

# Erectile dysfunction in patients with major burn injury: The significance of follow-up

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## ABSTRACT

**BACKGROUND:** There were few prospective studies investigating the relationship between the burn injury and erectile dysfunction (ED). The aim of this study was to prospectively explore the alteration in erectile functions regarding major burn.

**METHODS:** This study was conducted as a prospective survey in patients with major burn injury. The study group consisted of burn cases with at least 20% of body surface area affected according to the Wallace Rule of Nines. Initially International Index of ED-5 (IIEF-5) was administered to the patients in the burn unit, and it was repeated in the 2<sup>nd</sup> and 6<sup>th</sup> months. Burn types, the severity of burns, age of patients, and alteration in IIEF-5 scores were compared.

**RESULTS:** The study included 63 male patients. The median age of the patients was 35 (20–73) years, and the median burn percentage was 22 (20–60). The rate of ED was markedly increased during follow-up as 8%, 39.7%, and 25.4% at baseline, 3<sup>rd</sup>, and 6<sup>th</sup> month evaluation, respectively. The median initial IIEF-5 score of the patients was 23 (5–25). Subgroup analysis revealed that IIEF-5 score of patients with electrical and flame burn significantly decreased at 3<sup>rd</sup> month compared with the baseline values. The median IIEF-5 score of patients with electrical burn increased at 6<sup>th</sup> month compared with 3<sup>rd</sup> month ( $p=0.042$ ). Binary logistic regression analysis showed that age and service period, and IIEF-5 Score at 3<sup>rd</sup> month and burn grade were all statistically significantly associated with the normal erectile function (IIEF-5 $\geq$ 18), at 3<sup>rd</sup> month and 6<sup>th</sup> month, respectively.

**CONCLUSION:** The current trial demonstrated that IIEF-5 scores of patients with major burn can show significant impairment in long term, and it seems a time-dependent process. This is the first prospective trial showing that IIEF can be utilized to monitor erectile function of burn patients in a longer follow-up program.

**Keywords:** Burn injury; erectile dysfunction; International Index of Erectile Dysfunction-5 Questionnaire.

## INTRODUCTION

Burn injury is one of the most severe traumas affecting many organ systems. In recent years, burn-related mortality has decreased due to the development of burn care and rehabilitation services, and studies focusing on improvement in organ functions and quality of life have increased.<sup>[1]</sup> Erectile dysfunction (ED) is defined as the inability to provide and/or maintain a sufficiently rigid erection for satisfactory sex-

ual performance.<sup>[2]</sup> It may be of organic and/or psychogenic origin and many organic diseases can cause ED. Many systemic conditions such as diabetes mellitus, hypertension, hyperlipidemia, cardiovascular diseases, and peripheral vascular diseases are the most important risk factors for ED.<sup>[3]</sup> ED following burn injury may develop due to physical trauma and psychological stress.<sup>[4]</sup> Despite the development of rehabilitation techniques, ED usually neglected in patients with burn injury.

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In a cross-sectional study including 125 male patients with thermal and electrical burn injury, ED was detected in 66 patients (53%) using Initially International Index of ED-5 (IIEF-5).<sup>[4]</sup> The authors also postulated a significant association between the total body surface area and severity of ED. Another observation on 256 patients with electrical burn, ED was recorded in 52.7% of cases without a significant difference among the age groups based on IIEF-5.<sup>[5]</sup> These studies reported a higher incidence of ED in burn patients. However, there is no clinical trial evaluating possible changes in ED during the follow-up after burn. Furthermore, no specific observation focusing on ED in severe burn cases is not available. Furthermore, there are no data about ED in patients with scald burns.

In this study, we aimed to evaluate erectile functions in patients with major burn injuries. Furthermore, we prospective analyzed the course of erectile functions in a longer time period by IIEF-5. In our study, in addition to electrical and thermal burns, we also evaluated ED in patients with scald burns.

## MATERIALS AND METHODS

This study was conducted as a prospective survey including patients with major burn injury in a burn center of a tertiary reference hospital. Ethics approval was obtained from the Local Human Ethics Committee of the institution (approval number: 2012/8). Duration of hospitalization of patients, surgical intervention requirements, types, and percentages of burn injuries were evaluated. Patients with the first-degree burn regardless of the burning surface, patients with inhalation burns, intubated patients, and patients with genital burns were excluded from the study. The subsequent major burn patients with at least 20% of body surface area affected according to the Wallace Rule of Nines were included in the study.

