Walking Protects Women Against Stroke: WHS Long-Term Follow-Up

Pam Harrison

April 8, 2010 — Women who walk 2 or more hours a week, especially at a brisk pace, are significantly less likely to experience any type of stroke than women who do not walk, according to long-term follow-up findings from the Women's Health Study (WHS).

Findings were published online April 6 and will appear in the June issue of Stroke.

Jacob Sattelmair, MSc, Harvard School of Public Health, Boston, Massachusetts, found that during an average follow-up of 11.9 years, walking time and walking pace were inversely related, either significantly or with borderline significance, to total, ischemic, and hemorrhagic stroke risk among 39,315 healthy US women 45 years and older who participated in the WHS.

Specifically, women who walked 2 hours or more per week had a 30% lower risk for any stroke than women who did not walk, whereas women whose usual walking pace was brisk (>4.8 km/hour) had a 37% lower risk for any stroke compared with women who did not walk.

Women who walked 2 hours or more per week also had a 57% lower risk for hemorrhagic stroke compared with women who did not walk, whereas women whose usual walking pace exceeded 4.8 km/hour had a 68% lower risk for hemorrhagic stroke than women who did not walk. Interesting, vigorous physical activity was not related to stroke risk in the same study.

There was an inverse association between total leisure-time physical activity and risk for total and ischemic stroke, but the association was of borderline significance. Nevertheless, women who were most active in leisure-time activities were 17% less likely to have any type of stroke than the least active women.

"This was a cohort of female health professionals, predominantly white, so they may not be representative of all middle-aged women in the US, but there really is no obvious reason to suggest that findings would necessarily be different in other populations," Mr. Sattelmair told Medscape Neurology. "I think the overall take-home in terms of stroke prevention is that regular physical activity is essential to minimize the risk of cardiovascular disease."

Observational Study
On scheduled completion of the WHS in March 2004, women participating were invited to continue in a follow-up observational study; 88% of the WHS cohort who were still alive did. At baseline, women were asked to estimate the average time spent on 8 groups of recreational activities during the past year: walking or hiking; jogging; running; bicycling; aerobic exercise; aerobic dance; use of exercise machines; tennis, squash, or racquetball; lap swimming; and lower-intensity exercise, including yoga.

"They also reported their usual walking pace," the investigators added. The cohort was stratified into those who do not walk regularly and those who walk at a pace of less than 3.2 km/hour, 3.2 to 4.7 km/hour (considered to be an average pace), 4.8 to 6.3 km/hour (considered to be brisk pace), or 6.4 or more km/hour (a striding pace). During follow-up, 579 total strokes occurred: 473 ischemic strokes, 102 hemorrhagic strokes, and 4 strokes of unknown type.

"There was no overall linear trend of decreased risk for total stroke across categories of vigorous activity...and findings for ischemic stroke again mirrored those for total stroke," the investigators observe.

Neither age nor body mass index modified the relationship between physical activity and stroke risk.

<table>
<thead>
<tr>
<th>Time spent walking at baseline/at 3 years (hours per week)</th>
<th>&lt;2/&lt;2</th>
<th>≥2/≥2</th>
<th>≥2/&lt;2</th>
<th>≥2/≥2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total stroke, No. of cases</td>
<td>117</td>
<td>29</td>
<td>26</td>
<td>31</td>
</tr>
<tr>
<td>Ischemic stroke, No. of cases</td>
<td>98</td>
<td>28</td>
<td>19</td>
<td>26</td>
</tr>
<tr>
<td>Hemorrhagic stroke, No. of cases</td>
<td>19</td>
<td>1</td>
<td>7</td>
<td>5</td>
</tr>
</tbody>
</table>

**Vigorous Intensity Activity**

As investigators observed, it is not entirely clear why there was an association between walking, a moderate-intensity activity, and stroke risk yet no association with vigorous-intensity activity. "Participation in vigorous activities was far lower than moderate activities such as walking in the present cohort," they note, "which may reduce our ability to observe an effect."

Another possible explanation, Mr. Sattelmair said, is that less vigorous activities such as walking may have a more favorable effect on blood pressure, which is a significant risk factor for both hemorrhagic and ischemic stroke.

**Brisk Walking**

Commenting on the study to Medscape Neurology, Frank Hu, MD, PhD, Harvard School of Public Health, noted that findings from the Nurses’ Health Study published in the Journal of
American Medical Association 10 years ago on which he was the first author mirror those reported in the current WHS study (2000;283:2961-2967).

"We found that increasing physical activity including brisk walking was protective against stroke, especially ischemic stroke, in middle-aged and older women," Dr. Hu said, "and in our study, the predominant form of physical activity was walking as well."

There was also a "dose-dependent" response between the amount of time spent walking and decrease in stroke risk in the Nurses' Health Study, and walking pace "was independently associated with a lower stroke risk as well, meaning that women who walked faster had an even lower risk of developing stroke than others," he said.

"The bottom line is that physical activity, including moderate physical activity, is beneficial for the prevention of stroke, but we don't have sufficient data to say that it is more beneficial for one type of stroke than for any other type of stroke," Dr. Hu concluded.

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Authors and Disclosures

Journalist

Pam Harrison

Pam Harrison is a freelance writer for Medscape.

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