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Health related quality of life and return to work after minor extremity injuries: A longitudinal study comparing upper versus lower extremity injuries

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ABSTRACT

Purpose: To investigate the impact on health related quality of life (HRQL) during the first year after minor extremity injury and to determine whether there is a difference in recovery patterns and return to work between upper extremity injuries (UEI) and lower extremity injuries (LEI).
Method: A total of 181 adults' age 18 years or older randomly selected from patients admitted to an emergency department with minor injuries were studied. HRQL was measured using the Functional Status Questionnaire (FSQ) at 1–2 weeks, 3, 6, and 12-months post-injury. Pre-injury FSQ scores were measured retrospectively at admission. A quasi-least square (QLS) model was constructed to examine differences of FSQ scores at each measuring point for UEI and LEI.
Results: Fractures of the knee/lower leg (25%) were the most frequently injured body area. Slips or falls (57%) and traffic-related events (22%) were the most common injury causes. The mean ISS was 4.2 (SD 0.86). Both groups had significant declines in the FSQ scores physical and social functioning at 1–2 weeks after injury. Patients with UEI made larger improvements in the first 3 months post-injury versus patients with LEI whose improvements extended over the first 6 months. None of the groups reached the pre-injury FSQ scores during the first post-injury year except in the subscale work performance where UEI exceeded the pre-injury scores. At 12 months post-injury, significant lower FSQ scores remained in the LEI group compared to the UEI group in intermediate activities of daily living (p = 0.036, d 0.4) and work performance (p = 0.004, d 0.7). The return to work at 3 months and 12 months were 76% and 88% for UEI and 58% and 77% for LEI. No significant differences were found between groups in the FSQ scale mental health and social interaction.
Conclusions: LEI had the highest impact on HRQL and return to work during the first year which exceeded the consequences of UEI. These findings contribute to the information about the consequences of injury in order to give sufficient prognostic information to patients and different stakeholders. Future investigations should aim to investigate specific minor extremity injuries and identify factors that facilitate recovery and return to work.

Introduction

Extremity injuries are among the most common injuries in the adult population and are a major source of disease burden and productivity loss in society [1–3]. Both hospitalised and non-hospitalised patients contribute to this burden. Of the approximately 31 million visits for injuries to emergency departments in the USA, extremity injuries account for approximately half of the visits, most often caused by falls or being struck by or against an object [1]. The majority of extremity injuries are low-acuity and minor with an Injury Severity Score (ISS) below 9 [4,5]. The most frequently injured body regions in the lower extremities are the ankle and foot and, in the upper extremities, the finger, wrist and lower arm [4,5]. One of the most costly injury types are hand and

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wrist injuries ranking before lower extremity injuries and skull-brain injuries; lost work time is the largest contributor to the economic burden [6].

Health-related quality of life (HRQL) is increasingly being used to measure outcomes of the impact of injury on health from the patients' perspective [7,8]. The patient-reported outcome measure (PROM) is an essential component for accurately calculating the global burden of injury to ensure adequate policy responses to prevention and treatment [7,8]. HRQL instruments need to be multidimensional and measure aspects of recovery that are meaningful to patients and include physical, psychological, and social functioning [9,10]. Several studies in hospitalised patients with lower extremity injuries have documented significant impact on short- and long-term disability such as decreased mobility, pain, psychological distress, and decreased social interactions [11–13]. Studies in upper extremity injuries have found similar outcomes [14–16]. Long-term follow-up studies ranging from 3.5 to 10 years after multiple trauma have also identified that injuries to the distal part of the lower extremity are associated with long-term functional disability affecting people's capacity to work and their quality of life [17,18]. The impact of long-term functional disability has been shown in epidemiological studies where injuries of low severity without threat to life lead to sustained suffering with far more healthy life-years lost then by mortality [6,7,19]. Despite the frequency with which minor extremity injuries occur relatively few studies have investigated the impact on people's lives. To date there is a knowledge gap in patient-reported outcomes on the recovery pattern after minor extremity injury and the differential health impact between upper and lower extremity injuries.

The main objectives of this study was: (1) to examine the physical, psychological, social and role function using the Functional Status Questionnaire (FSQ) during the first year after seeking emergency department care for minor extremity injuries, and (2) to determine whether health-related quality of life (HRQL) and return to work varies significantly by upper or lower extremity injuries.

