

# First Treatment in Burns: Evaluation of Treatment Attempts at Scene

*Yanıkta İlk Tedavi: Olay Yerindeki Tedavi Uygulamalarının Değerlendirilmesi*

Ozer Ozlu, Abdulkadir Basaran

Department of General Surgery, Adana  
City Training and Research Hospital,  
Adana, Turkey

## Abstract

To determine and evaluate the first treatments applied just after injury at scene or at primary/secondary care health institutions to burn patients before admission to a burn center and to provide suggestions to increase awareness in first treatment of burns. Between November 1, 2019 and December 31, 2019 300 burn patients, who admitted for the first time to the outpatient clinics of our tertiary burn center and agreed to participate were included in this descriptive-cross-sectional study. Patient data and the first treatments applied at the scene or another health care institution were evaluated. There were 153 male (51.0%) and 147 female (49.0%) patients. Scalds with tea (n=96) and water (n=79) was the most common etiology for burns. The percentage of burned total body surface area was 3.82±4.8. The first intervention was performed at the scene in 79% (n=237) patients, while in a health institution in 21% (n=63). 73.8% (n=175) of interventions at scene and 39.7% (n=25) of 63 interventions performed in a health institution were not appropriate. Patients or their parents who admitted to our outpatient burn clinic did not have enough information about first aid in burns. With education programs for mothers, awareness can be raised about indoors childhood burns and appropriate first intervention. For protection and correct intervention in workplaces, education on occupational health and safety should be continued seriously. There were also deficiencies in treatments performed in health institutions. In this regard in-service training to health personnel would be beneficial.

**Keywords:** Burns; first treatment; awareness;

## Özet

Çalışmanın amacı, yaralanmadan hemen sonra olay yerinde veya birinci/ikinci basamak sağlık kuruluşunda yanık merkezine gönderilmeden önce yanan hastalara uygulanan ilk tedavileri belirleme ve değerlendirmenin yanı sıra yanıkların ilk tedavisinde farkındalığı artırmaya yönelik öneriler sunmaktır. Bu tanımlayıcı-kesitsel çalışmaya 1 Kasım 2019 ile 31 Aralık 2019 tarihleri arasında üçüncü basamak yanık merkezi polikliniğine ilk kez başvuran ve katılmayı kabul eden 300 yanık hastası dahil edildi. Hasta verileri ve olay yerinde veya başka bir sağlık kuruluşunda uygulanan ilk tedaviler değerlendirildi. Çalışmaya katılan 300 hastanın %51'i erkek (n=153), %49'u (n=147) kadındı. Etiyolojide en sık çay (n=96) ve su (n=79) ile yanma görüldü. Yanık vücut alan yüzdesi 3,82±4,8 olarak bulundu. İlk müdahale %79 (n=237) hastada olay yerinde yapılırken, %21 (n=63) hastada bir sağlık kurumunda yapılmıştı. Olay yeri müdahalelerinden %73,8'i (n=175) uygun müdahale değildi. Sağlık kurumunda yapılan 63 müdahalenin %39,7'sinin (n=25) uygun olmadığı görüldü. Yanık polikliniğimize başvuran hastaların veya ebeveynlerinin yanıkta ilk yardım konusunda yeterince bilgileri olmadığı görüldü. Annelere yönelik eğitim programları ile ev içi çocuk yanık insidansında azalma ve doğru ilk müdahale konusunda farkındalık sağlanabilir. İş yerlerinde korunma ve doğru müdahale için ise iş sağlığı ve güvenliğiyle ilgili çalışmaların ciddiyetle sürdürülmesi gereklidir. Yanık ile ilgili sağlık kurumlarında yapılan uygulamalarda da eksiklikler olduğu saptandı. Bu konuda sağlık personeline hizmet içi eğitim verilmesinin faydalı olacağı düşünüldü.

**Anahtar Kelimeler:** Yanık; ilk tedavi; farkındalık;

## Correspondence:

Özer ÖZLÜ

Department of General Surgery,  
Adana City Training and Research  
Hospital, Adana, Turkey  
e-mail: ozerozlu5757@yahoo.com

