ELSEVIER

Burns 32 (2006) 20–23

BURNS

www.elsevier.com/locate/burns

The utility of the functional independence measure (FIM) in discharge planning for burn patients☆

Benji Choo, Nisha Umraw, Manuel Gomez, Robert Cartotto, Joel S. Fish *

Ross Tilley Burn Centre, Sunnybrook and Women's College Health Sciences Centre, 2075 Bayview Avenue, Suite D704, Toronto, Ont., Canada M4N 3M5

Accepted 11 April 2005

Abstract

Determining burn patients' need for inpatient rehabilitation at discharge is difficult and an objective clinical indicator might aid in this decision. The functional independence measure (FIM) is a validated outcome measure that predicts the need for rehabilitation services. This study evaluated the utility of the FIM score for discharge planning in burn patients. A retrospective chart review and FIM score determination was performed on all major burn patients discharged from a regional adult burn centre between July 1, 1999 and June 30, 2000. From 164 adult burn patients discharged, 37 met the American Burn Association criteria for major burns. One patient had insufficient data. Therefore, 36 patients were studied (mean age 47.3 ± 17.4 years, and mean body area burned 27.4 ± 12.9%). All 17 patients with FIM scores greater than 110 were discharged home, and patients with FIM score of 110 or lower were discharged to another institution (rehabilitation hospital $n = 14$, other acute care hospital $n = 4$, or a nursing home $n = 1$) $p < 0.0001$. A discharge FIM score of 110 or lower was strongly associated with the need for inpatient rehabilitation, while a FIM score greater than 110 indicates the patient is independent enough to manage at home. Further prospective studies will be necessary to validate these findings.

Keywords: Functional independence measure; FIM; Discharge planning; Burns

1. Introduction

Burn patients discharged from an acute care hospital often require inpatient rehabilitation. The ability to identify these patients is often a difficult process. Traditionally, the decision involves collaborative discussions between the burn team, the patient, and the patient's supportive network. Often the decisions are based on subjective "feelings" of how the patient will cope once discharged from the acute care hospital rather than unbiased objective measurements. An objective and functional outcome measure is needed to aid in the discharge planning process. Today's health care system also demands validation of the services that are provided and recommended for our patients.

The functional independence measure (FIM) was developed in 1983 by a national task force in the United States to meet a long standing need for an outcome measure that documents the severity of patient disability and outcomes of medical rehabilitation [1]. The FIM has been recognized as an indicator of burden of care and has the ability to predict the need for rehabilitation services [2–6]. The FIM consists of 18 items with two subscales: motor (13 items) and cognitive (5 items) (Appendix A). Each item is given a score of 1–7, the lower the score the more dependent, the higher the score the more independent. The scores are tallied up for a maximum total score of 126 and a minimum score of 18 [7].

The FIM has demonstrated reliability and validity in a number of different patient populations (multiple sclerosis, stroke [3,5,8–10], spinal cord injury [2,11,12], and traumatic brain injury) [2,6], but has not been widely used in the burn population [13–15]. The purpose of the present study was to evaluate the FIM as a tool in discharge planning for burn patients. Specifically, we were interested in whether the FIM

☆ Presented in part during the 33rd Annual Meeting of the American Burn Association, Boston, MA, USA, April 18–21, 2001.

* Corresponding author. Tel.: +1 416 480 6703; fax: +1 416 480 6763.
E-mail address: joel.fish@sw.ca (J.S. Fish).

0305-4179/$30.00
doi:10.1016/j.burns.2005.04.033

might predict the need for inpatient rehabilitation following burn center discharge.

2. Methods

We retrospectively reviewed the charts of all adult burn patients (age $\geq$ 15 years) discharged from a regional burn center between July 1, 1999 and June 30, 2000. Only patients who met the American Burn Association (ABA) criteria for a major burn were included in the study (i.e., burns of more than 25% TBSA, full-thickness burns of 10% TBSA or greater) [16]. Discharge FIM scores were determined retrospectively by one of the authors (BC) using the discharge summaries of rehabilitation, nursing and medical notes, to estimate rehabilitation requirements for each patient. FIM score was then compared between patients who were discharged to another institution, and patients discharged home from the burn center. Two-tailed unpaired Student's *t*-tests were performed comparing FIM scores, TBSA, age, length of stay, and number of operations between those who went home versus those who went to another institution. The Chi square statistics was used to determine the relationship between the FIM score and discharge destination (i.e., home versus other institution). A $p < 0.05$ was considered significant. Data is presented as mean $\pm$ S.D.

