Published in final edited form as:

Pediatr Emerg Care. 2011 May ; 27(5): 371–373. doi:10.1097/PEC.0b013e318216b0e7.

Pediatric Minor Injury Outcomes:

An Initial Report

Martha W. Stevens, MD, MSCE*, Amy L. Drendel, DO, MS*, and Keri R. Hainsworth, PhD†

*Pediatrics, Section of Emergency Medicine, Medical College of Wisconsin, Milwaukee, WI

†Anesthesiology, Medical College of Wisconsin, Milwaukee, WI

Abstract

Objectives—The objectives were (1) to present a preliminary evaluation of outcomes after pediatric emergency department (PED) minor injury care (not previously described) and (2) to test the feasibility of study methods and of a HRQOL tool in this acute care setting.

Methods—A prospective observational study of clinical and functional short-term outcomes in PED patients with minor injury was performed.

Results—Thirty-five (80%) of 44 families completed telephone follow-up. Children had a median of 3 days of pain; 24% had pain for more than 7 days. Children returned to normal activity in a median of 3 days, and 37%, in more than 7 days. Fifty percent of families had normal activities disrupted, with median of 5 days and 39% in more than 7 days. Among children with school/scheduled activities, 55% missed more than 3 days, and 20% missed more than 7 days. Among parents who missed work/school, the mean was 1 day, and 22% missed more than 3 days. The acute Pediatric Quality of Life Inventory (PedsQL) was feasible for emergency department/follow-up use and had the expected inverse correlations with poor outcomes.

Conclusions—We found significant morbidity after PED treatment of minor injury. The study methods and PedsQL patient and proxy forms were feasible for emergency department use. The PedsQL had some initial indications of construct validity for this population.

Keywords

patient-reported outcomes; minor injury; health-related quality of life

Injury is a common emergency department (ED) presentation in children, accounting for up to 40% of visits. More than 90% of these visits do not result in hospital admission and are defined as minor injury.

In adults, cumulative morbidity (population total health loss by utility index) of minor injuries has been found to be much greater than that of major injuries that result in death or hospitalization¹; the same may be true in children. A recent expert panel convened by the Institute of Medicine called for research in pediatric emergency care outcomes to improve the evidence base in pediatric injury and its treatment.²

It is notable that very little information has been reported on the clinical or functional outcomes in children with minor injury. This is a brief report of an initial assessment of

these short-term outcomes after pediatric ED (PED) care. This preliminary project had 3 aims: to provide an initial description of minor injury morbidity (not previously reported in children), to assess the feasibility of patient enrollment/follow-up methods, and to assess the feasibility of PED and follow-up administration of a brief pediatric health-related quality of life (HRQOL) instrument. As a secondary aim, the total scores from the HRQOL instrument were compared with broad components of clinical outcome as a preliminary to the evaluation of construct validity of the instrument in this setting.

METHODS

This prospective study was conducted in a large urban children's hospital ED serving diverse local and referral populations. A sample composed of all children aged 2 to 18 years with minor injuries who presented during selected ED shifts (based on the research assistant's availability) were enrolled. Patients were excluded if no legal guardian was present, if non-English speaking, or if injury was the result of child maltreatment. Caretakers completed a verbal questionnaire; ED information about demographics and injury characteristics was collected from patients, their caretakers, or the PED chart at the time of the visit; and baseline child (patient) and parent (proxy) forms of the acute Pediatric Quality of Life Inventory 4.0 Generic Core Scales (PedsQL)³ were administered. From 7 to 10 days after the visit, children and caretakers completed telephone questionnaires about their clinical and functional outcomes (days of pain, type of pain medications used, days to return to normal activity levels, days of missed school or work for both patients and caretakers, days of disrupted family activity, and follow-up health care visits). At this time, follow-up patient and proxy PedsQL questionnaires were also administered. All enrolled children were provided with routine ED care. This study received institutional review board approval; caretakers and children provided consent and assent, respectively.

