

Transient seizure activity demonstrated by Tc-99m HMPAO SPECT and diffusion-weighted MR imaging

Takao SAGIUCHI, Katsumi ISHII, Yuuji ASANO, Yuki AOKI, Reiko WOODHAMS,
Hisashi YANAIHARA, Shinichi KAN and Kazushige HAYAKAWA

Department of Radiology, Kitasato University School of Medicine

Cerebral perfusion single photon emission computed tomography (SPECT) has been used to confirm the localization of the epileptic focus and the evaluation of seizure. Recently, diffusion-weighted MR imaging (DWI) has been recognized for evaluation of seizure activity. We describe a case of transient seizure activity demonstrated by Tc-99m HMPAO SPECT and DWI. This patient was a 61-year-old woman with a 10-month history of right middle cerebral artery (MCA) infarction who had a generalized seizure during MRI. DWI immediately after seizure showed transient hyperintensity in the right frontal gray matter and the white matter, and these apparent diffusion coefficients (ADC) were transiently decreased. This transient hyperintensity on DWI corresponded to transient hyperperfusion identifying the epileptic focus on interictal Tc-99m HMPAO SPECT. Transient sustained seizure activity might cause these changes on DWI and SPECT. It was considered that interictal Tc-99m HMPAO SPECT showed the delayed hyperperfusion caused by excitatory neuronal overaction and DWI showed cytotoxic edema seizure-induced by energy failure of the membrane-bound Na/K-ATPase pump.

Key words: seizure activity, epilepsy, diffusion-weighted MR imaging, technetium-99m hexamethylpropyleneamine oxime (Tc-99m HMPAO), single photon emission computed tomography (SPECT)