

Hemodynamic and metabolic state of hyperfixation with ^{99m}Tc -HMPAO brain SPECT in subacute stroke

Ihnho CHO,^{*,**} Kohei HAYASHIDA,^{*} Satoshi IMAKITA,^{*} Norihiko KUME^{*} and Kazuki FUKUCHI^{*}

^{}Department of Radiology, National Cardiovascular Center*

*^{**}Department of Nuclear Medicine, Yeungnam University Hospital*

By means of positron emission tomography (PET), we investigated the hemodynamic and metabolic state of the hyperfixation identified as the increased accumulation with ^{99m}Tc -*d,l*-hexamethylpropyleneamine oxime (HMPAO) by single photon emission computed tomography (SPECT) in patients with subacute stroke. We studied four patients with subacute stroke having hyperfixed areas evaluated with CBF, CMRO_2 , OEF and CBV by PET. The hyperfixation rate with ^{99m}Tc -HMPAO was obtained by comparing the surplus rate with standardized CBF. The OEF and CMRO_2 values in the hyperfixed areas of 4 patients were significantly lower than those in normal 5 controls ($p < 0.01$), but CBF and CBV were almost the same in patients and normal controls, but the hyperfixation rate of 0.30 ± 0.15 in 4 patients correlated well with CBV ($r = 0.97$, $y = 11.75x + 0.42$; $p < 0.05$).

Hyperfixation with ^{99m}Tc -HMPAO in the infarct area revealing a mismatch between CMRO_2 and CBF meant relative luxury perfusion. The hyperfixation rate determined by ^{99m}Tc -HMPAO brain SPECT correlated with CBV in the PET study. We can conclude that one of the main factors which caused hyperfixation was vasodilatation as well as the blood brain barrier disruption and the neovascularization.

Key words: hyperfixation, cerebral infarction, Tc-99m HMPAO, brain SPECT, PET