

Abstract

The basic examination of the cerebrospinal fluid provides a quick orientation in the diagnostic algorithm of CNS diseases about the nature of the pathological process. The current evaluation of cytology and biochemical parameters of glucose metabolism reports about the cells present and at the same time about the level of their activation.

The aim of the work was to investigate the relationship between biochemical and cytological findings in cerebrospinal fluid in a large data set ($n = 8\ 178$), or confirm the hypothesis of a significant alteration in the Coefficient of Energy Balance (CEB) in cytological classes typically accompanying oxidative burst of phagocytes. CEB was subjected to analysis and comparison with other energy parameters (lacto-glucose ratio, gluco-lactate ratio, concentration of lactate and glucose in cerebrospinal fluid). The relationships between blood and cerebrospinal fluid glucose and lactate concentrations were investigated.

CEB values were statistically significantly different in cytological groups, which reflected purulent inflammation, tumor involvement or infection by potential intracellular pathogens, the hypothesis was confirmed. Other energy parameters excluding glycorrhachia distinguish these cytological groups as well as CEB. There are inaccuracies in the derivation and interpretation of CEB, but CEB has reached the largest range of values, so it can stratify between layers of pathological deviation better than all other parameters compared. The dependence of glycorachia, glucose quotient (Q_{glu}) and CEB on glycaemia has been described. When interpreting energy parameters containing glycorrhachia, it is useful to know the current glycaemia and adjust the cut-off for it. The relationship between the concentration of lactate and glucose in cerebrospinal fluid and between the concentration of lactate in cerebrospinal fluid and blood has not been proven.

The results of the work significantly confirmed the crucial need for the cyto-energetic principle of interpretation of cerebrospinal fluid results.

Key words: cerebrospinal fluid, Coefficient of Energy Balance, cytology, glucose, glycaemia, glycolysis, lactate, oxidative burst.