



The Link between Alzheimer's Disease and COVID-19

By Leigh Ann Green

Alzheimer's patients and others suffering with dementia are more likely than non-suffers to contract severe cases of COVID-19. A recent study points to a genetic variant as the link between these two diseases.

A biological factor has been found linking the novel coronavirus to a much older global affliction--Alzheimer's disease. A study reported in the May 26, 2020, edition of *The Journals of Gerontology, Series A*, points to a [genetic variant](#) as the common link. Individually, these diseases represent a serious threat to our aging population. The threat of contracting severe COVID-19 is significantly increased for those with Alzheimer's disease and other forms of dementia.

Up to 40% of all reported [COVID-19 cases](#) have been in people 65 years and older. The highest COVID mortality rates are among elderly adults and those with weakened immune systems. This is especially the case for those with the [comorbid condition](#) of primary neurodegenerative disorders such as Alzheimer's disease and related dementias. A 2019 study in [Wuhan, China](#), focused on the relationship between COVID-19 and neurological issues. Researchers concluded that reduced consciousness or instances of delirium occurred more often among severe COVID-19 patients.

Additional research was conducted through the [UK Biobank](#) on over 250,000 participants who were 65+ and included 448 hospitalized COVID-19 patients. Results from this study found that

those people with Alzheimer's disease or dementia are three times more likely to fall victim to severe COVID-19 than those with no preexisting dementia.

Several explanations have been offered for the relationship between COVID-19 and Alzheimer's disease. For example, those with dementia are particularly vulnerable to contracting and spreading the coronavirus. They may not completely understand or remember to comply with the suggested health measures of social distancing, wearing face masks, or adequately washing their hands. Alzheimer's patients living in [nursing homes](#) or assisted living facilities have experienced an upheaval in their daily routines. Visits from family and friends have been halted and regular staffing has often been cut or changed. The resulting anxiety, agitation, depression, and loneliness often leads to falls and declining health.

International researchers involved in the May 2020 study suggest the high risk for severe COVID-19 cases may not be due simply to the effects of Alzheimer's disease, dementia, advancing age, or nursing home exposure. The risk may be due, at least in part, to an underlying [genetic issue](#).

The study, involving more than 600 people in England who were diagnosed with COVID-19 between March 16 and April 26, showed a link between the APOE e4 gene variant (apolipoprotein E) and an increased susceptibility to SARS-CoV-2, the coronavirus causing COVID-19. [SARS-CoV-2](#), enters cells through the ACE2 (angiotensin converting enzyme 2) receptors. ACE2 is highly expressed in the lungs. APOE is also highly co-expressed in the lungs and has been associated with increased risk to viral, bacterial, and parasitic infections.

In addition, the APOE e4 genotype affects cholesterol transport and inflammation. An increased risk in heart disease has been noted in those who carry the APOE homozygous e4e4 gene. Known to increase an individual's risk of developing Alzheimer's up to 14 times, this variant gene is also associated with dementia and delirium. The same homozygous [genotype](#) was linked to a doubled risk of contracting severe COVID-19 as compared with people who had two copies of the e3 variant. Data from the UK Biobank indicates one in 36 people of European ancestry have this particular e4e4 allele.

The researchers involved in this study stress that further investigation is needed to fully understand the relationship between COVID-19 and the APOE genotypes. However, this new information linking Alzheimer's and COVID-19 has led to increased awareness within the medical community and could potentially result in new treatments for those suffering from these dual pandemics.

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