

Researchers Explore Diabetes, Gene and Cognitive Performance Relationship

1 October 2009

(PhysOrg.com) -- University of Maine researchers studying cardiovascular risk factors that influence cognitive performance have discovered that diabetics who carry a particular genotype — one or more of the ApoE-e4 alleles — are at greater risk for diminished cognitive capacity than individuals without the gene.

ApoE, or Apolipoprotein E, has, among other functions, a role in repair of damaged neurons. The ApoE-e4 allele is a variant of the genotype and some people carry one or two of these alleles.

The results of the new research appear in an article published in August edition of the diabetes medical journal "*Diabetologia*," titled "Presence of the APOE-e4 allele modifies the relationship between [type 2 diabetes](#) and [cognitive performance](#): the Maine-Syracuse Study."

Researchers Merrill F. "Pete" Elias, Michael Robbins and Penelope Elias, all professors of psychology at UMaine, with Zsuzsanna Nagy of the School of Clinical and Experimental Medicine, University of Birmingham, England, and UMaine psychology graduate student Gregory A. Dore as lead investigator, replicated a well-known finding that diabetes is a risk factor for lower cognitive performance. They also reported an important new finding: The relationship between diabetes and cognition is stronger in diabetic individuals who carry either one or two ApoE-e4 alleles.

Previous research has established that diabetes is associated with cognitive deficit and declining cognitive function over time and also with a greater risk of developing dementia. The UMaine researchers took their analysis a step further by examining the interaction of objectively defined diabetes and the ApoE-e4 allele as it relates to complex cognitive abilities — using multiple cognitive tests in non-demented and stroke-free participants of the Maine Syracuse Longitudinal Study.

Levels of cognitive performance by individuals aged 50-98 years — with and without diabetes and those with and without the ApoE-e4 allele — were determined through one of the most extensive batteries of cognitive tests employed in longitudinal studies. The study is one of many investigations that are part of the ongoing "Maine-Syracuse Longitudinal Study," involving more than 2,700 people since begun by Merrill Elias and professor of medicine David H. P. Streeten in Syracuse, N.Y. in 1974.

In these investigations, examining cardiovascular risk factors and cognitive performance, there has been a general trend for the presence of ApoE-e4 alleles to exacerbate the effects of other risk factors for lowered levels of cognition, including high levels of the amino acid homocysteine.

The researchers say that since nothing can be done currently to change or alter the ApoE-e4 allele, and identification of the ApoE gene is not a routine medical procedure, the most effective way to protect against cognitive deficit in diabetic individuals, especially those with other risk factors, is for them to get regular physical exercise and lead a healthier lifestyle with a healthy, balanced diet, and to be treated.

"Preventing cognitive deficit is another reason why early diagnosis and treatment of diabetes is very important," Merrill Elias says.

The researchers suggest further study should be conducted, specifically longitudinal studies, to help determine the specific biological mechanisms by which the ApoE-e4 alleles change cognitive performance over time.

[More information](#): The full text of the research may be found [here](#).

Provided by University of Maine

APA citation: Researchers Explore Diabetes, Gene and Cognitive Performance Relationship (2009, October 1) retrieved 7 September 2022 from <https://medicalxpress.com/news/2009-10-explore-diabetes-gene-cognitive-relationship.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.