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Abstract

CSF Enzyme Activities in Patients with Head Injury

—especially on GOT, GPT, LDH and CPK—

by

Hiroshi NAKAMURA, Takumi MIZUNO,
Katsuhiko KAWAMURA, Tetsuro KAMINO

from

Osaka Minami National Hospital Department
of Neurosurgery, Osaka, Japan

In our studies on patients with head injury, it was noted that there are some correlations between their clinical courses and the urinary excretion of creatine (Cr), creatinine (Crn), 17-ketosteroid and 17-hydroxycorticosteroid.

We observed the high urinary excretion of Cr in patients with severe head injury while almost negative in a mild case.

We reported those facts in 1974.

Also noted in patients with head injury is the relationship between the enzyme-activities (GOT, GPT, LDH

and CPK) in the cerebrospinal fluid and their clinical courses.

In this paper, we reported 34 cases of head injured patients (simple type: 2, concussion: 9, contusion: 8, acute intracranial hematoma: 7 and chronic intra-cranial hematoma: 8).

The control values of CSF enzyme-activities were determined in these 14 cases (simple head injury, whip-lash injury and osteoma of the skull) as GOT<15, GPT<7, LDH<12 and CPK<8 units.

In the moderate cases, a slight increase in activities of 4 enzymes in CSF were observed, while in severe or comatose cases, the enzyme-activities (especially LDH and CPK) were greater than in the controls.

In the dead cases these values were five times as high as the normal case.

In the patients recovering from a serious stage, these activities decreased to normal.

High CSF enzyme-levels tend to indicate a poor prognosis and low levels a favorable prognosis.

In the patients with a significant elevation of CSF enzymes, a high urinary excretion of Cr [normal range: 0-150 (ca. 50)mg/day] was often observed.

There was no apparent correlation between the enzyme level in CSF and that in serum and the increase or decrease of these 4 enzymes are not always proportionate with each other.

As reported by Green (1958) and Lending (1961), cerebral cell necrosis and increased permeability of BLB, BBB or cerebral cell membrane can be related to the increase of enzymeactivities.

With these observations, it can be considered that severe head injury gives influence on metabolic function in the hypothalamus and may cause in the levels of CSF enzymes and/or the urinary excretions of Cr, Crn and corticosteroids.

And the examinations of enzyme activities in the patients with head injury may become a useful aid to make an outlook of their clinical course and prognosis.



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