

MANDATE OF THE WHO COLLABORATING CENTRE TASK FORCE ON MILD TRAUMATIC BRAIN INJURY

Hans von Holst^{1,2} and J. David Cassidy^{3,4,5}

From the ¹Department of Neurosurgery and the WHO Collaborating Centre for Neurotrauma, Karolinska Institutet, Stockholm, Sweden, ²Center for Technology in Health, Royal Institute of Technology, Stockholm, Sweden, ³Alberta Centre for Injury Control and Research, Department of Public Health Sciences, University of Alberta, Edmonton, Alberta, Canada, ⁴Department of Medicine, University of Alberta, Edmonton, Alberta, Canada, ⁵Section for Personal Injury Prevention, Department of Clinical Neurosciences, Karolinska Institutet, Stockholm, Sweden

In collaboration with outside experts, the WHO Collaborating Centre for Neurotrauma at the Karolinska Institute, Stockholm, Sweden, has assembled a task force to undertake a best-evidence synthesis of the literature on mild traumatic brain injury. The task force has addressed the epidemiology, diagnosis, prognosis, treatment and economic costs of mild traumatic brain injury in order to make recommendations to reduce the medical as well as the social consequences of mild traumatic brain injury.

Key words: mild traumatic brain injury, epidemiology, diagnosis, treatment, prognosis.

J Rehabil Med 2004; suppl. 43: 8–10

Correspondence address: Hans von Holst, President of the WHO Collaborating Centre on Neurotrauma Task Force on MTBI, Department of Neurosurgery, Karolinska Hospital, SE-171 76 Stockholm, Sweden.
E-mail: hans.vonholst@ks.se

BACKGROUND

As part of its Constitution, the World Health Organization (WHO) promotes and conducts research in the field of health. An optimal way of promoting research is through collaborations with and among national institutions within Member States of the WHO. As such, a network of WHO Collaborating Centres has evolved and been formalized over the years with the purpose of: standardizing health terminology to international standards; synthesizing and disseminating scientific and technical information about health problems; helping to support national and international programmes of health; participating in health education and training, including research training; providing information and advice on scientific, technical and policy issues on health; and collaborating to improve human health (1). These roles can strengthen institutional capacities in countries and regions throughout the world.

In 1992, the WHO granted collaborating status to the Karolinska Institute for a WHO Collaborating Centre for Neurotrauma, Prevention Management and Rehabilitation, hereafter referred to the WHO Collaborating Centre for Neurotrauma (WHO-CCN). As part of its programme of activities, the WHO-CCN, in collaboration with outside experts, developed a protocol to undertake a scientific review of mild traumatic brain

injury (MTBI). This protocol was presented and then funded by several Swedish sponsors and 3 Canadian provincial government insurance companies. With funding in place, the WHO-CCN assembled a core team of clinician/scientists to undertake the bulk of the work, an international advisory board to review the annual progress and quality of the work and an administrative committee to deal with budgetary and other administrative issues.

BEST-EVIDENCE SYNTHESIS

Healthcare today is an extremely complex endeavour influenced by multiple factors. This is reflected by the amount of information required truly to understand the complexity of any given clinical problem. Thousands of healthcare journals publish volumes of papers on various conditions every year. The sheer enormity of health-related publications makes it impossible for any one person to stay up-to-date with this literature. Moreover, the scientific quality of the published information varies enormously, to the point where bad studies greatly outnumber the good ones. Therefore, not only is it difficult to survey the literature, but one must also have the scientific skills to critique the pertinent information, and these skills are not common amongst clinicians and other decision-makers.

Since decisions about the organization and delivery of healthcare should be based on the effectiveness of the interventions or policies, it is important to identify and base decisions on good scientific information. The first step in this process is to identify all the relevant literature on the topic of interest. This requires a systematic and comprehensive search of computerized databases, government reports, academic reports and other sources. Once the relevant literature is identified, it must be scientifically reviewed to determine its quality. The best studies, or studies containing the “best evidence”, are assembled, and these form the basis for recommendations. Best-evidence synthesis is a scientific process for locating, appraising and synthesizing evidence from scientific studies (2, 3). It summarizes, appraises, synthesizes, and therefore, increases access to a good knowledge base, which is critical for healthcare decisions. In addition, by identifying what is not known on the topic of interest, best-evidence synthesis represents the first step in identifying the important questions that need to be addressed

by new research. Therefore, it provides a powerful scientific tool in the assessment of healthcare delivery, especially where there is a large body of diverse literature of varying quality spread over different publications addressing an important or controversial health problem (4–6).

DEFINITIONS

MTBI is sometimes referred to by a number of other names, such as concussion, minor brain injury, mild head injury and minor head injury (7). The term brain injury is used throughout this document in preference to the term head injury, since the term minor head injury might also be used in reference to non-brain injuries, such as injuries to the eye, face and scalp lacerations, and this document is concerned with injuries to the brain.

Concussion is a general term that is usually defined as a disturbance in neurological function caused by the mechanical force of rapid acceleration/deceleration. Concussion covers a range of symptoms and severity, although the term concussion is rarely used to refer to severe brain injury and generally refers to mild or moderate brain injury. A mild concussion consists of seeing stars or feeling dazed, and does not necessarily involve loss of consciousness. When the lay population uses the term concussion, they generally mean this kind of mild injury. In a more severe concussion, there can be unconsciousness and neurological abnormalities. When unconsciousness and/or neurological abnormalities dissipate within a short time after the injury and the subsequent confusion and disorientation resolve within hours, the condition is usually considered a mild brain injury.

