

A STUDY OF MORTALITY IN BURNS

(A review of 1513 cases)

* Prof. R. C. Sinha, M. B. B. S. (Hons.), M. S. (Gen. Surg.)
M. S. (Pl. Surg.), F. I. C. S. (U. S. A.)

** Dr. S. K. Verma, M. B. B. S. (Hons.), D. A. (Bihar), M. S. (Plas. Surg.)

Major burn injury is an extremely stressful experience both for the burn victims and their families. Burn is one of the commonest variety of trauma in our community, several thousand people being affected every year, resulting not only in loss of valuable life but also varying grades of residual debility in the survivors. Many of the patients die before expert treatment can be made available to them. Out of the immediate survivors many patients have to travel long distances to reach burn centres. This delay in treatment is one of several factors which enhance the mortality. Other factors are lack of expertise and resources at personal and institutional levels.

Mc Neill (1976) in a study of 1615 patients found that the percentage of burn injury and age of the patient are the two most significant prognostic factors. He also observed that females suffered, on an average 0.5% more area of burns, are 8.5 years older and have a mortality rate which is three times higher than in male patients.

Monafo et al (1978) found that the mean age of non-survivors was 47 years, 15 years more than the survivors. He also found that the victims of severe inhalation injury died usually within 42 hours even though the percentage of burn injury was not very large. Average hospital stay of patients was 133 days. Sepsis originating on the wound

directly or indirectly accounted for most of the late deaths, and the median lethal burn size ranged from 55% to 65%. Waisbren et al (1978) found that there was elevation in the concentration of lactic acid and blood urea with depression in bone marrow function before death.

Pegg et al (1979) had an overall mortality rate of 8.3 per cent in their patients in a period of 5½ years. Nearly twice the number of females (12.7 per cent) died as compared to males (6.5 per cent). Accidental body garment fire were responsible for the largest deaths. But accidental petrol burn was the single largest cause of death in males.

Materials and Methods

This study is based on patients admitted to the Plastic Surgery Deptt. of Patna Medical College Hospital, Patna from Jan., '70 to Dec., '79. A total of 1513 case-reports have been studied retrospectively to find out the incidence of age, sex, extent of trauma, mode of injury and the mortality.

Observation and discussion

In this study 25.77 per cent of the cases were children below 12 years of age. 63.05 per cent adults between 12 to 45 years of age and 11.16 per cent older than 45 years of age. The sex of children patients was comparable but in adults, males constituted only 1/3rd of the

* Associate Professor and Head of the Department of Plastic Surgery, P. M. C. H., Patna.

** Registrar, Department of Plastic Surgery P. M. C. H., Patna.

Table I

Age Group	No. of cases	Percentage of cases	Sex			
			Male		Female	
			No. of cases	% of cases	No. of cases	% of cases
0—12 years	390	25.77%	188	41.2%	202	51.7 %
12—45 years	954	63.05%	335	35.0%	619	64.8 %
Above 45 years	169	11.16%	56	33.1%	113	66.8 %

total. This is because of the fact that female folks in India are doing most of the work in the kitchen on open hearths wearing flowing garments like "Sari", "Orhni" etc.

Table II

Percentage area of burns	Total No. of cases	Percentage of cases
Below 15%	379	25.04%
15—30%	217	14.34%
Above 30 %	917	60.62%

Out of 1513 cases of burns 25.04% cases had less than 15 percent involvement of body surface area 14.34 percent had 15 to 30 per cent involvement and 60.62 per cent cases had more than 30 per cent injury. This indicates that about 2/3rd of the cases admitted for treatment of burns are major burns (Table II).

Table III

Mode of Injury	Total No. of cases	Percentage of cases
Cloth catching fire	1316	86.97%
Electric Burns	158	10.44%
Chemical Burns	15	0.99%
Scald	24	1.58%

The mode of burn injury is shown on table III, cloth catching fire was the commonest mode of burn. Scalding formed 1.5 percent cases only. This indicates that majority of the burn injuries could be prevented.

Table IV

Age of patients	Total No. of cases	Mortality	
		Total No. of cases	Percent of cases
0—12 years	390	72	18.4%
12—45 years	954	384	40.2%
Above 45 years	169	42	24.8%
Total	1513	498	32.8%

Mortality rate is shown on table IV. On analysing the mortality figures with relation to age we found that among the children there was a mortality of 18.4 percent whereas in patients aged 12 to 45 years the mortality was 40.2 per cent and in those above 45 years of age it was 24.8 percent. The high mortality among the adult was because they had great extent of burns.

