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肾脏皮、髓质ADC在慢性肾脏病分期中的应用

Application of ADC value of renal cortex and medulla in staging chronic kidney disease

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中文摘要:

目的 应用DWI技术探讨ADC对不同分期慢性肾脏病(CKD)的鉴别诊断价值。方法 临床确诊的52例CKD患者及27名健康志愿者(正常对照组)均接受MR常规检查和DWI,b值分别取100、500、1000 s/mm²,定量测量各组肾脏皮、髓质的ADC值并进行统计学分析,观察各组肾脏ADC值的差异,以ROC曲线评价ADC值的鉴别诊断价值。结果 各b值下正常对照组、轻度组和中、重度损害组肾脏皮、髓质ADC值均依次降低($P<0.05$),以皮、髓质ADC₁₀₀₀值在正常对照组与轻度损害组之间、轻度损害组与中、重度损害组之间的差异最显著(P 均 <0.001)。b=1000 s/mm²时,以肾脏髓质ADC值区分正常对照组与轻度损害组的最佳诊断阈值为 1.82×10^{-3} mm²/s,敏感度和特异度分别为69.60%、100%;以肾脏皮质ADC值区分轻度损害组与中、重度损害组的最佳诊断阈值为 1.82×10^{-3} mm²/s,敏感度和特异度分别为65.50%、82.60%。结论 DWI可以反映CKD患者肾脏皮、髓质水分子扩散运动的变化,测量肾脏皮、髓质ADC值有助于对患者进行分期。

英文摘要:

Objective To explore the differential diagnostic value of ADC of renal cortex and medulla in staging chronic kidney disease (CKD) with DWI. **Methods** Fifty-two patients with CKD (including 22 with minor CKD and 29 with moderate/severe CKD) as well as 27 healthy volunteers (normal control group) were included. All subjects received conventional MR and DWI examinations with multiple b values including 50, 100, 500 and 1000 s/mm². The ADC values of cortex and medulla in kidney with each b value were measured respectively and analyzed. The ADC values of cortex and medulla were compared among control group, minor CKD group and moderate/severe CKD group. ROC analysis was performed to evaluate the value of ADC on differential diagnosis of CKD. **Results** ADC values of cortex and medulla went down in turn among normal control group, minor CKD group and moderate/severe CKD group ($P<0.05$) with all b values. The most significant differences of ADC₁₀₀₀ values of cortex and medulla were found between normal control group and minor CKD group, as well as minor CKD group and severe CKD group (both $P<0.001$). The cutoff value, sensitivity and specificity of medullary ADC₁₀₀₀ values for differentiating control group and minor CKD group were 1.82×10^{-3} mm²/s, 69.60% and 100%, respectively, while those of cortical ADC values for differentiating minor CKD group and moderate/severe CKD group were 1.82×10^{-3} mm²/s, 65.50% and 82.60%, respectively. **Conclusion** Water diffusion changes of kidney in patients with CKD could be reflected by DWI. The cortical and medullary ADC values are helpful for staging CKD.

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