Serial Proton magnetic resonance spectroscopy in lesions of Balo concnetric sclerosis

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摘要

Abstract

OBJECTIVE: Balo concentric sclerosis is a rare demyelinating disorder. Serial proton magnetic resonance spectroscopic (1H-MRS) studies were carried out to better understand the biochemical changes within concentric lesions. MATERIALS AND METHODS: Five concentric lesions in four patients with Balo concentric sclerosis were chosen as the objects of serial observation. They included two early acute lesions (showing as concentric ring enhancement on magnetic resonance imaging (MRI) after gadoliniumadministration), two late acute lesions (showing as marginal enhancement on MRI), and one early subacute lesion (showing as edematous concentric lesions without enhancement on MRI). The duration of follow-up ranged from 2-23 months (mean 10 months).A total of 20 1H-MRS studies were performed. On each 1H-MRS study, short-echo (30 ms) and long-echo (136 ms) spectra were obtained. The peaks of N-acetyl-asparate (NAA), choline-containing compounds (Cho), creatine and phosphocreatine (Cr), lactate,and mobile lipid were observed and compared. RESULTS: Generally, a decrease of NAA/Cr ratio and an increase of Cho/Cr ratio were seen on all the spectra. Observing longitudinally, a trend of decreasing NAA/Cr ratio first and then partially recoveringlater was noted. The lowest level of NAA/Cr ratio was noted at the late acute stage or early subacute stage. The Cho/Cr ratio and amplitude of the lactate peak showed a similar trend as that of NAA/Cr, but in an opposite direction. It was rising first and descending later. The highest levels of Cho/Cr ratio and lactate peak were also observed at the late acute or early subacute stage. In addition, lactate peaks could be detected as long as 7 months after onset of symptoms. Lipid metabolite (twobroad peaks at 0.9-1.5 ppm) was seen at the initial study of each group, but fluctuated in size on follow-up. CONCLUSION: The characteristic biochemical changes of concentric sclerosis were a decreased NAA/Cr ratio, an increased Cho/Cr ratio, two broad peaks at 0.9-1.5 ppm, lactate production, and a reversible NAA/Cr ratio on follow-up. The serial 1H-MRS studies revealed a strong biochemical association between NAA, Cho, and lactate, which may be caused by the same pathogenetic process of

demyelination and inflammatory cellular infiltration. The specificity of the serial changes may provide information about the stage of the concentric lesion and perhaps aid in monitoring progression of concentric lesions and evaluating therapy.