

Further evidence shows education reduces risk of Alzheimer's

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New research from Cambridge University, supported by European

Union funding, has added weight to the theory that education protects against Alzheimer's disease.

A study just published in the *British Medical Journal* confirms there is a link between education and the build-up of 'plaques' and 'tangles' of misshapen proteins, which lead to the gradual death of [brain](#) cells, characteristic of Alzheimer's disease.

The causes of the disease are still largely unknown and drugs treatments have suffered disappointing set backs in their development. So the focus of attention is shifting to trying to work out how to reduce the number of cases by tackling risk factors before the disease develops. This could be showing some success: research from the Cambridge Institute of Public Health has shown that the incidence of Alzheimer's is falling in the UK, probably due to improvements in education, and smoking reduction and better diet and exercise.

This latest study, titled 'To determine which potentially modifiable risk factors, including socioeconomic, lifestyle/dietary, cardiometabolic, and inflammatory factors, are associated with Alzheimer's disease' involved 17 008 patients with Alzheimer's disease and 37 154 controls. It considered 24 potentially modifiable risk factors.

Conventional observational studies have consistently shown that low [educational attainment](#) is associated with an increased risk and it has been estimated that 19 % of cases are potentially attributable to low education.

Inconclusive evidence from conventional observational studies indicates that the following are risk factors: obesity; hypertension and high cholesterol in midlife; diabetes; smoking; low vitamin D and folate concentrations; hyperhomocysteinaemia (an abnormally high level of homocysteine in the blood), and high C reactive protein concentrations

(an acute-phase protein that serves as an early marker of inflammation or infection). Physical activity, a healthy diet, moderate alcohol drinking, and coffee consumption are associated with decreased risk.

The researchers, in part supported by EU through the COSTREAM project, explain that available evidence is in large part inadequate as observational studies generally rely on self-reported information. They are susceptible to doubts arising from the relationship between cause and effect. Data from randomised trials are scarce and inconclusive.

Bringing new evidence into the debate

Researchers grouped the risks into categories: socioeconomic, lifestyle/dietary, cardiometabolic, and inflammatory. They studied genetic variants that increase the risk of a variety of different environmental [risk factors](#) to see if these were more common in 17 000 patients with Alzheimer's disease. Results showed the strongest association with genetic variants that predict higher educational attainment.

'This provides further strong evidence that education is associated with a reduced risk of Alzheimer's disease,' says first author Dr. Susanna Larsson, 'It suggests that improving education could have a significant effect on reducing the number of people who suffer from this devastating disease.'

How education might reduce the risk of Alzheimer's is uncertain but it could be related to what is known as 'cognitive reserve', the ability to recruit alternative brain networks, or to use brain structures or networks not normally used, in order to compensate for brain ageing. Other research has shown that the same amount of damage in the brain is associated with less severe and less frequent Alzheimer's in people who have received more education, which could support that theory. The

evidence points to the fact that [education](#), which helps to improve brain wiring, could be increasing the reserve of networks the brain can continue to draw on.

COSTREAM (Common mechanisms and pathways in Stroke and Alzheimer's [disease](#)) brings together epidemiologists, geneticists, radiologists, neurologists researching the similarities between both conditions, which have an overlapping pathogenesis. The team is harnessing their vast international network in order to link various big datasets along with combining novel analytical strategies with emerging technologies in the field of genomics, metabolomics, and brain MR-imaging.

Provided by CORDIS

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