Alzheimer's disease raises the risk of severe COVID-19 and death from this viral disease

3 June 2021, by Elton Alisson

Patients with dementia and especially Alzheimer's run a threefold risk of dying as a result of infection by SARS-CoV-2. The risk is six times greater if they are over 80, according to a study by Brazilian researchers. Credit: Gerd Altmann/Pixabay

Neurodegenerative disorders that cause dementia increase the risk of contracting severe COVID-19 and dying from the disease. For people with Alzheimer's the risk is three times greater. It can be six times greater if they are over 80, according to a study conducted in Brazil by researchers at the University of São Paulo (USP) and Butantan Institute in partnership with colleagues at the Federal University of Rio de Janeiro (UFRJ).

An article on the study, which was supported by FAPESP, is published in *Alzheimer's & Dementia: The Journal of the Alzheimer's Association*.

"We found that all causes of dementia are risk factors for severity and death in COVID-19 and that these risks are more pronounced for Alzheimer's patients," Sérgio Verjovski-Almeida, principal investigator for the project and a

professor at USP's Chemistry Institute, told Agência FAPESP.

Dementia had already been identified as a risk factor for COVID-19, alongside other comorbidities, such as cardiovascular and respiratory diseases, high blood pressure, diabetes, obesity, and cancer. One of the reasons is age: Patients with dementia tend to be older, and many live in care homes where the risks of infection and viral transmission are greater.

However, no studies had previously been conducted to find out whether people with neurodegenerative disorders that cause dementia, such as Alzheimer's and Parkinson's, are more infected by the novel coronavirus and run a greater risk of progressing to the severe form of COVID-19 or dying from the disease, and none so far had set out to see whether old age heightens this risk.

To answer these questions, the researchers investigated data on positive diagnoses, hospitalizations and deaths from COVID-19 for a cohort of 12,863 patients over 65 who tested positive or negative for SARS-CoV-2. The data was included between March and August 2020 in UK Biobank, a biomedical database containing genetic and health information collected from half a million patients since 2006 by a team led by Rory Collins, Professor of Medicine and Epidemiology at the University of Oxford.

Of the nearly 13,000 subjects, 1,167 tested positive for COVID-19 by RT-PCR. To control for a possible bias associated with younger asymptomatic individuals who were not tested, the researchers excluded subjects aged 49-65 and included only those aged 66 and older, stratifying them into three age groups: 66-74 (6,182), 75-79 (4,867), and 80-86 (1,814).

"The advantages of using clinical data from UK Biobank include the amount of detail, as the

records refer to all pre-existing diseases and whether the patient tested positive, was hospitalized and died from COVID-19," Verjovski-Almeida explained. "This enabled us to assess the risk factors associated with infection, severity and death from the disease, including all causes of dementia, especially Alzheimer's and Parkinson's."

Statistical analysis showed that all causes of dementia, especially Alzheimer's, were risk factors for severity of the disease and death in the case of hospitalized patients, regardless of age.

Alzheimer's specifically did not increase the risk of hospitalization compared with chronic comorbidities. After admission to hospital, however, Alzheimer's patients ran a threefold risk of developing severe COVID-19 or dying from the disease compared with patients who did not have Alzheimer's. For Alzheimer's patients over 80 the risk was six times greater compared with patients in younger age groups.

"Some factor that hasn't yet been identified increases the predisposition of Alzheimer's patients to progress to severe COVID-19 and die from the viral disease," Verjovski said. "The results of our study point to a need for special attention to these patients when hospitalized."

Diagnostic hypotheses

A possible explanation for the observed outcomes is that chronic inflammatory conditions or defective immune responses due to aging of the immune system (immunosenescence) may increase the vulnerability of these patients and reduce their capacity to mount an effective response to infection by the virus.

Another hypothesis is that Alzheimer's alters the permeability of the blood-brain barrier, making infection of the central nervous system more likely.

Recent research has shown that SARS-CoV-2 is able to invade the central nervous system via the olfactory mucosa and that the presence of the virus in this region results in a local inflammatory immune response. The same study detected the virus in the brainstem, which comprises the primary cardiovascular and respiratory control center, raising the possibility that infection of the central nervous system may mediate or aggravate respiratory and cardiovascular problems in COVID-19 patients.

"We will now analyze these patients' genomes, also available from UK Biobank, to find out which genes are mutated and may be implicated in the augmented risk of severe COVID-19 and death for Alzheimer's patients," Verjovski-Almeida said.

Provided by FAPESP

APA citation: Alzheimer's disease raises the risk of severe COVID-19 and death from this viral disease (2021, June 3) retrieved 7 June 2021 from https://medicalxpress.com/news/2021-06-alzheimer-disease-severe-covid-death.html