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Fractionated stereotactic re-irradiation for recurrent glioblastoma: A systematic review and meta-analysis

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Abstract

Background: The clinical benefit and the safety of fractionated stereotactic re-irradiation in treating patients with recurrent glioblastoma are still disputed. Thus, we conducted a meta-analysis to explore the clinical benefit and the safety of fractionated stereotactic re-irradiation for patients with recurrent glioblastoma.

Materials and methods: We retrieved the eligible papers published up to Nov. 2022 through PubMed, Embase, Cochrane, Web of Science, and Clinical Trials. Gov, and other biomedical databases and evaluated the quality of the studies by Newcastle-Ottawa Scale. The random effect model was used to pool 12-month overall survival rates, 12-month progression-free survival rates, and radiational necrosis risk, and an interaction test was used to compare defined subgroups.

Results: We identified eight eligible studies, including 307 patients. The overall survival rate of 12 months was 33.1 % (95 % CI 26.0 %-40.9 %), and the progression-free survival rate of 12 months was 13.4 % (95 % CI 8.0 %-21.3 %). Radiation necrosis was low in incidence in the included studies. Additionally, the subgroup analysis demonstrated that factors such as age, time interval (from the first radiation to the re-irradiation), total dose, and single dose, impacted the survival rate.

Conclusion: Fractionated stereotactic re-irradiation produces relative clinical benefit and safety for patients with recurrent glioblastoma.

Keywords: Fractionated stereotactic; Meta-analysis; Re-irradiation; Recurrent glioblastoma.