

REVIEW ARTICLE



Systematic Review of the Prognosis After Mild Traumatic Brain Injury in Adults: Cognitive, Psychiatric, and Mortality Outcomes: Results of the International Collaboration on Mild Traumatic Brain Injury Prognosis

Linda J. Carroll, PhD,^a J. David Cassidy, PhD, DrMedSc,^{b,c,d,e} Carol Cancelliere, DC, MPH,^{b,c} Pierre Côté, DC, PhD,^{c,e,f} Cesar A. Hincapié, DC, MHSc,^{b,e} Vicki L. Kristman, PhD,^{e,g,h,i} Lena W. Holm, DrMedSc,^j Jörgen Borg, MD, PhD,^k Catharina Nygren-de Bousard, MD, PhD,^k Jan Hartvigsen, PhD^{d,l}

From the ^aSchool of Public Health and Alberta Centre for Injury Control and Research, University of Alberta, Edmonton, Canada; ^bDivision of Health Care and Outcomes Research, Toronto Western Research Institute, University Health Network, University of Toronto, Toronto, Ontario, Canada; ^cInstitute of Health Policy, Management and Evaluation, University of Toronto, Toronto, Ontario, Canada; ^dInstitute of Sports Science and Clinical Biomechanics, Faculty of Health, University of Southern Denmark, Odense, Denmark; ^eDivision of Epidemiology, Dalla Lana School of Public Health, University of Toronto, Toronto, Ontario, Canada; ^fFaculty of Health Sciences, University of Ontario Institute of Technology-Canadian Memorial Chiropractic College Centre for the Study of Disability Prevention and Rehabilitation, Toronto, Ontario, Canada; ^gDepartment of Health Sciences, Lakehead University, Thunder Bay, Ontario, Canada; ^hInstitute of Work and Health, Toronto, Ontario, Canada; ⁱDivision of Human Sciences, Northern Ontario School of Medicine, Lakehead University, Thunder Bay, Ontario, Canada; ^jDivision of Epidemiology, Institute of Environmental Medicine, Karolinska Institutet, Stockholm, Sweden; ^kDepartment of Clinical Sciences, Rehabilitation Medicine, Karolinska Institutet, Danderyd University Hospital, Stockholm, Sweden; and ^lNordic Institute of Chiropractic and Clinical Biomechanics, Odense, Denmark.

Abstract

Objective: To synthesize the best available evidence on objective outcomes after adult mild traumatic brain injury (MTBI).

Data Sources: MEDLINE and other databases were searched (2001–2012) for studies related to MTBI. Inclusion criteria included published, peer-reviewed articles in English and other languages. References were also identified from the bibliographies of eligible articles.

Study Selection: Randomized controlled trials and cohort and case-control studies were selected according to predefined criteria. Studies had to have a minimum of 30 MTBI cases and assess objective outcomes in adults.

Data Extraction: Eligible studies were critically appraised using a modification of the Scottish Intercollegiate Guidelines Network (SIGN) criteria. Two reviewers independently reviewed each study and extracted data from accepted articles into evidence tables.

Data Synthesis: Evidence was synthesized qualitatively according to modified SIGN criteria, and studies were categorized as exploratory or confirmatory based on the strength of their design and evidence. After 77,914 records were screened, 299 were found to be relevant and critically reviewed, and 101 were deemed scientifically admissible. Of these, 21 studies that were related to the objective outcomes form the basis of this review. Most evidence indicates the presence of cognitive deficits in the first 2 weeks post-MTBI, and some evidence suggests that

Supported by the Ontario Neurotrauma Foundation (grant no. 2010-ABI-MTBIWHO-871).

The funder was not involved in the design or preparation of the study protocol, or in the management of the project, analysis or interpretation of data, or the preparation of the final article.

No commercial party having a direct financial interest in the results of the research supporting this article has conferred or will confer a benefit on the authors or on any organization with which the authors are associated.

The findings and conclusions in this research are those of the authors alone and do not necessarily represent the official views or policies of the Centers for Disease Control and Prevention or any agency of the United States government. Inclusion of individuals, programs, or organizations in this article does not constitute endorsement by the United States government.

complete recovery may take 6 months or a year. A small number of studies indicate that MTBI increases the risk of psychiatric illnesses and suicide.

Conclusions: Early cognitive deficits are common, and complete recovery may be prolonged. Conclusions about mortality post-MTBI are limited. This review has implications for expected recovery after MTBI and MTBI-related health sequelae. Well-designed confirmatory studies are needed to understand the medium- to long-term consequences of MTBI and to further evaluate the effect of prior MTBI and injury severity on recovery.

