ABSTRACT

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National-level overall survival patterns for molecularly-defined diffuse glioma types in the United States.

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BACKGROUND: Molecularly-defined diffuse glioma types - including IDH-wildtype glioblastoma, IDH-mutant astrocytoma, IDH-mutant 1p/19q-codeleted oligodendroglioma, and H3 K27M-mutant diffuse midline glioma - were incorporated into U.S. cancer registry reporting for individuals with brain tumors beginning in 2018. We leveraged these new data to estimate the national-level overall survival (OS) patterns associated with glioma integrated diagnoses.

METHODS: Individuals diagnosed with diffuse gliomas in 2018 and had brain molecular marker data were identified within the U.S. National Cancer Database. OS was estimated using Kaplan Meier methods and stratified by WHO CNS grade, age, sex, tumor size, treatment, extent of resection, and MGMT promoter methylation. Additionally, the effects of WHO CNS grade were examined among individuals with IDH-wildtype astrocytic gliomas.

RESULTS: 8,651 individuals were identified. One-year OS was 53.7% for WHO grade 4 IDH-wildtype glioblastomas; 98.0%, 92.4%, and 76.3% for WHO grade 2, 3, and 4 IDH-mutant astrocytomas, respectively; 97.9% and 94.4% for WHO grade 2 and 3 IDH-mutant 1p/19q-codeleted oligodendrogliomas, respectively; and 55.9% for H3 K27M-mutant diffuse midline gliomas. Among IDH-wildtype glioblastomas, median OS was 17.1 months and 12.4 months for methylated and unmethylated MGMT promoters. Additionally, IDH-wildtype diffuse astrocytic gliomas reported as WHO grade 2 or 3 demonstrated longer OS compared to grade 4 tumors (both $p<0.001$).

CONCLUSIONS: Our findings provide the initial national OS estimates for molecularly-defined diffuse gliomas in the U.S. and illustrate the importance of incorporating such data into cancer registry reporting.

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