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Demographic variation in incidence of adult glioma by subtype, United States, 1992-2007.

Dubrow R, Darefsky AS.

Yale School of Public Health, Yale School of Medicine, P.O. Box 208034, New Haven, CT 06520-8034, USA. robert.dubrow@yale.edu.

Abstract

ABSTRACT:

BACKGROUND: We hypothesized that race/ethnic group, sex, age, and/or calendar period variation in adult glioma incidence differs between the two broad subtypes of glioblastoma (GBM) and non-GBM. Primary GBM, which constitute 90-95% of GBM, differ from non-GBM with respect to a number of molecular characteristics, providing a molecular rationale for these two broad glioma subtypes.

METHODS: We utilized data from the Surveillance, Epidemiology, and End Results Program for 1992-2007, ages 30-69 years. We compared 15,088 GBM cases with 9,252 non-GBM cases. We used Poisson regression to calculate adjusted rate ratios and 95% confidence intervals.

RESULTS: The GBM incidence rate increased proportionally with the 4th power of age, whereas the non-GBM rate increased proportionally with the square root of age. For each subtype, compared to non-Hispanic Whites, the incidence rate among Blacks, Asians/Pacific Islanders, and American Indians/Alaskan Natives was substantially lower (one-fourth to one-half for GBM; about two-fifths for non-GBM). Secondary to this primary effect, race/ethnic group variation in incidence was significantly less for non-GBM than for GBM. For each subtype, the incidence rate was higher for males than for females, with the male/female rate ratio being significantly higher for GBM (1.6) than for non-GBM (1.4). We observed significant calendar period trends of increasing incidence for GBM and decreasing incidence for non-GBM. For the two subtypes combined, we observed a 3% decrease in incidence between 1992-1995 and 2004-2007.

CONCLUSIONS: The substantial difference in age effect between GBM and non-GBM suggests a fundamental difference in the genesis of primary GBM (the driver of GBM incidence) versus non-GBM. However, the commonalities between GBM and non-GBM with respect to race/ethnic group and sex variation, more notable than the somewhat subtle, albeit statistically significant, differences, suggest that within the context of a fundamental difference, some aspects of the complex process of gliomagenesis are shared by these subtypes as well. The increasing calendar period trend of GBM incidence coupled with the decreasing trend of non-GBM incidence may at least partly be due to a secular trend in diagnostic fashion, as opposed to real changes in incidence of these subtypes.

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