3. Results

Between July 1, 1999 and June 30, 2000, there were 164 adult burn patients who were discharged from our facility and 37 of them met the ABA criteria for major burns [16]. One patient had insufficient data in the chart to complete a FIM score, therefore, 36 patients: 28 males (77.8%) and 8 females (22.2%) were studied. The most frequent etiology was flame burns ($n = 27$, 75%), followed by scald burns ($n = 5$, 3.9%), electrical flash injuries ($n = 3$, 8.3%), and chemical burn ($n = 1$, 2.8%). The mean age for all patients was 47.3 $\pm$ 17.4 years (range 16–81 years), the mean TBSA was 27.4 $\pm$ 12.9% (range 10–56%), the mean length of stay was 37.9 $\pm$ 28.4 days (range 3–123 days), the mean number of operations was 3.2 $\pm$ 3.0 (range 0–12), and the mean FIM score was 104.1 $\pm$ 23.2 (range 32–126) (Table 1).

Of the 36 patients, 17 (44.2%) were discharged home, and 19 (52.8%) to another institution. Of those 19 patients discharged to another institution, 14 (38.9%) went to an inpatient rehabilitation facility, 4 (11.1%) to another acute care facility, and 1 (2.8%) to a nursing home. FIM scores were significantly different between those who went home and those who were discharged to another institution (121.6 versus 88.4, $p < 0.00001$). All patients who were discharged home had a FIM score greater than 110, and all patients discharged to another institution had FIM scores of 110 or lower ($p < 0.0001$) (Table 1).

Patients' length of stay (20.5 days versus 53.5 days, $p = 0.0002$) and their number of operations (1.5 operations versus 4.7 operations, $p = 0.0008$) were also significantly different between those who were discharged home and those who were discharged to another institution. Age and TBSA were not found to be significantly different between the two groups (Table 1).

4. Discussion

This study confirmed that burn patients discharged home had a FIM score greater than 110, and those patients discharged to another institution had FIM scores of 110 or lower. Thus, it appears that the FIM score is a good tool at discharge with the ability to distinguish the burden of care required for each burn patient.

An abstract by Nakamura et al. in 1997 deemed the FIM as an inadequate tool for burn patients because it did not address the many needs or characteristics of the burn patient [13]. For example, it did not address the appearance of scars, the functional limitation of contractures, the quality of the skin, chronic wounds, or the sensitivity of the patient. The main limitations of that abstract were that it used a case example only, and it tended to disregard the FIM based on what the FIM could not do rather than on what it was meant to do. In response to Nakamura's conclusion on the inadequacy of the FIM for burns [13], it is agreed that

Table 1
Discharge destination and the function independence measure (FIM) score of patients with major burns

Variable	All patients	FIM score $\leq$ 110	FIM score > 110	*p*-Value
Patients [*n* (%)]	36 (100.0)	19 (52.8)	17 (47.2)	0.637352
Males [*n* (%)]	28 (77.8)	14 (73.7)	14 (82.4)	0.532251
Age (years $\pm$ S.D.)	47.3 $\pm$ 17.4	51.8 $\pm$ 17.6	42.2 $\pm$ 16.3	0.099967
TBSA (% $\pm$ S.D.)	27.4 $\pm$ 12.9	30.2 $\pm$ 15.0	24.3 $\pm$ 9.4	0.162935
Length of stay (days $\pm$ S.D.)	37.9 $\pm$ 123.0	53.5 $\pm$ 30.2	20.5 $\pm$ 11.3	0.000184
Operations ($n \pm$ S.D.)	3.2 $\pm$ 3.0	4.7 $\pm$ 3.4	1.5 $\pm$ 1.1	0.000757
FIM score $\pm$ S.D.	104.1 $\pm$ 23.2	88.4 $\pm$ 22.0	121.6 $\pm$ 3.8	<0.00001
Discharge destination	Home = 17 Rehab. Hosp. = 14 Other = 5	Rehab. Hosp. = 14 Other = 5	Home = 17	<0.00001

FIM: Functional independence measure; S.D.: standard deviation; TBSA: total body surface area; Other: acute care hospital or nursing home.