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Impact of upfront adjuvant chemoradiation on survival in patients with molecularly defined oligodendroglioma: the benefits of PCV over TMZ

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Abstract

Purpose: Oligodendroglioma is an adult-type diffuse glioma defined by 1p/19q codeletion and IDH1/2 mutation. Treatment includes surgery followed by observation alone in select low-grade tumors, or combination radiation and chemotherapy with procarbazine, lomustine, and vincristine (PCV) or temozolomide (TMZ). While prospective studies investigating treatments for molecularly defined oligodendrogliomas are ongoing, this retrospective study analyzes the relationship between adjuvant regimens and progression-free survival (PFS).

Methods: Adults with IDH-mutant, 1p/19q codeleted oligodendroglioma (WHO grade 2 or 3) who underwent surgery between 2005 and 2021 were identified. Clinical data, disease characteristics, treatment, and outcomes were collected.

Results: A total of 207 patients with grade 2 and 70 with grade 3 oligodendrogliomas were identified. Median (IQR) follow-up was 57 (87) months. Patients with grade 3 tumors who received adjuvant radiation and PCV had longer median PFS (> 110 months) than patients who received radiation and TMZ (52 months, p = 0.008) or no adjuvant chemoradiation (83 months, p = 0.03), which was not seen in grade 2 tumors (p = 0.8). In multivariate analysis, patients who received PCV chemotherapy (Relative Risk [95% CI] = 0.24[0.05-1.08] and radiotherapy (0.46[0.21-1.02]) trended towards longer PFS, independently of grade.

Conclusion: Adjuvant radiation and PCV are associated with improved PFS over radiation with TMZ in patients with grade 3 molecularly defined oligodendrogliomas, and all-grade patients treated with PCV trended towards decreased risk of recurrence and progression. These results highlight the importance of ongoing clinical trials investigating these treatments.

Keywords: 1p/19q codeletion; IDH mutant; Molecular oligodendroglioma; PCV; Temozolomide.