Original Article

Presentation of Burn Injuries and their Management Outcome

Nasir Khan, M. A. Nasir Malik

Surgical Unit I, Pakistan Ordinance Factory Hospital, Wah Cantt, Pakistan.

Abstract

Objective: To study the causes of burns and presentation of burn patients to POF Hospital and their overall management outcome.

Methods: A cross sectional study of 111 burn patients presenting primarily to and admitted in Pakistan Ordinance Factory (POF) Hospital from December 2004 to August 2005 were included in the study. Patients of any age, any degree of burns and both sexes were included. Patients presenting after more than one week post burn or patients referred from other hospitals were excluded. A detailed history and examination was done before treatment was started. For statistical analysis, patients were divided into different age groups. The place of acquiring burns, the causes and mechanisms of burns and overall management outcome was studied and results expressed as means and percentages.

Results: Mean age of patients was 18.96 years, 37.8% of the patients were children less than 10 years of age (Group I), 39.6% were males more than 10 years of age (Group II), and 22.5 % were females more than 10 years of age (Group III). Overall, 55% of the patients were males and 45% were females. Mean total body surface area (TBSA) burnt was 11-20%. In group-I patients, the place of burns was their home. The burns occurred at home in 31.8% of Group II patients, and 96% of Group III patients. The place of burns was workplace in 61.3% of Group II patients, and only 4% of Group III patients. The mechanism of burn was scalding in 73.8% of Group I, flame burns in 40.9% of Group II patients and 72% of Group III patients. 25% of Group II patients got electrical burn. The overall mortality was 29.7%.

Conclusion: The cause of burns was scalding at home in the majority of children less than ten years of age (Group I). Similarly the majority of group-II patients got burns at workplace in the form of either flame burns or electric burns. Many of the females more than ten years of age (Group III) got flame burns at home (suicidal, homicidal or accidental) (JPMA 56:394;2006).

Introduction

Burns injury is a public health concern, often associated with pain, emotional stress, prolonged hospitalization, permanent disfigurement and family stress.[1] Most burns occur at home in winter and carry considerable mortality.[2]

The majority of burns are less than 20% of total body surface area.[3] The most common cause of burns is scalds. The mortality from burns is falling as a result of massive early excision and grafting of severe burns patients.[4] Self inflicted burns represent a major social and medical problem.[5] Injuries of firework handling is also a common problem and despite being illegal, fireworks are easily and cheaply available.[6] Chemical burns are also very common at workplaces.[7] Often children less than five years are the main victims of burn injuries.[8] Scalding from hot beverages carries significant morbidity and is an important paediatric public health issue.[9] The decrease in the overall mortality rates due to burns is mainly due to a large decrease in the paediatric group rates.[10]

Domestic violence against women resulting in burns is another common problem. Suicidal intentions resulting in burns, makes a large proportion of female burns, the major motive being marital conflicts.[11] Electrical burn injuries are also very common and this stresses the need to educate general public with regard to the devastating nature of high voltage electrical injury and highlight the importance of prevention.[12]

POF Hospital Wah, receives an average of 10-15 burns cases each month. No work has been done in the past to study the presentation of burn patients and their overall management outcome at POF Hospital Wah. The present study was aimed to assess the causes and presentation of burns injuries and their overall management outcome at POF Hospital Wah.

Patients and Methods

A cross sectional study was conducted at burn centre POF Hospital Wah, a tertiary referral centre, from December 2004 to August 2005.

All the burnt patients presenting primarily to and admitted in POF Hospital Wah were included in the study. These included patients of both sexes, any age and any degree of burns.

Patients presenting for admission after more than one week post burn were excluded. Also patients referred from other hospitals were excluded from the study, because most of these patients had developed sepsis.

At the time of admission, detailed history was taken, including the marital status, place, circumstances, cause and time of burns from patient and relatives separately (accidental or otherwise). For the purpose of analysis, patients were divided into three age groups, namely, children less than 10 years of age (group I), males more than 10 years of age (group II), and females more than10 years of age (group III). A detailed examination was undertaken and patient's haemodynamic status¸ hair, mouth, nose and clothes examined. Total Body Surface area (TBSA) burnt was calculated using "Rule of Nine". The degree of burns was also established. Investigations were carried out including complete blood count, random blood sugar, serum urea, serum creatinine, serum electrolytes, X-rays chest, serum total proteins and serum albumin.

Fluid requirements were calculated using Parkland formula. Treatment was started with intravenous fluids, antibiotics, H2 blockers and pain relief. Blood transfusions and FFPs were given as needed. Injectable human albumin was also given as required. Early tangential excision and skin grafting was done under general anaesthesia. Daily clinical progress of the patient was recorded and patient's outcome noted, either as expired or cured and discharged for follow up in OPD.

Statistical analysis was performed with SPSS version 10 and the results expressed as means and percentages.

Results

A total of 111 patients were studied, mean age was 18.96 years and the standard deviation was 14.76 years. Children aged less than 10 years (group I) were 42 (37.8%). Males aged more than 10 years (group II) were 44(39.6%). Females more than 10 years (group III) were 25 (22.5%). Overall, males were 61(55%) and females were 50(45%). Mean TBSA burnt was 11-20%.

In group I, the place of burns was home for all the patients. In group II, the place of burns was their workplace in 27 (61.3%), and home in 14 (31.8%). A few of the males had burn injuries while in the market (3 males). In group III, 24 (96%) got burns at home, and only one at workplace.

