

DIAGNOSTICAL VALUE OF LIQUOR CHANGES IN BRAIN STROKE PATIENTS

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The differential diagnosis between cerebral haemorrhage and brain softening in the early stage of stroke (insultus) may present considerable difficulties. In certain cases, the clinical differential-diagnostical reference points appear to be insufficient. However, correct etiopathogenetic therapy might be embarked on only provided the nature of the stroke sustained has been precisely determined, as diagnostical errors lead to fatal consequences. Hence, the great practical importance of prompt and correct diagnosis of the acute cerebral circulation derangements. To establish exact diagnosis in similar cases some of the paraclinical investigations are also resorted to.

The liquor investigation plays an important and not infrequently decisive role in the differential diagnosis of brain stroke (4, 5, 6, 8, 9, 10). Any way, we should add right away that the reason of the comparatively scarcely studied liquor in acute vascular processes stems in the fear of performing puncture in patients with vascular diseases. Neurologists are still discordant as to the possibilities and scope of application of lumbar puncture as well as in terms of interpretation of the data of cerebrospinal fluid investigations, aimed at establishing the character of the vascular process within the first post-stroke days (M. I. Guitur) (3).

We set out to study the diagnostical value of the data of liquor investigations in patients undergoing treatment at the clinic over the past five years (1964—1968).

The liquor was investigated in a series of 91 patients with brain stroke, aged 20—80 years; of the total number, 21 died and the diagnosis was verified pathologically. The lumbar puncture in all the patients was carried out in lateral recumbent position of the subjects, from the fifth to tenth day since the onset of the stroke. Usually from 3 to 5 cc liquor was obtained for investigation purposes. Complications related to the technique of taking the liquor were not observed.

We shall deal with the liquor in three basic groups of vascular lesions of the brain, namely: 1. hemorrhage in the brain and liquor spaces, 2. Softening of the brain substance and 3. Dynamic disturbance of the cerebral circulation.

Of 29 patients with preliminary clinical diagnosis — subarachnoid hemorrhage in 15 the liquor is bloody, in 10 — xanthochromic and in 4 — clear transparent. In three of the cases with clear liquor, an increased number of erythrocytes in the liquor was found during microscopic investigation. In one case only no erythrocytes were established in the liquor. Thus, pro-

ceeding from the liquor finding, the diagnosis was changed in one case, and corroborated with greater precision — in 28.

Out of the 11 cases with parenchymatous hemorrhage studied, 7 are with clear liquor, but the microscopic investigation disclosed 12—40 erythrocytes per three fields. The latter finding warrants the assumption that the focus of the hemorrhage in these cases is rather restricted and more distant from the liquor spaces, and therefore the infiltration of erythrocytes into the liquor is insignificant.

In focal brain softenings, the liquor is altered only in one half of the cases. In 10 patients, out of a total of 20 with clinical diagnosis cerebral thrombosis, the liquor is within normal limits. In 9 of the latter group, the protein level in the liquor is increased over 33 mg %, and in 2 the increase of the liquor protein is with rather elevated values — 82 and 88 mg %. The liquor in 19 of the cases with diagnosis cerebral thrombosis is clear and transparent. In one patient only, xanthochromic liquor was established, justifying the alteration of the preliminary clinical diagnosis. The rise of protein in the liquor of patients with cerebral thrombosis might be explained, on the one hand, by the proximity of the softening focus to the ventricular system or subarachnoidal spaces, and on the other, by the stasis phenomena in the cerebral circulation. Belenkaya R. M. (2) states that in the period of resolution and organization of the focus, products from the decomposition of brain substance fall directly into the liquor.

In 8 cases with diagnosis — dynamic impairment of the cerebral circulation — the liquor is clear and transparent. The preliminary clinical diagnosis in these instances was confirmed. In two additional cases with preliminary diagnosis — dynamic impairment of the cerebral circulation — the diagnosis was changed into parenchymatous hemorrhage after the lumbar puncture.

