Effect of gross total resection (GTR) in WHO grade II astrocytomas: A SEER based survival analysis.

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Abstract

INTRODUCTION: We wished to compare the survival benefit associated with gross total resection (GTR) in World Health Organization (WHO) grade II astrocytomas (A2) to those of grade III (A3) and grade IV (glioblastoma) astrocytomas.

METHODS: Using the Surveillance, Epidemiology, and End Results (SEER) Program (1999-2010) database, we identified 4,113 A2 patients. Surgical resection was defined as GTR, subtotal resection (STR), or no resection. Kaplan-Meier and multivariate Cox proportional hazards analyses were used to assess survival with respect to extent of resection (EOR). Results were compared to the benefit of GTR over STR in 2,755 A3 and 21,962 glioblastoma patients from the same database.

RESULTS: A multivariate Cox proportional hazards analysis indicated that A2 patients who underwent a GTR had a 28.3% reduction in the hazard of death relative to A2 patients who underwent STR. Similar risk reductions were observed in A2 patients age < 50 and ≥ 50. However, because of differences in the natural history of these cohorts, the relative hazard reduction translated into distinct overall survival profiles. For A2 patients age ≥ 50, the GTR associated survival benefit was approximately 6 months, resembling that observed in glioblastoma patients. In contrast, GTR in A2 patients age < 50 was associated with survival profiles superior to those observed in A3 patients.

CONCLUSIONS: In the SEER database, GTR associated survival benefit in A2 patients age ≥ 50 resembled that observed in glioblastoma, while GTR in A2 patients age < 50 was associated with a distinctly more favorable survival profile.