J Neurooncol. 2025 May 22. doi: 10.1007/s11060-025-05028-7. Online ahead of print.

Diffuse hemispheric glioma, H3 G34-mutant: defining the clinical picture through a single institution case series and literature analysis

Andrew Williams [#] [1], Bryan Neth [#] [2], Mason Webb [3], Jonathan Schwartz [4], David Daniels [5], Samantha Caron [6], Jian Campian [6], Joon Uhm [2], Cristiane Ida [7], William G Breen [8], Aditya Raghunathan [7], Ugur Sener [2]

Affiliations

PMID: 40402198 DOI: 10.1007/s11060-025-05028-7

Abstract

Purpose: Diffuse hemispheric glioma, H3 G34-mutant (DHG, H3 G34) is an uncommon new tumor type defined in the World Health Organization 2021 classification. DHG, H3 G34 primarily affects children and young adults. There is paucity of knowledge regarding its demographic and prognostic factors. We present an institutional case series and a comprehensive literature review to better determine factors contributing to overall survival.

Methods: We included an institutional case series (n = 6) and comprehensively reviewed previously published individual cases of DHG, H3 G34 through January 2025. A total of 514 individual cases of DHG, H3 G34 were identified and utilized for analyses (n = 257 with individual level survival data). We performed survival analysis using the Kaplan-Meier method and Cox regression.

Results: Median age of the cohort was 16 years (range: 1-66 years). Median OS was 21 months. OS was improved with gross total resection compared to subtotal resection and biopsy only (Log-rank $p < 0.001$). Patients with primary tumor location in the right hemisphere had longer OS relative to other tumor locations (Log-rank $p < 0.001$). Patients with H3 p.G35V (G34V) mutations as opposed to p.G35R mutations had shorter OS (Log-rank $p = 0.01$). There was no difference in survival outcomes by patient age, MGMT promoter methylation status, the presence of TP53/ATRX/PDGFRA mutations or contrast enhancement.

Conclusions: We present the largest combined data set of patients with DHG, H3 G34 to date and describe in greater clarity the prognostic factors which impact survival in this disease. Unlike many primary brain tumors including glioblastoma and tumors in adolescents and young adults, survival does not appear to be significantly impacted by age.

Keywords: Glioma; H3 G34; Pediatric; Series; Young adult.