### Assessment of Burn Injury

Burn depth classification was used in all patients. According to burn depth classification, the epidermis in the first degree, the surface of the epidermis and dermis in the second degree, the epidermis and dermis in the third degree, and the fourth degree the deeper tissues (muscle and bone) are burned together with the subcutaneous tissue.<sup>[5]</sup> The Wallace Rule of

Nines was used for the calculation of the burning surface.<sup>[6]</sup> The Wallace Rule of Nines is a world-wide tool to assess the total body surface area involved in burn patients. Measurement of the initial burn surface area is particularly important in adjusting fluid resuscitation requirements. The estimation of burned body surface area is based on assigning percentages to different body areas. For example, the entire head is estimated as 9%, the entire trunk is estimated as 36%, each lower extremity is assigned as 18%.

### Assessment of ED

Validated IIEF-5 form was used in all patients.<sup>[7]</sup> Major burn patients filled IIEF-5 at the time of hospitalization, at the 3<sup>rd</sup> and 6<sup>th</sup> months. The erectile functions of the patients were evaluated in four categories: Normal (18–25), mild ED (14–17), moderate ED (10–13), and severe ED (5–9) In our study, 17 or fewer scores were defined as ED.<sup>[7,8]</sup>

### Statistical Analysis

The data were evaluated with SPSS 22.0 statistical program. Descriptive statistical methods (median, interquartile range, frequency, and percentage) were used to evaluate the study data. Shapiro-Wilk test was used to determine the distribution of data and the data were found to be non-parametric. Mann-Whitney U test was used for independent groups and Wilcoxon test was used for dependent repeated groups. All P values were two-tailed and findings at  $p < 0.05$  were considered statistically significant. The associations between erectile function were found following burn injury at 3<sup>rd</sup> and 6<sup>th</sup> months, and relevant covariates were calculated using binary logistic regression models. Univariate analyses were used to evaluate the association between burn injury and appropriate covariates. The covariates included age, hospitalization at inward (day), surgical intervention, blood transfusion, IIEF-5 score, features of burn injury as surface area, type, and grade. Multivariable adjusted odd ratios and 95% CIs were calculated.

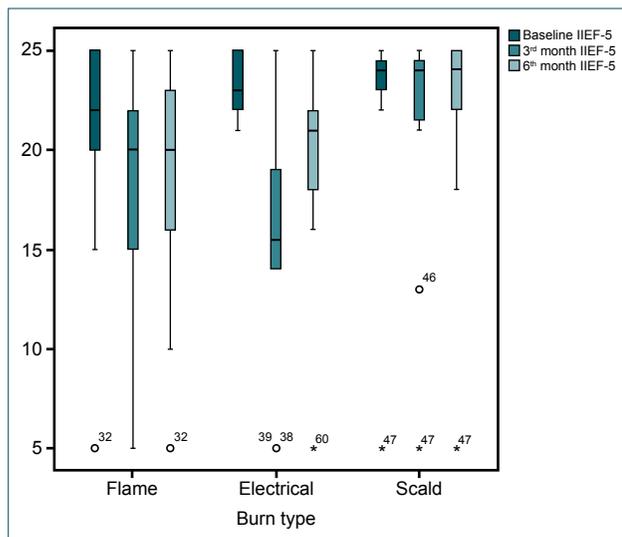
## RESULTS

Sixty-three male patients were included in the study. The median age of the patients was 35 (20–73) years, and the median burn percentage was 22 (20–60). The median length of inten-

**Table 1.** Patients' characteristics

	Electrical injury Median, (IQR) (n=14)	Flame injury Median, (IQR) (n=38)	Scald injury Median, (IQR) (n=11)	p-value
Age (years)	36.50 (8.00)	35.5 (16.00)	30.00 (16.00)	0.392
Burn rate (%)	22.5 (13.00)	22.00 (9.00)	22.00 (8.00)	0.913
Intensive care period (day)*	4 (21)	5.5 (8)	8.5 (10)	0.690
Service period (day)	18.5 (52)	16 (22)	12 (11)	0.233

\*Number of patients that has been to intensive care unit for electrical injury, flame injury and scald injury is 13 (93.3%), 26 (68.4%), 4 (36.4), respectively.



