

Dissociation of brain edema induced by cold injury in rat model: MR imaging and perfusion studies with ^{14}C -iodo-antipyrine

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The purpose of this study is to confirm whether T2-weighted imaging and perfusion imaging, i.e. autoradiogram of ^{14}C -iodoantipyrine, on the course of brain edema correspond to each other or not. Cold injured rat brains were used as a model and were sequentially examined by both methods and compared with each other and with histological specimens. Special focus relies on the time changes in the lesions. High SI of T2-weighted images were observed and the percentages in the high SI area to the total brain area in the same slice were 4.7 ± 0.31 , 5.6 ± 0.46 and 3.4 ± 0.42 for 6, 24 and 48 hours, respectively. By contrast, low perfusion areas were indicated in the perfusion study and their percentages were 4.6 ± 0.55 , 5.6 ± 0.86 and 2.4 ± 0.35 for 6, 24 and 48 hours, respectively. At 48 hours after cold injury, low perfusion areas were smaller than high SI areas. Moreover, high accumulation areas consisting of macrophages were observed surrounding necrosis. It is concluded that there is dissociation between perfusion and T2-weighted MR imaging, where the collection of macrophages surrounding edema lesions and necrosis had the same appearance on MRI and different accumulations on perfusion studies.

Key words: cold injury, MRI, autoradiography, brain perfusion, rat, edema