



ELSEVIER

Journal of PHYSIOTHERAPY

journal homepage: www.elsevier.com/locate/jphys

Invited Topical Review

Physiotherapy management of whiplash-associated disorders (WAD)

Michele Sterling

Centre of National Research on Disability and Rehabilitation Medicine (CONROD), The University of Queensland and Griffith University, Australia

KEY WORDS

Whiplash-associated disorders
Physiotherapy
Interdisciplinary management

[Sterling M (2014) Physiotherapy management of whiplash-associated disorders (WAD). *Journal of Physiotherapy* 60: 5–12]

© 2014 Published by Elsevier B.V. on behalf of Australian Physiotherapy Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

Introduction

'Whiplash-associated disorders' (WAD) is the term given to the variety of symptoms often reported by people following acceleration/deceleration injury to the neck, most commonly via a road traffic crash. The cardinal symptom is neck pain but neck stiffness, dizziness, paraesthesia/anaesthesia in the upper quadrant, headache and arm pain are also commonly reported. The neck-related pain is associated with disability, decreased quality of life, and psychological distress. Due to WAD often being a compensable injury, it is a controversial condition, with some still denying it as a legitimate condition.¹ This is despite the wealth of evidence demonstrating both physical and psychological manifestations that have implications for management. This narrative review will outline the burden of WAD, the clinical pathway following injury, and factors predictive of both good and poor recovery. The diagnosis and assessment of WAD will be discussed. This will be followed by an overview of the current evidence for management of the condition and future directions for research and clinical practice in order to improve health outcomes for this condition.

The burden of WAD

Whiplash injury following a road traffic crash is common, with recent figures suggesting more than 300 persons per 100,000 are seen in emergency departments every year in Europe and North America,² and in Australia, whiplash injuries comprise ~75% of all survivable road traffic crash injuries.³ Musculoskeletal conditions and injuries from road traffic crashes account for a large proportion of disease burden worldwide, with the burden associated with such conditions increasing.⁴ The economic costs of whiplash injuries in Queensland, Australia are substantial and exceeded \$350 million from 2011 to 2012.⁵ In New South Wales in the period 1989–1998, there were 50,000 whiplash compulsory third-party claims costing ~\$1.5 billion.⁶ The total costs associated with whiplash injury exceed costs for both spinal cord and traumatic brain injury

sustained in road traffic crashes.⁵ The situation is little different in other Western countries. For example, in the United Kingdom, whiplash personal injury claims exceeded £3 billion per year,⁷ while in the United States, costs reached US\$230 billion per annum in 2000.⁸

Consistent international data indicate that approximately 50% of people who sustain a whiplash injury will not recover but will continue to report ongoing pain and disability one year after the injury.² Mental health outcomes are also poor, with the prevalence of psychiatric disorders in people with persistent WAD being 25% for post-traumatic stress disorder,^{9–11} 31% for Major Depressive Episode, and 20% for Generalised Anxiety Disorder.¹¹ Individuals with mental health problems report higher levels of disability, pain, and reduced physical function,^{12,13} and conditions with comorbid physical injury and psychiatric disorder are associated with double the health care utilisation and considerably greater time off work compared to those with physical injury alone.¹¹

Clinical course of WAD and prognostic factors for recovery and non-recovery

Cohort studies have demonstrated that recovery, if it occurs, takes place within the first 2–3 months following the injury with a plateau in recovery following this time point.^{10,14} Even in those with poor overall recovery, there appears to be an initial decrease in symptoms to some extent in this early post-injury period. Recently, three distinct clinical recovery pathways following whiplash injury were identified using trajectory-modelling analysis.¹⁰ The first is a pathway of good recovery, where initial levels of pain-related disability were mild to moderate and recovery was good, with 45% of people predicted to follow this pathway. The second pathway involves initial moderate to severe pain-related disability, with some recovery but with disability levels remaining moderate at 12 months. Around 39% of injured people are predicted to follow this pathway. The third pathway involves initial severe pain-related disability and some recovery to moderate or severe disability, with

<http://dx.doi.org/10.1016/j.jphys.2013.12.004>

1836-9553/© 2014 Published by Elsevier B.V. on behalf of Australian Physiotherapy Association. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/3.0/>).

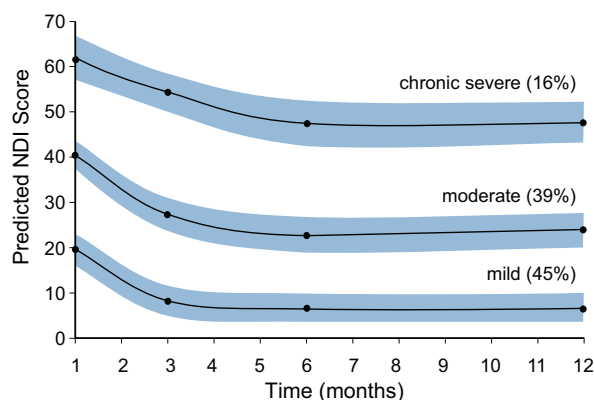


Figure 1. Predicted Neck Disability Index (NDI) trajectories with 95% confidence limits and predicted probability of membership (%). Suggested cut-offs for the NDI are: 0 to 8% (no pain and disability); 10–28% (mild pain and disability), 30–48% (moderate pain and disability), 50–68% (severe pain and disability) and >70% complete disability.⁷⁵

Modified from Sterling et al¹⁰ with permission.

16% of individuals predicted to follow this pathway. The identified pathways are illustrated in Figure 1. They may provide useful conceptualisation for clinicians of the possible recovery trajectories.

