

Clin Transl Oncol. 2025 Nov 2. doi: 10.1007/s12094-025-04107-5. Online ahead of print.

Are conventional and hypofractionated chemoradiotherapy comparable in glioblastoma patients?

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PMID: 41176740 DOI: [10.1007/s12094-025-04107-5](https://doi.org/10.1007/s12094-025-04107-5)

Abstract

Background/objectives: Hypofractionated radiation therapy (Hypo-RT) schedules may offer radiobiological, patient convenience, and healthcare resource advantages over standard fractionated radiation therapy (S-RT) for glioblastoma (GBM). Additionally, simulated integrated boost (SIB) Hypo-RT is proven to be an effective and safe treatment. We report on our experience regarding progression-free survival (PFS), overall survival (OS), and RT-related toxicities in GBM patients treated with Hypo-RT and S-RT.

Methods: Patients with IDH-wild-type GBM received either Hypo-RT (40.05-52.5 Gy/15 fractions) or S-RT (60-70 Gy/30 fractions). Volumetric modulated arc therapy was performed for all patients. Concomitant temozolomide (75 mg/m²/day) and adjuvant chemotherapy (TMZ 150-200 mg/m² for 5 days every 28 days) were administered. OS and PFS were estimated using the Kaplan-Meier method.

Results: Ninety-five patients were treated (Hypo-RT: 52, S-RT: 43). With a median follow-up of 25 months (range 9-63), the median age was 65 and 54 years for the Hypo-RT and S-RT groups, respectively. All patients tolerated the treatment well; no significant adverse effects were observed in either group. No acute or late neurological side effects of grade ≥ 2 were reported during RT. Grade 3-4 hematologic toxicity occurred in five cases, all of which interrupted concomitant TMZ (all happening in the S-RT arm). The time to progression for the S-RT and Hypo-RT groups was 13.7 and 11.1 months, respectively ($p = 0.243$). Regarding OS, the S-RT group had a median OS of 28.8 months compared to 17.5 months in the Hypo-RT group ($p = 0.007$).

Conclusions: Although further investigations are ongoing, a statistically significant difference exists between Hypo-RT and S-RT in OS. Hypo-RT could potentially become the standard of care not only for elderly patients but also for those with poor prognosis. Further investigation with additional data is necessary to determine the most effective standard approach.

Keywords: Glioblastoma; Hypofractionated; Normofractionated; Radiotherapy.

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