

Prediction of cerebral infarct sizes by cerebral blood flow SPECT performed in the early acute stage

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Cerebral infarct due to embolic stroke without recanalization was examined by cerebral blood flow (CBF) SPECT in the early acute stage, and the possibility of predicting the size it will reach in the later stages was evaluated. Twenty patients (67 ± 13 years) were examined by CBF SPECT with ^{99m}Tc -ECD 4.5 ± 3.1 hours after the onset of cardiogenic cerebral embolism. The ratio of the antero-posterior length of the cerebral hemisphere to that of the severe ischemic region, which was defined as an area of clear-cut severe reduction in CBF as observed by SPECT, was calculated. One week after the onset, the cerebral infarct was measured in the same manner by CT, and the relationship between the two measurements was evaluated. The CBF in the region of severe ischemia and the surrounding region was determined by the Patlak plot method, and the affected/non-affected (A/NA) ratio was calculated. In severe ischemic regions the CBF ranged from 1.7 ml/100 g/min to 20 ml/100 g/min (mean, 11 ± 5 ml/100 g/min), whereas the A/NA ratio ranged from 4% to 45% (mean, $26 \pm 11\%$). On the other hand, the CBF in the surrounding regions ranged from 20 ml/100 g/min to 52 ml/100 g/min (mean, 34 ± 8 ml/100 g/min) whereas the A/NA ratio ranged from 52% to 104% (mean, $77 \pm 11\%$). The coefficient of correlation between the infarct size predicted by SPECT and that measured by CT was $r = 0.986$, and the correlation equation was $Y = 1.047X - 2.969$. CBF SPECT performed in the early acute stage can be used to predict the size of cerebral infarct.

Key words: SPECT, cerebral infarct, early acute stage, cerebral blood flow, ^{99m}Tc -ECD