

Magnetic resonance imaging and positron emission tomography findings in status epilepticus following severe hypoglycemia

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We recently experienced a case with asymmetrical cortical abnormality on MRI with focal status epilepticus following severe hypoglycemia. The cerebral blood flow and metabolisms for oxygen and glucose were determined using positron emission tomography (PET) during focal status epilepticus following severe hypoglycemia and at the follow-up period. Prolonged seizure activity produced profound glucose hypermetabolism and mild hyperemia in the region of the presumed cortical focus of epilepsy and in structures anatomically remote from the focus, corresponding to the areas of abnormal signal intensity on the MRI. The patient remained comatose and exhibited a diffuse hypoperfusion/hypometabolism and symmetrical brain atrophy on the follow-up PET and MRI, respectively. Cytotoxic brain edema due to profound glucose metabolism without compensatory increase of the blood flow during status epilepticus may account for the brain abnormality observed on the early MRI. Simultaneous examination of the cerebral blood flow and metabolism using PET can provide useful information about the pathology in patients with status epilepticus.

Key words: cerebral blood flow, hypoglycemia, glucose metabolism, positron emission tomography (PET), status epilepticus