

Analysis of Hospitalized Burned Patients in Bandar Abbas, Iran

*Hasani L. MSc, **Aghamolei T. PhD, ***Boushehri E. MSc, ****Sabili A. MSc

*Dept. of Public Health, School of Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

**Dept. of Health, School of Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

***Dept. of Biostatistics & Epidemiology, School of Health, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

****Nursing Management, Khalijefars Hospital, Social Security Organization, Bandar Abbas, Iran

(Received 12 Dec 2009; accepted 25 Apr 2009)

Abstract

This study was conducted to determine the causes and outcomes of burn in patients referred to Shahid Mohammadi Hospital in Bandar Abbas, southern Iran, in which 212 burned patients were assessed from March 2007 to March 2008. Mean age of patients was 22.14 yr. Heat contact was the main cause of burn with 92.5%. 49.1% of total burns occurred among less than 20 yr old people. Mortality rate was 10.4%. Most of burns occurred at home. An educational program is necessary to prevent thermal burning at home.

Keywords: *Electrical burn, Thermal burn, Chemical burn, Burned surface, Iran*

Introduction

Burns account for 5% or more of the total hospital in-patients at any time (1). In Zimbabwe, the mortality was 22% (2). Burn injuries cause significant morbidity and mortality, both in developing and developed countries (3). Of major injuries, burns account for over 1% of the global burden of the disease (4). Burn injuries in Iran like other developing countries, are much more common than in the USA and Europe (5). Many studies have been performed on burn injury in Iran (6, 7). These studies reported an overall incidence rate of mortality ranging from 2.0 to 5.6/100 000 person/yr. These studies have shown that most burn injuries are caused by handling kerosene and occurred at home.

A major public health issue raised by these studies is suicide attempt by self-inflicted burning in females and children, accounting

for up to 37% of burn accidents in this population. Based on these findings, the main objective of this study was to assess the characteristics and outcome of burn patients in Hormozgan Province in order to assess the reasons for such injuries and possible strategies to reduce them. Shahid Mohammadi Hospital is the only burn center for patients in this province, which has a population of more than 1 million inhabitants.

Material and Methods

This was a 12-month study from 21 March 2007 to 19 March 2008 and included all burn patients admitted to Shahid Mohammadi Burn Center. Data were collected using a checklist, including age, date of admission, length of hospitalization, percentage of burn (total body surface area, TBSA), time, season, cause of the burn accident and outcome of treatment. Data were obtained from medi-

cal records. TBSA was estimated by the “rule of nines”. Patients were divided into 3 groups based on TBSA%: group 1 with TBSA% < 30%, group 2 with TBSA% between 31%-60% and group 3 with TBSA% > 60%.

Statistical analysis was performed using SPSS, version 13. The chi squared test, *t*-test, ANOVA, were computed. A *P*-value < 0.05 was considered statistically significant.

Results

During the study duration, 212 burn patients were admitted to the hospital. Most of them were female (66%). Their mean age was 22.14 (SD 16.01) yr (range: 40 days–83 yr). The age distribution and data related to the injury and outcome are shown in Table 1. Of 212 patients, 22 died giving a death rate of 10.4%. Mean and median of TBSA were 30.21% (SD 25.41) and 20%, respectively (range: 1%–100%) (Table 1). The mean (SD) of TBSA among the patients who survived were 25.1% (19.49%) and those who died were 74.36% (28.12%), respectively (*P*= 0.003) (Table 2).

Thermal burning was the commonest cause of burn (92.5%), followed by electrical burning (7.1%) and chemical burning (0.5%) (Table 3). Of 196 patients with flame injuries, 130 (77.8%) were caused by oil and gasoline, 98(22.2%) by gas explosion and 55 (16.28%) by scald. Among the age groups less than 20 yr and 21-40 yr and more than 40 yr, there were 10 (4.7%) cases of self-inflicted burn injury (suicide attempts). Most of burning occurred at home 57(74.1%).

The mean length of hospital stay of the patients was 7.8 (SD 8.9) days (range: 1 to 52 days). There was a significant between mean length of hospitalization and TBSA (Anova, *P*= 0.002) and with post hoc tukey. There were significant between mean length of hospitalization and TBSA between group one(less than 30% TBSA) with group three (more than 60%) *P*= 0.001, and between group two (between 31%and 60%) with group three (more than 60%) *P*= 0.04.

The total mortality rate was 10.4%. Most of the patients were admitted in the winter months (33%), followed by spring (22.2%), summer (21.7%) and autumn (23.1%).

Table 1: Mortality and extent of burn injury in total patients by age group

Age group (years)	Patients No. (%)	Deaths No. (%)	TBSA (%)Mean (SD)	Hospital stay (days) Mean (SD)
< 5	45(21.2)	2(4.4)	19.66(13.90)	7.13(5.91)
6–15	26 (12.3)	1(3.8)	23.53(19.95)	11.3(11.91)
16–25	68(32.1)	11(16.2)	33.82(28.85)	7.51(9.82)
26–40	50(23.6)	3(6)	28.62(17.58)	8.42(6.78)
41–60	18(8.5)	2(11.1)	48.50(35.76)	5.44 (11.75)
> 60	5 (2.4)	3(60)	61(42.48)	2.6(2.50)
Total	212(100.0)	22(10.4)		

TBSA= total body surface area

SD = standard deviation.

