

ORIGINAL ARTICLE

Health Care Utilization of Workers' Compensation Claimants Associated With Mild Traumatic Brain Injury: A Historical Population-Based Cohort Study of Workers Injured in 1997-1998



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Abstract

Objective: To compare the health care use of workers with an injury before and after making a workers' compensation claim for mild traumatic brain injury (MTBI).

Design: Cohort study of workers with an MTBI who received workers' compensation benefits.

Setting: Workers' compensation system in Ontario, Canada.

Participants: Workers (N=728) who made an incident claim involving MTBI to the Ontario Workplace Safety and Insurance Board between 1997 and 1998. We linked workers' compensation and Ontario Health Insurance Plan files and collected all health care services accrued during the year before and 2 years after the claim was initiated.

Interventions: Not applicable.

Main Outcome Measures: We report our results as a 7-day simple moving average of health care services per 1000 claimants per day. We stratified our analysis by age, sex, the preclaim level of health care utilization, diagnostic category, and health care specialty.

Results: Over the 2 years, 728 claims related to MTBI were filed by workers with an injury. The majority of the claims (65.8%) were filed by men, and 28.3% were filed by those aged between 25 and 34 years. The cumulative rate of health care utilization was stable (mean=67.6 visits/1000 claimants per day; 95% confidence interval [CI], 65.0–70.2) throughout the year before claim initiation. Health care utilization peaked during the first 4 weeks following the initiation of the claim (mean=274.3 visits/1000 claimants per day; 95% CI, 172.2–376.4) and remained on average 182% higher than that at baseline throughout the 5th to 12th week postclaim. Two years after the initiation of the claim, utilization remained 9.5% higher than the preclaim level. The increase was more pronounced (125% higher) for workers with less than the median preclaim utilization level.

Conclusions: Making a workers' compensation claim involving MTBI is associated with a long-term increase in health care use.

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Mild traumatic brain injury (MTBI) is a common injury after falls and traffic collisions.¹ A Canadian study examining both hospital-treated cases and those presenting to a family physician calculated the incidence of MTBI in Ontario to lie between 493/100,000 and 653/100,000, depending on whether the diagnosis was made by primary care physicians or a secondary reviewer.² The best evidence from systematic reviews suggest that the incidence of hospital-treated MTBI is high, with reported rates ranging from 100 to 300/100,000 globally.¹ Many MTBIs are not treated at hospital, and so the true population-based rate is likely greater than 600 per 100,000.¹ MTBI is an important problem in the workplace and for return to work (RTW). Each year, approximately 6 of every 1000 lost-time claims (insurance claims for wage replacement while off work) in Ontario are compensated for a work injury involving MTBI,³ and the incidence of MTBI claims is 1.5 (95% confidence interval [CI], 1.3–1.7) per 10,000 full-time equivalents.⁴ Workers experiencing MTBI are 3.5 (95% CI, 2.9–4.3) times more likely than the general unemployed population to remain unemployed 1 year later.⁵

In the acute stage of MTBI, cognitive deficits and symptoms are common, but most patients recover within 3 to 12 months.⁶ In Ontario, 87% of compensated workers with an MTBI had a single episode of wage replacement benefits, with a median duration of 11 (95% CI, 10–12) days.⁴ Fifty percent came off wage replacement benefits after 17 cumulative days and 75% after 72 days.⁴ Yet, 5% remained on wage replacement benefits up to 2 years after an MTBI.⁴ Conversely, a Norwegian study found the proportions of workers working preinjury and 1 year postinjury to be similar.⁷ There is limited evidence for factors predictive of RTW.⁸ Some evidence suggests that those with greater education⁹ and more independence in their jobs¹⁰ have quicker RTW. Sex does not appear to be important, but younger workers tend to come off workers' compensation benefits faster.⁴ Compensation and litigation delay RTW.⁶

In Ontario, as in most jurisdictions, submitting a claim for workers' compensation results in a worker's seeing a clinician. The clinician diagnoses and treats the worker's symptoms and may provide advice regarding safe and timely RTW. One goal of the treatment is to safely return a worker with an injury to work. Consequently, successful RTW should coincide with reduction in the use of health care services and a return to preclaim levels.

Ontario is a Canadian province of 12.8 million inhabitants with a universal health care system.¹¹ Work-related injuries and diseases are compensable by the Workplace Safety and Insurance Board (WSIB), a public no-fault insurer legislated by the Workplace Safety & Insurance Act.¹² Approximately 65% of Ontario workers are covered by the WSIB. The health care costs incurred by workers with an injury are reimbursed by the workers' compensation board. Workers who are self-employed or employed by self-insured companies are not covered by the WSIB.

On January 1, 1998, the Ontario government introduced a new workers' compensation law (Bill 99) that modified the management of RTW.¹² According to Bill 99, employers and workers are required to communicate with each other, identify early

appropriate employment, and provide the WSIB with information concerning the RTW process.^{12,13} The role of the WSIB is to assist employers and workers to achieve safe and early RTW.

A recent study described the medical rehabilitation service usage for all cases of TBI.¹⁴ Although approximately 70% to 90% of all brain injuries are considered to be mild,¹ no study has specifically described the health care use of workers with an MTBI. The primary objective of our study was to compare the health care use of workers with an injury before and after making a workers' compensation claim for MTBI. We also aimed to determine whether the use of health care varied according to age, sex, the preclaim level of health care utilization, health care specialty, and diagnostic categories. Finally, we compared health care utilization before and after the introduction of the new workers' compensation law in Ontario. Given recovery from MTBI generally occurs within 3 to 12 months, we hypothesized that the 2-year postclaim health care use would return to preclaim levels.

Methods

Study design

We conducted a historical population-based cohort study of Ontario workers aged 18 years or older who made a lost-time claim to the WSIB between January 1, 1997, and December 31, 1998. This study period was selected because it corresponds to the introduction of a new workers' compensation law in Ontario and would also ensure that all claims information would be registered and captured in the database. Often, it can take a few years to ensure that all claim information is input into the WSIB system, and so the use of historical data ensured that all data would be included.

Study population

We included workers who filed an incident lost-time claim for MTBI. An *incident claim* was defined as the first claim filed for MTBI for a worker in the period 1997 to 1998. Claims were excluded if there was another claim filed for MTBI in the 1-year period before the index claim, where the index claim was the incident claim of interest. We created the cohort using administrative data from the WSIB.

Definition of MTBI

The World Health Organization Collaborating Centre Task Force on Mild Traumatic Brain Injury provided an operational definition of MTBI.¹⁵ Because we extracted information from the WSIB data sources, we did not have access to all the information necessary to apply the World Health Organization Collaborating Centre Task Force on Mild Traumatic Brain Injury definition. Therefore, we identified cases of MTBI using the "part of body" and "nature of injury" codes from the WSIB lost-claims data. We used the brain part of body code (1100) and the concussion nature of injury code (6200). This specific code combination is considered the primary group for capturing MTBI.³ The methodology used to identify lost-time claimants is described in detail elsewhere.³ The positive predictive value for identifying MTBI using

List of abbreviations:

CI	confidence interval
MTBI	mild traumatic brain injury
OHIP	Ontario Health Insurance Plan
RTW	return to work
WSIB	Workplace Safety and Insurance Board

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