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## 1. Introduction

First aid in burns are applications performed without seeking medical equipment at the scene to prevent the situation from getting worse until medical assistance is provided by healthcare professionals. It has been reported in many publications that appropriate first aid reduces pain, edema, and inflammation and contributes to wound healing (1-4). The first thing to do at the scene is to remove the heat source. Afterwards, clothes should be removed quickly to start cooling process. Cooling should ideally be done with approximately 15 degrees of water within 20 minutes after injury and should continue for 20 minutes (2,3,5). Use of ice water should not be applied as it will cause vasoconstriction and eventually progression of burns, as well as may cause hypothermia especially in children. It is sufficient to cover the burned area with a sterile cloth or a clean garment on the way to the health institution (4). The width and depth of the wound are evaluated once the patient is transferred to a health institution. Based on this evaluation, appropriate fluid resuscitation is initiated by opening the vascular access to the required patients and urinary monitoring is done with a Foley catheter. Any jewelry or clothes that will disrupt the circulation is removed (6). In first-degree burns, moisturizing creams are sufficient; the wound does not need to be covered. In second degree burns, the wound is closed with gauze impregnated with paraffin or oily cream. Silver sulfadiazine may be preferred in the initial treatment of burns but not for the face (2-4). The use of drugs that can lead to vasoconstriction should be avoided.

In this study, it was aimed to determine the first applications of the first and second degree burns at the scene or in the health institutions before admission to a burn center and to evaluate these interventions. In addition, the first steps to be taken in the burn and suggestions to raise awareness are presented.

## 2. Materials and Methods

A total of 300 patients admitted to our outpatient clinic of the Burn Center for the first time between 1 November 2019 and 31

December 2019 and accepted to participate in the study were included in the study. Electrical burns and burns with suspicion of inhalation are not included. A written consent was obtained from the participants. In this descriptive-cross-sectional study, the demographic data of the patients, the place where the burn injury happened, the etiology of the burn, the educational status of the participants, the first applications performed at scene or in the health institution were questioned. The percentage of burned total body surface area and hospitalization were also evaluated.

This study was approved by the local Clinical Research Ethical Committee of our Hospital (Decision no: 2019/585).

### *Statistical Analysis*

Statistical Package for Social Sciences 20.0 for Windows was used for the analysis of the data. Results were expressed as mean (standard deviation) (min-max), n and percent.

## 3. Results

Between 1 November 2019 and 31 December 2019, 300 patients who admitted to our outpatient burn clinic for the first time and volunteered to participate were included in the study. Among the participants 51% of them were male (n=153) and 49% (n=147) were female. The mean age of the patients was  $9.46 \pm 15.4$  (min-max=0.5-79) years. The percentage of burned total body area (TBSA) was found to be  $3.82 \pm 4.8$  (min-max=1-37). Burn injuries happened indoors in 85.33% (n=256) of patients whereas 9.66% (n=29) happened in the open area and in the remaining 5% (n=15) at workplace. Among 29 injuries occurred at open areas, 25 of them occurred at the roof or garden of the house where there was easy access to a water source. Demographic and clinical data of the patients are given in Table 1.

Scald burns with water and tea were the most common cause of burns. The etiology of burns is summarized in Table 2.

**Table 1.** Demographic and clinical data of patients.

	Study Group (n=300)
Age (years)	9.46±15.4
Gender M/F (n)	153/147
<b>Education Status</b>	
Illiterate	59
Primary school	102
Secondary School	71
Higher Education	68
TBSA (%)	3.82±4.8
Hospitalization (Yes/No)	58/242

Values shown as mean±standard deviation, M/F= Male/Female, TBSA= Total Body Surface Area

**Table 2.** Etiology of burns.

Etiology	Study Group (n=300)	
	n	%
Tea	96	32.0
Water	79	26.3
Contact	46	15.3
Meal	29	9.7
Flame	27	9.0
Milk	12	4.0
Oil	6	2.0
Chemical	5	1.7

In 79% (n=237) of the patients, the first intervention was performed at the scene, while in 21% (n=63) of patients in a medical institution. Approximately 73.8% (n=175) of the first interventions (such as water and ice application, centaury oil, yogurt, toothpaste) were not appropriate. Regarding doing nothing at the scene (n=63) also as an inappropriate intervention, 79.33% (n=238) of the first intervention were not appropriate. In addition the ideal cooling time, which should be 20 minutes, was applied by few patients or

parents and some of them did not fully remember the cooling time with the rush also. For that reason a cooling time more than 10 minutes is accepted as an appropriate intervention. Only 62 (26.2%) of our patients were cooled properly. Although most of the patients or parents applied tap water as the first intervention, it was considered as an inappropriate intervention if the duration of cooling was less than 10 minutes. Our data about the first intervention at the scene is given in Table 3.

