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Prognostic factors for chronic neck pain in persons with Minor or moderate injuries in traffic accidents

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Abstract

Prognostic factors for chronic neck pain were identified in a prospective Norwegian insurance cohort comprising 636 persons with minor or moderate traffic injuries.

One questionnaire was used at baseline and another at 3 years post-injury. Daily severe or very severe neck pain at three years follow up was defined as chronic neck pain.

Eight significant independent prognostic factors for chronic neck pain were identified: (1) rear-end or frontal and rear-end collision, odds ratio (OR): 4.10 (95% confidence interval (CI): 1.72–10.82); (2) neck and/or shoulder pain before the accident, OR: 2.38 (95% CI: 1.07–5.37); (3) post-accident (a) memory and concentration problems, OR: 4.62 (95% CI: 1.99–11.20), (b) bodily tension, OR: 3.43 (95% CI: 1.49–8.42), (c) difficulties to climb stairs, OR: 5.03 (95% CI: 1.77–14.95), (d) difficulties to bend forward, OR: 4.85 (95% CI: 2.06–11.79), (e) difficulties to do heavy labour, OR: 3.70 (95% CI: 1.24–11.64); (4) beliefs in future work disability, OR: 2.64 (95% CI: 1.11–6.48).

The results indicate that development of chronic neck pain is influenced by pre-accident neck and/or shoulder pain, the impact of the collision, as well as post-accident symptoms, perceived impaired function and pessimism for the future ability to work.

Keywords: Whiplash injury; Traffic accident; Neck injury; Chronic neck pain; Prognosis

1. Introduction

Neck pain is the most common symptom in whiplash injuries, typically caused by rear-end collisions. Other directions of the collision may also cause such injuries (Spitzer et al., 1995) that account for a large proportion of the overall impairment and disability caused by traffic accidents (Sterner and Gerdle, 2004). A Norwegian expert group concluded that 3–5% of persons exposed to a whiplash trauma in a car crash will develop acute symptoms, comprising neck pain and headache in more than 80%, and that 10% of these will develop chronic complaints that have a considerable impact on their level of functioning (Rø et al., 2000).

In the systematic review of the literature on whiplash published by the Quebec Task Force in 1995 (Spitzer et al., 1995) it was concluded that the symptoms are self-limited with favourable prognosis for most patients. However, the authors found that the scientific quality of the prognostic studies was poor and that it was impossible to make evidence-based recommendations on prognostic factors for recovery (Spitzer et al., 1995). The updated Quebec Task Force report on the prognosis of acute whiplash included 13 cohort studies and concluded that besides age, gender, baseline neck pain intensity, baseline headache intensity and baseline radicular signs and symptoms, there was little consistency in the literature about the prognostic factors for recovery (Cote et al., 2001).

The prognostic value of age, gender and radicular symptoms could not be confirmed in another recent systematic review

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that was based on 29 independent prospective cohort studies (Scholten-Peeters et al., 2003). This review concluded that there was strong evidence for no association between adverse prognosis and age, gender, acute psychological response, angular deformity of the neck, rear-end collision or compensation. Strong evidence was found for high initial pain intensity being an adverse prognostic factor. In addition several factors with limited prognostic value for functional recovery were identified. Finally, they emphasised that the presence or absence of these factors can help care providers to predict the prognosis and to guide treatment.

The aim of the present study was to identify prognostic factors for chronic neck pain after traffic accidents with minor or moderate injuries in a Norwegian insurance cohort. More specifically we used the information in a standardised claims handling questionnaire to identify prognostic factors for daily severe or very severe neck pain 3 years after the accident. In addition, the predictive capacity of these factors was quantified.

2. Methods

2.1. Study design

A prospective cohort design was used to assess persons who acquired moderate or minor injury in a traffic accident by the use of standardised claims handling questionnaire (CHQ) less than 3 months post-injury and then a follow-up questionnaire (FUQ) at 3 years post-injury.

2.2. Participants

Participants were recruited from a cohort of persons aged 16 years or older who were injured in a traffic accident with liability insurance with If insurance company and who reported the injury to the claims handling office for the eastern part of Norway in the periods 1 July 1996 to 31 October 1996 and 1 April 1997 to 31 October 1997. In Norway all car owners have mandatory traffic liability insurance, and the present material comprise approximately 17% of all traffic injuries in Norway in the two defined time periods. Injured persons were excluded for three reasons: (1) registered injury of the brain (except concussion), cranial nerves, spinal cord, eyes, abdominal organs or registered multi-traumas; (2) the first medical information to the insurance company suggested that the injury could be major and that the questions in the CHQ therefore could be improper; (3) minor initial symptoms which resolved completely in short time (Fig. 1).

2.3. Data collection

The total number of reported injured persons was 2327. The CHQ was sent to 2059 persons (964 women and 1095 men). It was returned from 1638 (79.6%), and 1310 (63.6%) returned it within 3 months after the accident (median: 36 days, quartiles: 25 and 51 days). Those who returned the CHQ later than 3 months after the accident were excluded from the analysis because it has been suggested to define whiplash-associated disorders as chronic when they last longer than 12 weeks (Tenenbaum et al., 2002). The 3-year FUQ was returned from 636 of these 1310 (48.5%). These 636 persons comprise the study group (Fig. 1).

2.4. Dependent variable

The dependent variable was taken from the FUQ which comprised questions about pain location and pain intensity, current employment status, physical functioning, and customer satisfaction, but not about treatment. The definition of chronic neck pain was based on two questions; frequency (never, sometimes and daily) and severity (very severe, severe, moderate and mild) of neck pain. We defined daily severe or very severe neck pain 3 years after the accident as chronic neck pain.

2.5. Independent variables

The prognostic variables were based on the CHQ, a four page questionnaire, which comprised questions grouped in 10

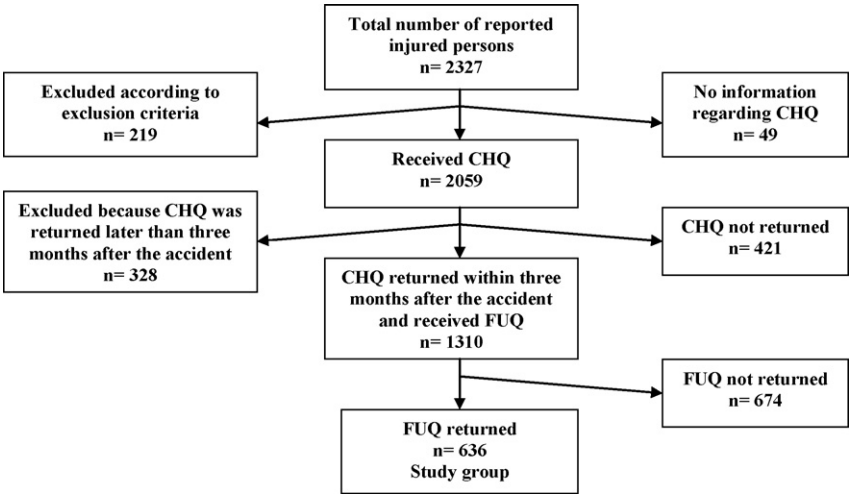

Fig. 1. Flowchart of the study recruitment. CHQ = claims handling questionnaire; FUQ = follow-up questionnaire.