HealthManagement
Promoting Management and Leadership

Gene Variant Affects Brain Atrophy in Mild Cognitive Impairment

According to a study published online in the journal Radiology, the presence of a gene variant in people with mild cognitive impairment (MCI) is associated with accelerated rates of brain atrophy.

Research was focused on the gene apolipoprotein E (APOE), known as the most important genetic factor in non-familial Alzheimer's disease (AD). Jeffrey R. Petrella, M.D., associate professor of radiology at Duke University School of Medicine in Durham, N.C and the study's senior author, explained that APOE has different alleles, or gene variations, and while all people possess two APOE alleles, most people have at least one copy of the APOE epsilon 3 (ε3) variant, which is considered neutral with respect to Alzheimer's risk.

In comparison to the other APOE alleles, the less common epsilon 4 (ε4) allele is associated with a higher risk for development of AD, earlier age of onset, and faster progression in those affected.

Dr. Petrella and colleagues conducted the study by analysing data from the Alzheimer's Disease Neuroimaging Initiative (ADNI) involving over 235 patients, mean age 79.9, with MCI, a slight but noticeable decline in cognitive ability that is tied to a higher risk of AD, using MRI to measure brain atrophy rates in these patients over a 12- to 48-month period.
The ε4 carriers in the study group exhibited significantly increased atrophy rates than ε3 carriers in 13 of 15 brain regions hypothesized to be key components of the cognitive networks disrupted in AD.

Commenting on the findings Dr Petrella said they showed atrophy in brain regions known to be affected by AD, in a population of patients at risk for AD, yet not diagnosed with the disease. He believes this suggests the possibility of a genotype-specific network of related brain regions that undergo faster atrophy in MCI and potentially underlies the observed cognitive decline.

Noting that the researchers did not explore why APOE ε4 might accelerate atrophy, Dr Petrella attributes this affect to a combination of factors. He went on to specify the protein's broad role in the transport and normal metabolism of lipids and a protective function on behalf of brain cells, including its role in the breakdown of beta-amyloid, one of the proteins implicated in the pathophysiology of AD.

MRI is playing an increasingly prominent role in MCI research, and Dr. Petrella predicted that the design and execution of future clinical trials will be improved through the increased knowledge about the effects of APOE. As an example he cited that researchers could enrich their samples with ε4 patients in MCI prevention trials to better determine potential treatment effects on brain regions vulnerable to degeneration.

Advances in knowledge will further benefit the expansion of the role of MRI measures in clinical trials investigating novel drugs with potentially disease-modifying capabilities.

As Dr Petrella highlighted, current FDA-approved drugs treat symptoms, but do not modify the underlying cause of the disease, whereas the researchers goal lies in developing and testing drugs that modify the disease process itself.

Source: RSNA

14 January 2014

Published on : Tue, 14 Jan 2014