log-likelihoods. It was found that the exponential infusion function was optimal among these three infusion functions for the calculation of regional CBF.

Finally, estimation errors of the parameters \( \{ A_i \} \) and \( \{ \alpha_i \} \) regarding to sampling intervals and total measurement durations are evaluated to calculate Cramer-Rao bounds in computer experiments, where several sets of parameter values \( \{ A_i \} \) and \( \{ \alpha_i \} \) were suitably assumed by previously obtained real data processing. Under these parameter values, it was found that one second sampling interval was sufficient and about 20 minutes sampling duration was necessary for the calculation or regional CBF.

**Comparison between V-P Shunt (Ventriculo-Peritoneal Shunt) and L-P Shunt (Subarachnoid Lumbo-Peritoneal Shunt), rCBF Study**

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In 12 cases of adult hydrocephalus, ventriculo-peritoneal shunt (V-P shunt) or subarachnoid lumbo-peritoneal shunt (L-P shunt) procedures were performed on 7 and 5 cases respectively. The effect of these two operative methods was estimated by measuring pre and post operative regional cerebral blood flow (rCBF) and by physical examinations. Ten mCi of \( ^{133} \text{Xe} \) was injected into right or left internal carotid artery to obtain mean rCBF by two compartmental analysis of regional Xenon clearance method. Postoperatively almost all patients improved clinically. In V-P shunt group, postoperative mean rCBF increased about 15% compared with that of preoperation, whereas in L-P shunt group, postoperative mean rCBF increased about 22%. In conclusion, less traumatic L-P shunt procedure was proved to be of value to correct adult hydrocephalus observed frequently among the patients of senile dementia. This procedure, similar to V-P shunt, did accompany rCBF improvement.

**CSF Dynamics in Chronic Adult Hydrocephalus Before and After shunt Operation**

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So called normal pressure hydrocephalus, chronic adult hydrocephalus after subarachnoid haemorrhage had been studied by many investigations using RI cisternography. Recently the CT scan added.

However the report of clinical study about comparison of CSF dynamics before and after shunt operation is rare.

Up to the present, we observed the morbidity after subarachnoid haemorrhage using clinical symptoms, EEG, air study, RI cisternography, and RI clearance curve study, consequently we determined the criteria of shunt operation. Now we observed the CSF dynamics before and after shunt by RI cisternogram, RI clearance curve, EEG, and CT scan, in case of chronic adult hydrocephalus shunted following our criteria.

Materials:

Shunted cases after subarachnoid haemorrhage of ruptured aneurysm 19, AVM2 and others 1.

Results:

1. RI clearance curve before shunt operation was classified to two types.

   (1) Type I had RI peak time within 6 hours.

   (2) Type II had more than 24 hours.

   in each types, RI clearance curve was ab-