

# CHOROID PLEXUS SCINTIGRAPHY; A CLINICAL AND EXPERIMENTAL STUDY

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Komatani et al. developed and reported a choroid plexus scintigraphy with Sn-(111)-pyrophosphate and Tc-99m-pertechnetate. They pointed out that a clear image of the choroid plexus was effective to detect the displacement of the ventricular system. But there are no reports describing about its clinical significance. The purpose of the present study is to discuss how useful the choroid plexus scintigraphy is, in the diagnosis of neurosurgical patients. And also we investigated in animal experiment, how much radionuclides do accumulate in the each part of the ventricular system.

In 35 clinical cases, Tc-99m-pertechnetate was injected 24 hours after prior administration of Sn-diphosphate, and 2 hours later brain scintigrams were obtained by a scintillation camera. On the other day, CT-scan was performed on the same patient. Then, the choroid plexus scintigram was compared with the result of CT-scan.

In animal experiment, 20 rats were sacrificed 2 hours after the injection of Tc-99m-pertechnetate. A half of them had been treated with Sn-diphosphate 24 hours before the injection of Tc. After brain was removed, choroid plexus, ventricular wall which mainly consist of ependymal layers and cerebral cortex were dissected and their radioactivities were counted by a well counter.

The following results were obtained from these clinical and experimental studies.

1. It was confirmed radionuclides did not accumulate in the ventricular wall, but mainly in the choroid plexus.
2. The almost whole form of choroid plexus was clearly seen on this scintigram.
3. But it is with difficulty to judge the existence of ventricular enlargement from the shape and position of the choroid plexus images.
4. It is almost impossible to know the displacement or deformation of the ventricle on this scintigram.
5. In future, this scintigraphy may be useful for studying the form and function of the choroid plexus in some special cases, such as hydrocephalus.

# 3',5' CYCLIC ADENOSINE MONOPHOSPHATE CONCENTRATION IN CSF OF PATIENTS WITH CONSCIOUSNESS DISTURBANCE

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There are increasing evidences which suggest that 3',5' cyclic adenosine monophosphate (cAMP) is involved in the regulation of intracellular metabolism, and particular high concentration of cAMP has been detected in the brain and CSF. In the present study, the relationship of CSF and plasma cAMP concentration with the consciousness level was investigated. Each samples of CSF and blood were centrifuged immediately after collection and then stored at  $-40^{\circ}\text{C}$ . Within 2 weeks, the samples were analyzed for cAMP by radioimmunoassay.

For the control, the concentration of cAMP was measured in plasma and CSF of patients with normal consciousness. Plasma cAMP was  $20.4 \pm 6.3$  pmol/ml. (mean  $\pm$  SD) and CSF cAMP was  $46.0 \pm 13.8$  pmol/ml. 163 samples from 64 patients who had consciousness disturbances following various brain organic diseases (cerebrovascular accident : 39 cases, head injury : 18 cases, brain tumor : 7 cases ) were studied. The levels of consciousness were graded as the followings, I : alert, II : drowsy-confusion, III : stupor-semicoma, IV : coma-deep coma. Resultantly a significant correlation was proved between the level of consciousness and CSF cAMP concentration (I:  $46.0 \pm 13.8$ , II:  $34.8 \pm 11.7$ , III:  $23.1 \pm 7.0$ , IV:  $3.6 \pm 1.7$ ). Recovery of sensorium was associated with CSF cAMP levels returning toward normal values, whereas patients who remained severe consciousness disturbance, markedly diminished CSF cAMP levels. But plasma cAMP levels of those patients were within the normal range.

The effect of L-DOPA and Thyrotropine Releasing Hormone (TRH) administration was studied in 12 patients with consciousness disturbance. For each patients, improvement of consciousness level after L-DOPA or TRH was associated with a elevation in CSF cAMP concentration, but not in patients with no improvement of consciousness level. From these studies, it was suggested that the concentration of cAMP in CSF had positive correlation with the consciousness disturbance may serve as an excellent prognosticating factor in brain organic lesions.