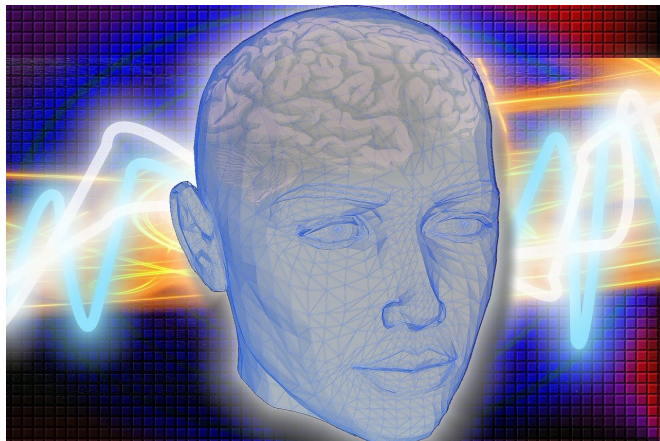


Head injuries may worsen cognitive decline decades later

12 March 2021



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People who experienced head injuries in their 50s or younger score lower than expected on cognitive tests at age 70, according to a study led by UCL researchers.

Head injuries did not appear to contribute to [brain](#) damage characteristic of Alzheimer's disease, but might make people more vulnerable to dementia symptoms, according to the findings published in *Annals of Clinical and Translational Neurology*.

Lead author Dr. Sarah-Naomi James (MRC Unit for Lifelong Health and Ageing at UCL) said: "Here we found compelling evidence that [head](#) injuries in early or mid-life can have a small but significant impact on brain health and thinking skills in the long term. It might be that a head [injury](#) makes the brain more vulnerable to, or accelerates, the normal brain ageing process."

The study involved 502 participants of the UK's longest-running cohort study, the MRC National Survey of Health and Development Cohort, which has been following participants since their birth in the same week in 1946.

At age 53, they were asked 'Have you ever been knocked unconscious?' to assess whether they had ever suffered a substantial head injury; 21% of their sample had answered yes to this question. And then around age 70 (69-71), the study participants underwent brain scans (PET/MRI), and they took a suite of cognitive tests.

The participants had all completed standardised cognitive tests at age eight, so the researchers were able to compare their results at age 70 with expected results based on their childhood cognition and other factors such as educational attainment and socioeconomic status.

The researchers found that 70-year-olds who had experienced a serious head injury more than 15 years earlier performed slightly worse than expected on cognitive tests for attention and quick thinking (a difference of two points, scoring 46 versus 48 on a 93-point scale). They also had smaller brain volumes (by 1%) and differences in brain microstructural integrity, in line with evidence from previous studies, which may explain the subtle cognitive differences.

The researchers did not find any differences in levels of the amyloid protein, implicated in Alzheimer's disease, or other signs of Alzheimer's-related damage.

Dr. James said: "It looks like head injuries can make our brains more vulnerable to the normal effects of ageing. We have not found evidence that a head injury would cause dementia, but it could exacerbate or accelerate some dementia symptoms."

Joint senior author Professor Jonathan Schott (UCL Dementia Research Centre, UCL Queen Square Institute of Neurology) said: "This adds to a growing body of evidence linking head injury with brain health many years later, with yet more reasons to protect the brain from injury wherever possible."

The researchers did not have data on the frequency, severity or cause of the head injuries, to see if long-term impacts might have been even greater for certain people. The academics are continuing their research with this cohort to see if neurodegeneration or cognitive decline continues in late life among those with past head injuries.

Joint senior author Professor Nick Fox (UCL Dementia Research Centre and UK Dementia Research Institute at UCL) added: "Serious head injury can have immediate devastating effects, but what is becoming increasingly clear is that less severe but repeated head injuries—such as those sustained in contact sports—can have an effect on brain health many years later.

"Our study shows that, even in the general population, a head injury sufficient to cause a loss of consciousness can subtly affect cognition in later life. It has never been more clear that we need to do all we can to protect our brains from injury throughout our lives."

The study was funded by Alzheimer's Research UK, the Medical Research Council (MRC) Dementias Platform UK, the Wolfson Foundation and The Drake Foundation, and involved researchers at UCL, London School of Hygiene and Tropical Medicine, King's College London, University of Gothenburg and the UK Dementia Research Institute.

Lauren Pulling, CEO of The Drake Foundation, which funds research on head impacts in sport, said: "These new findings add to the growing evidence base showing that head impacts can have tangible, long-term effects on the brain. With this in mind, and in addition to further research, it is essential that sport's governing bodies take note and use a common-sense approach to universally minimise players' risk of head injury, right through from grassroots to elite levels."

Dr. Susan Kohlhaas, Director of Research at Alzheimer's Research UK, said: "With millions of people around the world experiencing head injuries every year, reducing the risk of sustaining these injuries should be an important public health goal. Looking for brain shrinkage and other signs of

damage soon after a head injury, are important steps towards understanding how brain injury is related to brain health and long-term thinking and memory problems.

"As the UK's leading dementia research charity we are pleased to have funded this research and these findings add to our understanding of the factors that affect the health of the brain. While head injuries are usually impossible to predict or avoid, there are steps that we can all take to help keep our brains healthy as we age.

"That's why Alzheimer's Research UK has launched the thinkbrainhealth.org.uk campaign to engage people with this important aspect of their health and to make the public more aware of the things they can do to support their brain health."

More information: Sarah?Naomi James et al, A population?based study of head injury, cognitive function and pathological markers, *Annals of Clinical and Translational Neurology* (2021). [DOI: 10.1002/acn3.51331](https://doi.org/10.1002/acn3.51331)

Provided by University College London

APA citation: Head injuries may worsen cognitive decline decades later (2021, March 12) retrieved 1 May 2021 from <https://medicalxpress.com/news/2021-03-injuries-worsen-cognitive-decline-decades.html>

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