ABSTRACT

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Molecular, Histological, and Clinical Characteristics of Oligodendrogliomas: A Multi-Institutional Retrospective Study.

Dono A(1)(2), Alfaro-Munoz K(3), Yan Y(1), Lopez-Garcia CA(2), Soomro Z(3), Williford G(3), Takayasu T(2), Robell L(3), Majd NK(3), de Groot J(3), Esquenazi Y(1)(4)(5), Kamiya-Matsuoka C(3), Ballester LY(1)(2)(5).

Author information:
(1)Vivian L. Smith Department of Neurosurgery, School of Biomedical Informatics, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, Texas, USA.
(2)Department of Pathology and Laboratory Medicine, School of Biomedical Informatics, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, Texas, USA.
(3)Department of Neuro-Oncology, MD Anderson Cancer Center, Houston, Texas, USA.
(4)Center of Precision Health, School of Biomedical Informatics, McGovern Medical School, The University of Texas Health Science Center at Houston, Houston, Texas, USA.
(5)Memorial Hermann Hospital, Houston, Texas, USA.

BACKGROUND: Reports suggest that phosphatidylinositol 3-kinase pathway alterations confer increased risk of progression and poor prognosis in oligodendroglioma, IDH-mutant, and 1p/19q-codeleted molecular oligodendrogliomas (mODG). However, factors that affect prognosis in mODG have not been thoroughly studied. In addition, the benefits of adjuvant radiation and temozolomide (TMZ) in mODGs remain to be determined.

OBJECTIVE: To evaluate the role of PIK3CA mutations in mODGs.

METHODS: One hundred seven mODGs (2008-2019) diagnosed at 2 institutions were included. A retrospective review of clinical characteristics, molecular alterations, treatments, and outcomes was performed.

RESULTS: The median age was 37 years, and 61 patients (57%) were male. There were 64 (60%) World Health Organization (WHO) grade 2 and 43 (40%) WHO grade 3 tumors. Eighty-two patients (77%) were stratified as high risk (age 40 years or older and/or subtotal resection per Radiation Treatment Oncology Group-9802). Gross-total resection was achieved in 47 patients (45%). Treatment strategies included observation (n = 15), TMZ (n = 11), radiation (n = 13), radiation/TMZ (n = 62), and others (n = 6). Our results show a benefit of TMZ vs observation in progression-free survival (PFS). No difference in PFS or overall survival (OS) was observed between radiation and radiation/TMZ. PIK3CA mutations were detected in 15 (14%) mODG, and shorter OS was observed in PIK3CA-mutant compared with PIK3CA wild-type mODGs (10.7 years vs 15.1 years, P = .009). WHO grade 3 tumors showed a shorter PFS, but no significant difference in OS was observed between WHO grades.

CONCLUSION: Our findings suggest that mODGs harboring PIK3CA mutations have worse OS. Except for an advantage in PFS with TMZ treatment, adjuvant TMZ, radiation, or a combination of the two showed no significant improvement in OS.

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