

Meta-Analysis

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Stereotactic radiosurgery versus combined stereotactic radiosurgery and bevacizumab for recurrent glioblastoma; a systematic review and meta-analysis of survival

Mohammad Amin Habibi ¹, Mohammad Ghorbani ², Saeid Esmailian ³, Forouhar Tajvidi ⁴, Parham Nekotalaban ⁵, Amir Reza Boskabadi ², Fakhroddin Alemi ⁶, Rasa Zafari ⁷, Mohammad Sina Mirjani ⁸, SeyedMohammad Eazi ⁸, Poriya Minaee ⁸

Affiliations

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Abstract

Recurrent glioblastoma (rGBM) is a brain tumor that is resistant to standard treatments. Although stereotactic radiosurgery (SRS) is a non-invasive radiation technique, it cannot fully prevent tumor recurrence and progression. Bevacizumab blocks tumor blood supply and has been approved for rGBM. However, the best way to combine SRS and bevacizumab is still unclear. We did a systematic review and meta-analysis of studies comparing SRS alone and SRS plus bevacizumab for rGBM. We searched three databases for articles published until June 2023. All statistical analysis was performed by STATA v.17. Our meta-analysis included 20 studies with 926 patients. We found that the combination therapy had a significantly lower rate of overall survival (OS) than SRS alone at 6-month 0.77[95%CI:0.74-0.85] for SRS alone and (100%) for SRS plus bevacizumab. At 1-year OS, 0.39 [95%CI: 0.32-0.47] for SRS alone and 0.61 [95%CI:0.44-0.77] for SRS plus bevacizumab (P-value:0.02). However, this advantage was not seen in the long term (18 months and two years). Additionally, the combination therapy had lower chances of progression-free survival (PFS) than SRS alone at the 6-month and 1-year time points, but the differences were insignificant. Our study indicates that incorporating bevacizumab with SRS may lead to a short-term increase in OS for rGBM patients but not long-term. Additionally, the PFS rate did not show significant improvement in the group receiving combination therapy. Further clinical trials are necessary to validate the enhanced overall survival with combination therapy for rGBM.

Keywords: Bevacizumab; Meta-analysis; Recurrent glioblastoma; Stereotactic radiosurgery; Survival outcomes.

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