-100 protein in the CSF of patients was determined by ELISA test. Statistical analysis of the data made using the program «BioStat2009».

Results: Patients were divided into groups depending on the etiology and severity of the disease. In the group of patients with pneumococcal meningitis in 19 (73.08 %) - severe disease, in 7 (26,92 %) was observed moderate severity, 5 (19,23 %) patients died. In the group of patients with meningococcal meningitis in 8 (28.6 %) experienced moderate severity, 20 (71.4 %) - severe disease, 2 (7.1 %) patients died. The results indicate a statistically significant ($P < 0,001$) increased levels of neurospecific proteins in patients with both meningococcal and pneumococcal meningitis at the acute period. On first day of treatment in patients with moderate severity CSF level of S-100 protein was $496,14 \pm 38,53$ ng/l, NSE - $18,20 \pm 1,97$ ug/l, GFAP - $3,31 \pm 0,31$ ng/ml; in patients with severe disease CSF level of S-100 protein was $1731,53 \pm 160,12$ ng/l, NSE - $25,57 \pm 2,55$ ug/l, GFAP - $8,63 \pm 1,53$ ng/ml ($P < 0,001$). In patients who died CSF S-100 protein and GFAP levels was the highest ($P < 0,05$). In the control group CSF levels of S-100 protein was $355,63 \pm 29,17$ ng/l, NSE - $15,71 \pm 0,47$ ug/l, GFAP - $2,27 \pm 0,12$ ng/m ($P < 0,001$). At 10-12 days of treatment CSF levels of neurospecific protein decreased, but in patients with severe disease were significantly higher than in the control group ($P < 0,001$).

Conclusions: Increasing CSF neurospecific protein levels demonstrates the presence of CNS cells damage in all the patients with bacterial meningitis. CSF neurospecific proteins level is directly dependent on the severity of the disease and highest in patients with severe course ($P < 0,001$). This may have diagnostic and prognostic value.