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儿童结节性硬化症脑白质磁共振弥散加权成像及ADC值测量

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Title: Magnetic resonance diffusion-weighted imaging and ADC value measurement in the white matter of children with tuberous sclerosis complex

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关键词: 结节性硬化症; 儿童; 脑白质; 表观弥散系数

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摘要: 目的 探讨结节性硬化症(TSC)儿童与正常儿童脑白质磁共振表观弥散系数(ADC)值差异以及TSC儿童脑白质ADC值与临床相关性。方法 回顾性分析52例经临床确诊的TSC的MRI图像,按年龄分组,测量脑白质ADC值,并以同期性别和年龄相匹配的健康体检儿童作为对照;同时按照临床有无癫痫、智力障碍或孤独症对病情严重程度进行评分,分析病情严重程度与ADC值之间的相关性。结果 各年龄组TSC患者额、顶、枕、颞叶及小脑白质ADC值均高于对照组脑白质ADC值,其中除1~3岁年龄组颞叶和小脑以及>12~18岁年龄组小脑外($P>0.05$),其余各年龄组各部位脑白质ADC值均与对照组有显著差异($P<0.05$)。大脑各部位脑白质ADC值增加与临床病情严重程度之间存在显著相关性($P<0.05$)。结论 TSC儿童脑白质ADC值升高,反映了脑白质髓鞘破坏或发育障碍,可能是TSC临床出现认知障碍的主要基础。

Abstract: Objective To compare the magnetic resonance (MR) apparent diffusion coefficient (ADC) values in the white matter of children suffered from tuberous sclerosis complex (TSC) with those of healthy controls, and to explore the association of ADC values with the severity of neurological symptoms. Methods Fifty-two patients with clinically confirmed TSC who underwent MR diffusion-weighted imaging our hospital during December 2007 to June 2012 were

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enrolled. The ADC values were measured in the frontal, parietal, occipital, temporal and cerebellar white matter, and were compared with those in age-matched healthy controls. According to the presence of epilepsy, mental retardation and autism, the neurological severity scoring was conducted, and the correlation of neurological severity with ADC values was analyzed.

Results ADC values of the white matter were higher in the TSC patients compared with the healthy controls, and the increase of ADC values reached statistical significance in all regions and all age groups ($P < 0.05$) except for the temporal and cerebellar white matter in the age group between 1 and 3 years old and the cerebellar white matter in the age group between 12.1 and 18 years old ($P > 0.05$). There was significantly positive correlation between the ADC values and the neurological severity of the TSC patients ($P < 0.05$).

Conclusion The increase of ADC values in the white matter of TSC children indicates white matter myelination impairment or development disorder, which may be the basis of cognitive disorder in clinic.

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