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Work disability after road traffic injury in a mixed population with and without hospitalisation

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ABSTRACT

Background: Studies addressing work disability after road traffic injury are generally aimed at seriously injured hospital patients, and less is known about the disability burden associated with injuries not requiring hospitalisation. The aim of this study was to describe the distribution and determinants of work disability outcomes for patients with musculoskeletal and orthopaedic traffic injuries, including those not sufficiently severe to require hospitalisation.
Methods: Persons injured in road traffic accidents in 2005–2007 claiming compensation via the Transport Accident Commission (Victoria, Australia) were included if they had compensated time off work, and their most serious injury was musculoskeletal or orthopaedic ($n = 5970$). Work disability outcomes were determined from income compensation payments over 17 months following the accident. Logistic regression models were used relating demographic and injury characteristics to work disability.
Results: Of the injuries, 59% required hospitalisation; 15% required hospitalisation of >1 week. Long-term work disability was common with 32% of injuries resulting in work disability ≥6 months after the accident. The duration of work disability increased markedly with length of hospital stay. Those with no hospital stay accounted for 27% of all work disability days; those with ≤7 days in hospital (including no hospital stay) accounted for 71%. Female sex, age ≥35 years and early opioid prescriptions were also risk factors for work disability ≥6 months after the accident.
Conclusion: The majority of work disability days were among patients with one week or less in hospital. Because (short) hospitalisation was relatively common after traffic accidents, the relative work disability burden of non-hospitalised injury is not as great as in a mixed injury aetiology population.

1. Introduction

Road traffic related injuries resulting in disability and death are a global public health concern. Preventive measures are generally aimed at reducing fatality rates; however, there is much to be gained by specifically considering interventions aimed at reducing the harm arising from non-fatal injuries. In Australia, fatality rates have decreased by an average of 3% annually since 1992 (Gargett et al., 2011), but the number of people seriously injured in road traffic accidents has actually been increasing (Henley and Harrison, 2011). Trends in non serious road traffic injury are unknown.

Studies addressing the long-term functional or vocational outcomes after road traffic injury are usually conducted among patients recruited from hospitals, trauma centres or intensive care units, and the results are limited to patients with relatively severe injuries (MacKenzie et al., 1998; Schnyder et al., 2003; Soberg et al., 2007; Toien et al., 2012; Vles et al., 2005). Without taking into account the contribution of non hospitalised injuries, such studies may underestimate the true socioeconomic impact of traffic injury. Whiplash injury, as an example of a condition that usually does not require hospitalisation but can result in extensive work disability, has been shown to be a major contributor to the total financial cost of injury (Buitenhuis et al., 2009; Bylund and Bjornstig, 1998). In the non traffic related injury outcomes literature, there is a developing consensus that non-serious injuries comprise the majority of the population burden of injury (Boake et al., 2005; McClure and Douglas, 1996; Waller et al., 1995). Work-related musculoskeletal injuries are an example of non traffic injuries that generally do not require hospitalisation but that are associated with substantial work disability (Berecki-Gisolf et al., 2012a). If the true burden of road traffic injury is to be reduced then it is important to quantify and address not only the fatalities, and the increasing problem of serious injuries, but also the as yet unquantified burden arising from non-hospitalised road traffic injuries.

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The aim of this study was to describe the distribution and determinants of work disability outcomes for patients with musculoskeletal and orthopaedic traffic injuries, including those whose injuries were not sufficiently severe to require hospitalisation.

2. Methods

2.1. Setting

The Transport Accident Commission is a state-government organisation established to pay for treatment and benefits for people injured in traffic accidents in the state of Victoria, Australia. It is a population based scheme, funded from annual car registration payments by Victorian motorists. It uses a no-fault scheme, i.e. the injured person is eligible for benefits regardless of who caused the accident. Income replacement, medical, rehabilitation and lifetime care costs resulting from transport injury are compensated by the scheme.

A fully de-identified research database containing Transport Accident Commission claims and payments records is held at the Institute of Safety, Compensation and Recovery Research (Melbourne, Australia) (Ruseckaite et al., 2012). This was the data source for this study. Institutional ethics approval was gained from Monash University Human Research Ethics Committee for use and disclosure of the claims information.

