

significant difference was observed between red cells and serum albumine, the former being delayed more than the latter.

Results in 7 hereditary spherocytosis revealed that the mean transit time of autogeneous abnormal cells through their own spleen was significantly longer not only than that of normal cells through normal spleen but also than that of normal cells through the same patient's spleen. The time of any red cells was also significantly longer than that of serum albumine.

In the fast circulating path, red cells were sometimes accelerated to pass through and their transport efficiency was indicated to be greater than the plasma, since the rate constant value of exponential component for the fast path was in

some cases greater for Cr-51 red cells than that for I-131 H.S.A. .

Circulation of such substances as to be extracted in the spleen, for instance, colloid particles or artificially denaturated red cells, was in some instances to be delayed. This retardation was closely related and preportional to particle size of colloids or to deformation grade of the treated cells and resulted in elevation of extraction efficiency of such substances in a single passage.

The circulation characteristics of the spleen was elucidated more accurately by this detailed analysis, which would provide us more useful information concerning patho-physiology of this organ.

## **Regional cerebral blood flow study in hypertensive intracerebral hemorrhage with $^{133}\text{Xe}$ clearance method**

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Isotope clearance method developed by Lassen and Ingvar now make it possible to acquire quantitative data on regional alterations of cerebral blood flow of several brain diseases, but it does not appear to be a comprehensive evaluation dealing with the regional cerebral blood flow (rCBF) of intracerebral hemorrhage.

The purpose of this paper was to discuss the alteration of rCBF and its regulatory functions tested by  $\text{CO}_2$  inhalation and induced change in blood pressure on patients of acute stage of hypertensive intracerebral hemorrhage.

**Methods and Materials:** Thirty-eight patients with hypertensive intracerebral hemorrhage were examined. The mean duration from onset to the first rCBF studies was 4.4 days (the day of onset—19 days after the onset), the mean interval from the first to second studies was 14.5 days (7 days—

21 days) on conservatively treated group, and 13.8 days (7 days—29 days) on surgically treated group.

The rCBF measurement was carried out on six regions of ipsilateral side of the lesion with the  $^{133}\text{Xe}$  regional clearance technique. The isotonic solution of 1 mCi  $^{133}\text{Xe}$  was injected into the internal carotid artery through a thin polyethylene catheter and the  $^{133}\text{Xe}$  clearance curves of the rest stage were measured for 15 min., and then, the response of cerebral circulation to hypercapnia induced by 5%  $\text{CO}_2$  inhalation and hypotension induced by intravenous injection of Regitin were examined.

Detector head which used for this study had 6 scintillation probes with 25.4 X 25.4 mm NaI (Tl) crystals collimated by 25 mm i.d. X 107 mm long lead cylinder.

Informations from each probe were collected by FM analog data recorder and these were loaded into digital computer. Regional cerebral blood flow of each region was calculated automatically with height over area method (rCBF 10) to estimate the rest state flow value and initial slope method (rCBF init) to the functional test.

During these examination arterial  $\text{PCO}_2$ ,  $\text{PO}_2$ , PH and arterial blood pressure were also measured.

All subjects were examined by serial carotid angiography on the same day as rCBF study carried out.

**Results:** On the patients of the intracerebral hemorrhage, blood flow of the diseased hemisphere decreased in the many cases and evidence of focal hyperemia, focal ischemia, focal vasoparalysis and loss of autoregulation were also detected.

The results of present studies were summarized as follows.

1. Diffuse ischemia in diseased hemisphere was observed in 30 out of the 36 cases, and its occurrences were almost the same from onset

to one month later.

2. Relative focal hyperemia was detected in 14 of the 36 cases and it was observed more frequently during first 4 days, while a few cases showed the focal hyperemia up to 27 days after the onset. The regional hyperemia was detected more frequently at the neighboring region of the hematoma. Focal ischemia was detected in 5 cases out of 36 cases and it was observed mainly at inferior occipital region.

3. Vasoparalysis for hypercapnia was observed in 13 cases out of 29 cases and 5 cases out of these showed so called global vasoparalysis. The vasoparalysis was seemed to be occurred with almost the same frequency during the first one month.

4. Autoregulation was studied on only 4 cases, all of which showed loss of autoregulation and the two cases global loss of autoregulation.

5. In surgically treated group, marked improvement on mass sign was observed angiographically, but statistically significant improvement in cerebral blood flow could not be proved and on a few cases ischemic focus was detected at operated region.

## **Detection of regional myocardial ischemia by external scanning-computer system**

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The effects of an acute occlusion or partial obstruction of the left circumflex coronary artery on regional distribution of  $\text{Rb}^{86}$ ,  $\text{K}^{42}$ , and/or  $\text{K}^{43}$  clearance of the heart were investigated in dogs.

1) Direct measurement of  $\text{Rb}^{86}$  clearance of myocardium in dogs:

In control dogs,  $\text{Rb}^{86}$  clearance of right ventricle averaged 4.5, which was significantly lower than that of left ventricle 5.7 and intraventricular septum 5.8 ml blood/g myocardium/10 minutes respectively. When the left circumflex coronary artery was partially obstructed and its mean pressure was reduced below 50 mmHg,  $\text{Rb}^{86}$