

Diffusion-Weighted MR Imaging in MELAS (mitochondrial myopathy, encephalopathy, lactic acidosis, and stroke-like episode) Syndrome

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Purpose: To investigate the nature of edematous lesions seen on MR images during acute episodes of MELAS with particular attention to findings on diffusion-weighted images (DWIs)

Materials and Methods: A total of 13 MR examinations (including nine DWIs) in four MELAS patients were performed with a 1.5 T equipment. In all patients, the diagnosis was confirmed by gene analysis. Visual assessment and comparison of the apparent diffusion coefficients (ADCs) of edematous lesions and normal white matter were done on DWIs and changes on follow-up MR images were analyzed.

Results: DWIs obtained within 1 week after acute neurological symptoms revealed hyperintense edema in all patients. The ADCs in edema and normal white matter were 0.62 ± 0.09 and 0.85 ± 0.12 , respectively ($p < 0.05$). On follow-up MR images, whereas signal intensities in edematous lesions decreased, the ADC increased gradually. Edematous lesions were not reversible on follow-up MR images which showed residual abnormal signal intensity (n=4), encephalomalacia (n=4), and petechial hemorrhage (n=2) .

Conclusion: Cytotoxic rather than vasogenic edema is present in the acute stage of MELAS, and they results in severe sequelae of infarction.