Two common criteria used to define severity of brain injury include: (i) length of time the patient is unconscious after the injury, often termed loss of consciousness (LOC) and (ii) length of post-traumatic amnesia (PTA), i.e. the time period from when the patient regains consciousness until he or she regains the capacity for continuous memory. The most common way of assessing the patient's level of consciousness is the Glasgow Coma Scale (GCS) (8). Mild brain injury is defined as a GCS score of 13–15. PTA is often assessed more informally, by asking the patient, the family or the attending medical personnel to estimate the PTA time period. The cut-off for PTA for mild brain injury is usually 24 hours. When the length of time the patient is unconscious is used as a criterion for severity, a mild brain injury is usually defined as less than 30 minutes of unconsciousness. If a patient has a skull fracture, focal neurological deficits or hemiparesis, the brain injury is not usually considered to be mild.

It should be noted that the common criteria for defining a brain injury as mild are not necessarily compatible. For example, a patient may meet the GCS criteria for mild brain injury, but suffer a longer period of PTA, which would place him or her in the moderately brain injured category. This leads to some confusion in the literature. There is a need for a universally acceptable definition for MTBI, based on valid diagnostic criteria (9).

MANDATE

The World Health Organization Collaborating Centre for Neurotrauma at Karolinska Institute, Stockholm, Sweden assembled a group of international clinician-scientists and methodologists to undertake a best-evidence synthesis on MTBI and review data from insurance companies participating in this collaboration for possible epidemiological analysis. The mandate of the task force is to make recommendations to reduce the medical, social and economic consequences of MTBI. The task force has addressed the epidemiology (incidence, risk and prevention of MTBI), diagnosis, prognosis, treatment, and economic costs of MTBI. The mandate of the task force is concerned with mild brain injury with traumatic closed head aetiology, especially resulting from motor vehicle collisions and falls. To achieve this, the task force undertook 3 phases of investigation. These are: (i) a scientific review and synthesis of the world scientific literature on MTBI; (ii) original research on MTBI in Sweden; and (iii) original research on traffic-related MTBI in the Canadian province of Saskatchewan. This work is reported in this supplement. It is our sincere belief that the evidence collected and synthesized in this report will provide a baseline of scientific information to inform patients, clinicians, researchers, policy-makers, insurers, governments and other stakeholders on MTBI.

ACKNOWLEDGEMENTS

As president and scientific secretary of this task force, we thank members of the scientific secretariat for several years of tireless work, members of the advisory board for their patience and valuable guidance, our administrative committee for their guidance and budgetary work, and our sponsors for providing the funding for this substantial effort.

This work was supported by a grant from AFA Insurance, Sweden; Folksam Insurance, Sweden; the Volvo Car Company, Sweden; Saskatchewan Government Insurance, Canada; the Insurance Corporation of British Columbia, Canada; and La Société de l'assurance automobile du Québec, Canada. Dr Cassidy is supported by Health Scholar Awards from the Alberta Heritage Foundation for Medical Research.

REFERENCES

1. World Health Organization. What is a WHO collaborating centre? WHO collaborating centre website [cited 2003 May 1]. Available from: URL: http://whqlily.who.int/general_infos.asp.
2. Slavin RE. Best evidence synthesis: an alternative to meta-analytic and traditional reviews. *Edu Researcher* 1986; 15: 5–11.
3. Slavin RE. Best evidence synthesis: an intelligent alternative to meta-analysis. *J Clin Epidemiol* 1995; 48: 9–18.
4. Spitzer WO, Skovron ML, Salmi LR, Cassidy JD, Duranceau J, Suissa S, et al. Scientific monograph of the Quebec Task Force on Whiplash-Associated Disorders: redefining “whiplash” and its management [erratum in *Spine* 1995 Nov 1; 20: 2372]. *Spine* 1995; 20 (suppl 8): 1S–73S.
5. Spitzer WO, LeBlanc FE, Dupuis M, Abenhaim L, Belanger AY, Bloch R, et al. Scientific approach to the assessment and management of activity-related spinal disorders. A monograph for clinicians.

- Report of the Quebec Task Force on Spinal Disorders. *Spine* 1987; 12 (suppl 7): S1–S59.
6. Spitzer WO, Lawrence V, Dales R, Hill G, Archer MC, Clark P, et al. Links between passive smoking and disease: a best-evidence synthesis. A report of the Working Group on Passive Smoking. *Clin Invest Med* 1990; 13: 17–42.
 7. Levin HS, Eisenberg HM, Benton AL, eds. *Mild head injury*. Oxford: Oxford University Press; 1989.
 8. Teasdale G, Jennett B. Assessment of coma and impaired consciousness. A practical scale. *Lancet* 1974; 2: 81–84.
 9. Carroll LJ, Cassidy JD, Kraus JF, Coronado V, Holm L. Methodological issues and research recommendations for mild traumatic brain injury: the WHO Collaborating Task Force on Mild Traumatic Brain Injury. *J Rehabil Med* 2004; (suppl. 43): 84–105.