**Figure 1.** Time-dependent change of the IIEF-5 score in patients with flame, electrical, and scald burn injury.

sive care unit stay was 3 (0–37) days, and the median duration of hospital room stay was 16 (2–89) days. Sixty percent of all burns were flame (n=38), 22.2% was electric (n=14) and 17.5% was scald (n=11). The median age was 35.5 (IQR=16) years in patients with flame burns, 36.50 (IQR=8) in patients

with electrical burns, and 30.00 (IQR=16) in patients with scald burns. These demographic parameters of the patients are shown in Table 1.

The rate of ED was initially 8%. There is remarkable increase at the 3<sup>rd</sup> and the 6<sup>th</sup> month evaluation as 39.7% and 25.4%, respectively. The change in the rate of ED was significant (p<0.05). Regarding the whole group, only 16% (n=10) of the patients had comorbidity (diabetes mellitus and/or hypertension). The initial rate of ED in comorbid patients was 30%. This rate was 60% in the 3<sup>rd</sup> month and 40% in the 6<sup>th</sup> month in this subgroup. ED was initially not observed in patients under the age of 50 years (n=56). ED was only observed in five patients who over 50 years of age (n=7). There was no statistical difference between the age groups according to burn type (p>0.05).

The median initial IIEF-5 scores of the patients were 23 (5–25), at the 3<sup>rd</sup> month 20 (5–25) and at the 6<sup>th</sup> month 22 (5–25). At the 3<sup>rd</sup> and 6<sup>th</sup> month, IIEF scores were lower than the baseline, but not statistically significant. The IIEF-5 scores of electric, flame, and scald burns are shown in Table 2. Particularly, 3<sup>rd</sup> month IIEF-5 score was significantly lower in electrical injury than scald injury (p=0.018). The median IIEF-5 score of patients with electrical and flame burn decreased significantly at 3<sup>rd</sup> and compared with baseline (p<0.001, p=0.001), but

**Table 2.** The course of IIEF-5 scores based on the etiology of burn and need for burn-associated surgery

	n	Baseline IIEF-5 Median (IQR)	3 <sup>rd</sup> month IIEF-5 Median (IQR)	6 <sup>th</sup> month IIEF-5 Median (IQR)	p-values			
					All <sup>‡</sup>	Baseline vs 3 <sup>rd</sup> month <sup>#</sup>	Baseline vs 6 <sup>th</sup> month <sup>#</sup>	3 <sup>rd</sup> month vs 6 <sup>th</sup> month <sup>#</sup>
Electrical injury	14	23.00 (3.00)	15.50 (8)	21.00 (4.00)	<0.001	<0.001	0.089	0.042
Flame injury	38	22.00 (5.00)	20.00 (10.0)	20.50 (7.00)	<0.001	0.001	0.289	0.134
Scald injury	11	24.00 (2.00)	24.00 (4.00)	24.00 (4.00)	0.411	N/A	N/A	N/A
P-value		0.193	0.018*	0.074	–	–	–	–
Patients with surgery	27	22.00 (3.00)	13.00 (12.00)	18.00 (6)	<0.001	<0.001	0.019	0.062
Patients without surgery	36	23.00 (3)	22.00 (5)	23.00 (3)	0.004	<0.034	1.0	0.118
P-value		0.053	<0.001	<0.001	–	–	–	–

\*Electrical versus scald. <sup>‡</sup>Related samples wilcoxon signed rank test. <sup>#</sup>Pairedwise comparison in related samples Friedman's Two Way Analysis of Variance by Ranks.

**Table 3.** The alteration of IIEF-5 scores based on the length of hospital stay and burn grade

Burn Grade	Intensive care period (day) <sup>#</sup> Median (IQR) (n=43)	Service period (day) Median (IQR) (n=63)	Initial IIEF-5 Median (IQR) (n=63)	3 <sup>rd</sup> month IIEF-5 Median (IQR) (n=63)	6 <sup>th</sup> month IIEF-5 Median (IQR) (n=63)
Grade 2	4.00 (8)	14.00 (17)	23.00 (4)	20.00 (9.00)	22.00 (7.00)
Grade 3	16.00 (16)	44.00 (66)	23.00 (3)	14.00 (13)	16.00 (9)
P-value	0.024	0.022	0.490	0.015	0.008

<sup>#</sup>Number of patients that has been to intensive care unit for grade 2 and 3 burn injury is 36 (64.3%), 7 (77.8%), respectively.

not 6<sup>th</sup> month ( $p=0.089$ ,  $p=0.134$ ) (Table 2). Interestingly, the median IIEF-5 score of patients with electrical burn increased at 6<sup>th</sup> month compared with 3<sup>rd</sup> month ( $p=0.042$ ) (Table 2 and Fig. 1). Sixteen percent ( $n=10$ ) of the patients had comorbidity (diabetes mellitus and/or hypertension). The initial rate of ED in comorbid patients was 30%. This rate was 60% in the 3<sup>rd</sup> month and 40% in the 6<sup>th</sup> month.

