

ABSTRACT

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Re-irradiation for recurrent high grade glioma (HGG) patients: Results of a single arm prospective phase 2 study.

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BACKGROUND AND PURPOSE: Standard of care for recurrent high grade glioma (HGG) is missing. Several treatment options have been investigated including re-irradiation (re-RT). Results are promising but provided by retrospective studies. We designed a single arm prospective phase II study aiming to evaluate efficacy, and toxicity of re-irradiation.

MATERIALS AND METHODS: Adults patients with good performance status, HGG diagnosis reclassified according to the new 2021 fifth edition WHO CNS classification, an interval time (IT) from previous RT \geq 6 months were included. Outcome was evaluated by MRI imaging at 1 month, and every 3 months thereafter. Toxicities were evaluated in terms of radionecrosis occurrence, and neurocognitive status.

RESULTS: Ninety recurrent HGG patients were treated, 11 oligodendroglioma grade 3, 18 astrocytoma grade 3 and 4, and 61 glioblastoma grade 4. The median age was 54 years, and majority had KPS 90-100. The median IT between first-RT and re-RT was 24 months. Re-surgery has been performed in 56.6%, and chemotherapy in 53.3%. The median follow up time was 64 months; median overall survival (OS) time, 1,2,3-year OS rates were 17 months (95%CI 14-19), 66.7% \pm 4.9, 32.6% \pm 5.0, and 22.2 \pm 4.7. Prognostic factors impacting on survival were age ($p = 0.0154$), IT between first RT and re-RT ($p = 0.0051$), glioma grade ($p = 0.0090$), and IDH status ($p = 0.0001$). Radionecrosis grade 2-3 occurred in 9 (10%) patients; neurocognitive functions remained stable until disease progression.

CONCLUSION: Re-RT proved to be a safe and feasible treatment option with low toxicity. Younger patients with grade 3 IDH mutated gliomas, and a longer IT had the better outcome.

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