Predictors of long-term outcome after severe traumatic brain injury

Akademisk avhandling

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Föreliggande avhandling grundar sig på följande artiklar:

I **Ulfarsson T**, Arnar Gudnason G, Rosén T, Blomstrand C, Stibrant Sunnerhagen K, Lundgren-Nilsson A, Nilsson M.

Pituitary function and functional outcome in adults after severe traumatic brain Injury: the long-term perspective.

J Neurotrauma. 2013;30(4):271-80.

II **Ulfarsson T**, Lundgren-Nilsson A, Blomstrand C, Nilsson M.

A history of unemployment or sick leave influences long-term functioning and health-related quality of life after severe severe traumatic brain injury.

Brain Inj. Accepted for publication

III Godbolt AK, Stenberg M, Lindgren M, **Ulfarsson T**, Lannsjö M, Stålnacke BM, Borg J, Deboussard CN.

Impact of care pathways on outcome one year after severe traumatic brain injury.

Submitted

IV **Ulfarsson T**, Lundgren-Nilsson A, Blomstrand C, Jakobsson K-E, Odén A, Nilsson M, Rosen T.

Ten-year mortality after severe traumatic brain injury in western Sweden, a case-control study.

Submitted

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Predictors of long-term outcome after severe traumatic brain injury

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ABSTRACT

Aim: A complex interaction between several factors may influence and explain the variance in outcome after traumatic brain injury (TBI). The overall aim of this thesis was to explore, in individuals with severe TBI, the impact of posttraumatic hypopituitarism (PTHP), a history of unemployment or sick leave, and care pathways on long-term global outcome. Further, to investigate short- and long-term all-cause mortality after severe TBI.

Methods: The studies reported in this thesis included a total of 280 participants with severe TBI. In study I and II, a retrospective follow-up was performed of 51 consecutive individuals, age 16–65 years, who were admitted with severe TBI to Sahlgrenska University Hospital, Gothenburg, from 1999 to 2002.The impact of PTHP and of unemployment or sick leave before injury on functioning and health related quality of life (HRQL) was explored. Data from the time of injury were combined into a validated prognostic model to adjust for injury severity. Outcome was measured once, 2 -11 years after trauma, and included hormonal testing, the Short Form-36 Health Survey, the Glasgow Outcome Scale –Extended (GOSE), and a self-report questionnaire specifically designed for these studies. Data on sick leave and unemployment were gathered from the Swedish social insurance agency. Study III was a multi-centre, prospective, observational study of 114 individuals, age 18-65 years, with severe TBI from six neurosurgical centers in Sweden and Iceland, with a follow up one year after the injury. The study assessed the relationship between care pathways (length of stay in intensive care, time between intensive care discharge and rehabilitation admission), and global outcome (GOSE). A validated prognostic model was used to adjust for injury severity. In study IV, a comparison of the cumulative death rates and causes of death between 166 individuals admitted to Sahlgrenska and a community control group, was conducted retrospectively at 10 years after the severe TBI. The data was ascertained from the Swedish National Board of Health and Welfare register.

Results: A history of sick leave or unemployment before severe TBI was found to predict a worse long-term global outcome, more problems with activities of daily living and reduced HRQL at follow-up. A higher body mass index and overweight at follow-up was partially explained by PTHP. Otherwise no significant correlation was found between PTHP, functioning and HRQL. A longer length of stay in intensive care, and longer time between discharge from intensive care and admission to inpatient rehabilitation, were both associated with a worse global outcome at one year after injury. The risk of death was increased from a variety of causes for at least 10 years after severe TBI.

Conclusion: The participants with severe TBI reported lasting disability, and low HRQL, with a complex range of physical, cognitive, behavioral and emotional disturbance. This may increase risk for secondary medical morbidity and explain the increased risk of death for many years after the injury. The results of the studies should be considered when refining long-term outcome predictions and optimizing rehabilitation interventions (prevention, surveillance and treatment) and care pathways after severe TBI. These findings highlight the need to provide special interventions for individuals with a history of unemployment or sick leave before severe TBI and they indicate that screening for PTHP might be warranted to specific subgroups such as overweight individuals. Measures to establish well-timed rehabilitation admission may improve outcomes after severe TBI.

Key words: Severe Traumatic brain injury; Prognosis; Hypopituitarism; Pre-morbid; Rehabilitation; Health Facility Planning; Long-term outcome; Functioning; Quality of life; Survival analysis.

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