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Supramaximal versus gross total resection in Glioblastoma, IDH wild-type and Astrocytoma, IDH-mutant, grade 4, effect on overall and progression free survival: systematic review and meta-analysis

Juan F Mier-García [1] [2], Stefanía Ospina-Santa [3], Javier Orozco-Mera [4] [3], Ruichong Ma [5] [6] [7], Puneet Plaha [5] [7] [8]

Affiliations

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Abstract

Purpose: To synthesize the evidence on the impact on progression-free survival (PFS) and overall survival (OS) of supramaximal resection (SMR) over gross total resection (GTR) in Glioblastoma, IDH wild-type and Astrocytoma, IDH-mutant, grade 4 (Glioblastoma).

Methods: The PubMed, Scopus, Web of Science, Ovid and Cochrane databases were systematically searched (up to November 30, 2022). Studies reporting OS and PFS on adult humans with a suspected Glioblastoma, treated either with a SMR or GTR were included. Hazard ratios were estimated for each study and treatment effects were calculated through DerSimonian and Laird random effects models.

Results: The literature search yielded 14 studies published between 2013 and 2022, enrolling a total of 6779 patients. Analysis of the included studies reveals significantly better clinical outcomes favoring SMR over GTR in terms of PFS (HR 0.67; p = 0.0007), and OS (HR 0.7; p = 0.0001).

Conclusion: Glioblastoma, IDH wild-type and Astrocytoma, IDH-mutant, grade 4, are aggressive tumors with a very short long-term OS. SMR is an effective therapeutic approach contributing to increased PFS and OS in patients with this catastrophic disease.

Keywords: Astrocytoma; Glioblastoma; Meta-analysis; Resection; Survival.