Title
Association of aggressive resection with survival and progression-free survival in adult low-grade glioma: A systematic review and meta-analysis with numbers needed to treat.

Journal
Journal of Clinical Oncology, 35(15_suppl)

ISSN
0732-183X

Authors
Brown, Timothy J
Bota, Daniela Annenelie
Maher, Elizabeth A
et al.

Publication Date
2017-05-20

DOI
10.1200/jco.2017.35.15_suppl.2025

CENTRAL NERVOUS SYSTEM TUMORS

Association of aggressive resection with survival and progression-free survival in adult low-grade glioma: A systematic review and meta-analysis with numbers needed to treat.

Timothy J Brown, Daniela Annenelie Bota, Elizabeth A. Maher, Dawit Gebremichael Aregawi, Linda M. Liau, Paul D. Brown, ...

Show More

Abstract Disclosures

Abstract

2025

Background: Low-grade gliomas (LGG) account for 17-22% of all primary brain tumors. Optimal surgical management consists of optimum safe resection with the goal of complete resection. We performed a systematic review and meta-analysis to quantify the association of extent of resection with likelihood of survival, expressing our results in numbers needed to treat (NNT). **Methods:** A systematic review and study-level meta-analysis to determine the association of resection with overall survival and progression-free survival in newly diagnosed, supratentorial LGG in adults was performed by querying PubMed. Data were extracted to compare gross total resection (GTR) to subtotal resection (STR) and STR to biopsy (Bx) to determine relative risks (RR) of death and progression at 2, 5, and 10 years. Data were analyzed using a random effects model. NNT were calculated from significant comparisons and rounded up to the nearest whole number. Quality of evidence was determined by American Academy of Neurology criteria. **Results:** The systematic review resulted in 283 potential studies. Ultimately 29 studies were included in at least one comparison. There were no high quality (class I and II) or prospective studies discovered in the review. Comparing GTR to STR, RR with 95% confidence intervals (CI) of death at 2, 5, and 10 years, and NNT to avoid one death at 2, 5, and 10 years (GTR vs. STR) were 0.29 [0.17-0.52, $p < 0.0001$, NNT 17], 0.39 [0.29-0.51, $p < 0.00001$, NNT 6], and 0.50 [0.35-0.70, $p < 0.0001$ NNT 4]. RR and NNT for progression (GTR vs. STR) at 2, 5, and 10 years were 0.37 [0.24-0.57, $p < 0.0001$ NNT 7], 0.50 [0.39-0.64, $p < 0.0001$ NNT 4], and 0.67 [0.53-0.84, $p = 0.0005$ NNT 4]. Comparing STR to Bx, RR of death at 2, 5, and 10 years were 0.55 [0.34-0.88, $p = 0.01$ NNT 10], 0.9 [0.61-1.34], and 0.95 [0.73-1.23]. **Conclusions:** Increasing resection thresholds appear to be associated with improved overall and progression free survival, but the body of literature consists of low quality studies. Prospective studies are required to explore whether extent of resection matters or whether resectable tumors share a favorable biology associated with better outcome.