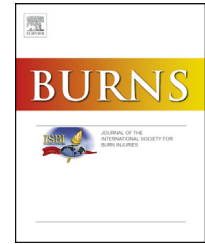


Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/burns

Prognostic factors in electrical burns: A review of 101 patients



Ayten Saracoglu^{a,*}, Tamer Kuzucuoglu^a, Sezer Yakupoglu^a,
Oguzhan Kilavuz^a, Erhan Tuncay^b, Burak Ersoy^c, Recep Demirhan^d

^a Kartal Dr. Lutfi Kirdar Training and Research Hospital, Clinic of Anesthesiology and Reanimation, Istanbul, Turkey

^b Kartal Dr. Lutfi Kirdar Training and Research Hospital, Clinic of General Surgery, Istanbul, Turkey

^c Mardin Kiziltepe State Hospital, Clinic of Plastic, Reconstructive and Aesthetic Surgery, Mardin, Turkey

^d Kartal Dr. Lutfi Kirdar Training and Research Hospital, Clinic of Thoracic Surgery, Istanbul, Turkey

ARTICLE INFO

Article history:

Accepted 15 August 2013

Keywords:

Electrical burn

Mortality

Injury

Causes

ABSTRACT

Purpose: Electrical burn wounds are among the most devastating of burns, with wide-ranging injuries. We aimed to document the factors affecting the mortality rate of patients presenting with electrical burn wounds to our regional burn centre.

Methods: This retrospective study was conducted on 101 patients from January 2009 to June 2012. Factors were classified under 11 topics and evaluated according to their relationship with the mortality rate.

Results: The major causes of death in burn victims were multiple organ failure and infection. Twenty-six percent of the 101 patients died, all of whom were male. One (1.4%) of the patients who survived was female; 73 (98.6%) survivors were male. The mean age in the deceased group was statistically higher than that of the other patients (32.7 vs. 35.6 years; $P < 0.05$). All-cause mortality was 2.79 times higher for larger burns (>25% total body surface area). The values for creatine kinase, creatine kinase-MB, total body surface area of burn, hospitalised period in the intensive care unit and intubation rate were significantly higher in the exitus group. Renal injury requiring haemofiltration was associated with an almost 12-fold increased risk for mortality. There was no statistically significant difference between patients regarding surgical interventions.

Conclusion: Electrical injury remains a major cause of mortality and long-term disability among young people. Our data demonstrated several risk factors associated with increased mortality rate in patients with electrical burn wounds.

© 2013 Elsevier Ltd and ISBI. All rights reserved.

1. Introduction

In the developed world, electrical burns constitute 3–5% of all burn cases; in developing countries, this ratio increases up to 21–27% [1] and the mortality rate is reported to be between 3.75% and 58.8% [2]. Approximately one-third of the electrical

burns occur in electrical workers, one-third in construction workers and the last third in children playing at home. There are some reports regarding electrical burns in our country but the real extent of the problem is still not very well known [3–7].

Most of the acute burns are life threatening, and require various types of surgical interventions such as eschar excision or split-thickness skin grafting, depending on the size,

* Corresponding author at: Clinic of Anesthesiology and Reanimation, Kartal Dr. Lutfi Kirdar Training and Research Hospital, Semsi Denizer Cad. E-5, Karayolu Cevizli Mevkii, 34890 Kartal, Istanbul, Turkey. Tel.: +90 2164413900; fax: +90 2163520083.

E-mail address: anesthesiayten@gmail.com (A. Saracoglu).

0305-4179/\$36.00 © 2013 Elsevier Ltd and ISBI. All rights reserved.