**Table 3.** First treatment at scene.

First Treatment	Patients (n=237)	
	n	%
Tap water	142	59.9
Water and ice	59	24.9
Centauray oil	13	5.5
Yoghurt	8	3.4
Tooth paste	6	2.5
Egg	3	1.3
Others	6	2.5

When the patients were questioned about the knowledge of first intervention in a burn injury, only 4 people who had experienced a burn injury before, and 3 people working in the heavy and dangerous work class category had satisfactory information. Other patients or parents did not have satisfactory knowledge regardless of their education.

When the interventions performed in a health institution were evaluated 60.3% (n=38) of them was appropriate and 39.7% (n=25) of them was not. Inappropriate interventions were the use of silver sulfadiazine to the face in 7 patients, the use of topical vasoconstrictors in 12 patients, and not dressing a second degree burn after applying antibiotic-containing cream to the wound.

#### 4. Discussion

First aid in burn helps to reduce pain and burn damage (7). Most burns occur at home, at work, or in open areas around home. In other words, most burns occur at a distance within reach to a water source required for appropriate first aid. In this study, the information of the burn patients or their parents about first aid and the practices performed at the injury scene or in the health institution were examined and our results were compared with similar studies in the literature.

Burn wounds are sterile, but are susceptible to colonization quickly by bacteria. While the exudate in the environment acts like a culture medium, the application of unsuitable substances increases the risk of infection (8). Applications such as yogurt, toothpaste, tomato paste, egg whites, potatoes, oil, milk,

urine and mud have been encountered in different publications (1,8-11). In our study, there were applications such as yogurt, toothpaste, egg whites, centauray oil and tar. Due to its easy availability in our region, the use of centauray oil is frequent. In a study on mothers' knowledge and behavior in home accidents, the level of knowledge was found to be higher in those with a high education level (12).

Improper practices in first treatment of burn result from lack of knowledge in the society. Studies conducted in many countries such as England, Wales, India and China found that there is about 3.7-32% accurate information about first aid in burns (7,10,13-15). While cooling the burned patient with the water was found as high as 82% but it was observed that the knowledge of proper duration for applying water decreased to 9% (7,10). In the studies conducted in our country, it was stated that water was used in the first intervention at the rate of 39.6% - 64%, but the duration for applying water was not specified (8,11). In our study, it was seen that 59.9% of the first intervention was cooling with water, but the correct intervention rate decreased to 26.2% considering the duration of time for applying water. In a study conducted at a university hospital in Wales, 32% of the participants were found to have correct first aid information for burns. The high rate found in the study has been attributed to the fact that 40% of the participants took compulsory basic first aid training at the workplace (13). In our study, 3 people who burned in the workplace in the heavy and dangerous business class category had knowledge about the first intervention in a burn injury and they applied

the proper intervention. In some studies the participants were questioned about their source of information on first aid in burns. They mostly stated the internet (32.9-79%), and to a lesser extent, other sources of information (health book, television, friends and health institutions) (7,16). In a meta-analysis examining the information about first aid in burns on the internet, Burgess et al. concluded that these contents were wrong, inadequate and inconsistent (17). Since the internet is mostly used to access information today, the correct information should be conveyed by the experts of the subject.

In a study on childhood burns and parenteral awareness the authors stated that 20% of the patients were referred to a burn center without performing any medical intervention in the health institution and some patients were referred without dressing a second degree burn (11). In our study, we also found that the first aid practices performed to 39.7% of the patients who admitted to a health institution other than a burn unit or center was not sufficient.

In a cross-sectional study in which first aid information determinants were examined in burns, it was observed that individuals who went to a first aid course gave 15% more correct answers to the questionnaire and those who took the course in the last five years had a higher rate of correct answers (18). After a multimedia campaign in New Zealand, it was observed that first aid information increased and hospitalization of burn patients decreased

(19). In a systematic review evaluating the publications related with attempts to increase the level of education, it was found that there was an increase in the level of knowledge and a decrease in harmful traditional practices with initiatives such as media campaigns and face-to-face education (20). In a study conducted in India, the results of the "community awareness program" and "school education programs", which span over a 5-year period, were discussed. Auditory and visual methods or face-to-face training were used to inform about in-kitchen arrangements, cooking on the floor, the way of dressing during cooking and the use of electrical tools. The results of the programs were satisfactory (14).

## 5. Conclusion

In conclusion it was observed that the patients or their parents who admitted to our outpatient burn clinic did not have enough information about first aid in burns. For this reason, with the training programs for parents, awareness can be raised about burns in the house and appropriate first treatment. Education and controls related to occupational health and safety must be taken seriously in work places to ensure protection and correct intervention at work. First aid courses should be organized at schools either. It is thought that it would be beneficial to provide in-service training to health personnel in order to eliminate the deficiencies in the practices performed for burns in health institutions.

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