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Differentiating between adult intracranial medulloblastoma and ependymoma using MRI

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Abstract

Aim: To investigate the value of routine magnetic resonance imaging (MRI) examination combined with diffusion-weighted imaging (DWI) in the differential diagnosis of adult intracranial medulloblastomas and ependymomas.

Materials and methods: MRI images of 18 medulloblastomas and 18 ependymomas in adult patients were analysed retrospectively, and the differences in MRI features of lesions and apparent diffusion coefficient (ADC) of solid lesions between the two groups were recorded. Independent sample t-tests and χ2 tests were used to analyse the differences in MRI signs and maximum ADC (ADC_{max}), minimum ADC (ADC_{min}), and mean ADC (ADC_{mean}) values between the two groups. The receiver operating characteristic (ROC) curve was used to determine the differential diagnostic efficacy and optimal threshold for each ADC value.

Results: Age, tumour location, and tumour enhancement were significantly different between adult medulloblastoma and ependymoma ($p<0.05$). The ADC_{max} (0.69 ± 0.11 versus $1.04 \pm 0.20 \times 10^{-3}$ mm^2/s, $p<0.001$), ADC_{min} (0.57 ± 0.12 versus $0.96 \pm 0.21 \times 10^{-3}$ mm^2/s, $p<0.001$), and ADC_{mean} (0.62 ± 0.11 versus $1.00 \pm 0.20 \times 10^{-3}$ mm^2/s, $p<0.001$) values were significantly lower in adult medulloblastoma than in ependymoma. The areas under the ROC curves of ADC_{max}, ADC_{min}, and ADC_{mean} were 0.951, 0.957, and 0.966, respectively. The optimal ADC_{mean} threshold was 0.75×10^{-3} mm^2/s, with a sensitivity of 88.9% and a specificity of 88.9%.

Conclusion: Routine MRI examination combined with DWI helps differentiate between intracranial infratentorial medulloblastoma and ependymoma in adults.

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