Table V

Sex of Patient	Total no. of cases	Average involv- ment of body surface	Mortality	
			Total No. of cases	Percent of cases
Male	579	58.5%	213	37.7%
Female	934	62.6%	285	30.5 %

Table V shows mortality in relation to sex of the patients, males had 37.7 percent mortality and female 30.5 percent. This it would appear that males had about 7.2 percent less

chance of survival. This finding is contrary to that reported by Western authors.

Table VI

Percentage of burns	Total no. of cases	Mortality	
		Total no. of cases	percentage of cases.
Below 15%	379	Nil	Nil
15%-30%	217	22	4.41%
Above 30%	917	476	95.58%

A study of Table VI will show that the burn victims having more than 30% involvement of body surface area 95.58% cases could not survive. This may be because the cases are brought to us after many hours of the injury and most of the time the shock has set in. Because of malnutrition among many of the victims and the strain of transportation the mortality becomes still more high as compared to the figures of advanced countries where the burn victims get immediate specialist care in sophisticated burn centres.

Table VII

Cause of death	Total no. of cases	Percentage of cases
Shock	179	35.94%
Infection	111	22.20%
Renal Failure	70	14.06%
Anaemia & Hypoproteinemia	59	11.85%
Curling ulcer & Malena	40	8.00%
Peritonitis due to perforation of Curling Ulcer.	20	4.00%
Associated abortion	10	2.00%
Static Pneumonia	9	1.80%

The immediate cause of death is shown on the table VII. Among the non-survivors 35.94% cases died of shock. 22.20% due to overwhelming infections. 14.06% due to renal failure, 11.85% due to Anaemia and hypoproteinemia. 8% due to Curling ulcer and Malena and 4% due to Peritonitis due to perforation

of curling ulcer. 2% cases died after abortion during the immediate burn injury and 1.8% due to static Pneumonia. Death due to shock has almost become non-existent in developed countries because of timely institution of Scientific care of these unfortunate victims. With improvement in the treatment facilities for burn cases similar results can be obtained. In that case our overall mortality figure will not be much higher to that of the figures in Western Countries.

Table VIII

	Survivors	Non-Survivors
Mean extent of burn	37.2%	59.7%
Mean age of patients	17.9 years	26.5 years.
Mean Hospital Stay	97 days	19.4 days.

Mean extent of burn was 22.5% higher among non-survivors whereas mean age of patient was 8.6 years higher. The mean Hospital stay among the non-survivors was 19.4 days.

Summary & Conclusion :

1. Mortality among 1513 cases of burns admitted in Patna Medical college Hospital, Under Plastic Surgery Department from Jan., 1970 to Dec., 1979 were reviewed.
2. 60.62% of the cases were of major burns (above 30%), 14.34% were between 15% to 30% and 25.04% were below 15%.
3. There was a total mortality of 498 cases out of which 213 were males and 385 were females with an overall mortality of 37.7% in males and 30.5% in females.
4. 86.97% of the cases had received the burn injury due to cloth catching fire and the accident was preventable.
5. 40.2% of the cases were from the age group 12 to 45 years. 24.8% above 45 years and 18.4 below 12 years.

6. In 35.94% of the cases the causes of death was shock. Whereas in 22.2% cases it was infection, 14.06% renal failure. more in non-survivors. whereas the mean age of non-survivors was 8.6% higher. The Hospital stay among the patients who died was 19.4 days.
7. The mean extent of burn was 22.5%

References :

1. BULL J. P. : Revised Analysis of mortality due to burn. *Lancet*, 2 : 113, 1971
2. DALE R. H. : Electrical Accidents. *Brit. J. of Plastic Surg.*, 7 : 44, 1954.
3. McNEILL D. C. : A survey of 1600 admissions to a regional burn unit. *Recent Advances in Plastic Surgery*, 1 : 93, 1976.
4. MONAFO, W. W., ROBINSON H. N. & YOSHIOKA : T : Lethal burn, *Arch. of Surg.* 113 : 397, 1978.
5. PEGG S. P., GREGORY J. J., HOGAN P. G. & MOTTARELLY I. W. : Epidemiological pattern of adult burn injuries, *Burns* 5 (V) : 325, 1979.
6. WAISBREN B. A. ? STERN M AND COLLENTINE, C. E. : Data for Comparative Study from a burn Centre, *Burns*, 5 (I) : 34, 1978.