

**Role of Diffusion-weighted MR Imaging in Children with Various Brain Pathologies**

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**목적 :** To exhibit our clinical experience of diffusion-weighted (DW) MR imaging for various brain pathologies and to determine its role in characterizing brain pathologies in children.

**대상 및 방법 :** DW images in 177 children (M:F = 96:81 , mean age, 4.7 years) with various brain pathologies were retrospectively collected over past 3 years. DW images (b value = 1000 s/mm) were reviewed along with corresponding apparent diffusion coefficient (ADC) maps. Brain pathologies included cystic or solid brain tumor (n = 55), cerebral infarct (n = 32), cerebritis with or without brain abscess (n = 21), metabolic or toxic brain disorder (n = 19), demyelinating disease (n = 16), hypoxic-ischemic encephalopathy (n = 16), intracerebral hemorrhage including traumatic brain lesion (n = 15), and posterior reversible leukoencephalopathy (n = 3). We reviewed whether DW images and ADCmaps contribute to further characterization of brain pathologies by defining a chronological age of lesions, the presence of cytotoxic edema in lesions, and the nature of cystic lesions.

**결과 :** Chronological age of cerebral infarct and hypoxic-ischemic encephalopathy was accurately determined on DW imaging. Hyperacute lesions were seen only on DW imaging. Signal intensity on ADC map increased with the age of the lesions. Brain tumors showed variable findings according to the type and grade of tumor. Cystic component within brain tumor showed increased water diffusibility, whereas brain abscess showed decreased water diffusibility. Demyelinating disease usually revealed increased water diffusibility. On the contrary, acute metabolic or toxic disease showed reduced water diffusibility. Hyperacute or late subacute hemorrhage showed high signal intensity on DW images.

**결론 :** Brain pathologies in children showed variable findings on DW imaging. DW imaging plays an important supplementary role in characterizing various brain pathologies in children.