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Disparities in pediatric neuroblastoma incidence trends in the United States

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Background: Many pediatric neuroblastoma studies show that racial, socioeconomic, and rural/urban disparities are prevalent in neuroblastoma survival. However, very few studies have assessed disparities in age-adjusted incidence trends of pediatric neuroblastoma.

Significance of the Problem: The differences in the incidence rate and its trends can generate questions to explore the reasons for such disparities and also open a path for assessing the causal relationship.

Hypothesis, Problem OR Question: The age-adjusted incidence rate of pediatric neuroblastoma is higher among non-Hispanic Whites. The age-adjusted incidence rate of pediatric neuroblastoma is higher among those with low median household income. The age-adjusted incidence rate of pediatric neuroblastoma is higher among those who live in non-metropolitan counties.

Experimental Design: We used the Surveillance, Epidemiology, and End Results (SEER) 17 data (2000-2020) to calculate age-adjusted incidence rates of pediatric neuroblastoma among individuals aged 0-19 using the U.S. 2000 standard population and Tiwari modifications. We used rural-urban continuum codes (RUCC) to classify metropolitan and non-metropolitan counties. We used joint point analysis to derive annual percent changes (APCs) in incidence trends between 2000-2020 by rurality, median household income, and race/ethnicity.

Results: Overall, from 2000 to 2020, the pediatric neuroblastoma-adjusted incidence rate was 0.8 per 100,000. The trends showed that the rate was increasing slowly, with an annual percentage change (APC) of 0.07. The incidence rate was lower for those who live in non-metropolitan counties (0.7 vs. 0.8 per 100,000) and those with lower income of less than 70,000 (0.7 vs. 0.8 per 100,000). The rate was highest for non-Hispanic whites (NHW), with a rate of 1.0 per 100,000, and lowest for Hispanic all races, with a rate of 0.5 per 100,000. Joint point analysis showed that although the incidence rate of NHW was highest, the trends suggest the rates were decreasing with APC -0.12, while in the case of Hispanic-all races, the rates were increasing with APC of 0.53. Similar trends were observed for counties. Initially, metropolitan counites had higher incidence rates, but the analysis suggests a decreasing trend with an APC of -0.07, while in the case of non-metropolitan counties, APC is 1.02, indicating rising incidence rates. Median household income also showed a similar trend with an APC of 0.99 for those with lower income, showing an increasing rate, while rates of those with higher income are decreasing with an APC of -0.39.

Conclusions: The results suggest that the age-adjusted incidence rate of neuroblastoma is increasing for Hispanic-all races, those who live in non-metropolitan, and those who have lower median household income. Further studies are required to assess the reasons for increasing trends.