Patents and methods

This study is a secondary analysis of a longitudinal cohort study of adults presenting to an emergency department at a large, urban university hospital for treatment of minor injuries. The original study was approved by the Institutional Review Board, University of Pennsylvania, and additional approval was obtained for this secondary analysis. Included in this current study are adults aged ≥18 years who received treatment for minor extremity injury that occurred within the 24 h of presentation to the emergency department and who were hospitalised or discharged to home from the emergency department with instructions and referrals to follow-up by specialty services. Patients were excluded: (1) if they were unable to understand English, (2) the current injury resulted directly from a coexisting medical illness, domestic violence, or suicide attempt, (3) if they had a current major depression, psychiatric disorders or cognitive deficit that prevented informed consent, and (4) if a previous physical injury had occurred in the past 2 years that required medical care.

Procedures

All adult patients triaged with a preliminary diagnosis of injury had the Triage-Revised Trauma Scores (T-RTS) and Injury Severity Score (ISS) calculated in the emergency department. Those who fulfilled the criteria of minor injury were approached once medically stable with short information about the study, asked for verbal consent to participate in the study and to complete the

pre-injury FSQ questionnaire as a retrospective assessment of preinjury health status based on the week prior to injury. Once verbal consent was obtained, the individual had the potential to be randomly selected for study participation as per a computer-generated randomisation schedule stratified by the typical flow of patients in the emergency department over 24 h a day 7 days a week. If randomly selected, a member of the research team contacted potential participants within approximately 48 h either during the in-hospital stay or if patients were discharged via telephone to describe the study and answer all questions related to the participation in the study. Interview times were arranged at convenient locations for the participants, at which time written informed consent was obtained. The recovery trajectory was followed by measurements at 4 different time points: within 1–2 weeks (acute phase), and continued at 3 months, 6 months, and at 12-months post-injury [9,10,20].

Measurements

The patient reported outcome measure of HRQL was assessed using the Functional Status Questionnaire (FSQ). The FSQ is a generic multidimensional measure initially developed and validated for use in ambulatory patients and was subsequently used in a variety of settings, with established psychometric validity and reliability, and sensitive to change over time [21]. The FSQ includes two daily living scales assessing physical functioning; items in the 'activity of daily living' scale (basic ADL 3 items) range from taking care of oneself to walking indoors and the 'intermediate activities of daily living' scale (intermediate ADL 6 items) range from household works, grocery shopping, driving a car or using public transportation to vigorous activities. The scale 'mental health' (5 items) assesses psychological functioning ranging from being a happy person to feeling so down in the dumps that nothing could cheer the person up. Three scales assess social and work activities; the 'work performance' scale (6 items) focuses on those employed full time or part-time during the previous month. Items range from doing as much work as others in similar jobs to fear of losing job related to the current health situation. Items in the 'social activity' scale (3 items) range from visiting with relatives or friends to participating in community activities, and 'social interaction' scale (5 items) assesses interpersonal relationships ranging from isolating oneself, being affectionate towards others to making unreasonable demands on family and friends. The sub-scales consist of three Likert scales: 5 point Likert scale for 'basic ADL', 'intermediate ADL' and 'social activity' ranging from "usually did not do for other reasons" to "usually did with no difficulty"; 6 point Likert scale for 'mental health' and 'social interaction' ranging from "all of the time" to "none of the time"; 4 point Likert scale for 'work performance' ranging from "all of the time" to "none of the time". Raw scores on each scale are transformed to a scale that ranges from 0 to 100, with higher scores indicating better perceived HRQL.

Patients were asked additional questions (additional HRQL items) about days spent in bed related to disability in the past month, days cut down from usual normal activities, satisfaction with sexual relationships (5 choices ranging from very satisfied to did not have any sexual relationship), frequencies of social interactions (6 choices ranging from every day to not at all), and feelings of overall health status (5 choices from very satisfied to very dissatisfied) [21–23].

Hospital medical records were reviewed to obtain injury-related characteristics. Patients were identified as having minor extremity injury if they had a Triage-Revised Trauma Score (T-RTS) of 12 and Injury Severity Score (ISS) between 2 and 8. The T-RTS is a physiological injury severity indicator used in general trauma populations for triage and clinical decision-making in the prehospital field or emergency departments [24]. Physiological