Moderate Fitness Levels Protect Against Stroke

BY SHARON WORCESTER
Southeast Bureau

NEW ORLEANS — Men and women with moderate levels of cardiorespiratory fitness may be at significantly reduced risk for stroke, according to the findings of a large, prospective study with long-term follow-up.

More than 46,400 men and nearly 15,300 women aged 18-100 years participated in the study and were followed for an average of 18 years. Participants underwent a baseline physical examination between 1970 and 2001 and, at enrollment, had no known history of MI or stroke, had a normal resting electrocardiogram, and could achieve at least 85% of the age-predicted maximal heart rate during a treadmill exercise test, Steven Hooker, Ph.D., reported at International Stroke Conference 2008.

The study was the first to show a significant independent association between cardiorespiratory fitness and fatal and nonfatal stroke.

During the follow-up period, 692 strokes occurred in the men, and 171 occurred in the women. Significant linear trends between fitness levels and the rates of total stroke and nonfatal stroke were found in both men and women, and between fitness levels and the rate of fatal stroke in men, after adjustment for such demographic and biologic factors as age, examination year, smoking, family history of cardiovascular disease, and body mass index, Dr. Hooker said.

The risk of total stroke was reduced by 40% in men in the highest fitness level quartile, compared with those in the lowest quartile, and by 43% in women in the highest fitness quartile, compared with those in the lowest (hazard ratios of 0.6 and 0.57, respectively), Dr. Hooker, director of the Prevention Research Center at the University of South Carolina, Columbia, noted at the conference, sponsored by the American Stroke Association.

The risk of nonfatal stroke was reduced by 38% in men and by 44% in the women (HR 0.62 and 0.56, respectively) when comparing those in the highest and lowest fitness quartiles.

As for the fatal stroke rates, 186 fatal strokes occurred in men, and only 55 occurred in women in the study. The risk for men in the highest, compared with the lowest, fitness quartiles was significantly reduced by 50% (HR 0.5), but the difference between the rates in women in those quartiles (nearly 60%, HR 0.42) was not significant, most likely because the study wasn't powered to detect a significant difference because of the small number of fatal strokes in women.

"We [saw] a noticeable drop in the rate of stroke at a fitness level associated with 7-8 METs [metabolic equivalents] based on their maximal treadmill test to exhaustion. Interestingly, beyond that point, there is no further decline in total stroke rate," Dr. Hooker said, noting that pattern was the same in men and women.

The study was the first to show a significant independent association between cardiorespiratory fitness and fatal and nonfatal stroke in men and nonfatal stroke in women, and one of few to use objective measures of fitness rather than self-reported physical activity levels. It shows a dramatic reduction in stroke incidence at those fitness levels, which are actually low levels of fitness for younger patients and moderate levels for older patients and which were seen in the lowest fitness quartile in the men and the second lowest in the women in this study.

"Basically, if folks are participating in some kind of physical activity that would meet current guidelines and recommendations for adults—brisk walking for 30 minutes 5 days a week, or jogging for 20-30 minutes 3 times a week—they would probably be able to attain and/or maintain that level of fitness, so I think there's some hope here for a lot of people out there," Dr. Hooker said.

The study has a number of strengths but is limited by the fact that nonfatal strokes were self-reported (although in those for whom medical records were verified, the agreement rate between self-reports and records was 89%), the inability to adjust for dietary and medical issues and changes in fitness levels over time, and the fact that participants were mostly white, well educated, and had middle to upper level incomes, thus limiting the generalizability of the findings to populations, Dr. Hooker noted.

Among those strengths were the use of a baseline examination to detect clinical disease, the number of measured risk factors, and the large number of person-years of follow-up (about 800,000 for men and 250,000 for women). ■

Excessive Daytime Sleepiness Linked With Higher Stroke Risk

BY JEFF EVANS
Senior Writer

NEW ORLEANS — People who experience routine episodes of dozing during the daytime may have a higher risk of stroke and other vascular events, according to a prospective, community-based cohort study of more than 2,000 people.

The risk of stroke also appeared to increase as the frequency of daytime dozing rose, suggesting a dose-response effect, Bernadette Boden-Albala, Dr.P.H., reported at the International Stroke Conference 2008.