There were various causes of burns in different age groups. The cause of burns were scalds from hot boiling water, tea or milk in 73.8% of group-I patients. In group II, scalds, flames and chemicals were the main causes and in group III flame burns dominated the picture (72% of group III). The mechanism of burns in different age groups is shown in Table 1.

Overall, 67.5% of the patients presented to hospital within 24 hours. In majority, hair were not burnt and there was no soot at mouth or nostrils. Only 3 patients had respiratory difficulty at presentation. Majority of group I

Table 1. Mechanism of burns in different age groups.

Age group	Mechanism of burns				
	Chemical	Scalds	Flame	Steam	Electric
Group I (Children less than 10 years)	0	31 (73.8%)	10 (23.8%)	0	1(2.3%)
Group II (Males more than 10 years)	11 (25%)	9 (20.4%)	18 (40.9%)	1 (2.2%)	5(11.3%)
Group III (Females more than 10 years)	0	5 (20%)	18 (72%)	2 (8%)	0
Total	11 (9.9%)	45 (40.5%)	46 (41.4%)	3 (2.7%)	6(5.4%)

Table 2. TBSA burnt in different age groups.

Age group	TBSA burnt					
	1-10%	11-20%	21-30%	31-50%	51-70%	71-100%
Group I (Children less than 10 years)	31 (73.8%)	6 (14.2%)	1 (2.3%)	2 (4.7%)	2 (4.7%)	0
Group II (Males more than 10 years)	15 (34%)	4 (9%)	6 (13.6%)	5 (11.3%)	6 (13.6%)	8 (18.1%)
Group III (Females more than 10 years)	6 (24%)	4 (16%)	2 (8%)	4 (16%)	5 (20%)	4 (16%)
Total	52 (46.8%)	14 (12.6%)	9 (8.1%)	11 (9.9%)	13 (11.7%)	12 (10.8%)

Table 3. Outcome with respect to TBSA burnt.

TBSA Burnt	Outcome	
	Expired	Cured and discharged
1-10%	0	52 (100%)
11-20%	0	14 (100%)
21-30%	2 (22.2%)	7 (77.7%)
31-50%	6 (54.5%)	5 (45.4%)
51-70%	13 (100%)	0
71-100%	12 (100%)	0
Total	33 (29.7%)	78 (70.2%)

and II, had worn either cotton clothes or mixed fabric clothes, while group III patients had silk or cotton clothes at the time of incident.

The bulk of patients had burns less than 20% of total body surface area, mean being 11-20%. Almost half (46.8%) of our patients had TBSA burnt up to 10% and 59.4% of the total patients had burns upto 20% TBSA.. TBSA burnt in different age groups is shown in Table 2.

The degree of burns was also assessed in each patient, 67 (60.3%) patients had mixed degrees of burns. Out of 111 patients, 33 (29.7%) patients could not survive, while 78 (70.3%) patients improved were discharged for follow up in OPD. Outcome with respect to TBSA burnt is shown in Table 3. There was no survival in patients having burns of more than 50% TBSA.

Discussion

Burn is the most severe form of injury a human can have. It is associated with extreme pain, disfigurement, prolonged hospitalization and loss of life. Treatment is not only expensive but also exhausting. The causes of burn injuries vary in different societies and countries, but in majority they are preventable.

Mean age in this study was comparable with two different studies from Iran.[11,13] Males were more than females in our study. This is also shown in other international studies, from Iran, Japan, Australia and Turkey.[3,11,13,17,18]

In this study, children formed a large group of burn patients. This observation was paralleled by the series by Maghsoudi in which it was shown that the highest incidence of burns is in the age group 1-9 years.[11] This finding is supported by many other international studies.[4,8,10,16] Almost all of these paediatric burn injuries were preventable and this stresses the need for parental education and proper child proof safety measures at homes.

The mean total body surface area (TBSA) burnt in our study was comparable with other international studies by Garner, Pegg, Song and Komalafe.[3,4,8,11,13,16] The data from these international studies confirmed the observation that in the bulk of burn patients, the TBSA burnt is not more than 20%.

Our observation that a large number of patients get burn injuries at home, is supported by the work of Tarim which showed comparable figures.[18] Similarly our observation regarding the workplace injuries is parallel with that of Song and Chua.[4] However, Pegg has reported slightly different results in this regard and this mismatch could be due to the difference in the socio-economic conditions of various countries and difference in the cultures, habits and behaviours of different populations being studied.[3]

The cause of burns was variable in different age groups of our study, as is also shown in other international studies.[1,3,4] Regarding the cause of burns overall (irrespective of the age), our results are comparable to the work of Kobayashi, Saadat and Komolafe.[8,13,17] Regarding the scalding in pediatric population, quite similar figures have been reported in other studies.[1,9,14,15,19] However Pegg has reported quite a few number of scald cases in paediatric age group.[3] This difference might be due to difference in the parental educational status and socio economic conditions

of different countries.

In our study, the number of cases of inhalational injuries were less as compared to the work of Kobayashi and Pegg but this could be due to our relatively smaller sample size.[3,17]

The overall mortality in our series was very high as compared to the international literature.[4,8,18,20] Even the study from the developing country Iran showed lesser mortality rates.[11] In our study, there was no survival in patients having more than 50% TBSA burnt. Whether this high mortality rate in our series is due to inadequate resources, less expertise, or some other factors, is yet to be determined by further studies.

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