World Neurosurg. 2023 Jul 7;S1878-8750(23)00930-0. doi: 10.1016/j.wneu.2023.07.001.
Online ahead of print.

Prognostic indicators for H3K27M-mutant diffuse midline glioma: a population-based retrospective Surveillance, Epidemiology, and End Results database analysis

Srijan Adhikari [1], Abhishek S Bhutada [2], Liliana Ladner [2], Joshua A Cuoco [3], John J Entwistle [3], Eric A Marvin [3], Cara M Rogers [3]

Affiliations

PMID: 37423332 DOI: 10.1016/j.wneu.2023.07.001

Abstract

Background: Diffuse midline glioma with histone H3K27M mutation (H3K27M DMG) is a recently recognized WHO grade IV glioma with a dismal prognosis. Despite maximal treatment, this high-grade glioma exhibits an estimated median survival of 9-12 months. However, little is known with regards to prognostic risk factors for overall survival (OS) for patients with this malignant tumor. The aim of the present study is to characterize risk factors influencing survival in H3K27M DMG.

Methods: This is a population-based retrospective study of survival in patients with H3K27M DMG. The Surveillance, Epidemiology, and End Results database was examined from the years 2018 to 2019 and data from 137 patients were collected. Basic demographics, tumor site, and treatments regimens were retrieved. Univariate and multivariable analyses were conducted to assess for factors associated with overall survival. Nomograms were built based on the results of the multivariable analyses.

Results: Median OS of the entire cohort was 13 months. Patients with infratentorial H3K27M DMG exhibited worse OS compared to their supratentorial counterparts. Any form of radiation treatment resulted in a significantly improved OS. Most combination treatments significantly improved OS with the exception of the surgery plus chemotherapy group. The combination of surgery and radiation had the greatest impact on OS.

Conclusions: Overall, the infratentorial location of H3K27M DMG portends a worse prognosis compared to their supratentorial counterparts. The combination of surgery and radiation had the greatest impact on OS. These data highlight the survival benefit in utilizing a multimodal treatment approach for H3K27M DMG.

Keywords: H3K27M; Kaplan-Meier; central nervous system; diffuse midline glioma; nomogram.