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11-17-2020

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Leisure activity for dementia prevention

More work to be done

Victor W. Henderson, MD, MS, and Merrill F. Elias, PhD, MPH

Dementia prevention is a worldwide priority because of the aging population, devastating consequences for patients and families, and the drain on societal resources. In the absence of disease-modifying therapies, there is interest in lifestyle factors that might prevent or delay the onset of dementia. Chief among these is leisure activity, conceptualized as pursuits undertaken for relaxation or pleasure after completion of essential chores and occupational responsibilities. Leisure activity invokes the cornerstones of cognitive reserve: mental activity, physical activity, and social engagement.¹

Leisure activity is linked to reduced risk of cognitive decline, mild cognitive impairment, and dementia, but these associations are often based on activity occurring less than a decade before dementia is diagnosed.² For Alzheimer disease, the most common cause of dementia, pathologic changes begin to accrue decades before dementia is recognized.^{3,4} Hence, protective associations may pertain to leisure activity ascertained well after the onset of neurodegeneration. One interpretation is that leisure activity helps stave off dementia symptoms even in the presence of subclinical neuropathology, perhaps by enhancing cognitive reserve.¹ A second possibility is that early neural dysfunction in pathways that underlie motivation and goal-directed behavior makes it more difficult to initiate and sustain leisure activity.

In this issue of *Neurology*[®], Sommerlad et al.⁵ report on incident dementia in relation to leisure activity in the Whitehall II cohort study. Their analyses involved 8,280 British civil servants aged 45–69 years (mean age 56) at the start of the study. Investigators summed the frequency of self-reported participation in 13 leisure activities—e.g., involvement in clubs and organizations; social indoor games like cards, bingo, or chess—at baseline (1997–1999), 5 years later (2002–2004), and 10 years later (2007–2009). The outcome was a dementia diagnosis from comprehensive national electronic registries over mean follow-up times of 18, 13, and 10 years, depending on the visit in which leisure activity data were collected.

The key result in the Sommerlad et al.⁵ study was that leisure activity was associated with reduced incident dementia, but only over shorter follow-up periods. For each SD higher on total leisure activity, dementia risk was 18% lower (hazard ratio 0.82, 95% confidence interval 0.69–0.98) when the mean follow-up was 8 years, 12% lower (0.88, 0.76–1.03) for 13 years of follow-up, and only 8% lower (0.92, 0.79–1.06) for 18 years of follow-up.⁵

These differences, if valid, might mean that leisure activity undertaken closer to the onset of dementia is more protective than leisure activity pursued more remotely. However, this supposition is challenged by other results. The risk of dementia among cohort members whose leisure activity declined during the years between the first and third assessments was greater than the dementia risk of those whose leisure activity was low at both times. For each SD of leisure

activity decline during this 10-year interval, dementia risk increased by over a third (hazard ratio 1.35, 95% confidence interval 1.10–1.66).⁵

An alternative and perhaps more likely possibility to explain the results of Sommerlad et al.⁵ is that reduced leisure activity is an early symptom of nascent neurodegeneration. Apathy is common in Alzheimer disease⁶ and is associated with incident dementia.⁷ Pathologies that can culminate in dementia might affect motivation and the ability to sustain goal-directed behaviors well in advance of frank cognitive impairment.

There are reasons to remain cautious about this disconcerting alternative. The Whitehall II investigators reported findings on all-cause dementia, but they did not consider vascular dementia or other dementia subtypes. Multiple pathologies contribute to dementia,⁸ and leisure activity might be protective for one pathologic process but not another. The investigators considered the frequency but not the intensity of leisure activities. Furthermore, data were not collected on other kinds of leisure activity, particularly those involving sport and exercise. However, similar findings in this cohort raise the possibility that physical activity, like leisure activity, wanes in the years preceding a dementia diagnosis.⁹ Although an important strength of the Whitehall II cohort is that outcomes were available for virtually all participants, some cases of dementia are never diagnosed, and some people with mild dementia may have been misclassified as having no dementia. Misclassification might underestimate the role of leisure activity in dementia prevention. Moreover, these study findings pertain to midlife and later-life leisure activity without informing us about roles of leisure activity in childhood or younger adulthood. Leisure activity holds intrinsic value for relaxation and pleasure. Even if withdrawal from leisure activity does not itself contribute to cognitive decline, reduced activity may still portend cognitive impairment.

The role of leisure activity in dementia prevention is far from settled, and additional research is needed. Long-term population-based or representative cohort studies, although difficult to implement, will provide increasingly precise estimates of the role that lifestyle choices in adulthood—leisure activity, aerobic activity, social engagement, adult education, nutrition, and others—might play in reducing dementia risk. Large, long-duration, randomized controlled trials could provide even stronger evidence of any causal relationship. Several such trials, planned or underway in the United States and other countries, focus on lifestyle interventions. These include the Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER), which incorporates diet, exercise, cognitive training, and the amelioration of vascular comorbidity. Interim FINGER results provide important proof of concept, but they are disheartening nonetheless.¹⁰ Compared to a control intervention, the intensive, personalized intervention led to statistically significant but clinically unimportant cognitive improvement on a comprehensive neuropsychological test battery, an average difference equivalent to only 0.02 SD per year.

In concert with other findings, the Sommerlad et al.⁵ study results raise new questions on how we should advise our patients on dementia prevention. Midlife and late-life leisure activity does no harm, but its role in dementia prevention is not yet clear. There is more work to be done.

Author contributions

V.W. Henderson: drafting/revision of the manuscript for content, including medical writing for content; study concept or design. M.F. Elias: drafting/revision of the manuscript for content, including medical writing for content.

Study funding

No targeted funding reported.

Disclosure

The authors report no disclosures relevant to the manuscript. Go to [Neurology.org/N](https://www.neurology.org/N) for full disclosures.

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