<http://dx.doi.org/10.1016/j.burns.2013.08.023>

location and depth of the lesion [8]. Early complications of electrical burns include fracture, dislocation and amputation; the rate of amputation of a damaged extremity part following electrical burns is approximately 30% [9]. Neurological damage, visual disturbance, ischaemic cardiac alterations and contractures are listed among the late complications associated with them [10]. In addition to these manifestations, certain cognitive impairments are also described, including slow thinking, concentration deficit, language and memory disturbances and emotional stress [11]. All of these complications result in increased morbidity and mortality rates, frequent surgical interventions and lengthened hospitalisation and rehabilitation periods. Electrical burns still constitute a serious health problem in our country, where almost 11.8% of the patients admitted to our burn centre complain of electrical burns, leading to severe complications and socioeconomic deteriorations. The mortality rate of electrical burns depends on several factors. The aim of this study is to analyse the extent of electrical burn-related injuries, to determine the mortality rate and to identify the risk factors influencing the mortality.

2. Materials and methods

Following the approval by the Local Ethics Committee of our hospital, medical records of 101 patients admitted to our regional burn centre between 1 January 2009 and 31 May 2012 were analysed retrospectively. Our centre resides in a leading training and research hospital, which is located close to a major industrial region. Upon patient admission, blood count measurement, including electrolyte levels, as well as serum markers of renal and hepatic functions, and electrocardiogram and radiologic investigations are routinely performed.

All patients received immunisation for tetanus prophylaxis and they had their burns washed every other day with lactated Ringer's solution kept at room temperature. Following the admission to the burn centre, the Parkland Formula was used to calculate the amount of resuscitation fluid and the urine output of the patients was monitored. Standard lactated Ringer's solution was preferred as the initial fluid. Maintaining a high urine output was the aim in resuscitating the patients. Appropriate antibiotherapy was administered to patients with positive culture results. Prophylactic antibiotics were not used before the results were known; however, the use of topical sulphonamides remains the standard of care in our burn unit. Samples were taken from burn wounds, blood and urine for culture. Surgical procedures such as escharotomy, amputation, grafting, debridement or fasciotomy were performed when indicated. Immediately after patients arrived at our burn unit, initial debridement was performed within 6 h where necessary. Limb amputations were performed after the formation of the demarcation line. Finally, grafting operations were performed in the first 48–72 h after hospitalisation. The management of these patients comprises the cooperation of anaesthesiologists, general surgeons, plastic surgeons, paediatric surgeons, paediatricians and infectious diseases specialists working as a team.

All the data were obtained from the medical records of our hospital. The age and gender of the patients, total burn surface area (TBSA), burn degree, duration of hospital stay, types and total count of surgical interventions, mortality rates, exposure to high- and low-voltage current, the venue of the burn incident and the requirement of intensive care unit (ICU) were noted. Patients admitted to the hospital with electrical burn followed up on an outpatient basis were excluded from the study. Nine patients with incomplete or missing medical records as well as five patients, whose treatment had been

Table 1 – Patient demographics, blood levels of CPK, CKMB, burn percentage, ratio for intubation and operation, time for ICU and ward stay, cause of burn.

		Alive Mean ± SD	Dead Mean ± SD	P
The annual distribution of the number of patients admitted to the hospital	2009	14	5	0.230
	2010	29	15	
	2011	23	7	
	2012	8	0	
Gender	Female	1	0	0.544
	Male	73	27	
Age (years)		32.7 ± 13.3	35.6 ± 13.3	0.043
CPK (U/L)		2910.4 ± 4691.3	5649.6 ± 10169.0	0.042
CKMB (U/L)		180.5 ± 335.5	192.4 ± 165.5	0.019
TBSA (%)		26.5 ± 19.6	42.5 ± 23.4	0.000
ICU stay (days)		10.0 ± 12.4	12.1 ± 11.7	0.000
Intubation		13	27	0.000
Amputation		5	2	1.000
Operation		40	18	0.257
Hemofiltration		4	11	0.000
Ward stay (days)		21	0	0.002
Cause of burn	Low voltage	61	13	0.001
	High voltage	13	14	

CPK, creatinine-phosphate-kinase; CKMB, creatine kinase-muscle and brain; TBSA, total body surface area. Student's t-test/Mann-Whitney U-test/Chi square test/Fischer's test.

Download English Version:

<https://daneshyari.com/en/article/3104497>

Download Persian Version:

<https://daneshyari.com/article/3104497>

[Daneshyari.com](https://daneshyari.com)