Education may be protective for people with gene for familial early onset Alzheimer's

5 August 2020

Credit: CC0 Public Domain

Even for people who carry the gene for early onset Alzheimer's disease, more years of education may slow the development of beta-amyloid plaques in the brain that are associated with the disease, according to a new study published in the August 5, 2020, online issue of *Neurology*.

About 1-6% of people with Alzheimer's disease have rare genes that cause the disease in everyone who has them. This is called familial Alzheimer's disease. It leads to an early onset of the disease, when people are in their 30s to 50s.

"Because we've assumed that the effects of these genes can't be changed, very little research has been done on whether we can modify the trajectory of the disease," said study author Sylvia Villeneuve, Ph.D., of the McGill University in Montreal, Canada. "It's exciting to see that education may play a role in delaying the start of this devastating disease, which affects people during the prime of life."

Most people diagnosed with Alzheimer's have the sporadic form of the disease, which is thought to be caused by a combination of both environmental and genetic factors, including a gene variant called APOE ?4, or apolipoprotein E ?4. Having this gene variant is known to increase the development of amyloid plaques in the brain, even though it does not guarantee that the person will develop symptoms of Alzheimer's disease.

The study involved two groups: one group of 106 people with an average age of 67 who had a parent diagnosed with the sporadic form of Alzheimer's disease, of whom 39% had the APOE ?4 gene variant; and another group of 117 people with an average age of 35 who had the gene mutations linked to familial early onset Alzheimer's disease, of whom 31% also had the APOE ?4 gene variant. Each group had an average 15 years of education. None of the participants showed symptoms of the disease at the start of the study.

Participants had brain scans to determine levels of amyloid plaques.

Researchers found that in the people with familial early onset Alzheimer's, increasing levels of education were associated with lower levels of amyloid plaques in the brain. The strength of the association between education and plaque levels was similar to the strength of this same association in people at risk of sporadic Alzheimer's disease.

In both groups, people with less than 10 years of education had about twice the amount of amyloid plaques when compared to people with more than 16 years of education.

"While it has been believed that people with familial Alzheimer's disease, with its strong genetic causes, may have few ways to slow development of the disease, our study shows that education may be somewhat protective, perhaps promoting brain resistance against these plaques, just as it has been shown to be in people with unknown causes of the disease," said Villeneuve.

A limitation of the study was that most participants were white, so results may not be the same for all people. Also, the quality of education may be affected by other factors like socioeconomic status, so future studies should look more closely at other factors in addition to years of education to determine whether other environmental factors may be at play to explain these study results.

Provided by American Academy of Neurology