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The safety and efficacy of dabrafenib and trametinib in patients with glioma: A systematic review and meta-analysis

Mohammad Amin Habibi [1], Mohammad Sina Mirjani [2], Muhammad Hussain Ahmadvand [3], Pouria Delbari [3], Omid Alasti [3]

Affiliations

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Abstract

Background: Dabrafenib and trametinib represent targeted therapy options under investigation for treatment of gliomas harboring BRAF V600 mutations. We systematically reviewed the literature and conducted meta-analyses to assess the efficacy and safety of these agents.

Methods: PubMed, Embase, and Scopus were searched from inception to September 2023 for studies examining dabrafenib and/or trametinib for gliomas. Outcomes included response rates (ORR, CR, PR), progression rates (PD), 6- and 12-month PFS, adverse events, and dosing modifications. Meta-analyses were conducted using random effect models.

Results: Nine studies met the inclusion criteria. Meta-analysis demonstrated overall response rates (ORR) of 50% (95% confidence interval (CI): 35-65%) for low-grade gliomas (LGG) and 40% (95% CI: 29-51%) for high-grade gliomas (HGG). Pooled ORR was 45% (95% CI: 36-54%) for both glioma grades. The complete response rate was 13% (95% CI: 05-27%) for HGG and 5% (95% CI: 1-10%) for both LGG and HGG. Six-month progression-free survival (PFS) rates reached 87% in LGG and 67% in HGG and a pooled 6-month PFS 78% (95% CI: 58-98%), declining at 12 months to 67% and 44%, respectively, with a pooled 12-month PFS 56% (95% CI: 34-79%). Grade 1-4 adverse events occurred in 100% of LGG and 63% of HGG patients.

Conclusions: Dabrafenib and trametinib demonstrate promising anti-tumor efficacy in gliomas, particularly low-grade tumors, achieving durable disease stabilization in many patients. However, toxicity significantly limited tolerability. Additional research should further examine efficacy and refine safe administration protocols across glioma subtypes.

Keywords: Antibody; Glioblastoma; Glioma; Immunotherapy; Monoclonal; Mutation.