Primary glioblastoma with oligodendroglial differentiation has better clinical outcome but no difference in common biological markers compared with other types of glioblastoma.


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Abstract

Background Glioblastoma multiforme with an oligodendroglial component (GBMO) has been recognized in the World Health Organization classification—however, the diagnostic criteria, molecular biology, and clinical outcome of primary GBMO remain unclear. Our aim was to investigate whether primary GBMO is a distinct clinicopathological subgroup of GBM and to determine the relative frequency of prognostic markers such as loss of heterozygosity (LOH) on 1p and/or 19q, O(6)-methylguanine-DNA methyltransferase (MGMT) promoter methylation, and isocitrate dehydrogenase 1 (IDH1) mutation.

Methods We examined 288 cases of primary GBM and assessed the molecular markers in 57 GBMO and 50 cases of other primary GBM, correlating the data with clinical parameters and outcome. Results GBMO comprised 21.5% of our GBM specimens and showed significantly longer survival compared with our other GBM (12 mo vs 5.8 mo, P = .006); there was also a strong correlation with younger age at diagnosis (56.4 y vs 60.6 y, P = .005). Singular LOH of 19q (P = .04) conferred a 1.9-fold increased hazard of shorter survival. There was no difference in the frequencies of 1p or 19q deletion, MGMT promoter methylation, or IDH1 mutation (P = .8, P = 1.0, P = 1.0, respectively). Conclusions Primary GBMO is a subgroup of GBM associated with longer survival and a younger age group but shows no difference in the frequency of LOH of 1p/19q, MGMT, and IDH1 mutation compared with other primary GBM.

KEYWORDS: 1p/19q, IDH1, MGMT, glioblastoma with an oligodendroglial component, histopathology

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