

ELECTROPHORETIC CHANGES OF PATIENTS WITH BLUNT ACUTE CRANIOCEREBRAL TRAUMA

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The permanent advances of contemporary technical progress in industry and living standards as well the increase of road transport are the main reasons for the higher frequency of traumatism in general and especially of craniocerebral traumas (CCT). The neurotraumatologists must be more precise in correct and exact diagnosing and determining the degree of CCT as related to further therapeutic behaviour and prognosis for these patients. The issues of forensic expert examination are an actual contemporary problem. Recently, the morphological and biochemical changes of CSF composition attain a greater diagnostic importance for evaluation of CCT severity.

The introduction and use of electrophoresis for CSF examination enabled the detection of various qualitative and quantitative changes of plasma and CSF protein content owing to complex biochemical processes after CCT. Only a few authors had carried out investigations of CSF protein profile in case of traumatic cerebral lesions. They had used a limited and nonhomogenous clinical material which had not allowed them to make more reliable conclusions. In Bulgaria, the electrophoretic method was introduced by I. Chankov (1956) and Y. Yordanov (1957). As regards the CSF electrophoretic investigation of proteins in cases with traumatic cerebral damage, only I. Chankov (1969) reported a small number of patients (12 ones) even in late period of traumatic brain disease. Later on V. Karakanov (1976) studied CSF protein composition in patients with BACCT in his thesis.

The purpose of our present work was to study the CSF electrophoretic changes as well quantitatively, as qualitatively, in relation to their specificity or typicalness in patients with various degree of BACCT.

Material and methods

We used agar electrophoresis because of its undoubted advantages as compared with those of over 11 electrophoretic methods and modifications contemporarily applied: great dividing ability, clear discrimination of fractions, rapidity, availability, sensitivity, etc. The study covers 62 patients with BACCT. 20 patients are with brain commotion and 42 ones with brain contusion.

Results and discussion

We found normal total protein levels between 15 and 45 mg % in all patients with brain commotion. Globulin reactions were positive (+). The amount of total protein was between 45 and 85 mg % (SI — 0,85 g (1)) in brain contusion patients. We established a hyperproteinorachia in 66 % of the patients and normal

Table 1

Degree of craniocerebral trauma	Number of patients	Males	Females
Brain commotion	20	12	8
Brain contusion I st degree	15	10	5
Brain contusion II nd degree	13	8	5
Brain contusion III rd degree	14	8	6
T o t a l	62	38	24

total protein levels (between 15 and 45 mg %) in the rest 34 % of the cases. Globulin reactions of Pandy; Nonne Appelt, and Weichbrodt are positive (+, ++, +++). The CSF electrophoretic investigation reveals the presence of definite quantitative and qualitative changes of protein constellation often even in cases of normal total protein amount. CSF electrophoregrams are normal and show normal relative levels of protein fractions in patients with brain commotion. Most frequently, mixed electrophoregrams of alpha-gamma type with increased relative levels of alpha-gamma globulin fractions are established in patients with slightly expressed brain contusion. The mixed alpha-gamma type is characteristic for the electrophoregrams of patients with middle degree of brain contusion. Sometimes electrophoregrams of serum type are found out in these patients. The electrophoregrams of patients with severe degree of brain contusion are of serum type and display lowered levels of prealbumins and tau-globulins as well increased ones of alpha- and gamma-globulins.

Habeck (1962) and Löwenthal (cited after 2) have often observed an increase of alpha₁- and alpha₂-globulins by using agar electrophoresis. N. Karakaney (1976) ascertained normal electrophoregrams of brain commotion patients and serum type electrophoregrams in cases with severe brain contusion showing diminution of prealbumins and tau-globulins as well an increase of alpha- and gamma-globulins. E. Cvetanova (1980) found out a reduction of prealbumins and an increase of alpha- and gamma-globulins followed by diminution of albumin-globulin ratio.

We could conclude that though not strictly specific and pathognomonic the CSF electrophoretic changes have a definite considerable diagnostic importance in patients with different degree of brain contusion. Their analysis contributes to correct therapeutic behaviour and helps the solving of the problems of forensic expert examination.

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ЭЛЕКТРОФОРЕТИЧЕСКИЕ ИЗМЕНЕНИЯ У БОЛЬНЫХ С ОСТРОЙ ЗАКРЫТОЙ ЧЕРЕПНО-МОЗГОВОЙ ТРАВМОЙ

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Р Е З Ю М Е

Автором проведено электрофоретическое исследование ликвора 62 больных с острой закрытой черепно-мозговой травмой. У 20 больных было сотрясение мозга, а у 42 больных — мозговая контузия. Электрофоретическое исследование ликвора показывает существование определенных количественных и качественных изменений белковой констеляции — мозговой жидкости, что часто наблюдается и при нормальном количестве общего белка. Автор считает, что электрофоретические изменения ликвора, несмотря на то, что они не строго специфичны и патогномичны, имеют большое значение для диагностики при мозговых травмах различной степени.