Archives of Physical Medicine and Rehabilitation 2014;95(3 Suppl 2):S152-73

© 2014 by the American Congress of Rehabilitation Medicine

Mild traumatic brain injury (MTBI) or concussion is common in the general population. A previous review on the incidence of MTBI estimated that there are 100 to 300 hospital-treated cases of MTBI per 100,000 persons per year. However, this is likely the tip of the iceberg because there is evidence that much MTBI is not treated at hospitals.¹ The main causes of MTBI are falls and motor vehicle collisions, and MTBI is a condition that disproportionately affects the young (teenagers and young adults) and is more common in men than women.¹ Given its frequency, having good information on the course of recovery and predictors of recovery is a priority.

There have been several systematic reviews examining the presence of cognitive outcomes after MTBI. One of these (published in 2003) reports² a meta-analysis showing a moderate effect of MTBI on cognitive functioning in the early stages of recovery. Although that review was not designed to track the course of recovery after MTBI (which requires studies with a longitudinal design), the authors extrapolated from mostly cross-sectional studies that, on average, cognitive recovery appears to occur within the first 3 months. A subsequent systematic review³ examined the presence of long-term MTBI-related cognitive impairment (>6mo), and reported that there was insufficient evidence to come to a conclusion.

The aim of the current article is to expand and update our knowledge about the presence and course of recovery of MTBI-related cognitive impairment in adults and prognostic factors for that recovery and to report other objectively measured outcomes of MTBI. A previous systematic review⁴ (a best evidence synthesis) on the course and prognostic factors for MTBI recovery was published in 2004 by the World Health Organization (WHO) Collaborating Centre Task Force on MTBI. To inform about the course of recovery and prognostic factors for recovery, studies must use a longitudinal design. In the 2004 review,⁴ only 9 longitudinal studies reporting on cognitive deficits in adults after non-sports-related MTBI were sufficiently methodologically sound to be included in the best evidence synthesis. The limited information available at the time suggested the presence of initial cognitive deficits, but generally good recovery of cognitive functioning. However, the paucity of studies limited the authors' confidence in this conclusion, leaving questions about how long cognitive recovery typically takes in adults and what preinjury or initial postinjury factors predicted good versus poor cognitive recovery.

The review^{4,5} suggested that much of the research on prognosis in adults was methodologically weak. In particular, the review called for more attention to the control of confounding and to selection of control groups. Specifically, investigators designing research were called on to consider the question of whether factors (eg, pain, medications, psychological distress, and other potential confounders) have an impact on assessment of cognitive functioning of adults with MTBI. Moreover, challenges faced by researchers in interpreting neuropsychological test scores have been

outlined by Iverson and Gaetz,⁶ among others. Iverson and Gaetz⁶ point out that intertest score scatter occurs even in the healthy population, and the more tests are administered, the greater the likelihood that an individual will score in the extreme range, even in the absence of a brain dysfunction. Therefore, cautious interpretation of study findings is warranted.

Since the above review was published in 2004, there has been a good deal of research activity in MTBI, and the current update of the WHO Collaborating Centre Task Force was undertaken by an international group of researchers and clinicians, the International Collaboration on MTBI Prognosis (ICoMP). The ICoMP conducted a systematic search, critical review, and best evidence synthesis of the research on MTBI prognosis published since the work of the WHO Collaborating Centre Task Force on MTBI. The current article forms a part of this endeavor and reports on those studies concerned with presence, course of recovery, and predictors of recovery of cognitive outcomes (assessed by neuropsychological measures); psychiatric outcomes of MTBI; mortality outcomes associated with MTBI; and other objectively assessed outcomes in adults subsequent to non-sports-related and non-military-related MTBI.

Methods

The protocol registration, case definition, literature search, critical review strategy, and data synthesis are outlined in detail elsewhere⁷ and in this issue.⁸ Briefly, the electronic databases MEDLINE, PsycINFO, Embase, CINAHL, and SPORTDiscus were systematically searched from 2001 to 2012. Reference lists of all systematic reviews and meta-analyses related to MTBI and all articles meeting the eligibility criteria were checked to ensure that relevant studies were not missed.

Articles were screened according to predefined criteria. Inclusion criteria included original, published peer-reviewed research reports in English, French, Swedish, Norwegian, Danish, and Spanish; human participants of all ages; and a minimum of 30 participants with MTBI or concussion. The definition of MTBI had to be consistent (but not necessarily identical) with the definitions provided by the WHO Collaborating Centre Task Force on MTBI⁵ and the Centers for Disease Control and Prevention.⁹ Eligible study designs were randomized controlled trials with prognostic information, cohort studies, and case-control studies. Exclusion criteria included cross-sectional studies, case reports, case series, and cadaveric, biomechanical, and laboratory studies.

Eligible articles were critically appraised using a modification of the Scottish Intercollegiate Guidelines Network (SIGN) criteria.¹⁰ Two reviewers performed independent, in-depth reviews of each eligible study, and a third reviewer was consulted for disagreements. ICoMP members also undertook 3 original

Download English Version:

<https://daneshyari.com/en/article/3448400>

Download Persian Version:

<https://daneshyari.com/article/3448400>

[Daneshyari.com](https://daneshyari.com)