Comparison of Treatment Patterns and Long-Term Survival between Four Histological Subtypes of Anaplastic Glioma

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Introduction

Survival and patterns of care in different types of anaplastic gliomas have been poorly documented. Our aim was to compare histology-specific survival between different types of anaplastic gliomas. We also assess predictors of survival and treatment patterns for the different histological subtypes.

Learning Objectives

By the conclusion of this session, participants should:

1. Understand the survival patterns for varying histological subtypes of grade III glioma.

2. Understand variations in treatment patterns among four main subtypes of anaplastic glioma.

Methods

The Surveillance, Epidemiology, and End Results (SEER) database was queried for patients from 1973 and 2005 that had a histologically confirmed diagnosis of one of the four Anaplastic Gliomas: Anaplastic Astrocytoma (AA), Anaplastic Ependymoma (AE), Anaplastic Oligodendroglioma (AO), and Anaplastic Ganglioglioma (AG). A multivariate analysis was performed to determine the association of overall survival with histological diagnosis, surgical resection, use of radiation therapy, age, and year of diagnosis.

Results

4,067 patients were identified with Anaplastic Gliomas (3,046 AAs, 107 AEs, 827 AOs, and 87 AGs). Log-rank analysis on survival at two years for all patients based on tumor type was 38.3% (36.5, 40.1) for AA, 58.8% (48.7, 68.5) for AE, 63.4% (59.8, 66.8) for AO, and 84.7% (68.8, 92.9) for AG. Whether or not patients received radiation therapy varied between tumor types. Radiation was administered in 76.8% of AA's, 9.4% of AE's, 67.4% of AO's and 19.5% of AG's. Median overall survival for each tumor type was 16 months for AA, 32 months for AE, 49 months for AO, and 99 months for AG.

Multivariate analysis showed that AA ($p<.0002$, HR 3.538) and AE ($p<.045$, HR 2.061) had a significantly reduced survival compared to AG; AO did not differ significantly from AG ($p<.0782$). Younger age, gross total resection, and radiation therapy were also shown to significantly effect overall survival ($p<.0001$).

Conclusions

Survival of patients with anaplastic gliomas varies significantly with histology: AA having the worst prognosis and AG having the best. Patterns of care and radiation use were also quite different between the different anaplastic gliomas.