

ABSTRACT

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Standard or extended STUPP? Optimal duration of temozolomide for patients with high-grade gliomas: a retrospective analysis.

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PURPOSE: Brain radiotherapy combined with concomitant and six cycles of adjuvant temozolomide (TMZ) is the standard treatment for newly diagnosed high-grade gliomas (HGGs). However, the optimal number of cycles of TMZ is still controversial. We conducted this retrospective cohort study to evaluate whether prolonging adjuvant TMZ beyond six cycles resulted in better survival outcomes.

METHODS: Patients with high-grade gliomas treated with standard brain radiotherapy combined with TMZ were retrospectively analysed. The duration of adjuvant TMZ ranged from 6 to 12 cycles. Those with 6 cycles of adjuvant TMZ were defined as the standard STUPP group, and those with 7-12 cycles were called the extended STUPP group. Median progression-free survival (PFS) and overall survival (OS) were estimated by the Kaplan-Meier method. The Cox proportional hazards model was adopted to estimate the Hazard ratio (HR) associated with PFS and OS.

RESULTS: From September 2011 to May 2021, 372 patients were eligible (143 in the standard group, 229 in the extended group). Patients who received extended STUPP had better PFS and OS compared with standard STUPP. The median PFS for the standard STUPP group was 12 months and for the extended STUPP group 22 months (log-rank $P < 0.001$). The median OS for the standard STUPP group and extended STUPP group were 12 months and 36 months, respectively (log-rank $P < 0.001$). In the subgroup analysis, the two treatments did not differ in IDH-mutated patients, while patients with IDH wild-type had a significantly better response to extended treatment than to standard treatment (PFS: log-rank $P = 0.004$; OS log-rank $P = 0.001$). Patients with MGMT promoter methylation treated with extended STUPP obtained longer PFS and OS than those treated with standard STUPP (PFS: log-rank $P = 0.015$; OS log-rank $P = 0.010$). Adverse events including leukopenia ($P < 0.001$), thrombocytopenia ($P = 0.090$), fatigue ($P < 0.001$) and nausea/vomiting ($P = 0.004$) were more frequent in the extended group.

CONCLUSION: Extended TMZ treatment was superior to standard 6-cycle TMZ for both PFS and OS. The incidence of toxicities in extended group was higher but tolerable.

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