Watch your step: Balance ability predicts cognitive impairment

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Physical balance may not seem like it would be associated with cognitive function. But now, researchers from Japan have developed a new way to predict cognitive problems according to physical balance.

In a study recently published in *BMC Geriatrics*, researchers from the

University of Tsukuba have revealed a new measure of physical balance that could help to identify individuals who are at risk of developing Alzheimer's disease (AD).

Mild cognitive impairment (MCI) is a medical condition characterized by minor changes in cognitive ability. As individuals with this condition have an enhanced risk of progression to AD, the early identification of MCI can guide medical interventions that could prevent this outcome. Problems with physical balance have long been understood to occur in individuals with AD, who have a high frequency of falls, and those with MCI have similar changes in vestibular function.

Therefore, it may be possible to screen individuals for MCI before they show symptoms according to whether they have problems with physical balance. However, at present, few options are available for efficient balance screening in the general population, which the researchers at University of Tsukuba aimed to address.

"Early interventions are critical for the prevention of AD," says lead author of the study Professor Naoya Yahagi. "Because changes in vestibular function have been associated with both MCI and AD, we wanted to develop a new way to efficiently assess such changes in the general population."

To do this, the researchers constructed a new method for evaluating balance capability and vestibular function using a Nintendo Wii balance board with foam rubber. The scale was called the visual dependency index of postural stability (VPS). Healthy volunteers aged 56–75 with no apparent cognitive impairment completed the VPS, as well as measures of cognitive function.

"The results were surprising," explains Professor Yahagi. "We found that scores on the VPS were highly associated with cognitive impairment

assessed using the Montreal Cognitive Assessment, which is a commonly used tool for screening cognitive ability."

Furthermore, the scale had relatively high sensitivity and specificity, indicating that it was successful in picking up important clues to indicate whether an individual was at risk of developing AD.

"Our findings indicate that features of MCI were easily picked up by the VPS. As such, this new scale may be useful way to screen for MCI in the general population," says Professor Yahagi.

Given that problems with physical balance are known to occur in individuals with MCI and AD, the VPS could be an inexpensive and accessible way to screen for cognitive impairment in the general population. The early and accurate detection of MCI could lead to new options for treatment, which could dramatically improve outcomes for individuals with neurodegenerative conditions.

Provided by University of Tsukuba