Pain scores were assessed in the PED using the previously validated modified Bieri Faces Pain Scale.⁴ The PedsQL 4.0 Generic Core Scale, a brief HRQOL measure, has been previously validated in many chronic illness care settings and populations, with well-documented reliability, sensitivity, and responsiveness, as well as population norms for US children.³ Children aged 2 to 4 years are assessed with parent report, and children aged 5 to 18 years are assessed with age-appropriate parallel child-and-parent reports. The 23 questions of the PedsQL were scored as per originators' instructions, with higher scores reflecting greater quality of life (range, 0–100).

Statistical Analysis

Continuous variables were summarized by mean, range, and SD, or by median and range if not normally distributed. Categorical variables were summarized by frequencies. Correlations were assessed using Spearman rank correlation coefficient.

RESULTS

Of 44 families initially enrolled, 35 (80%) completed the follow-up. Patient and injury characteristics are presented in Table 1. Age and injury patterns were similar to overall injury presentations in our ED, when compared with the hospital data of minor injury ED presentations during the preceding year.

Functional and Clinical Outcomes

Details of the main clinical and functional outcomes are presented in Figure 1. As reported on telephone follow-up, the children returned to normal activity in a median of 3 days, but in

37%, it took 7 days or more. Of the children with school, work, or other regularly scheduled activities, 55% missed 3 days or more, and 20% missed 7 days or more.

Fifty-one percent of families reported disruption of normal activities or routines after the visit (median, 5 days; 39% in 7 days or more). Parents missed a mean of 1 day of work or school; of those who missed days of work/school, 22% missed 3 days or more.

The median Bieri pain score in the ED was 2 of 5. Children had a median of 3 days of pain after the visit. Eighty-three percent had pain on the first day, and 24% still reported pain at 7 days. Seventy-one percent (25/33) of patients used pain medication on the first day after the visit, 60% on the second day, and 34% on the third day. Pain medications used at home were ibuprofen (38%), acetaminophen (23%), and prescription narcotic (31%). In 8%, the caretaker was unsure of the medication being used.

Although the sample was small, several significant and expected correlations were observed. Continued use of pain medication on day 3 positively correlated with increased days to return to normal activity for the child ($r = 0.61$, $P < 0.001$) and increased days of missed school/day care ($r = 0.54$, $P = 0.01$). The total days of pain was also positively correlated with increasing days for the child to return to normal activity ($r = 0.72$, $P < 0.001$) and increasing days of missed school/day care ($r = 0.44$, $P = 0.06$). Girls, patients with lower extremity injuries, and those prescribed with a narcotic in the ED were significantly more likely to have pain for more than 5 days ($P = 0.05$ for each). However, pain scores in the ED had no correlation with ED or home medication use or any of our functional outcomes.

Use of the PedsQL

The PedsQL child and parent forms were easy to complete at the visit and in telephone follow-up. The ED research assistant asked any missing items, if the PedsQL was self-completed; we had no missing data, except when school items were appropriately skipped. The mean total score of the parent PedsQL at the ED visit was 84 (SD, 17.0) and 77 (SD, 17.7) for the patient. Follow-up total scores were 80 (SD, 20.1) and 82 (SD, 16.5), respectively. These scores are comparable to healthy child population scores for patient and parent of 83 (SD, 13) and 81 (SD, 16), respectively. Total parent scores were inversely correlated with total days of pain ($r = -0.48$, $P < 0.05$), days for the child to return to normal activity ($r = -0.50$, $P < 0.05$), and days of disrupted family activities ($r = -0.4$, $P < 0.05$).

DISCUSSION

This report presents considerable morbidity in children after ED care for minor injury. These clinical and functional short-term outcomes have not been previously described. The proportions reporting persistent pain; functional disability; and school, work, and family disruptions are notable, given the high volume of these visits, but clearly, these outcomes need to be better characterized in larger random samples.

