Factors affecting peritumoral brain edema in meningioma: special histological subtypes with prominently extensive edema.

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Abstract

Various degrees of peritumoral brain edema (PTBE) are observed in patients with intracranial meningiomas. Factors affecting the occurrence of PTBE in intracranial meningioma were investigated. PTBE was investigated retrospectively for 110 patients with primary intracranial meningiomas. Predictive factors related to PTBE were analyzed, for example patient age, sex, magnetic resonance imaging features (contrast enhancement, tumor shape, tumor location, tumor volume), angiographical features (tumor stain, pial-cortical arterial supply, venous obstruction), and histopathological features (histological subtypes, mindbomb homolog 1 labeling index (MIB1-LI)). Histological subtypes were classified into World Health Organization (WHO) grade I common type (meningothelial, transitional, fibrous), grade I uncommon type, and grade II and III types. The extent of PTBE was assessed by calculation of the edema index (EI). PTBE was present in 53 cases (48 %). Male sex, heterogeneous enhancement, superficial location, tumor volume (≥10 cm³), remarkable tumor stain, pial supply, venous obstruction, malignant pathology, and MIB1-LI ≥4 % were correlated with PTBE in univariate analysis. Pial supply and remarkable tumor stain were correlated with PTBE in multivariate analysis. WHO grade I uncommon type had obviously higher EI than WHO grade I common type, and WHO grade II and III types (P < 0.001). Seven cases with prominently high EI (EI ≥10) were all WHO grade I uncommon type, including angiomatous, microcystic, secretory, and lymphoplasmacyte-rich meningioma. Prominently extensive PTBE might indicate the presence of WHO grade I uncommon type meningioma.

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