

Predisposing factors for conversion of mild cognitive impairment to AD identified

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Mild cognitive impairment (MCI) is often considered an early symptom of Alzheimer's disease (AD). An analysis of genetic risk factors predisposing to MCI is critical for accessing individual predisposition and reliably evaluating the effectiveness of early treatment. In a groundbreaking study published in the February 2010 issue of the *Journal of Alzheimer's Disease* investigators successfully used artificial neural networks (ANNs) to help understand the causal relation between multiple factors and the occurrence of neurodegenerative disorders.

ANNs are computer algorithms inspired by the highly interactive processing of the human [brain](#). Like the brain, they can recognize patterns, manage data and learn. This novel form of data analysis can accurately detect complex relationships between independent and dependent variables. When exposed to a complex data set, they recognize the underlying mechanisms of time series and outcomes, thus identifying complex interactions among input data, and recognising hidden relations that are not apparent using traditional statistical methods.

Using ANNs a team of researchers lead by Massimo Tabaton, University of Genova, Italy, analyzed 22 variables, which are recognized risk factors of AD in patients with MCI. Analysis indicated that hyperglycemia, female gender and the apoE4 [genotype](#), in this order, were the biological variables with the highest relevance for predicting the conversion of MCI into AD within 2 years. This was followed by the scores on attentional and short memory tests.

Professor Tabaton and his colleagues commented, "This finding may have implications in clinical practice, as genetic variations can be easily examined and combined with other biomarkers, personal history and environmental exposure to establish a tailored risk profile. In fact, adjustment for the baseline risk, which should be more accurately assessed by taking into account genetic variations, would be required to estimate the utility of therapeutic and preventive intervention."

"This work highlights the biological and genetic basis for the conversion of benign forgetfulness to AD and directs our efforts to new therapeutic avenues," agree George Perry and Mark A. Smith, Editors-in-Chief of the *Journal of Alzheimer's Disease*.

More information: Di Maria, Emilio, Sergio Cammarata, Maria Isola Parodi, Roberta Borghi, Luisa Benussi, Marialaura Galli, Daniela Galimberti, Roberta Ghidoni, Davide Gonella, Cristina Novello, Valeria Pollero, Lucia Perroni, Patrizio Odetti, Elio Scarpini, Giuliano Binetti, Massimo Tabaton. The H1 Haplotype of the Tau Gene (MAPT) is Associated with Mild Cognitive Impairment. *J Alzheimers Dis* 19:3 (February 2010), p 909-914.

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