In our study, there were 54 second-degree burns and 9 third-degree burns. There were no patients with first and fourth-degree burns. According to the degree of burns, intensive care and service duration and initial, 3<sup>rd</sup> and 6<sup>th</sup> month IIEF-5 scores are shown in Table 3. The IIEF-5 score of patients with

the third-degree burn was statistically lower at the 3<sup>rd</sup> and 6<sup>th</sup> month compared to the patients with second-degree burned (Table 3).

A total of 27 patients underwent surgery (scar revision, skin graft, etc.) due to burning injury. The median IIEF-5 scores of these patients decreased significantly compared to the 3<sup>rd</sup> and 6<sup>th</sup> months ( $p<0.05$ ) (Table 2). Another data we obtained during our study was related to the duration of intensive care stay.

Furthermore, we divided the patients according to the IIEF score  $\geq 18$  and below 18 at 3<sup>rd</sup> and 6<sup>th</sup> months except for patients ( $n=4$ ) who had IIEF score  $<18$  at baseline. In univariate

**Table 4.** Comparison of age, burn surface, service period, IIEF score at 3<sup>rd</sup> and 6<sup>th</sup> months, intensive care unit period, transfusion, burn type, burn grade, surgical intervention for burn, admission to intensive care unit and transfusion between patient with and without erectile dysfunction

	3 <sup>rd</sup> month patients with ED (IIEF<18) (Median, (IQR)) (n=23)	3 <sup>rd</sup> month patients without ED (IIEF $\geq$ 18) (Median, (IQR)) (n=36)	p-value	6 <sup>th</sup> month patients with ED (IIEF<18) (Median, (IQR)) (n=13)	6 <sup>th</sup> month patients without ED (IIEF $\geq$ 18) (Median, (IQR)) (n=46)	p-value <sup>#</sup>
Age (years)	28 (14)	31 (11)	0.050	36 (20)	33 (12)	0.487
Burn (%)	25 (21)	20 (5)	0.002	25 (17)	20.5 (5)	0.046
Service Period (day)	40 (48)	9 (11)	<0.001	54 (53)	11 (13)	<0.001
IIEF Score at 3 <sup>rd</sup> month	14 (10)	22 (5)	<0.001	5 (10)	21 (7)	<0.001
IIEF Score at 6 <sup>th</sup> month	17 (5)	23 (3)	<0.001	16 (3)	22 (4)	<0.001
Intensive care unit period (day) <sup>*</sup>	11 (19)	3 (2)	<0.001	16 (20)	3 (8)	0.002
Transfusion units <sup>**</sup>	11 (19)	2 (-)	0.462	3 (12)	5 (2)	0.534
Burn type, n (%)						
Flame	13 (56.5)	22 (61.1)	0.029 <sup>#</sup>	11 (84.6)	24 (52.2)	0.085 <sup>#</sup>
Electrical	9 (39.1)	5 (13.9)		2 (15.4)	12 (26.1)	
Scald	1 (4.3)	9 (25)		0 (0)	10 (21.7)	
Burn Grade						
2	17 (73.9)	34 (94.4)	0.047 <sup>#</sup>	8 (61.5)	43 (93.5)	0.010 <sup>#</sup>
3	6 (26.1)	2 (5.6)		5 (38.5)	3 (6.5)	
Surgical intervention for burn, n (%)						
No	5 (21.7)	31 (86.1)	<0.001 <sup>&amp;</sup>	3 (23.1)	33 (71.7)	<0.001 <sup>&amp;</sup>
Yes	18 (78.3)	5 (13.9)		10 (76.9)	13 (28.3)	
Admission to intensive care unit, n (%)						
No	4 (17.4)	14 (38.9)	0.080 <sup>&amp;</sup>	4 (30.8)	14 (30.4)	1.000 <sup>#</sup>
Yes	19 (82.6)	22 (61.1)		9 (69.2)	32 (69.6)	
Transfusion, n (%)						
No	11 (47.8)	35 (97.2)	0.001 <sup>&amp;</sup>	7 (53.8)	39 (84.8)	0.052 <sup>#</sup>
Yes	12 (52.2)	1 (2.8)		6 (46.2)	7 (15.2)	

