Mayo researchers find race has role in incidence, survival of rare brain tumor

July 30 2009

The incidence of a rare and deadly tumor called primary central nervous system lymphoma (PCNSL) is two times higher in black Americans, ages 20 to 49, than in white Americans, according to a Mayo Clinic study published in the June issue of *Journal of Neuro-Oncology*. In patients older than 49, the results were reversed. White Americans were twice as likely as black Americans to be diagnosed with PCNSL.

PCNSL is a primary tumor of the central nervous system that may simultaneously or sequentially involve the brain, spinal cord, meninges (the covering of the brain and spinal cord) and the eyes. PCNSL most often affects the elderly, people who are immunosuppressed because of illness or transplant, and patients with AIDS. Though uncommon, this tumor is increasing in incidence, even in patients without known risk factors. About 1,500 new cases are diagnosed in the United States every year.

"We undertook this epidemiological study to look for clues about the cause of PCNSL," says Brian O'Neill, M.D., a Mayo Clinic neurologist and the senior researcher in the study. Dr. O'Neill is the director of Mayo's National Cancer Institute-designated Specialized Program of Research Excellence (SPORE) in Brain Cancer.

This study was conducted by reviewing the records of 2,665 patients between 1992 and 2002 in 13 U.S. communities that are part of the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute. This program is a repository for population-

based information on cancer incidence and survival, covering 26 percent of the population and balanced for geographic, race and age differences. It has been used for etiologic cancer research for more than 30 years.

In the study, researchers found the PCNSL incidence rates for adults ages 20 to 49 (all reported with a 95 percent confidence interval) were:

- Black Americans: 1.43 per 100,000 per year
- White Americans: 0.72 per 100,000 per year

Incidence rates for those older than 50 were:

- Black Americans: 0.56 per 100,000 per year
- White Americans: 1.30 per 100,000 per year

The number of American Indians, Alaska Natives and Asian/Pacific Islanders diagnosed with PCNSL was too low to draw any conclusions about disease incidence.

Patients with PCNSL typically experience a rapid decline in neurologic function, with an average duration of symptoms of only four weeks to diagnosis. Symptoms may include headaches, confusion, language disturbance, gait and balance difficulties, personality changes and an inability to concentrate. Symptoms include floaters and blurred vision when PCNSL affects the eye.

The prognosis for PCNSL is poor and appears worse for black Americans. In this study, the
12-month survival rate for white Americans was 34 percent, compared

to 19 percent among black Americans. The difference between the races narrowed over time but the mortality rate continued to be better for white Americans. At the five-year mark, 16 percent of white Americans were alive, compared to only 9 percent of black Americans.

Current treatments are slowing or stopping tumor growth, sometimes dramatically, but are not increasing the cure rate. However, significant advances in the treatment of systemic lymphoma have come from critical research on new treatments. This experience has fostered increased interest in finding the cause or causative factors for PCNSL. For patients with normal immune systems, no known risk factors contribute to this brain tumor.

This is the first study to quantify incidence of PCNSL by racial groups. The study design did not allow the researchers to identify reasons for the racial differences and why they changed with age.

"We don't know if it's genetic, environmental or a combination," says Dr. O'Neill. "We don't know if the higher incidence in younger black Americans reflects socio-economic factors, access to health care, and also the role of HIV infection in black communities." However, the experience with other cancers such as multiple myeloma suggests that there may be a distinct genetic contribution. For example, the age-adjusted incidence of multiple myeloma is two times higher in black Americans than in white Americans. Another Mayo study demonstrated that the prevalence of a myeloma precursor condition in Ghanaian men was twice that in American men, supporting the hypothesis that race-related genetic susceptibility is an important issue to pursue.

Source: Mayo Clinic (news : web)