Out of 21 patients with lethal outcome in whom the diagnosis was determined on the basis of investigating the liquor, full correlation was present between the clinical and pathologoanatomical diagnosis. Thirteen of them were with parenchymatous hemorrhage, 3 — with subarachnoidal hemorrhage and 5 — with brain thrombosis. Of the latter group, one had protein in the liquor amounting to 90 mg %, and another one — 50 mg %. The brain softening in these cases was close to the ventricular system. Worth of interest is one of the cases presenting clinical picture characteristic of brain softening in which a moderate quantity of erythrocytes was discovered in the liquor — 112/3 at protein level — 91 mg %. The pathologoanatomical investigation revealed hemorrhagic infiltrate, located nearby the cerebral cortex. Such cases are usually difficult for diagnosing (R. M. Belenkaya — 1).

The data obtained from the liquor investigation in stroke patients give us sufficient reason to assume that in acute disorders of the cerebral circulation, the lumbar puncture, conducted within the first 5 days of the disease, has differential diagnostical importance and is a comparatively innocuous diagnostical procedure. Budinova—Smela (cited by 3) report the execution of lumbar puncture in the first post-stroke day with no complications whatsoever. J. Marshall (11) is in the opinion that each stroke patient admitted to the hospital must be subjected to lumbar puncture since the hazard of causing brain stem compression subsequent to impaction is too

much exaggerated. By means of investigating the liquor, we are enabled to determine with greater precision or alter the preliminary clinical diagnosis and thus embark on properly selected, correct etiopathogenetic treatment. The absence of blood in the liquor does not rule out cerebral hemorrhage, but it reduces substantially the probability for its presence. In the same time, the detection of blood in the liquor renders the diagnosis unquestionable. The presence of protein values in the liquor exceeding the normal ones (33 mg %) in practically half of the patients with brain softening makes possible the determination not merely of the character of the stroke sustained, but, up to a certain degree, also the locality of the cerebral focus in relation to the liquor spaces.

Inferences

1. The lumbar puncture made in patients with brain stroke is a comparatively safe diagnostical procedure.

2. By means of lumbar puncture we are enabled to confirm or change the preliminary clinical diagnosis.

3. The investigation of the liquor in patients with cerebral thrombosis may provide an orientation not only concerning the nature of the stroke sustained, but in some cases, also the proximity of the focus to the liquor spaces.

REFERENCES

1. Беленькая, Р. М. Журн. невропатологии и психиатрии 1961, 10, 1453.
2. Беленькая, Р. М. Клиника и терапия инсульта. Труды научно-исследов. психоневрол. института имени В. М. Бехтерева. Л. 1963, т. XXII. 159—177.
3. Гуйтур, М. И. Расстройства мозгового кровообращения. Киев 1965.
4. Лурье, З. Л. Расстройства мозгового кровообращения М. 1959.
5. Лебедев, В. В., Ю. С. Йоффе и Л. А. Лоцман. Дифференциальная диагностика острейшего периода нарушений мозгового кровообращения. Журн. невропат. и психиатрии 1969, 8, 1138.
6. Мартинов, Ю. С., Е. В. Малкова. К клинике кровоизлияний в мозжечок. Вопросы нейрохирургии 1969, 2, 44—48.
7. Хаджиев, Д., Г. Запryanов, Бюлетен НИИМП, 1967, 2, 20—24.
8. Шамбуров, Д. А., Спинномозговая жидкость. М. 1954.
9. Dopzenczo, A., M. Damska, D. Ostiowska, B. Karwowski. Wzrost zawartosci. Bialkaw Plunie mozgowo—Rdzeniowym W zawatach mozgowych. — *Neurologia, Neurochir. i Psychiat. Polska*, 1966, 11, 1299.
10. Lebourges, I., Bernard—Brunel. Gestestherapeutiques dangereux et gestes therapeutiques utiles au cours des accidents vasculaires cerebraux — *Clinique*, 1969, 64, 29—36.
11. Marshall, I. The diagnostic, problem in cerebrovascular disease scot. med., I, 12, 1967, 10, 335—338.

ДИАГНОСТИЧЕСКИЕ ВЕЛИЧИНЫ ИЗМЕНЕНИЙ ЖИДКОСТЕЙ ПРИ ЦЕРЕБРАЛЬНЫХ ИНСУЛЬТАХ

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Р Е З Ю М Е

Авторы исследовали жидкости у 91 больного с церебральными инсультами. Осложнения, вызванные люмбальной пункцией не наблюдались. Исследования жидкости позволили подтвердить диагноз у 87 больных и изменить его у 4 человек.

В заключение отмечается, что люмбальная пункция и исследование жидкости у больных церебральными инсультами является сравнительно безвредным и ценным диагностическим методом.