

Meta-Analysis

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# Application of bevacizumab in the management of meningiomas: a systematic review and meta-analysis

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## Abstract

Meningiomas are the most common intracranial lesions and constitute one-third of diagnoses. Surgical resection is the gold-standard treatment option. In case of treatment failure, therapeutic options are limited. Bevacizumab is a vascular endothelial growth factor ligand-binding monoclonal antibody that prevents angiogenesis. This study aims to investigate the efficacy and feasibility of bevacizumab in meningiomas. On December 30, 2023, a systematic search was conducted according to PRISMA guidelines using the PubMed, Scopus, Web of Science, and Embase databases. This study is conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flowchart. Our study included 12 studies, comprising 243 individuals and 310 tumors. Most of the studies were retrospective (80%). Most of the patients were male (47.9%). The bevacizumab was mostly administered intravenously at 10 mg/kg every two weeks (77.8%). The mean progression-free survival (PFS) and overall survival (OS) were  $19.1 \pm 4.7$  and  $23.9 \pm 8.4$  months, respectively. The response rate was 0.33 (95%CI: 0.14-0.60). The PFS-6, PFS-12, and PFS-24 were 0.80 (95% CI: 0.64-0.89), 0.66 (95%CI: 0.46-0.82), and 25% (95%CI: 0.16-0.37), respectively. The OS-6, OS-12, and OS-24 were 0.89 (95% CI: 0.80-0.96), 0.86 (95%CI: 0.65-0.95), and 0.48 (95%CI: 0.16-0.82), respectively. The meta-regression identified the total number of individuals, number of tumors, gender, WHO II/III, and prior resection as a possible source of heterogeneity for outcomes. This study highlights the effectiveness of bevacizumab in meningiomas, especially in refractory, high-grade, or neurofibromatosis patients.

**Keywords:** Brain metastasis; Glioma; Meningioma; VEGF.

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