



Fitness-to-drive after mild traumatic brain injury: Mapping the time trajectory of recovery in the acute stages post injury



Anne Baker^{a,*}, Carolyn A. Unsworth^{b,c,d,e}, Natasha A. Lannin^{b,f,g}

^a Institute for Safety, Compensation and Recovery Research, Monash University, Melbourne, Australia

^b Faculty of Health Sciences, La Trobe University, Victoria, Australia

^c Department of Occupational Therapy, Central Queensland University, Victoria, Australia

^d Department of Rehabilitation, School of Health Sciences, Jönköping University, Sweden

^e Department of Occupational Therapy, Curtin University, Perth, Australia

^f Department of Occupational Therapy, Alfred Health, Victoria, Australia

^g Rehabilitation Studies Unit, Sydney Medical School, The University of Sydney, Australia

ARTICLE INFO

Article history:

Received 19 December 2014

Received in revised form 8 February 2015

Accepted 11 March 2015

Available online 19 March 2015

Keywords:

Acute care

Fitness-to-drive

Mild traumatic brain injury

ABSTRACT

Introduction: Little is known about the trajectory of recovery in fitness-to-drive after mild traumatic brain injury (mTBI). This means that health-care professionals have limited evidence on which to base recommendations to this cohort about driving.

Objective: To determine fitness-to-drive status of patients with a mTBI at 24 h and two weeks post injury, and to summarise issues reported by this cohort about return to driving.

Method: Quasi-experimental case-control design. Two groups of participants were recruited: patients with a mTBI ($n = 60$) and a control group with orthopaedic injuries ($n = 60$). Both groups were assessed at 24 h post injury on assessments of fitness-to-drive. Follow-up occurred at two weeks post injury to establish driver status.

Main Measures: Mini mental state examination, occupational therapy-drive home maze test (OT-DHMT), Road Law Road Craft Test, University of Queensland-Hazard Perception Test, and demographic/interview form collected at 24 h and at two weeks.

Results: At the 24 h assessment, only the OT-DHMT showed a difference in scores between the two groups, with mTBI participants being significantly slower to complete the test ($p = 0.01$). At the two week follow-up, only 26 of the 60 mTBI participants had returned to driving. Injury severity combined with scores from the 24 h assessment predicted 31% of the variance in time taken to return to driving. Delayed return to driving was reported due to: “not feeling 100% right” ($n = 14$, 23%), headaches and pain ($n = 12$, 20%), and dizziness ($n = 5$, 8%).

Conclusion: This research supports existing guidelines which suggest that patients with a mTBI should not to drive for 24 h; however, further research is required to map factors which facilitate timely return to driving.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

For many years, the term mild traumatic brain injury (mTBI) was used in the literature interchangeably with the term concussion (Carroll et al., 2004). The focus of research for this cohort was around concussion sustained as a result of sporting incidents, and return to play guidelines was accordingly the primary area of interest (Cancelliere et al., 2014). In recent times, mTBI has been spotlighted as an issue for health professionals alongside post-traumatic stress disorder (PTSD), and reflects the increasing number of combat

veterans returning from war who require intervention to return to everyday activities (Classen et al., 2011; Reid et al., 2014). The focus of mTBI research is also extending beyond athletes to the general public (Hartvigsen et al., 2014), with the condition now being recognised as comprising 70–90% of all traumatic brain injuries sustained, often as a result of motor vehicle crashes. Roughly this translates as 493 to 653 per 100,000 people sustaining a mTBI (Marshall et al., 2012). Current best evidence classifies mTBI by one or more of the following: confusion or disorientation after the event, the experience of other transient neurological abnormalities not requiring surgery, loss of consciousness (LOC) for 30 min or less, post-traumatic amnesia (PTA) less than 24 h, and a Glasgow Coma Scale (GCS) score of 13–15 up to 30 min post injury (Carroll et al., 2004). In addition, these manifestations must not be due to drugs/alcohol/medications,

* Corresponding author. Tel.: +61 3 9903 8600.

E-mail address: anne.baker@monash.edu (N.A. Lannin).

be caused by other injuries or psycho-social issues, or be caused by penetrating cranio-cerebral injury (Carroll et al., 2004). Generally, symptoms are most pronounced 24 h post injury, rapidly improve within two weeks, and are usually fully resolved at three months post injury (McCrea et al., 2009). However, although labelled “mild”, some patients report ongoing symptoms (such as dizziness, fatigue, forgetfulness, headache, neck pain, sleep disturbances, and vision and/or hearing problems) up to one year post injury (Hartvigsen et al., 2014). The mTBI population is typically young, and keen to return to their everyday activities as quickly as possible post injury. The primary focus of interest for this cohort typically surrounds return to work, return to leisure activities/sport, and return to driving. Being the most preferred method of transport in many developed countries, driving can often be essential for both return to work and return to leisure activities/sport. However, at present, limited evidence and limited clinical guidelines exist to help facilitate return to driving after mTBI.

