Childhood head injury linked to higher risk of poor adult mental health and life chances (Update)

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Outcome	Absolute risk in unaffected contemporaries	Absolute risk in those with a single mild, moderate or severe brain injury	Absolute risk in those with repeated mild, moderate or severe brain injuries
Being admitted to hospital as a mental health inpatient	5.7%	10.4%	15.9%
Using a mental health service	14.2%	20.0%	26.6%
Receipt of disability benefits	3.9%	6.3%	12.4%
Receipt of means-tested benefits	11.5%	19.1%	22.3%
Poor school attainment	8.9%	13.9%	19.4%
Early death (before 41)	0.8%	1.6%	2.6%

Absolute risk (the resulting chance) of outcomes following childhood head injury in comparison to unaffected people in the same age group. Credit: University of Oxford

Childhood brain injuries, including concussions, are associated with an increased risk of subsequent mental illness, poor school attainment and premature death, according to a study published today in *PLOS Medicine*.

A research team, based in the UK, US and Sweden, funded by Wellcome, analysed data from more than a million Swedes born between 1973 and 1985 to examine the long-term impact of having a traumatic brain injury before the age of 25.

Professor Seena Fazel from Oxford University, lead author of the study, explained: "Swedish data recording makes it possible to link anonymised health, welfare and education records. We looked at low educational attainment, instances of psychiatric care, receiving welfare and disability benefit and early death.

"We found that a childhood brain injury increased the chances of all these things. More serious brain injuries and repeated brain injuries made them even more likely."

Head injuries included those presenting to hospital and outpatient services, with 77% of the sample with mild head injury (or concussions) and the remainder with more severe presentations. The team compared people who had experienced brain injury to unaffected people in their same age group, and also to their brothers and sisters who had not been injured.

Prof Fazel said: "Comparing results within families allows for other factors in a person's upbringing that could have a bearing on their later life. The differences could still be seen between injured and uninjured siblings, indicating that the effect of head injury is independent of other factors, like upbringing."

People who had experienced a single mild, moderate or severe brain injury during childhood were at twice the risk of being admitted to hospital as a mental health inpatient (an increase in absolute risk from 5% to 10%), and were 50% more likely to use a mental health service (increase from 14% to 20%) than unaffected people in the same age

group.

They were 80% more likely to receive disability benefits (increase from 4% to 6%) and 70% more likely to die before the age of 41 (increase from 0.8% to 1.6%). There were also 60% more likely to have done poorly at school (increase from 9% to 14%) or be in receipt of welfare benefits (increase from 12% to 19%).

People who had experienced repeated mild, moderate or severe brain injury were over two-and-a-half times more likely to receive disability benefits than contemporaries who had experienced a single-episode injury (increase from 6% to 12%).

While many of the results reinforce the growing body of research about the long term effects of head injuries in young people, this study is the largest undertaken so far. Professor Fazel continued:

"Our study indicates far-reaching and long-term consequences of head injury. It reinforces what we knew already - that prevention is key. As the data only included hospital admissions for head injury, and therefore didn't take into account less severe accidents many children have that go unrecorded, these are likely conservative estimates of the scale of the problem.

"Existing work to prevent head injuries to young people in sports, for example, needs to be enhanced. However, we cannot prevent every injury. Long term follow up could identify negative effects so that early intervention can prevent a drift into low attainment, unemployment and mental illness."

Dr Mary DeSilva, Head of Population, Environment and Health at Wellcome, which funded the study, said: "This study is a great example of how we can build a detailed picture of the long term health and social

implications of events like being concussed as a child, by using large sets of data collected over many years.

"With such comprehensive data researchers could also show that the risk of outcomes, including the likelihood of developing a psychiatric illness, became higher if the injury was more severe, or if there were multiple injuries."

More information: Amir Sariaslan et al, Long-Term Outcomes Associated with Traumatic Brain Injury in Childhood and Adolescence: A Nationwide Swedish Cohort Study of a Wide Range of Medical and Social Outcomes, *PLOS Medicine* (2016). DOI: 10.1371/journal.pmed.1002103

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