2.2. Sample

Injured persons with accepted injury compensation claims for accidents dating between 1 Jan. 2005 and 31 Dec. 2007 ($n = 53{,}232$) were eligible for inclusion in this study if they were aged $\geq$18 years, and their most serious injury was musculoskeletal or orthopaedic ($n = 32{,}930$). The most serious injury was established by the claims manager during an interview with the injured person early on in the claim. Only injured persons with compensated time off work as a result of the accident were included ($n = 5970$). Those with more than 10 weeks of hospital stay after the accident ($n = 76$) were excluded from analyses of early determinants of time off work because hospital stay beyond 10 weeks cannot be established within a fortnight of the accident: this information is not available as an early determinant. Furthermore, hospital stay and RTW are mutually exclusive and it is therefore not informative to include this group in modelling of time off work.

2.3. Work disability outcomes

Work disability outcomes were based on loss of earning payments made after the accident. Before loss of earnings payments commence, the initial sick leave is paid for by the employer. The duration of employer-paid leave can differ per claim, depending on the amount of accumulated leave. Although work related compensation was used as a proxy for work disability throughout this manuscript, some types of work disability such as taking up lighter tasks after the injury, or injury-related job changes, are not captured.

2.3.1. Work disability duration

At 18 months after the accident date, Transport Accident Commission claims are reviewed and loss of earnings payments either stop, or the recipient is considered to have a long-term (partial) work disability. To gain insight in the determinants of return to work without capturing compensation scheme processes, the follow-up was limited to 17 months post-accident. Return to work was defined as the final cessation of 'loss of earnings' payments, within the follow-up time of 17 months. Those receiving any loss of earnings payments in the last month of follow-up were censored. A binary outcome was derived for having any loss of earnings payments after 6 months dating from the day of the accident (any work disability after six months vs. none).

2.3.2. Loss of earnings capacity

If after 18 months the recipient is considered to have a long-term (partial) work disability, further payments are termed 'loss of earnings capacity' payments. Loss of earnings capacity was derived as a binary variable (i.e. any loss of earning capacity payment vs. none).

2.4. Variables

Information regarding age, gender, occupation, accident location, and type of injury was available in the claims database. Injury types were rated by claims managers on the basis of client interviews; the diagnoses are therefore not recorded directly from the treating medical practitioner. Prescription drugs related to the injury are covered by the insurance scheme. Records of these prescription drugs were used to derive information on opioid prescriptions in the first ten days after the accident: records of filled prescriptions were used as a proxy for medication use. Prescription drug payments contained an Australian Pharmaceutical Benefit Scheme item code, which corresponds with a drug name, manner of administration, form and strength (Australian Government Department of Health and Ageing). All prescriptions containing morphine sulphate, morphine hydrochloride, oxycodone, fentanyl, buprenorphine, tramadol, or codeine were coded as 'opioid', regardless of the form, strength or dose. Drugs prescribed during hospital stay are not captured: early opioids therefore refer to out-of-hospital opioid prescriptions only. For patients without hospital stay, medical costs are generally only reimbursed after a medical excess (sum of post-injury medical charges) has been reached. For this reason early opioid use was not analysed in patients without hospital stay (i.e. this is an indicator of early opioid use *as well as* high initial medical costs).

2.5. Statistical analysis

2.5.1. Burden of injury: work disability

The total sum of days for which loss of earnings payments were made (i.e. compensated days off work) during the 17 months following the accident was calculated separately per length of hospital stay. Hospital stay exceeding 10 weeks was included in this overview, to capture the full scope of work disability in those with orthopaedic or musculoskeletal injuries sustained in road traffic accidents. To calculate the median number of days of work disability for each sex, age category, occupation, accident area, and injury type, stratified general survival functions describing time to return to work were computed using the product limit method.

2.5.2. Early determinants of long-term work disability

Analysis of early predictors of work disability duration should include predictors that can be established soon after the accident. Hospital stay of 3–6 months, for example, is not an *early predictor* of work disability. One week after the accident, length of hospital stay is either none, 1–7 days, or more than 7 days, i.e. still in hospital. Because work disability is highly correlated with hospital stay, we considered the analysis of early determinants of work disability to be most informative for those with none and those with 1–7 days in hospital only. Being in hospital for at least seven days implies an absence from work for at least seven days regardless of other work disability determinants, and for this reason patients with more than a week in hospital were excluded from predictive modelling of work disability.