In 2012, a series of clinical practice guidelines were released in Canada, which suggested that patients should not drive for a minimum of 24 h after mTBI (Marshall et al., 2012). However in these guidelines (Marshall et al., 2012), and in other licensing/fitness-to-drive guidelines around the world (in Australia – Austroads, 2012; in America – Department of Motor Vehicles, 2013; in Europe – PORTARE, 2009), no evidence is provided about when a person is safe to drive after this 24 h period. Unsurprisingly, this has resulted in variation in clinical practice with some clinicians advising patients not to drive for at least 24 h and others advising patients not to drive until they feel that they are able to (Baker et al., 2015a; Moore and Leathem, 2004). While the majority of patients intend to return to driving as soon as possible post injury (Preece et al., 2013), many end up being required to compensate for self-perceived driving difficulties for up to 2–6 weeks post injury (Bottari et al., 2012; Sveen et al., 2013). Given the large number of people who sustain a mTBI each year and wish to return to driving, further research to guide practice is urgently required. Internationally, driving is not only one of the most common forms of transportation, but it is also one of the leading causes of death, injury, and disability (Australian Bureau of Statistics, 2010). Given that driving a car can be dangerous, people must have the skills need to safely control the vehicle and must be fit-to-drive. After a mTBI, it is not yet known if people have adequate skills to assure their own safety and also that of other road users. Therefore, it is vital that we begin to map the trajectory of recovery in fitness-to-drive after mTBI in order to ensure that this population group can be provided with evidence-based recommendations about when they should resume driving.

Further research is required to support our understanding of the recovery of fitness-to-drive in the acute stages after mTBI, and to inform the development of practice guidelines. Therefore, the aims of this study were to:

- a Determine the fitness-to-drive status of patients with a mTBI at 24 h post injury in comparison to a control group of orthopaedic patients,
- b Determine driving status of patients with a mTBI at two weeks post injury, and
- c Summarise patient-reported issues about the time taken to return to driving post injury.

2. Method

2.1. Setting and participants

Recruitment for this study was based in the Trauma and Orthopaedic wards at The Alfred Hospital, Victoria, Australia. The

Alfred Hospital is a major acute hospital with the largest trauma service in Australasia, treating over 5000 trauma patients annually (The Alfred Hospital, 2012). Clinical practice guidelines at The Alfred Hospital state that patients should be advised not to drive for two weeks post mTBI. A convenience sample of admitted in-patients from The Alfred Hospital was invited to participate in the study, using consecutive sampling. Participants for both samples were required to meet the following criteria:

2.2. General inclusion criteria

General inclusion criteria: be aged between 18–65 years, hold a probationary or full Australian driver's licence, be able to read and write in English for the purposes of testing, have no co-morbidities (as per the participant's medical records), and have a zero blood alcohol level reading (0.00%) and no illicit drugs in their system.

2.3. Specific inclusion criteria – mTBI group

Specific inclusion criteria – mTBI Group: have sustained a mTBI, with any one or more of the following (Carroll et al., 2004): confusion or disorientation after the event, the experience of transient neurological abnormalities not requiring surgery, LOC \leq 30 min, PTA \leq 24 h, and/or GCS 13–15.

2.4. Specific inclusion criteria – orthopaedic group

Specific inclusion criteria – orthopaedic group: have sustained trauma to one or more bones.

2.5. Procedure

Ethics approval for this study was obtained from the Human Ethics Committees at The Alfred Hospital and La Trobe University, Victoria, Australia. Data collection occurred daily from February–August 2014, until 120 participants were recruited ($n=60$ mTBI and $n=60$ orthopaedic). Approximately two patients were approached each day, and most agreed to participate in the study. Reasons for non-participation were primarily linked to feeling too unwell to complete the assessments. All assessments were administered by the first author, who is a qualified occupational therapy driver assessor (OTDA). Testing occurred at the patient's bedside, and lasted about 45 min. Patients with either a mTBI or an orthopaedic diagnosis were assessed at 24 h post injury on five assessments identified in the literature as representing a range of aspects of fitness-to-drive. Obtaining data from the orthopaedic control group was necessary at the 24 h time-point in order to account for common hospital associated factors that might have impacted on the results of these assessments other than mTBI (such as anxiety and pain). Orthopaedic participants were reasoned to act as a suitable control, given that this cohort is admitted under the same clinical pathway as mTBI patients but do not have any formal driving restrictions placed on them. For orthopaedic participants, no further follow up occurred after the initial 24 h assessment. Participants in the mTBI group were followed up at two weeks post injury, and again at the conclusion of the study if they reported being a ‘non-driver’ at their two week assessment.

2.6. Measures

The assessments selected for use at 24 h post injury had to be: suitable for bedside use, short in length, and able to be resumed if interrupted. These criteria were necessary given the busy and acute nature of the recruitment setting, with a high turn-over rate of patients, as well as frequent input given from medical and

Download English Version:

<https://daneshyari.com/en/article/572164>

Download Persian Version:

<https://daneshyari.com/article/572164>

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