Four patient who had ED (IIEF<18) at the initial evaluation were excluded from this analysis. <sup>\*</sup>Out of 41 patients who has been to intensive care unit, 19 had ED (IIEF<18) and 22 patients were free of ED (IIEF $\geq$ 18) at the 6<sup>th</sup> month of follow-up. Four patient who had ED (IIEF<18) at the initial evaluation were excluded from this analysis. <sup>\*\*</sup>Out of 13 patients who received transfusion, 12 had ED (IIEF<18) and 1 patient was free of ED (IIEF $\geq$ 18) at the 6<sup>th</sup> month of follow-up. <sup>#</sup>Fisher's Exact Test, & Pearson Chi-Square.

analysis, except for the transfusion unit at the 3<sup>rd</sup> (p=0.462) and 6<sup>th</sup> (p=0.534) months, and age (p=0.487), admission to the intensive care unit (p=1.000) and burn type (p=0.08) at the 6<sup>th</sup> months, all parameters had a significant p-value (Table 4). In multivariate analysis predictors of normal erectile function (IIEF $\geq$ 18) at the 3<sup>rd</sup> month of follow-up is found to be younger age and at the 6<sup>th</sup> month of follow-up is found to be higher IIEF5 score at the 3<sup>rd</sup> month and Grade 2 in contrast to Grade 3 burn with an odds ratio of 0.042 (Table 5).

## DISCUSSION

ED is a relatively common disorder with increasing incidence by aging. It was detected in 52% of men between the ages of

40–70 in the Massachusetts Male Aging Study.<sup>[9]</sup> Akkus et al.<sup>[10]</sup> reported a prevalence of ED 69.2% in patients over 40 years old in our country. In current trial, the rate of ED was initially relatively low as 8%. Since the age distribution of the study group is young, and the number of comorbidities was relatively low. However, the rate of ED was detected as 39.7% and 25.4%, at 3<sup>rd</sup> and 6<sup>th</sup> months, respectively. Therefore, a follow-up program after burn injury should include ED assessment.

During the follow-up overall IIEF scores were lower than the baseline, but not statistically significant. Furthermore, 3<sup>rd</sup> month IIEF-5 score was significantly lower in electrical injury than scald injury. Moreover, IIEF-5 score of patients with

**Table 5.** Multivariate analysis of predictive factors of normal erectile function at 3<sup>rd</sup> month and 6<sup>th</sup> month

Predictors of normal erectile function (IIEF $\geq$ 18) at 3 <sup>rd</sup> month	Odds ratio	95% Confidence interval	p-value of multivariate analysis
Age (years)	0.742	0.591–0.933	0.011
Burn (%)	0.930	0.795–1.087	0.362
Service period (day)	0.912	0.835–0.997	0.043
Burn type			
Flame		Ref	0.582
Electrical	0.422	0.025–7.164	0.551
Scald	5.640	0.078–408.859	0.429
Burn Grade			
2		Ref	
3	0.150	0.003–7.981	0.349
Surgery			
No		Ref	
Yes	0.354	0.028–4.511	0.424
Transfusion			
No		Ref	
Yes	0.036	0.001–1.711	0.092
Predictors of normal erectile function (IIEF $\geq$ 18) at 6 <sup>th</sup> month	Odds ratio	95% Confidence interval	p-value of multivariate analysis
Burn (%)	1.022	0.914–1.144	0.698
Service period (day)	0.959	0.894–1.028	0.239
IIEF-5 Score at 3 <sup>rd</sup> month	1.508	1.13–2.014	0.005
Burn Grade			
2		Ref	
3	0.042	0.003–0.685	0.026
Surgery			
No		Ref	
Yes	11.924	0.193–736.192	0.239
Transfusion			
No		Ref	
Yes	9.566	0.272–336.894	0.214

electrical and flame burn decreased significantly at 3<sup>rd</sup> month compared with baseline. The IIEF-5 score of patients with the third-degree burn was statistically lower at the 3<sup>rd</sup> and 6<sup>th</sup> month compared to the patients with second-degree burned. The duration of the intensive care unit reduced the IIEF-5 scores, but not statistically significant. The patients with a burn-related surgery had significantly IIEF-5 scores at the 3<sup>rd</sup> and 6<sup>th</sup> months. All these findings suggest that electrical burns and higher degree burns may be a risk factor for a remarkable decrease in IIEF-5 scores and ED development. Hence, these specific subgroups particularly require a re-assessment for ED at the follow-up.

