Burns Open 5 (2021) 134–136

Contents lists available at ScienceDirect

Burns Open

journal homepage: www.sciencedirect.com/journal/burns-open

Fatigue after burn – Is it common? A preliminary survey

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ARTICLE INFO

Keywords:
Fatigue
Burn injury
Fatigue Severity Scale (FSS)

ABSTRACT

Physical function and daily activities are often affected after burn injury. Fatigue is a condition that is rarely assessed. Being a well-known sequela after traumatic brain-injury or diseases of the nervous system, fatigue has also been described among the burn population with a negative impact on daily activities and reduced capacity for work.

The aim of this study was to examine if, and to what extent, fatigue is a problem among our burn victims.

Twenty consecutive patients scheduled for follow-up at the Burn center's outpatient clinic in Uppsala, were asked to fill out the Fatigue Severity Scale (FSS). A healthy reference group without a burn injury, gender and age matched, were asked to fill out the same questionnaire.

The results show that the patient group has a statistically significant higher score of fatigue compared to the reference group ($p = 0.004$). However, the results must be interpreted with caution considering the relatively small sample size. In future research it is also important to investigate the relationship between fatigue and daily activities, depression, return to work, and quality of life.

1. Introduction

Physical function and daily activities are often affected after burn injury [1]. Many patients experience complications like pain, muscle weakness, scar contractures, and scar hypertrophy [2]. The burn injury might also lead to fatigue [3,4], a condition that is rarely assessed.

Fatigue, also known as brain- or mental fatigue, is described as a deep, mental exhaustion without apparent cause. Fatigue is a well-known sequela after traumatic brain-injury or diseases of the nervous system such as stroke, multiple sclerosis, or Parkinson's disease. Fatigue is characterized by insistent or recurrent tiredness, unclear muscle- or skeletal pain, sleeping disorder, and a deterioration of cognitive functions, like concentration difficulties [5,6]. The cause of fatigue is still unclear [3,7], and the recovery is long.

Since the symptoms of fatigue affect daily activities, participation, and social relations it is important to be attentive. The knowledge about fatigue in general and how to treat it, is however limited. Different strategies are suggested, such as saving energy by cutting down on certain activities, ask for help and assistance, prioritize enjoyable activities, and care for good sleeping habits. Good nutrition and a healthy lifestyle including physical activity are recommended. Use of medication can sometimes be necessary [3,7,8].

Many report fatigue as a complication post-burn and studies show that fatigue and concentration difficulties affect quality of life [9] as well as daily activities, activity performance, and return to work [3,8,10]. Helm et al. [8] goes as far as to say that fatigue is the main obstacle to being able to return to work and daily activities. The symptoms often reduce with time but 26% still experience fatigue one year post-burn [11] and some never regain the same energy level as before the burn injury [3].

There has been attempts to explain fatigue, and the cause for it, among burn victims. One theory is that loss of muscle mass leads to reduced physical condition, weakness, and in turn reduced heart- and vascular status [12]. Another study on 25 patients shows that more than 80% have reduced oxygen consumption (VO_2max) many years after the burn injury when compared to healthy controls [12]. Negative impact on daily activities and reduced working ability has also been described among the burn population.

There are different ways to assess fatigue: simple yes or no-questions on whether patients experience a great tiredness; use parts of questionnaires, e g the Vitality score in SF-36; use specific and standardized instruments for fatigue (e.g. Fatigue Severity Scale (FSS), the Brief Fatigue Inventory (BFI)). In the literature only one reliable and valid instrument for the burn population can, to our knowledge, be found; the

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https://doi.org/10.1016/j.burnso.2021.03.005
Received 18 June 2020; Received in revised form 26 August 2020; Accepted 25 March 2021
Available online 4 June 2021

BFI. This assessment tool is translated into several languages, however not yet to Swedish [4].

Our experience is that many of our patients at the out-patient clinic at the Burn center in Uppsala complain about being tired and not able to cope the way they used to. The aim of this study was to examine if, and to what extent, fatigue is a problem among our burn victims.