Table 2: Mortality and length of hospitalization in total patients by total body surface area (TBSA) burnt

% TBSA	Patients No. (%)	Deaths No. (%)	Hospital stay days Mean (SD) ^b
< 20	108 (50.9)	1(4.5)	7.91(7.59)
21–40	58 (27.4)	3 (13.6)	10.89(11.61)
41–60	16 (7.5)	3 (13.6)	5.81(7.86)
61–80	14 (6.6)	3 (13.6)	3.21(6.14)
> 80	16(7.5)	12 (54.5)	2.18(2.53)

TBSA= total body surface area
SD = standard deviation.

Table 3: Causes of burn injuries and length of hospital stay in total patients

Variable	No.(n=212)	%
Type of burn		
Thermal	196	92.5
Electrical	15	7.1
Chemical	1	0.5
Hospital stay (days)		
< 10	157	74.1
11–20	40	18.9
21–30	10	4.7
31–40	1	0.5
> 40	4	1.9

Discussion

Burns are one of the most significant health problems throughout the world, leading to prolonged hospitalization and hence increased expense for the patients, their families and society. In this study, the majority of patients (49.1%) were younger than 20 years, which indicates greater exposure to burn agents in these age groups than in any other age group, a finding that has also been observed by another (8). In this study, 4.7% of burn injuries were self-inflicted, which is less than the result of another study (7). This was suicide attempts due to family disturb-

ances, marriage problems, etc. and most of them used oil and gasoline because of their ready availability at home and the context. This information was obtained by interviewing the patients; there were no data recorded in their files. Also in a cohort of 152 burned wives in India, 47 (31%) were homicidal burns and most of them were 16-25 years of age (77%) (9).

In this study, similar the other one (8), the majority of burns was caused by flame, with oil or gasoline being the flammable liquids most frequently involved. This is probably due to their wide availability and common use as domestic fuels in different parts of Hormozgan.

We had a death rate of 10.4%. A death rate of 19.6% was reported in another study (10). This was because the most common cause of burn in our study was flame and this type of burn is deeper and associated with more severe destruction of tissue than other causes of burn. It is also accompanied by considerable immunosuppression, which makes the patient vulnerable to infection (11). This is supported by the observation of a significant correlation between TBSA and mortality ($P=0.002$). Furthermore, there was a significant difference between the mean length of hospitalization and TBSA ($P=0.002$) indicating that with an increase in TBSA, the total length of hospitalization was reduced be-

cause of early death and transfer to the other provinces or referring. This concurs with observations from another study (10).

Of course, one major reason for the high mortality in our patients is the lack of burns intensive care unit (BICU) since 14 patients (15.4%) died within the first 72 hours of admission. The lack of a BICU leads to a delay in early excision of the burn wound and skin grafting, procedures that are essential for the optimal care for a burn patient (12). As found in other studies, the most frequent admissions occurred in winter (10) due to greater use of heating devices.

In conclusion, most of burns occurred at home and the most important cause of burning was thermal burn. Hence, educational programs are necessary in order to prevent burning especially thermal burn at home.

Acknowledgements

We would like to thank the Deputy for Research at Bandar Abbas University of Medical Science, Iran for the financial support of this project. We would also like to thank the administrator of Shahid Mohammadi Hospital and medical workers of this hospital especially Burn Emergency Unit. The authors declare that there is no conflict of interests.

References

1. Bowen-Jones JR, Coovadia YM, Bowen-Jones EJ. Infection control in a third world burn facility. *Burns*. 1990; **16**: 445-48.
2. Mzezewa S, Jonsson K, Aberg M, Salemark L. A Prospective study on the Epidemiology of burns in patients admitted to the Harare burns unit. *Burns*. 1999 Sep; **25**(6):499-504.
3. Barret JP, Gomez P, Solano I, Gonzalez-Dorrego M, Crisol FJ. Epidemiology and mortality of adult burns in Catalonia. *Burns*. 1999; **25**: 325-29.
4. Leistikow BN, Martin DC, Milano CE. Fire injuries, disasters and costs from cigarettes lights, a global overview. *Preventive medicine*. 2000; **31**: 91-9.
5. Rajabian MH, Aghaei S, Fouladi V. analysis of survival and hospitalization time for 2057 burn patients in shiraz, southwestern iran. *Med Sci Monit*. 2007 Aug; **13**(8): CR353-5.
6. Maghsoudi H, Pourzand A, Azarmir G. Etiology and outcome of burns in Tabriz, Iran. An analysis of 2963 cases. *Scandinavian journal of surgery*. 2005; **94**(1):77-81.
7. Saadat M. Epidemiology and mortality of hospitalized burn patients in Kohkiluyeh va Boyer-Ahmad province, Iran (2002-2004). *Burns*. 2005; **31**(3): 306-9.
8. Avsarogullari L, Sozuer E, Ikizceli I, Kekec Z, Yurumez Y, Ozkan S. Adult burn injuries in an emergency department in central Anatolia, Turkey: a 5-year analysis. *Burns*. 2003; **29**(6):571-7.
9. Kumar V, Tripathi CB. Burnt wives: a study of homicides. *Medicine, science, and the law*. 2004; **44**(1): 55-60.
10. Rastegar Lari A, Alaghebandan R, Nikui R. Epidemiological study of 3341 burns patients during three years in Tehran, Iran. *Burns*. 2000; **26**: 49-53.
11. Bang RL, Gang RK, Sanyal SC, Mokaddas E, Ebrahim MK. Burn septicemia. *Burns*. 1998; **24**(4):354-61.
12. Merrel SW, Saffle JR, Larson CM. The declining incidence of fatal sepsis following thermal injury. *Journal of trauma*. 1989; **29**:1362-66.