To investigate the relationship between daytime sleepiness (as a measure of underlying sleep disturbance) and stroke, Dr. Boden-Albala and her associates used data from the multiethnic Northern Manhattan Study of 3,298 residents living in that part of the island. The study has been ongoing since 1993 and stopped enrollment in 2002, but the Epworth Sleepiness Scale (ESS) and other questions about sleep and sleep disorders were not collected until nearly 2004, said Dr. Boden-Albala of the departments of neurology and sociomedical sciences at Columbia University, New York.

A total of 2,092 participants answered questions relating to sleep disturbance for the study. These people had an average age of 73 years and a high school graduation rate of 45%. The study comprised 18% whites, 20% blacks, and 60% Hispanics (2% were other ethnicities).

The investigators asked all of the participants the following questions:

► Do you know or have you been told that you snore at night?

► Do you know or have you been told that you choke or stop breathing when you are sleeping and, if yes, does it occur less than 5 nights per week (mild to moderate) or more than 5 nights per week (severe)?

Some degree of snoring was reported by 63%, whereas only 6% reported choking or stopping breathing during sleep.

Each participant also answered eight questions on a modified version of the ESS, which asked about daytime sleepiness to document sleep disturbance. The scale asks, "How often would you say that you doze while: you're sitting and reading; watching television; sitting inactive in a public place; as a passenger in a car, train, or bus; sitting or talking to someone; sitting quietly after lunch; as a driver in a car; or in any other situation where you doze," Dr. Boden-Albala said at the conference, which was sponsored by the American Stroke Association.

Overall, 44% reported no dozing, 47% reported some dozing, and 9% reported a significant level of dozing, defined on the ESS as a score of 10 or higher.

During a mean follow-up period of 2.3 years, the participants have suffered 40 strokes (31 of which were ischemic), 123 vascular events (stroke, myocardial infarction, or vascular death), and 156 total deaths.

There was no significant association between snoring (at any level of severity) and vascular events, but there was a significant dose-response relationship between a person's level of sleepiness and their risk for stroke. Patients who reported some dozing had more than twice the risk of both ischemic stroke and all types of stroke, compared with people who reported no dozing, whereas those with "significant dozing" had a more than threefold higher risk of ischemic stroke and a more than fourfold higher risk of all types of stroke. These analyses were adjusted for age, gender, race/ethnicity, education, systolic blood pressure, diabetes, physical activity, obesity, and coronary artery disease.

Compared with participants who reported no dozing, the risk of having a vascular event was 40% higher for those who reported some dozing and was more than two times higher for those who reported significant dozing.

The study is limited by an uncertainty of what truly is being measured. Is it measuring sleep apnea, disturbance, or deprivation, she asked, or is there an underlying process that is contributing to daytime sleepiness?

"We need to validate all of this with gold-standard sleep studies, although the Epworth [Sleepiness] Scale has been tested and has been well validated," Dr. Boden-Albala cautioned.

"The elevated risk in the highly prevalent 'some dozing' group [shows that] the impact of this novel risk factor may be quite important in further studies," she concluded.

Prior to the current study, most studies in this area of research have focused on the associations between sleep (apnea and deprivation) and the development of vascular risk factors such as hypertension, obesity, and diabetes, as well as the relationship between sleep apnea and stroke. ■

Impaired Fasting Glucose Boosts Stroke Risk in Asymptomatic Men

COLORADO SPRINGS — Hyperglycemia was associated with a significantly increased stroke risk in a prospective study of 43,393 asymptomatic middle-aged men free of known cardiovascular disease and diabetes at baseline.

This finding raises the possibility that prevention and treatment of hyperglycemia could play a major role in stroke prevention, Dr. Xuemei Sui reported at a conference sponsored by the American Heart Association.

The men were seen for a preventive medical examination at the Cooper Clinic in Dallas during 1971-2003. During nearly 703,000 man-years of follow-up, the group collectively experienced 156 fatal and 456 nonfatal strokes.

The age-adjusted fatal stroke rate was 2.1 cases per 10,000 man-years in subjects with a normal fasting plasma glucose (FPG) level of 80-109 mg/dL, 3.4/10,000 man-years in those with impaired fasting glucose as defined by an FPG of 110-125 mg/dL, and 4.0/10,000 man-years in subjects with undiagnosed diabetes as reflected by an FPG level of 126 mg/dL or above.

Among men with an FPG of 110 mg/dL or more, each 10-mg/dL increment in FPG was associated with a 7% increased risk of total stroke events after adjustment for family history of cardiovascular disease, age, body mass index, hypertension, hypercholesterolemia, smoking status, and alcohol intake, said Dr. Sui of the University of South Carolina, Columbia.

—Bruce Jancin