JOURNAL ARTICLE CORRECTED PROOF

MGMT promoter methylation and survival following chemotherapy for WHO grade 4 IDH-mutant astrocytoma

Get access

, , , , ✉

Neuro-Oncology, noae157, https://doi.org/10.1093/neuonc/noae157
Published: 11 September 2024 **Article history** ▾

Extract

MGMT promoter methylation is an established prognostic and predictive biomarker in patients with IDH-wildtype glioblastoma.[1–3] However, World Health Organization (WHO) central nervous system (CNS) grade 4 IDH-mutant astrocytomas—unlike glioblastoma—uncommonly exhibit monosomy 10 (harboring *MGMT*), therefore the effect of *MGMT* promoter methylation on response to alkylating chemotherapy is unclear. Using US registry data, we previously defined the epidemiology of WHO grade 4 IDH-mutant astrocytomas.[4,5] Here we investigate the outcomes associated with *MGMT* promoter methylation and chemotherapy among WHO grade 4 IDH-mutant astrocytoma patients in the United States.

Patients with WHO grade 4 IDH-mutant astrocytomas from 2018 to 2021 were identified from the National Cancer Database (NCDB). Starting in 2018, cancer registries implemented new site-specific data items for *MGMT* promoter methylation, WHO grade, and "Brain Molecular Markers" (including IDH status).[4–6] The NCDB only reports treatment data from the first-line setting. Chemotherapy is reported as none, single-agent, or multi-agent, without drug details. Because first-line temozolomide is recommended by National Comprehensive Cancer Network (NCCN), Society for Neuro-Oncology (SNO), and European Association of Neuro-Oncology (EANO) guidelines in this population and other single-drug regimens are rare for this indication, we assumed that first-line single-agent chemotherapy represented temozolomide.[1–3] The relationship between *MGMT* promoter status, single-agent chemotherapy, and OS was examined using multivariable Cox regression, adjusting for patient age, radiotherapy, and extent of resection (EOR). The NCDB is publicly available and only contains deidentified data, which qualifies for human subjects research exemption.