Regarding the etiology of impairment in erectile functions in burned patients there may be several assumptions. Dean et al.<sup>[11]</sup> reported that traumatic artery occlusion may cause arteriogenic-induced ED. In the same article, endothelial dysfunction has been reported to impair endothelium-dependent vasodilatation in vessels. In our study, IIEF-5 scores decreased after the burn injury during the follow-up. We suggest that low IIEF-5 scores may be associated with vascular damage after burn injury. Salehi et al.<sup>[4]</sup> reported the incidence of ED as 53% in their study involving 123 patients with thermal and electrical burns (97 patients had thermal burns and 28 electrical burns). There were no differences in the incidence of ED between the two groups in their study. There was a significant negative correlation between IIEF-5 score and age, and a significant relationship was found between total body surface area and ED. In our study, patients with scald burns were included and all patients were re-evaluated with IIEF-5 in the 3<sup>rd</sup> and 6<sup>th</sup> months. The IIEF scores were lower in patients with electrical burns. We also investigated the relationship between burn depths and ED, indicating lower IIEF scores in patients with third degree burn. We noticed that IIEF-5 scores decreased significantly in this subgroup of third degree burned patients at the 3<sup>rd</sup> month regardless type of burn. Larger series may be needed for more accurate results.

In the study of Kim et al.,<sup>[12]</sup> 256 patients with electrical injury were evaluated and a significant relationship was found between electrical injury and ED. They evaluated patients hospitalized in the burn center for 5 years (1998–2003) were evaluated retrospectively. The findings of the patients with electrical burns in this study are consistent with our study. In our study, the IIEF-5 score was decreased in patients with electrical injury. Robson et al.<sup>[13]</sup> described the vascular effect of electric current. Due to the electric current, arachidonic acid metabolites are formed in the body at high temperatures and cause vascular contraction and thrombus formation. The effect of electric current changes as vessel diameters changes. Small vessels are affected more by thermal damage than large vessels and coagulation necrosis may develop. Large vessels can be protected from this effect by dissipating heat because the blood flow is both greater and faster. It could be an explanation for the significant decrease in the IIEF-5 score in the electrical injury subgroup in our study. Changes in IIEF-5 score in flame

and scald subgroups may be attempted to be explained by this pathogenesis but they need to be proved experimentally.

Another possible explanation of ED is neurogenic origin. The central nervous system, autonomic system, sensory and motor systems can be affected by burn injury regardless of type. This damage may be primarily due to burns or may be due to secondary causes. Pelvic and vertebral fractures, spinal cord trauma that may occur as a result of falling are secondary causes of neurological injury. ED may develop due to these neurological damages.<sup>[14,15]</sup> In the literature, the rate of ED associated with pelvic fracture by high energy varies between 18 and 60%.<sup>[16]</sup> In our study, there were no direct cases of burn-related neurological pathology and fractures, so we could not explain the IIEF-5 scores in our groups with these findings. Cohen et al.<sup>[17]</sup> reported that electrical injury may cause peripheral nerve damage and reflex sympathetic dystrophy may develop due to this damage. Another theory for burn-related ED is that significant inflammatory responses occur in severe burns. The xanthine oxidase released by histamine increases the number of free oxygen radicals.<sup>[18]</sup> Oxidative stress and reactive oxygen species lead to endothelial dysfunction, microcirculation disordered finally vascular insufficiency.

The present study also showed that burn injury has a time-dependent effect on the IIEF-5 score. IIEF-5 score seems to be mostly affected at 3<sup>rd</sup> month rather than at 6<sup>th</sup> month after burn, which may be interpreted as an improvement by time. At baseline, 3<sup>rd</sup> and 6<sup>th</sup> month evaluations, the ED rate was 8%, 39.7%, and 25.4%, and median initial IIEF-5 scores of the patients were 23 (5–25), 20 (5–25), and 22 (5–25), respectively. Similarly, the median IIEF-5 score at 6<sup>th</sup> month is better than IIEF-5 score at 3<sup>rd</sup> month in the electrical and flame injury group, in both burn grade group, and in patient with burn-related surgery. In multivariate analysis, we found that a higher IIEF-5 Score at 3 months and second-degree burn injury were predictive factors for normal erectile function at 6 months of follow-up. Ahmad et al.<sup>[19]</sup> reported that 52.94% of the patients suffered from sexual dissatisfaction in the 6<sup>th</sup> month after burn injury. However, this study included genital injury and female patients. One may speculate that the improvement of IIEF-5 scores at the 6<sup>th</sup> month can be related to recovering from burn symptoms.

