

The Rising Trend of Ischemic Stroke in the Young

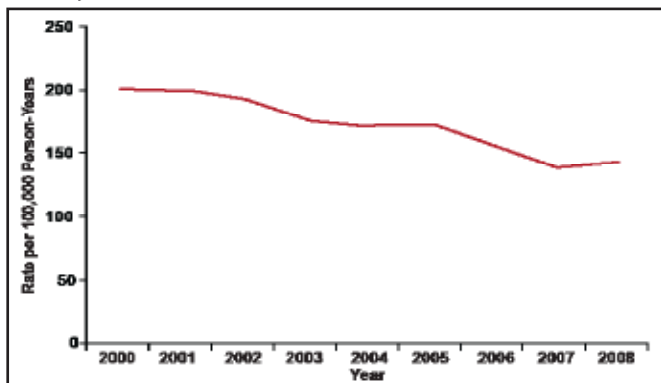
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The costs and lifelong morbidity that are associated with stroke are great when the victims are young [Goodman S et al. *Curr Treat Options Neurol* 2008; Fox CK, Fullerton HJ. *Curr Artheroscler Rep* 2010]; yet, recent reports have identified increasing trends in hospitalization for ischemic stroke among adolescents and young adults [George MG et al. *Ann Neurol* 2011]. Mai N. Nguyen-Huynh, MD, MAS, Kaiser Permanente Division of Research, Oakland, California, USA, presented results from a study that confirms the growth of ischemic stroke in the young.

The report by Dr. Nguyen-Huynh and colleagues investigated trends in ischemic stroke by age, gender, and race in a large, multiethnic population. In early 2011, the researchers used primary discharge ICD-9 codes for acute ischemic stroke to identify retrospectively cases that were treated at Kaiser Permanente Northern California between January 2000 and December 2008. They included 1 stroke per person per year. Age-adjusted stroke rates were standardized to data from the 2000 United States Census population, and Poisson regression analysis was used to examine trends.

Results from the data—a total of 25,433 acute ischemic strokes—showed that the age-adjusted rate of ischemic stroke decreased from 203 per 100,000 in 2000 to 145 per 100,000 in 2008 ($p < 0.001$; Figure 1). The greatest drop was among African-Americans, a fall from 310 strokes per 100,000 people to 261 per 100,000 ($p < 0.001$). However, this was mainly true for patients aged ≥ 65 years.

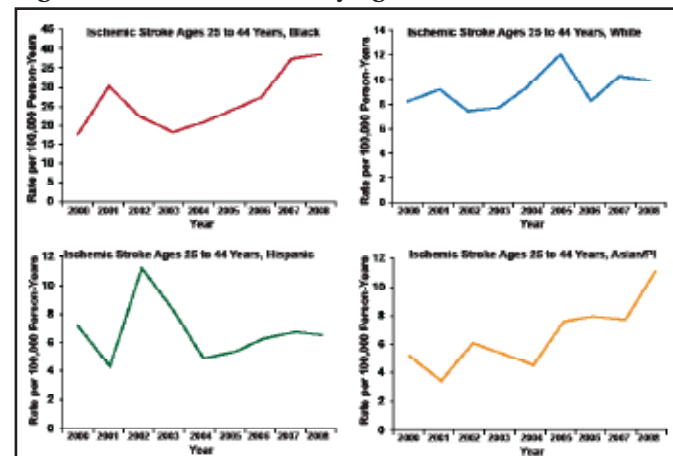
Figure 1. Age-Adjusted Rates of Ischemic Stroke (All Races).



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For those aged 25 to 44 years, there was a rising trend in the number of ischemic strokes, especially for blacks and Asians (Figure 2). These findings are consistent with other data showing that African-Americans and Mexican-Americans have a higher incidence of ischemic stroke and experience it at a younger age than non-Hispanic whites [Lloyd-Jones D et al. *Circulation* 2010].

Figure 2. Ischemic Stroke by Age and Race.



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Between 1990 and 2009, the proportion of Hispanics in the US rose from 8.9% to 15.8%; yet, ethnic-specific data on stroke are sparse. States do not consistently report information on race and ethnicity and not all are required to do so. This leads to nonrandom missing data. Prior reports show approximately 20% missing data on race and ethnicity [Institute of Medicine. *Race, Ethnicity and language data: standardization for health care quality improvement*. 2009; Shoenman JA et al. *Med Care Res Rev* 2007].

In summary, rates of ischemic stroke hospitalizations and mortality among older adults have decreased over the past 15 years [Kissela BM et al. *Stroke* 2010], but significant increasing trends among adolescents and young adults have taken place over the same period [George MG et al. *Ann Neurol* 2011].

The rise is concomitant with growth in traditional risk factors—including obesity, hypertension, diabetes, and high rates of tobacco and alcohol use—among adolescents and young adults. George et al. [Ann Neurol 2011] found, for example, that nearly 33% of those aged 15 to 34 years and more than 50% of those aged 35 to 44 years with ischemic stroke also had a diagnosis of hypertension.

Further studies are needed to assess traditional as well as nontraditional vascular risk factors and identify stroke prevention targets among the young.