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Reappraisal of prognostic factors in CNS WHO grade 3 oligodendrogliomas IDH-mutant and 1p/19q co-deleted: lessons from the French POLA cohort

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Abstract

Background: In POLA cohort, three pathological groups of CNS WHO grade 3 oligodendroglioma IDH-mutant and 1p/19q co-deleted have been described: group 1 (high mitotic count only), group 2 (microvascular proliferation MVP and no necrosis), and group 3 (MVP and necrosis).

Methods: 494 patients from the POLA cohort, with a median follow up of 96 months were included. To identify the impact of the pathological groups and contrast enhancement in group 1 on overall survival (OS) or progression free survival (PFS), survival curves were obtained (Kaplan-Meier method) and compared (log-rank test). Prognostic value of clinical factors and CDKN2A homozygous deletion HD were also tested. Multivariate analysis was performed.

Results: Survival analysis demonstrated that the pathological groups were associated with both progression-free survival (PFS P=0.01) and overall survival (OS P=0.001). In group 1, patients with contrast enhancement (1CE+) had a poorer prognosis compared to those without (OS P=0.028, PFS P=0.006). Further stratification into group 1CE-, group 1CE+, group 2, and group 3 provided clearer prognostic distinctions (OS P=0.002, PFS P<0.0001). Other prognostic factors included age (OS P<0.0001, PFS P=0.002), extent of surgical resection (OS P=0.001, PFS P=0.003), KPS (OS P<0.0001, PFS P=0.002), postoperative treatment (OS P=0.007, PFS P<0.0001), and CDKN2A HD (OS and PFS P<0.0001). The pathological groups remained of prognostic significance for PFS in multivariate analysis.

Conclusion: Necrosis and CDKN2A HD are adverse prognostic factors of WHO grade 3 oligodendrogliomas, IDH mutant and 1p/19q co-deleted. Besides, in group 1 patients, lack of contrast enhancement is a factor of better prognosis.

Keywords: CDKN2A HD; CNS WHO grade 3 oligodendroglioma IDH-mutant and 1p/19q co-deleted; contrast enhancement; microvascular proliferation; mitoses; necrosis.

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