Traumatic Brain Injuries and Whiplash Injuries
Epidemiology and Long-Term Consequences

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Akademisk avhandling
som med vederbörligt tillstånd av Rektor vid Umeå universitet för avlägga av medicine doktorsexamen framläggs till offentligt försvare i Hörsal B, Tandläkarhögskolan, Norrlands Universitetssjukhus, Umeå fredagen den 7 dec 2012, kl. 13:00. Avhandlingen kommer att försvaras på engelska.

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ABSTRACT

Background The incidence of traumatic brain injuries (TBI) is about 500 cases per 100,000 inhabitants per year, a majority of which are mild TBI (MTBI). The incidence of whiplash injuries is about 300/100,000/year. There are several similarities between MTBI and whiplash injuries with regard to the causes of injury (traffic crashes and falls), the demographic profile of the injured (mostly young persons), and the type of symptoms exhibited by some of the injured (for example head/neck pain, fatigue, impaired cognitive functioning, and depression).

Main aim To investigate the epidemiology and long-term consequences in terms of symptoms, disability, and life satisfaction in TBI and whiplash cases in a well-defined population.

Material and methods Data on frequencies and characteristics of TBI and whiplash injuries were extracted from the injury database at the emergency department (ED) of Umeå University Hospital (UUH). The results were presented as descriptive epidemiology. The 18-65 year-old persons who sustained an MTBI or whiplash injury in 2001, were provided a questionnaire three and five years after injury respectively, in which questions were asked about: Symptoms, Rivermead Post Concussion Symptoms Questionnaire (RPQ); Disability, Rivermead Head Injury Follow Up Questionnaire (RHFUQ); Life satisfaction, LiSat-11. A local reference population of was used for comparison of the RPQ. A national cohort was used as reference for LiSat-11. Data on sick leave for the cases of whiplash injuries were analysed to calculate the cost to society for loss of productivity.

Results In 2001, the incidence of TBI was 354/100,000/year. The mean age was 23 and 55% were men. Ninety-seven percent of the injuries were classified as mild (Glasgow coma scale 13-15). The main causes were falls (55%) and traffic related injury events (30%). In 8% of the cases (17% of the elderly persons) an intracranial bleeding was detected by using CT. The 3-year follow-up of the MTBI patients showed that women had more symptoms and disability (~50%) than men (~30%). Both women and men had more symptoms and lower life satisfaction compared with the reference population. The incidence of traffic-related whiplash injuries in adults was 235/100,000/year and the annual incidences were relatively stable during 2000-2009. Combining the incidences with national insurance data showed that the proportion of insurance claims decreased during the period. When looking at whiplash trauma following all causes of injury in 2001, traffic crashes caused 61% of the injuries and falls caused 14%. Neck fractures occurred in 3% of the cases. Five years after whiplash injury, the injured persons had more symptoms and lower life satisfaction than the references. Sick leave ≥15 days was granted in 14% of the cases of whiplash injuries. The median number of sick days was 298 and the cost of loss of productivity during the follow-up was 5.6 million USD. The frequencies of symptoms were relatively alike when comparing subjects with whiplash injuries to subjects with MTBI.

Conclusion TBI and whiplash injuries are common, especially among young people, and the injuries render long-term symptoms, disability, and impaired life satisfaction in up to 50% of the cases. Symptoms exhibited are alike between the two types of injuries. The cost to society for loss of productivity is high, and there is a need for enhanced preventive measures aiming at reducing traffic-related injuries, sports injuries, alcohol-related injuries, and falls. Physical, mental, and social factors are important and should be addressed when examining and treating patients with persisting symptoms following TBI and whiplash injuries.

Keywords Traumatic Brain Injuries; Whiplash Injuries; Epidemiology; Follow-up Studies; Cohort Studies

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