2. Material and methods

Twenty consecutive patients scheduled for follow-up at the Burn center's outpatient clinic in Uppsala, were asked to fill out the Fatigue Severity Scale (FSS). The patients were ≥18 years old and mastered Swedish verbally and in writing. A healthy reference group without a burn injury, gender and age matched, were asked to fill out the same questionnaire.

This project was a retrospective review of medical patient records as a pre-screening and quality check before a recently started prospective randomized control trial of fatigue in burn patients. This project was approved of by our hospital's Office of Clinical Trials (FoU2019-0002-36). The prospective RCT has been approved of by the Swedish Ethical Review Authority (2020-00387).

The Fatigue Severity Scale (FSS) was chosen for this study since it is available in Swedish, reliable, and has been validated (however not yet for the burn population) [13,14]. Furthermore, the instrument is easy to administer and fill out. FSS is a self-assessment scale with 9 questions. Each item is scored on a Likert scale which ranges from 1 – disagree to 7 – agree. The cut-off point is 4; if the average score of the 9 questions is ≥ 4 the patient suffers from fatigue.

In connection with ordinary follow-ups patients are asked to fill out various other self-assessment instruments including the EQ-5D Health Questionnaire, a health-related quality of life measurement [15]. EQ-5D is a standardized assessment measuring self-assessed health-related quality of life and current state of health. The assessment is divided into two parts; part one is a self-estimate in five dimensions: mobility, self-care, usual activities, pain and discomfort, anxiety and depression. Every dimension has three answers. Part two is an appreciation of the total current state of health using a visual, analogue Likert Scale (VAS) [15].

Descriptive data and correlations were analyzed with Pearson's Correlation, using IBM SPSS Statistics for Windows (version 23, IBM Corp, Armonk, NY, USA),

3. Theory/calculation

Fatiguability is an impairment of body functions according to the International Classification of Functioning, Disability and Health (ICF). Fatigue affects a person's activity level and participation and is, in turn, affected by environmental and personal factors [16].

This holistic and person-centered view helps to structure and map the patient's situation. The result of this and future studies may help to increase the knowledge on fatigue after burn and guide the patient towards a more meaningful and manageable everyday life.

4. Results

The survey was conducted between February 1 and May 31, 2019. Eleven men (55%) and nine women agreed to participate. They were aged 18 to 89 years (mean = 45.3) with a burn injury of 0.025 to 57 TBSA % (mean = 11.3). Length of stay during their initial inpatient care at the ICU varied from 0 to 70 days (mean = 11). The allocation of visits was equally distributed between six and twelve months postburn (9 and 11 visits respectively), all separate individuals, which means that none of the twenty patients appears twice in the investigation.

The total mean FSS score of the patient group is 4.55. In the patient group 13 (65%), 6 men (55%) and 7 women (78%), score above the cut-off point (≥4) in FSS. The total mean FSS score in the reference group is 3.24. In the reference group 7 (35%), 4 men (36%) and 3 women (33%), score above the cut-off point.

The results show that the patient group has a statistically significant higher mean score in FSS ($p = 0.004$) (Table 1).

Interesting to note is that in the patient group women score 17% higher than men (4.79 vs 4.10) whereas in the reference group women rate their fatigue 22% lower than men (2.60 versus 3.33).

Due to small subgroups of less than ten individuals no statistical analyzes has been performed. But a tendency shows that women in the patient group seem to rate their fatigue higher than men (FSS ≥ 4). Comparisons between the scoring at 6- and 12-months post-burn show a similar tendency (Table 2).

The statement with the lowest average rating is "Exercise brings on my fatigue" with a mean score of 2.95 in the patient group (1.8 in the reference group). The statement with highest rating is "Fatigue interferes with my physical functioning" with a mean of 5.7 in the patient group (3.85 in the reference group). The highest average rating in the reference group is "My motivation is lower when I am fatigued" (average 5.7).

A comparison between FSS and the question in EQ-5D referring to anxiety/depression shows a significant correlation ($p = 0.01$) with FSS in the patient group. Data on previous documented psychiatric history or treatment has not been possible to add/consider due to patient secrecy and different health records systems in different parts of health care.

