Unlocking Alzheimer's secrets by studying neuropsychiatric symptoms

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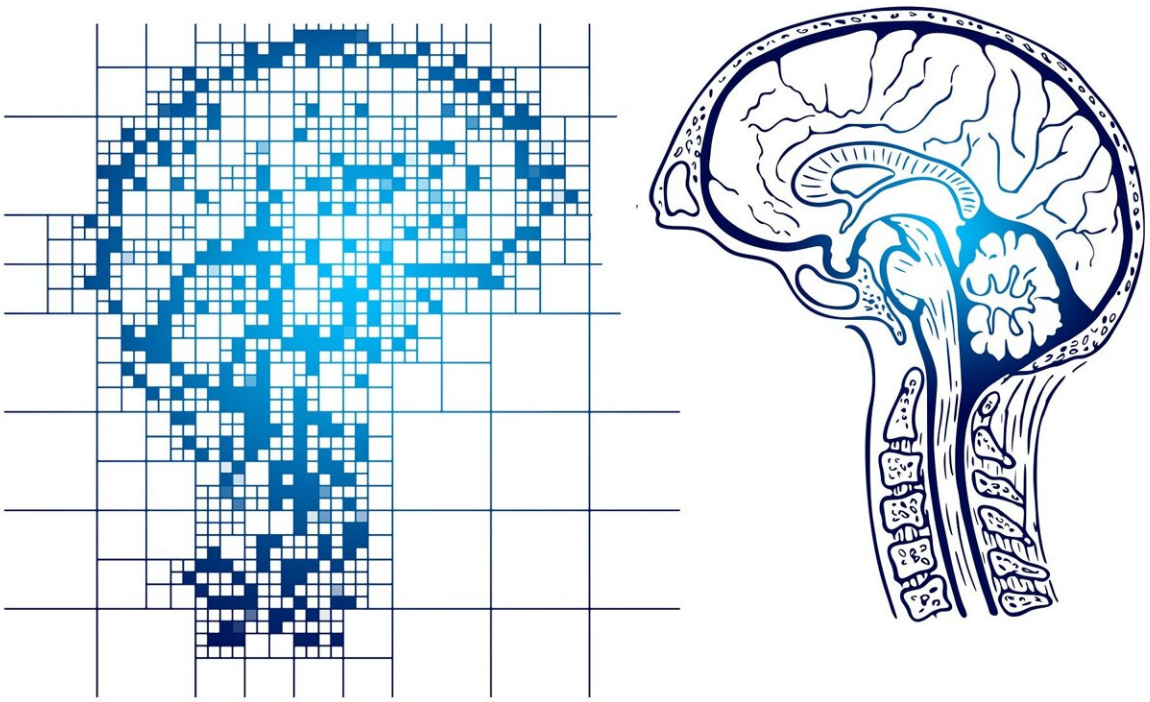

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As the years add up, it's common to notice slight changes in our ability to remember and think. Older people who have more marked changes than their peers can be diagnosed with mild cognitive impairment (MCI).

Currently, we can't easily predict which of these patients will develop Alzheimer's disease and which will not.

"It's hard to predict which patients with MCI will have a more rapid progression and receive a diagnosis of dementia," said Maria Vittoria Spampinato, M.D., division director of Neuroradiology at the Medical University of South Carolina.

"It's important to know who is likely to progress to dementia, as they will need a lot of support and assistance from their family and other caregivers," she continued.

To improve our ability to predict progression to AD, Spampinato and her team looked at the connection between neuropsychiatric symptoms (NPS), such as worsened anxiety and depression, and the journey from MCI to dementia, specifically AD. Their findings show that NPS is a useful model for predicting progression to AD.

Alzheimer's disease can be described as a glitch in the brain's communication system. The brain "glitches" because certain proteins clump abnormally, disrupting brain function. The two main types of clumping proteins are beta-amyloid plaques and tau tangles. These proteins can disrupt brain function by forming between or within neurons, leading to memory loss, problem-solving issues, and, ultimately, difficulty completing daily tasks.

Spampinato and her team hoped to find out if NPS could be a simple and noninvasive method for tracking disease progression.

"Although it's important to do lab testing to measure the number of amyloid plaques and tau disease, NPS testing is important in identifying which patients are at greater risk," she said.

To test whether NPS could help predict MCI to AD progression, the MUSC team identified 300 MCI patients ages 65 and older from the Alzheimer's Disease Neuroimaging Initiative database. Patients were given the Neuropsychiatric Inventory (NPI) to document symptoms, such as anxiety, depression, delusions, hallucinations, abnormal movement behavior, and sleep disorders—collectively known as NPS—as potential early signs of preclinical AD to establish a prediction model for AD.

The study findings showed that more than a quarter of the MCI patients went on to develop AD. For each one-point increase in NPI score, there was a 3% increase in the risk of mental decline leading to the diagnosis of AD.

Surprisingly, the study showed that NPS predicted the risk of mental decline better than certain established risk factors of AD.

Based on these findings, Spampinato recommends that MCI patients be screened for NPS, as it is an important factor to consider for predicting disease progression.

"If you feel down or anxious and you experience memory issues as you age, it is important to seek help early and get a thorough evaluation for both cognitive and mental health concerns," said Spampinato.

The prediction model developed by Spampinato and her team shows promise for identifying which patients with MCI will progress to AD. However, it will need validation in a larger group of patients recruited from memory care institutions before being used in the clinic.

The study's findings emphasize the importance of considering NPS in the early diagnosis and treatment of preclinical AD. They also set the stage for future research aimed at unraveling the mechanisms underlying

the progression from MCI to AD.

The paper is published in the *Journal of Alzheimer's Disease*.

More information: Maria Vittoria Spampinato et al, Neuropsychiatric Symptoms and In Vivo Alzheimer's Biomarkers in Mild Cognitive Impairment, *Journal of Alzheimer's Disease* (2023). DOI: 10.3233/JAD-220835

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