Overall Survival in Grade III and IV Gliomas by Race: A Systematic Literature Review

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Introduction

For most cancer types, Black Non-Hispanics have a higher prevalence and mortality compared to other races, however racial differences in high-grade gliomas have shown increased prevalence in White Non-Hispanics in several large database studies. Despite known differences in incidence of tumor type by race, there remains little conclusive data on the role of race and ethnicity in overall survival in patients with high-grade glioma.
Methods

In accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a systematic literature review was conducted utilizing Ovid, PubMed, Cochrane, Embase, and Scopus databases for studies published between 2007 to 2018. Databases were queried with the following:

(Glioma AND [Ethnic OR Demography, OR African American OR Arab OR Hispanic OR Asian, OR White OR race OR racial] AND [survival OR survival analysis OR survival rate OR treatment outcome OR Survivor OR Outcome].
Results

After application of inclusion and exclusion criteria, a total of 275 articles met criteria for full-text review, and 27 studies were included in the final analysis (figure 1).

Among the 25 studies that reported a statistically significant difference in survival or hazard ratios between races there was a nearly unanimous finding of lower survival and higher hazards of mortality among White Non-Hispanics compared to non-White patients. Across studies, Asian/Pacific Islanders exhibited the lowest hazards of mortality.

These findings have not been explained by differences in surgical resection, radiation therapy, or age at diagnosis.
Figure 1

PRISMA 2009 Flow Diagram

- Records identified through database searching (n = 392)
- Additional records identified through other sources (n = 0)
- Records after duplicates removed (n = 392)
- Records screened (n = 392)
- Records excluded (n = 217)
  - Full-text articles assessed for eligibility (n = 175)
  - Full-text articles excluded, with reasons (n = 148)
- Studies included in qualitative synthesis (n = 27)
Discussion

The majority of high grade glioma patients in the included studies were middle-aged White Non-Hispanic males. The wide variation in capturing outcomes of minority populations highlights the necessity of large multi-institution studies.

Of the 15 studies that reported data for Asians/Pacific Islanders, 12 of these studies reported the improved survival in Asians/Pacific Islander compared to all the races studied.

Accounting for differences in age, gender, extent of resection, tumor site and volume, as well as patient insurance status, differences in the tumor genetic makeup may account for the observed differences in survival.
Discussion

Multiple studies highlight the likely contribution of socioeconomic factors and cultural beliefs to survival trends seen.

One study reported an increased proportion of gross total resection surgery occurring in White Non-Hispanics and Black Non-Hispanics compared to Asians/Pacific Islanders and Hispanics, in addition to reporting Asian/Pacific Islanders being the most likely group to be treated non-surgically.

One study showed increased survival in races other than Black Non-Hispanics and White Non-Hispanics when radiation therapy was not received.
Summary Points

- Recent trends in the literature suggest that race and socioeconomic factors may impact survival in high grade glioma patients.

- There is evidence of superior high grade glioma survival rates for the Asian Pacific Islander population when compared to other races/ethnicities.

- Larger, multi-institution studies are needed to better understand how race and ethnicity impact survival in patients with these tumors.