5. Discussion

The aim of the study was to investigate the level of fatigue, as measured by The Fatigue Severity Scale (FSS) score (cut-off point of ≥4) in our burn patients using a self-assessment scale. The FSS has not yet been used in the burn population, at least not to our knowledge. In future studies it would therefore be valuable to use a validated and reliable instrument for burn patients to investigate whether the results remain. Further correlations and relationships to other parameters, such as age, gender, or total burn surface area, was not the primary focus in this study.

It is somewhat surprising that as many as 65% of our burn patients, almost twice as many as in the reference group, meet the criteria of fatigue according to FSS. This results in a significant difference. Compared with a large survey by Kroenke et al. [17] 24% of adult patients in two ordinary primary care clinics indicated that fatigue was a major problem to them.

The statement with the highest average rating in the experiment group is "Fatigue interferes with my physical functioning". Advice on a healthy and active lifestyle is therefore important to emphasize [3,7,8], especially since most of the patient group consider that exercise does not increase fatigue.

Considering that burn patients sometimes have other diagnoses, illnesses, or a social situation affecting their tiredness, e.g. a previous stroke, dementia, depression, or small children at home, it might be difficult to state the actual cause for their fatigue. The causes are also, most likely, several. The comparison to a gender and age matched reference group without a burn injury, however, shows a significant difference.

Women with a burn injury tend to score their fatigue higher than

Table 1
Descriptive statistics of patient group and reference group.

	Patients n = 20	References n = 20
FSS score range (mean) sd	1.22–6.33 (4.55*) 1,38	1.22–6.44 (3.24*) 1,34
FSS ≥ 4, n (%)	13 (65)	7 (35)
FSS ≥ 4, mean (men/women %)	5.07 (55/78)	4.62 (36/33)

* $p = <0.05$.

Table 2
Descriptive statistics of the patient group.

Subgroup	Patients FSS ≥ 4, n = 13 n, (FSS score range) mean	Patients FSS < 4.0, n = 7 n, (FSS score range) mean
Male	6 (4.33–6.11) 5.16	5 (1.22–3.56) 2.82
Female	7 (4.89–6.33) 5.62	2 (2.78–3.78) 3.28
6 months	5 (5.11–6.22) 5.69	4 (1.22–3.56) 2.67
12 months	8 (4.33–6.33) 5.24	3 (2.78–3.78) 3.33

men. This corresponds with the results of Kroenke et al. [17]. The prevalence of fatigue in a Swedish cohort of general population also shows that women had significantly higher fatigue scores than men [18].

Earlier research describes that symptoms of fatigue and depression sometimes overlap and that an underlying association exists [19,20]. Rossi et al. [21] also found a strong correlation with quality of life. Comparing our results from EQ-5D, the question on anxiety and depression, with FSS a significant correlation was found also in this study which speaks for further investigation so as to offer the patient adequate treatment and information.

In our clinic, as a result of this study, the FSS is now included at the follow-ups. Patients with an evident fatigue are offered information. The treatments for fatigue, mentioned earlier, are recommended for fatigue in general. Irrespective of the cause of fatigue it is valuable to give the patients advice and support on how to handle their everyday life in a better way.

The major limitation of this study is the small size of the patient group. The results of the subgroups of less than ten individuals are not reliable and no statistical analyzes has therefore been performed in these subgroups. However, a trend is notable. A larger sample/cohort would nevertheless be desirable for a more generalizable result.

With a larger sample it would also be possible to statistically analyze data and correlations in subgroups such as gender, TBSA (Total Body Surface Area) % and age.

Like many other studies this one also brings on more questions. In future research it would be beneficial to compare the Swedish results on fatigue in burn patients, in a larger scale. Therefore, it seems important to validate the Swedish version of the BFI, which is more widely used in the burn population across the world.

It is also important to investigate the relationship between fatigue and daily activities, depression, return to work and quality of life; to pinpoint the impact fatigue has on everyday life. Further on it would also be interesting to perform a long-term follow-up to see if the experienced fatigue holds on for several years and how long it takes until it subsides, if it ever does?

6. Conclusion

The result of this study shows that burn patients suffer a significantly higher risk of developing fatigue. The FSS score for the 20 patients showed that 13 (65%) experienced fatigue as compared to 7/20 (35%) in the gender and age matched reference group ($p = 0.004$).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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