

Semiquantitative analysis of interictal glucose metabolism between generalized epilepsy and localization related epilepsy

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Positron emission tomography (PET) with [¹⁸F]fluoro-D-deoxyglucose (FDG) has been used to detect seizure foci and evaluate surgical resection with localization related epilepsies. However, few investigations have focused on generalized epilepsy in children. To reveal the pathophysiology of generalized epilepsy, we studied 11 patients with generalized epilepsy except West syndrome, and 11 patients with localization related epilepsy without organic disease. The FDG PET was performed by simultaneous emission and transmission scanning. We placed regions of interest (ROI) on bilateral frontal lobe, parietal lobe, occipital lobe, temporal lobe, basal ganglia, thalamus and cerebellum. Standardized uptake value (SUV) was measured and normalized to SUV of ipsilateral cerebellum. Then, we compared the data of generalized epilepsy to those of localization related epilepsy.

FDG PET revealed significant interictal glucose hypometabolism in bilateral basal ganglia in generalized epilepsy compared to that in localization related epilepsy (right side: $p = 0.0095$, left side: $p = 0.0256$, Mann-Whitney test). No other region showed any significant difference ($p > 0.05$) between the two groups. These findings indicate that the basal ganglia is involved in the outbreak of generalized seizures or is affected secondarily by the epileptogenicity itself.

Key words: children, epilepsy, positron emission tomography, SPECT