With up to 50% of those sustaining a whiplash injury reporting ongoing pain and disability, it is of clinical interest to be able to identify both those at risk of poor recovery and those who will recover well. This may assist in targeting ever-shrinking health resources to those in most need of them. The most consistent risk factors for poor recovery are initially higher levels of reported pain and initially higher levels of disability.^{2,15} A recent meta-analysis indicated that initial pain scores of >5.5 on a visual analogue scale from 0 to 10 and scores of >29% on the Neck Disability Index are useful cut-off scores for clinical use.¹⁵ In view of the consistency of these two factors to predict poor functional recovery, they are recommended for use by physiotherapists in the assessment of patients with acute WAD.

Other prognostic factors have been identified, including psychological factors of initial moderate post-traumatic stress symptoms, pain catastrophising and symptoms of depressed mood.^{2,16,17} Additionally, lower expectations of recovery have been shown to predict poor recovery.^{18,19} In other words, patients who do not expect to recover well may indeed not recover.

Cold hyperalgesia has been shown to predict disability and mental health outcomes at 12 months post-injury,^{19,28,48} and decreased cold pain tolerance measured with the cold-pressor test predicted ongoing disability.²¹ A recent systematic review concluded that there is now moderate evidence available to support cold hyperalgesia as an adverse prognostic indicator.²² Other sensory measures such as lowered pressure pain thresholds (mechanical hyperalgesia) show inconsistent prognostic capacity. Walton et al showed that decreased pressure pain thresholds over a distal site in the leg predicted neck pain-related disability at 3 months post-injury,²³ but other studies have shown that this factor is not an independent predictor of later disability.²⁰ The exact mechanisms underlying the hyperalgesic responses are not clearly understood, but are generally acknowledged to reflect augmented nociceptive processing in the central nervous system or central hyperexcitability.^{24,25}

Some factors commonly assessed by physiotherapists do not show prognostic capacity. These factors include measures of motor and sensorimotor function such as the craniocervical flexion test, joint repositioning errors, and balance loss.²⁶ Decreased range of neck movement is inconsistent in that some studies have found it to be predictive and others have not.¹⁵ This is not to say that

these factors should not be considered in the clinical assessment of patients with WAD, but they should not be used to gauge prognosis. Other factors commonly considered to predict outcome, such as those associated with compensation processes and accident-related factors, are not robust prognostic indicators.²⁷ Similarly, demographic or social factors such as age, income and educational levels demonstrate inconsistent prognostic capacity.^{2,15}

Most prognostic studies of WAD have been phase 1 or exploratory studies, with few confirmatory or validation studies having been conducted.²⁸ Validation studies are important in order to confirm the prognostic capacity of identified factors in a new and independent cohort. A recent study undertook validation of a set of prognostic indicators including initial disability, cold hyperalgesia, age and post-traumatic stress symptoms. The results indicated that the set showed good accuracy (area under the curve 0.89, 95% CI 0.84 to 0.94) in discriminating patients with moderate/severe disability from patients with full recovery or residual milder symptoms at 12 months post-injury.¹⁶ These results are clinically useful, as physiotherapists usually aim to broadly identify patients likely to report persistent moderate to severe symptoms. Such a validation study is rare in this area of research and goes some way towards providing greater confidence for the use of these measures in the early assessment of whiplash injury.

Based on the results of previous cohort studies, a clinical prediction rule to identify both chronic moderate/severe disability and full recovery at 12 months post-injury was recently developed. The results indicated that an initial Neck Disability Index score of $\geq 40\%$, age ≥ 35 years, and a score of ≥ 6 on the hyperarousal subscale of the Posttraumatic Stress Diagnostic Scale²⁹ could predict patients with moderate/severe disability at 12 months with fair sensitivity (43%, 95% CI 31 to 55), good specificity (94%, 95% CI 89 to 96), and a positive predictive value of 71% (95% CI 55 to 84).³⁰ It is also important to predict patients who will recover well as these patients will likely require less intensive intervention. Initial Neck Disability Index scores of $\leq 32\%$ and age ≤ 35 years predicted full recovery at 12 months post-injury, with a positive predictive value of 71%.³⁰ A third medium-risk group could either recover or develop chronic pain and disability (>32% on the Neck Disability Index, score >3 on the hyperarousal subscale). The hyperarousal subscale comprises five items that evaluate the frequency of symptoms including: having trouble falling asleep, feelings of irritability, difficulty concentrating, being overly alert, and being easily startled.³¹

In summary, Box 1 presents consistent prognostic indicators for poor functional recovery, factors with consistent evidence of not being associated with poor recovery, and factors with inconsistent evidence.

Diagnosis and assessment

The Quebec Task Force (QTF) classification of whiplash injuries (presented in Table 1') was put forward in 1995³² and it remains the classification method still currently used throughout the world. Whilst the QTF system is rather simplistic and based only on signs and symptoms, it allows practitioners and other stakeholders involved in the management of patients with WAD to have a common language about the condition. Most patients fall into the WAD II classification, although health outcomes for this group can be diverse and this has been outlined as one problem with the QTF system.³³ Modifications to the QTF system have been proposed but have generally been more complicated³³ and, for this reason, not easily taken up by all stakeholders involved in the management of WAD.

The diagnosis of WAD has changed little in recent times. In the vast majority of cases, specific tissue damage or a peripheral

Download English Version:

<https://daneshyari.com/en/article/5864295>

Download Persian Version:

<https://daneshyari.com/article/5864295>

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