This project demonstrated the feasibility of enrolling patients with minor injury, completing ED questionnaires and the PedsQL instrument in this acute care environment, and obtaining successful telephone follow-up. With the help of a research assistant, the sample was easily collected for a 2-month period, had minimal missing data, and completed telephone follow-up in 80%.

As compared with the use for chronic disease conditions in pediatrics, the reports of the generic use of HRQOL instruments in assessing acute pediatric emergency medicine presentations are extremely limited. Our experience in a prior study using a different generic pediatric HRQOL instrument, the Child Health Questionnaire, in the PED and in telephone

follow-up in children with acute asthma found it to have good construct validity but difficult to use in these settings (poor feasibility) and only moderately responsive to acute changes in clinical and functional status.⁵ The only prior report of the use of the PedsQL in the PED found it to be valid and responsive in children with febrile illnesses but only the parent (proxy) report form was tested.⁶ In the current study, we found both patient and proxy forms of the PedsQL feasible for use for our ED population. A problem with telephone follow-up was identified when it was discovered that an unknown number of child reports had been completed by the parent; this must be specifically addressed in future use. In addition to our aim of testing the feasibility of the patient and proxy forms of the PedsQL in the ED and at telephone follow-up, we found initial indications toward construct validity with statistically significant inverse correlations of the total score with persistent pain and decreased function. However, with its small sample, this study was not intended for formal evaluation of the psychometric parameters of reliability, validity, or responsiveness. Further assessment of the PedsQL in this acute care setting is needed.

Outcomes research in pediatric emergency care has been limited by the lack of appropriate patient-specific assessment tools for acute conditions. Only after exploring and describing short-term patient-reported outcomes can we develop ways to quantify them. The ability to measure these outcomes is essential in determining the effectiveness attributed to ED processes of care for children.

References

1. McClure RJ, Douglas RM. The public health impact of minor injury. *Accid Anal Prev.* 1996; 28(4): 443–451. [PubMed: 8870771]
2. Future of Emergency Care Series, Emergency Care for Children: Growing Pains. Institute of Medicine; Washington, DC: National Academic Press; 2006.
3. Varni JW, Burwinkle TM, Seid M, et al. The PedsQL 4.0 as a pediatric population health measure: feasibility, reliability, and validity. *Ambul Pediatr.* 2003; 3:329–341. PedsQL link: www.pedsql.org. [PubMed: 14616041]
4. Hicks CL, von Baeyer CL, Spafford PA, et al. The Faces Pain Scale–Revised: toward a common metric in pediatric pain measurement. *Pain.* 2001; 93(2):173–183. [PubMed: 11427329]
5. Gorelick MH, Scribano PV, Stevens MW, et al. Construct validity and responsiveness of the Child Health Questionnaire in children with acute asthma. *Ann Allergy Asthma Immunol.* 2003; 90(6): 622–628. [PubMed: 12839320]
6. Mistry RD, Stevens MW, Gorelick MH. Health-related quality of life for pediatric emergency department febrile illnesses: an evaluation of the Pediatric Quality of Life Inventory 4.0 generic core scales. *Health Qual Life Outcomes.* 2009; 7:5. [PubMed: 19178744]

FIGURE 1.

Outcomes in days after ED visit. Parent work indicates parent missed work or school ($n = 33$); Return nl activity (return to normal activity), days for child to return to normal activity ($n = 35$); Pain, days of pain after ED visit ($n = 33$); Missed school, child missed school or regularly scheduled activities (not applicable in 15/35; $n = 20$); Family disruption, days for family activities/routines to return to normal ($n = 35$).

TABLE 1**Patient and Injury Characteristics (n = 35)**

Age, y	
Median	8
Range (IQR)	2–16 (4–12)
Female sex	31%
Race/ethnicity, %	
White	74
Black	23
Hispanic	3
Type of injury, %	
Soft tissue *	49
Fracture	31
Sprain/strain	17
Head injury	3
Body part injured, %	
Face/neck	37
Upper extremity	31
Lower extremity	31

* Soft tissue includes lacerations, contusions, foreign body, and burn.

IQR indicates interquartile range.