

Cognitive decline may help predict future fracture risk in women

July 21 2021



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Researchers led by the Garvan Institute of Medical Research have discovered a link between cognitive decline and a faster rate of bone loss, and found that cognitive decline over five years increased future fracture risk in women. The association between cognitive decline and bone loss was weaker in men.

The study of individuals aged 65 and older was carried out over 16 years and has revealed a potential new approach to help identify older people who may be at risk of fracture.

"Bone loss and [cognitive decline](#) are major public health issues, but both are 'silent diseases' that can go undetected and untreated for long periods, often until the conditions are severely progressed," says Professor Jacqueline Center, Head of the Clinical Studies and Epidemiology lab at Garvan, endocrinologist at St Vincent's Hospital and senior author of the findings published in the *Journal of Bone and Mineral Research*.

"Our study has revealed a link between the two in women, which suggests that cognition should be monitored together with [bone health](#), as a decline in one could mean a decline in the other. These findings may help refine best practice guidelines of how cognition and [bone](#) health are monitored in older age, to ensure appropriate treatment can be more effectively administered."

New insights on major public health issues

Around the world, 200 million people are affected by osteoporosis and more than 35 million by dementia—numbers which are expected to double over the next two decades due to a global increase in life expectancy.

"Cognitive decline and bone loss both result in increased disability, loss of independence and an increased risk of mortality. There is some evidence that older individuals with dementia have a higher risk of hip fractures, but whether the decline of both bone and cognitive health are linked over time has not been studied," says Dr. Dana Bliuc from the Garvan Institute, who is first author of the paper.

"We set out to understand the long-term association, with our study the first to investigate both cognitive and bone health data over more than 15 years."

The team used data from the Canadian Multicentre Osteoporosis Study (CaMos), which documented skeletal health in people living in the community since 1995. The researchers looked at cognitive and bone health measurements of 1741 women and 620 men aged 65 years and older, who had no symptoms of cognitive decline at the beginning of the study.

Linking cognition and bone health

"After adjusting for all other variables, we observed a significant link between a decline in cognitive health and bone loss in women. This association was weaker and not statistically significant in men," says Dr. Bluc.

"Interestingly, we also saw that cognitive decline over the first five years was associated with a 1.7-fold increase in future fracture risk in women in the subsequent 10 years. This was independent of the level of bone loss," adds Dr. Bluc.

"While this study could not identify a causal link—whether a decline in cognitive function leads to a decline in bone loss, or vice versa—it suggests that cognitive decline should be monitored along with bone health, as a decline in one may signal the need for increased vigilance in the other," says Professor Center.

The researchers add that the link could potentially be mediated by a third factor, such as estrogen deficiency, which affects women after menopause and has been independently associated with both [bone loss](#) and cognitive decline. This research also opens the door for additional

studies into what the link between these two common conditions may be.

"What our study highlights is that cognitive health is potentially an important factor for providing more information to individuals and their health professionals on fracture risk, and ultimately improve health outcomes for our older population," says Professor Center.

More information: Dana Bliuc et al, Cognitive decline is associated with an accelerated rate of bone loss and increased fracture risk in women: a prospective study from the Canadian Multicentre Osteoporosis Study, *Journal of Bone and Mineral Research* (2021). [DOI: 10.1002/jbmr.4402](https://doi.org/10.1002/jbmr.4402)

Provided by Garvan Institute of Medical Research

Citation: Cognitive decline may help predict future fracture risk in women (2021, July 21) retrieved 18 April 2024 from <https://medicalxpress.com/news/2021-07-cognitive-decline-future-fracture-women.html>

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