

## Summary

### **The principles of neurosurgical and neurointensive care liquorology**

We observed the development of the cerebrospinal fluid (CSF) patterns in 120 patients after bleeding in the CNS (central nervous system). We used our original cytological-energetic principle to investigate 1453 samples of the CSF from these patients. The principal aim of our investigation is the detection of immunocompetitive cells in the CSF and the specification of their activation via the coefficient of energy balance (KEB). Furthermore we evaluated the numbers of erythrocytes and leucocytes in the CSF and also the catalytic activities of the aspartate aminotransferase (AST) in the CSF as biomarkers of structural disorder of the CNS. Our goal was to evaluate a three week long development of the CSF patterns to gain more accurate information for a more effective therapy and for a better prediction of further clinical development of these patients.

We confirmed that following biomarkers were unfavourable for the development of the CSF compartment and probably the CNS as a whole:

- higher extent of bleeding in the CNS;
- higher frequency of the neutrophile granulocytes in the CSF compartment;
- higher extent of anaerobic metabolism in the CSF compartment;
- higher level of the catalytic activity of the AST in the CSF;
- higher age of the patient;
- the severity of the impairment of the patient early after the bleeding in the CNS;
- impaired reactivity of the immunity system in the CSF compartment.

More invasive neurosurgeries such as aneurysm clipping was associated with more pronounced changes in the early development of the CSF compartment after a neurosurgical intervention. Contrary to this, the semiconservative approach with the external CSF drainage was associated with the worst impairment of the CSF compartment later our observation. It could be concluded from our results that the best therapeutical approach is the endovascular treatment with coiling.

We did not prove the significant influence of vasospasms in the CNS on the development of the abnormal CSF patterns. The presence of extracellular bacteria was the biomarker with unfavorable predictive value for further development in the CSF compartment. The presence of some unknown factors which inhibit initiation of the effective bactericidal inflammatory response could be anticipated from our results.