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Long-term risk of dementia after traumatic brain injury - a population-based cohort study

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Background and Aim: Traumatic brain injury (TBI) is common in accidents, sports and military operations. It has been suggested that TBI may increase the risk of dementia, but previous studies have been few, small and limited by short follow-up time. We aimed at evaluating the risk of dementia after TBI in a large cohort with up to 37 years of follow-up.

Methods: We established a population-based cohort consisting of all persons who were living in Denmark on January 1, 1995 and who were at least 50 years of age at some point between 1999 and 2013 using information from Danish nationwide registries (the Civil Registration System, the National Patient Register, the Psychiatric Central Register, and the National Prescription Registry). Information on TBI and Dementia was available from 1977 to 2013. Hazard ratios (HRs) and corresponding 95% confidence intervals were estimated using Cox proportional hazards regression models.

Results: We followed a cohort of 2,794,852 individuals for a total of 27.6 million person-years of whom 132,093 had at least one hospital contact for TBI, and 126,734 were diagnosed with dementia. The HRs of dementia were highest during the first six months following TBI (HR: 4.06; 95%CI: 3.79-4.34) and decreased thereafter consistently with time since the TBI; the HR was 1.17 (1.13-1.21) 14 years or more after the TBI. The HR of dementia increased with increasing number of TBIs from 1.22 (1.19-1.25) for individuals with one TBI to 2.83 (2.14-3.75) for those with five or more TBIs. The estimates did not change much when we used a reference group of persons who have had a fracture but no TBI.

Conclusion: TBI was associated with an increased risk of dementia and the risk increased with increasing number and severity of the TBI.