Mental stress and depression are a major cause of ED. Especially patients with severe burns may be very vulnerable to mood disorders. During the re-assessment at 3<sup>rd</sup> and 6<sup>th</sup> months, these factors might have a role in the development of ED. As a limitation of our study, the degree of depression and mental status of the patients were not evaluated. We only focused the presence of ED by using IIEF. Furthermore, there is no long-term follow-up data of patients after 6<sup>th</sup> month.

## Conclusion

ED is one of the most important factors affecting the quality of life in patients with burn injury. Numerous complications

can develop following burn injury and therefore ED can be ignored. In our study, it was shown for the first time in the literature that the IIEF-5 score decreased at the 3<sup>rd</sup> and 6<sup>th</sup> months after the burn. Consequently, the rate of ED was increased during the follow-up. It has been found that electrical and flame injury, third-degree burns and patients who underwent burn-related operation are at risk in terms of decreasing the IIEF-5 score. However, the improvement of the IIEF-5 score at the 6<sup>th</sup> month compared with the 3<sup>rd</sup> month in patients with electrical burn injury suggests that it may be a reversible process. Therefore, follow-up of burned patients at certain time intervals for ED is suggested according to our results. Further studies with a larger sample size are needed to evaluate the relationship between burn and ED.

**Ethics Committee Approval:** This study was approved by the İzmir Tepecik Training and Research Hospital Local Ethics Committee (Date: 15.03.2012, Decision No: 2012/8).

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## ORJİNAL ÇALIŞMA - ÖZ

### Majör yanıklı hastalarda erektil disfonksiyon: Takibin önemi

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**AMAÇ:** Yanık hasarı ve erektil disfonksiyon (ED) arasındaki ilişkiyi araştırarak ileriye yönelik çalışma sayısı azdır. Bu çalışmanın amacı, majör yanık ile ilgili olarak erektil fonksiyonlardaki değişiklikleri ileriye yönelik olarak araştırmaktır.

**GEREÇ VE YÖNTEM:** Bu çalışma, majör yanık hasarı olan hastalarda ileriye yönelik bir araştırma olarak yürütüldü. Çalışma grubu, Wallace Dokuz Kuralı'na göre vücut yüzey alanının en az %20'sinin etkilendiği yanık olgularından oluşuyordu. Yanık ünitesindeki hastalara başlangıçta Uluslararası Eretil Disfonksiyon-5 İndeksi (IIEF-5) uygulandı ve üçüncü ve altıncı aylarda tekrarlandı. Yanık tipleri, yanıkların şiddeti, hastaların yaşı ve IIEF-5 skorlarındaki değişiklikler karşılaştırıldı.

**BULGULAR:** Çalışmaya 63 erkek hasta alındı. Hastaların ortalama yaşı 35 (20-73), ortalama yanma yüzdesi 22 (20-60) idi. ED oranı, başlangıçta 3. ve 6. ay değerlendirilmelerinde sırasıyla %8, %39.7 ve %25.4 olarak belirgin şekilde arttı. Hastaların ortalama başlangıç IIEF-5 skoru 23 (5-25) idi. Alt grup analizi, elektrik ve alev yanığı olan hastaların IIEF-5 skorunun, başlangıç değerlerine kıyasla üçüncü ve altıncı aylarda anlamlı derecede azaldığını ortaya koymuştur.

**TARTIŞMA:** Mevcut çalışma, majör yanık hastalarının IIEF-5 skorlarının uzun vadede önemli bir bozulma gösterebileceğini göstermiştir. Bu, daha uzun bir takip programında yanık hastalarının erektil fonksiyonunu izlemek için IIEF'in kullanılabilirliğini gösteren ilk ileriye yönelik çalışmadır.

**Anahtar sözcükler:** Eretil disfonksiyon; Uluslararası Eretil Disfonksiyon Sorgu İndeksi-5; yanık hasarı.

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