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Evaluation of critically perfused area in acute ischemic stroke for therapeutic reperfusion: A clinical PET study

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To evaluate critically perfused areas in the acute ischemic brain, 9 patients were studied by positron emission tomography (PET) within 7–32 hours after the onset. The cerebral blood flow (CBF) and oxygen metabolic rate ($CMRO_2$) were evaluated and compared with sequential change in CT findings. In all the regions developing subsequent necrosis on CT, CBF dropped below 17 m*l*/100 g/min. But in some of these lesions, $CMRO_2$ remained above the minimum value for regions in which infarction did not develop, and the tissue density on CT obviously remained normal for several hours after PET scan. The mean CBF in these lesions (14.0 m*l*/100 g/min, range: 9.9–17.3 m*l*/100 g/min) was significantly higher than that in ischemic areas with low density on CT before or just after PET study (~10 m*l*/100 g/min, range: 7.7–14.1 m*l*/100 g/min). These findings suggest that a part of the tissue with CBF between 10-17 m*l*/100 g/min is still viable at least 7 hours after the onset of ischemia, but becomes non-viable in a longer period of ischemia. These lesions should respond to effective treatment, including therapeutic reperfusion.

Key words: cerebral blood flow, ischemic threshold, cerebral infarction, positron emission tomography