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Prognostic value of surgical resection over biopsy in elderly patients with glioblastoma: a meta-analysis

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Abstract

Purpose: Maximal-safe resection has been shown to improve overall survival in elderly patients with glioblastoma in observational studies, however, the only clinical trial comparing resection versus biopsy in elderly patients with surgically-accessible glioblastoma showed no improvements in overall survival. A meta-analysis is needed to assess whether surgical resection of glioblastoma in older patients improves surgical outcomes when compared to biopsy alone.

Methods: A search was conducted until October 9th, 2023, to identify published studies reporting the clinical outcomes of glioblastoma patients > 65 years undergoing resection or biopsy (PubMed, MEDLINE, EMBASE, and COCHRANE). Primary outcomes were overall survival (OS), progression-free survival (PFS), and complications. We analyzed mean difference (MD) and hazard ratio (HR) for survival outcomes. Postoperative complications were analyzed as a dichotomic categorical variable with risk ratio (RR).

Results: From 784 articles, 20 cohort studies and 1 randomized controlled trial met our inclusion criteria, considering 20,523 patients for analysis. Patients undergoing surgical resection had an overall survival MD of 6.13 months (CI 95%=2.43-9.82, p = < 0.001) with a HR of 0.43 (95% CI = 0.35-0.52, p = < 0.00001). The progression-free survival MD was 2.34 months (95%CI = 0.79-3.89, p = 0.003) with a 0.50 h favoring resection (95%CI = 0.37-0.68, p = < 0.00001). The complication RR was higher in the resection group favoring biopsy (1.49, 95%CI = 1.06-2.10).

Conclusions: Our meta-analysis suggests that upfront resection is associated with improved overall survival and progression-free survival in elderly patients with newly diagnosed glioblastoma over biopsy. However, postoperative complications are more common with resection. Future clinical trials are essential to provide more robust evaluation in this challenging patient population.

Keywords: Biopsy; Glioblastoma; Meta-analysis; Resection.