General Articles A

A-1. The Increased Intracranial Pressure and the Concentration of the CSF Protein

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The various kinds of intracranial pathogenesis increase the intracranial pressure and the quantity of the intracranial protein.

We have studied the effect of increased CSF protein on intracranial pressure, CSF production and absorption.

The dogs were paralyzed and artificially ventilated under pentobarbital sodium anesthesia.

1. The relationship among CSF pressure, CSF absorption and protein in the CSF.

The artificial CSF was infused into one lateral ventricle with the rate of 0.1111 ml/min by means of the infusion pump. The ventricular pressure was increased to 200 mmH_2O and the plateau achieved. If the protein solution (3g/100ml) was infused with the same rate, the ventricular pressure was elevated to the higher plateau level of 277 mmH_2O and never returned to the initial CSF pressure even after the infusion had stopped for an hour.

The resistance to the CSF absorption was calculated as follows:

$\Delta F/\Delta P$ ΔF=the change of the infusion rate (ml/min). ΔP=the change of the infusion pressure (mmH_2O).

There was no significant difference between the control and the resistance to the absorption of artificial CSF containing albumin (3g/100ml).

2. The effect of protein on the CSF production.

The ventriculocisternal perfusion was performed to study the effect of protein on the CSF formation. The CSF formation was increased by 11% when the perfusate contained 3g/100ml of albumin. The bulk absorption was decreased by 21% of the control if the perfusion was performed with the protein solution.

The colloid osmotic pressure of the albumin solution seemed to increase the CSF production.

A-2. The Effect of the Intraventricullarly Introduced the RBC Suspension on the Bulk Formation and Absorption of the Cerebrospinal Fluid

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It has been previously reported by the authors that the formation rate of cerebrospinal fluid increased when autologous serum was introduced into the lateral ventricle.

Following the introduction of the RBC suspension treated by refrigerated centrifugation, the formation rate of cerebrospinal fluid increased abruptly up to about 3 times and returned to ordinary formation level within 30 minutes. This change of the formation rate of cerebrospinal fluid could not be attributed to the change of intraventricular osmotic pressure by the introduction of the RBC suspension, but any factor in the blood besides osmotic change must have been at work, because samples from outlet of the perfusion system did not show any changes of osmotic pressure which was measured by freezing point depression method. The factors which have changed the formation rate were assumed to be permeability globulin, bradykinin and 5-hydroxytriptamin (serotonin).

Bradykinin and 5-hydroxytriptamin caused the change of the formation rate of cerebrospinal fluid and the results were quite similar, but there was no change ovserved by 5-hydroxytriptamin administration into the system so far as ordinarily included amount