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Impact of boost sequence in concurrent chemo-radiotherapy on newly diagnosed IDH-wildtype glioblastoma multiforme

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Abstract

Background: The standard of care for glioblastoma multiforme (GBM) is maximal surgical resection followed by conventional fractionated concurrent chemoradiotherapy (CCRT) with a total dose of 60 Gy. However, there is currently no consensus on the optimal boost technique for CCRT in GBM.

Methods: We conducted a retrospective review of 398 patients treated with CCRT between 2016 and 2021, using data from two institutional databases. Patients were divided into two groups: those receiving sequential boost (SEB, N = 119) and those receiving simultaneous integrated boost (SIB, N = 279). The primary endpoint was overall survival (OS). To minimize differences between the SIB and SEB groups, we conducted propensity score matching (PSM) analysis.

Results: The median follow-up period was 18.6 months. Before PSM, SEB showed better OS compared to SIB (2-year, 55.6% vs. 44.5%, p = 0.014). However, after PSM, there was no significant difference between two groups (2-year, 55.6% vs. 51.5%, p = 0.300). The boost sequence was not associated with inferior OS before and after PSM (all p-values > 0.05). Additionally, the rates of symptomatic pseudo-progression were similar between the two groups (odds ratio: 1.75, p = 0.055).

Conclusions: This study found no significant difference in OS between SEB and SIB for GBM patients treated with CCRT. Further research is needed to validate these findings and to determine the optimal boost techniques for this patient population.

Keywords: Boost; Glioblastoma multiforme; Radiotherapy.