THE BENEFITS OF WALKING TO REDUCE COGNITIVE DECLINE

Mary G. Gabb, MS1; and Kristine Yaffe, MD2

1Senior Clinical Editor, Champaign, Illinois; 2Departments of Psychiatry, Neurology, and Epidemiology and Biostatistics, University of California, San Francisco, California.

Correspondence to Kristine Yaffe, MD, Departments of Psychiatry, Neurology, and Epidemiology, University of California, San Francisco, Chief, Geriatric Psychiatry, SF VA Medical Center, 4150 Clement Street, San Francisco, CA 94121.

ABSTRACT

The benefits of physical activity (eg, decreased cardiovascular disease and hypertension, improved lipid profile, increased fitness, and decreased inflammation) are all conditions that could affect cognition. Several investigators have attempted to measure the benefits of physical activity for the risk of dementia, but each study has its own limitations. The study presented here is one of only a few prospective studies in this area, and it measures the benefits of both recreational and routine physical activity in almost 6000 women. The results show that women who walk a significantly decreased risk of dementia, which is proportional to the number of blocks they walk—ie, there is a dose response. These results underscore the need for further and more extensive studies on the benefits of exercise to ward off the cognitive decline with dementia.

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The benefits of physical activity are well known: decreased mortality, decreased cardiovascular disease, favorable alterations in lipids, decreased hypertension, increased fitness, and decreased inflammation—all conditions that could affect cognition. Even in animals, studies show increased neuronal growth in physically active rodents.

Most of the cross-sectional studies looking at physical activity in humans have shown an inverse relationship between physical activity and risk of dementia. Few prospective studies have been performed. Of them, Albert et al showed that strenuous daily activities were associated with cognitive decline, while Broe et al did not observe protective effects. These studies have been limited by their small cohort size, short duration (ie, a few months), and use of young adults as participants.

STUDY DESIGN

This study was designed to prospectively assess the decreased risk of cognitive decline with physical activity and any factors that may confound that relationship. It also sought to determine whether there might be a dose response between level of activity and risk of cognitive decline.

The analytic cohort consisted of 5925 women followed for 6 to 8 years. The women were older than 65 years of age, mostly white, with a mean age of 70.5 years. Women with baseline cognitive deficits or physical limitations had been excluded.

Study measures focused on physical activity and scores from a modified Mini-Mental State
RESULTS

The results show a wide range of extent of activity, with 10% having never walked and 10% walking more than 200 blocks per week. Similarly, 5% were completely sedentary and 5% expended more than 5000 kcals per week. The cohort was then divided into quartiles based on level of activity. As expected, physical activity was inversely associated with age, smoking, comorbid conditions, depression, and body mass index, and directly associated with education (P<0.05 all). Baseline modMMSE scores were similar across quartiles (25.1 in lowest quartile vs 25.2 in the other quartiles).

Tables 1 and 2 show the decrease in cognitive decline and the adjusted odds ratios for the number of blocks walked per week and the total kcals expended per week, based on quartiles. The results are adjusted for age, education level, health status, depression, function, smoking, estrogen, and comorbid conditions. The results were consistent across the different subgroups of women, including those 70 years or older and those under 70 years, the presence or absence of comorbid conditions, and fewer than 12 or at least 12 years of education.

There were several limitations to the study. For example, physical activity was based on self-report using the Paffenbarger scale. Although self-report can be inaccurate, the Paffenbarger scale has been commonly used in other studies and appears to be a valid accounting of physical activity. There was no clinical assessment of the cognitive decline, so it is not clear how much of the decline is due to AD, vascular disease, or some other form(s) of dementia. Attrition and the mostly white, all-female cohort can lead to bias. And it is difficult to control for other factors of healthy living, despite adjusting for the numerous factors outlined in Tables 1 and 2.

CONCLUSION

Clearly, increased activity to the highest quartile is associated with a 30% to 40% decreased risk of cognitive decline, and there appears to be dose dependence. In fact, even a moderate degree of activity was protective. These results support a long-term research focus to evaluate if physical activity, and the types of physical activity, may protect against cognitive decline.

REFERENCES


Table 1. Blocks Walked Per Week

<table>
<thead>
<tr>
<th>Quartile of Blocks Walked</th>
<th>No. of Women</th>
<th>Cognitive Decline (%)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest</td>
<td>1450</td>
<td>24</td>
<td>1.00</td>
</tr>
<tr>
<td>Second</td>
<td>1438</td>
<td>22</td>
<td>0.87 (0.72-1.05)</td>
</tr>
<tr>
<td>Third</td>
<td>1581</td>
<td>18</td>
<td>0.63 (0.52-0.77)</td>
</tr>
<tr>
<td>Highest</td>
<td>1456</td>
<td>17</td>
<td>0.66 (0.54-0.82)</td>
</tr>
</tbody>
</table>

P for trend <0.001

Table 2. Total Kcals Expended Per Week

<table>
<thead>
<tr>
<th>Quartile of Total Kcals/Week</th>
<th>No. of Women</th>
<th>Cognitive Decline (%)</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest</td>
<td>1470</td>
<td>24</td>
<td>1.00</td>
</tr>
<tr>
<td>Second</td>
<td>1491</td>
<td>21</td>
<td>0.90 (0.74-1.05)</td>
</tr>
<tr>
<td>Third</td>
<td>1480</td>
<td>18</td>
<td>0.78 (0.64-0.96)</td>
</tr>
<tr>
<td>Highest</td>
<td>1480</td>
<td>17</td>
<td>0.74 (0.60-0.90)</td>
</tr>
</tbody>
</table>

P for trend 0.001

Adjusted for age, education, health status, depression, function, smoking, estrogen.