Multivariate analysis improves on cognitive testing in Alzheimer's disease

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Multivariate analysis of cognitive tests in Alzheimer's disease identifies five distinct groups of Alzheimer's disease patients, and suggests that multivitamins might slow progression only in certain groups.

Currently, cognitive impairment of patients diagnosed with Alzheimer's disease (AD) is measured using the 'Mini-Mental State Examination' (MMSE) test, which involves monitoring answers to five types of questions and using an algorithm to score patients. However, the MMSE test has received criticism, with factors such as educational background being shown to affect scores.

A new research article from Pablo Moscato and colleagues, from the Hunter Medical Research Institute and University of Newcastle (Australia), presents a multivariate approach intended to improve on the MMSE test.

The study saw an analysis of 3717 patients from the Coalition Against Major Diseases dataset, with five groups of patients identified: cognisant, inattentive, forgetful, distant and absent. The groups were distinct in terms of both characteristics and prognostics. Furthermore, out of the five MMSE questionnaire categories only three were found to be critical for grouping: registration, attention and recall.

"This project [was] motivated by the observation that the CAMD database is an aggregation of several trials that employed varying cognitive test versions and are therefore generally incompatible or not

directly comparable among each other in terms of the calculated patients' overall cognitive performance," noted the authors. "Our goal [was] to resolve which test categories contribute to the patient group differentiation the most and to build a model that can be employed to reliably assign a patient to an AD cognitive group associated with certain impairment characteristics and clinical prognosis, independent of the questionnaire version."

The researchers also analyzed transitions between groups. Inna Tishchenko, first author, commented: "we analyzed the cognitive performance of AD patients over a time frame of up to 4 years and obtained hints that multivitamins might slow progression only in the group that presents a mild impairment in recalling." Furthermore, they provide insight into the progression pathways of AD, and highlight the possible existence of subgroups.

The model presented by the group is freely available for use via the supplementary material.

More information: Inna Tishchenko et al, Alzheimer's disease patient groups derived from a multivariate analysis of cognitive test outcomes in the Coalition Against Major Diseases dataset, *Future Science OA* (2016). DOI: 10.4155/fsoa-2016-0041