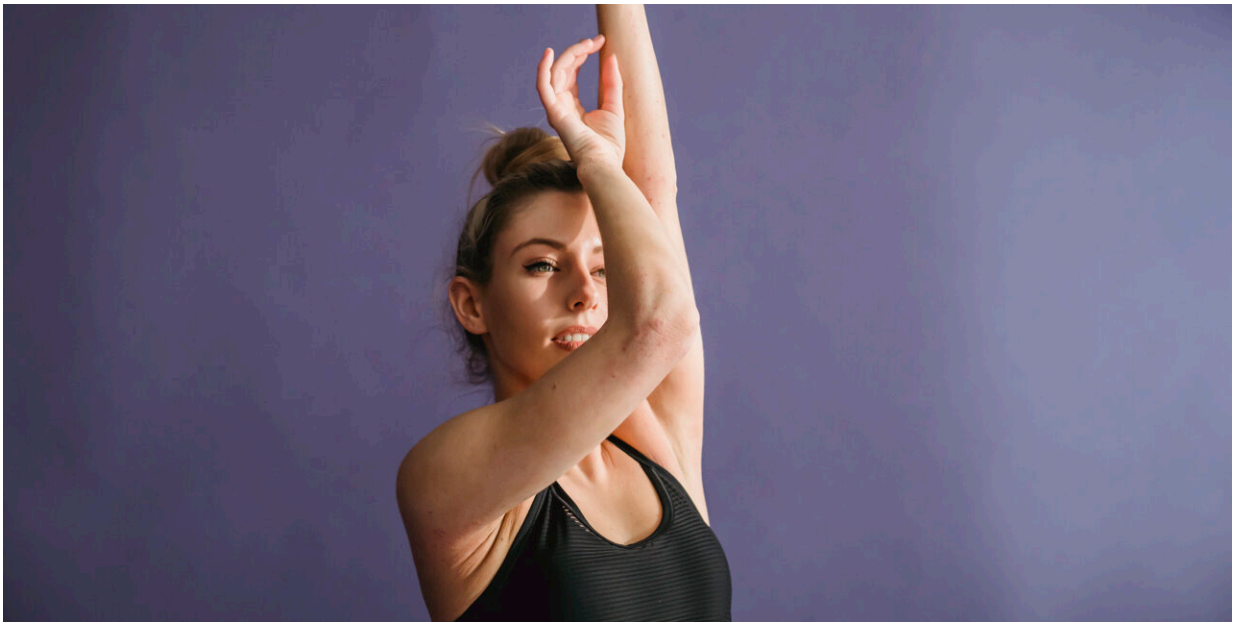


Assessment of balance deficits in neurocognitive disorders

August 29 2022



Credit: Marta Wave from Pexels

Balance is important to maintain in many aspects of life, but the most important may be your body's sense of balance—also known as vestibular sense—which keeps you upright when moving or standing. Deficits in balance have been observed in people with Alzheimer's disease (AD) and mild cognitive impairment (MCI). Recently, researchers in Japan have shed new light on the nature of these balance deficits in neurocognitive disorders, which may have important

implications for our understanding of the progression of these diseases.

In a new study published in *Gait & Posture*, researchers led by a University of Tsukuba team measured balance ability in individuals with AD and MCI using the index of postural stability (IPS). IPS is an indicator of balance ability that is assessed using a stability platform known as a stabilometer. It allows for the assessment of balance under conditions such as a visual block condition (in which participants close their eyes) or a proprioception block condition (in which participants stand on a soft foam surface atop the stabilometer). These conditions help to determine which [sensory information](#) is important for balance ability. The research team, led by the University of Tsukuba team, sought to assess IPS in people with AD and MCI and to evaluate the relationship between the IPS results and [brain images](#).

"IPS is a useful index to assess balance ability, but previous studies have not investigated IPS in people with AD and MCI," says lead author Professor Tetsuaki Arai. "We wanted to shed light on the relationship between balance and cognitive function in neurocognitive disorders."

The researchers evaluated IPS under four sets of conditions: open eyes/hard surface, closed eyes/hard surface, open eyes/soft surface, and closed eyes/soft surface. In a subset of participants with AD or MCI, [magnetic resonance imaging](#) was performed to visualize potentially affected regions of the brain.

"We found that IPS score was significantly lower in the closed eyes/hard surface condition in AD cases compared with MCI cases," says senior author Professor Miho Ota.

The research team's findings suggested that the vestibular and/or balance-sensing systems were more severely impaired in people with AD. Brain imaging analysis also showed a positive correlation between activity in

the hippocampus, a region of the brain involved in learning and memory, and IPS for the closed eyes/hard surface condition in both AD and MCI cases. These results indicate that changes in balance due to deficits of the vestibular hippocampal pathway may serve as a potential marker for the diagnosis of MCI and the progression of MCI to AD.

More information: Ryotaro Ide et al, Dynamic balance deficit and the neural network in Alzheimer's disease and mild cognitive impairment, *Gait & Posture* (2022). [DOI: 10.1016/j.gaitpost.2022.01.018](https://doi.org/10.1016/j.gaitpost.2022.01.018)

Provided by University of Tsukuba

Citation: Assessment of balance deficits in neurocognitive disorders (2022, August 29) retrieved 26 April 2024 from <https://medicalxpress.com/news/2022-08-deficits-neurocognitive-disorders.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.