 DOI: 10.18231/2394-6776.2017.0005

Study of predisposing factors in fatal thermal injuries

Sudeepa Das[1], Niranjan Sahoo[2,*], MK Hansda[3], SN Mishra[4], AK Shukla[5]

[1]Associate Professor, [5]Senior Resident, MKCG Medical College, Berhampur, Odisha, [2,3]Assistant Professor, [4]Junior Resident, IMS & SUM Hospital, Bhubaneswar, Odisha

***Corresponding Author:**
Email: nira.cuttack@gmail.com

Abstract

Thermal burns are major cause of death and disability affecting to the developing countries like India. High mortality has become a medical problem in rural India. The females are the usual sufferers. The mortality is almost 100% at the extremes of the age. Mostly the incidence took place in living place. Thin built and medium built individuals are usual sufferers with stout built individuals pose a great defense with less mortality. Higher income group people are the least sufferers. Most important factor is the percentage of surface area burn which is responsible for the fatality of the cases.

Keywords: Burn, Fatal, Predisposing factor, Thermal injury.

Introduction

Burn deaths are an important public health problem in a developing country like India. Though injury caused by burn is one of the most important preventable causes of prolonged illness and death, it has failed to catch the attraction of both of medical profession and lay public, only because the colossal losses of life, money and time are not eye catching like epidemics of infectious diseases, that sweep away number of lives in a short time.(1)

Among the world India in 1998, was the only country where fire (burns) was classified amongst the 15 leading causes of death. High mortality in young married women from burns has already become an alarming & continuous medical problem in rural India. The incidences of burn mortality by age, sex, residence, marital status; manner & reasons have been reported only in frequently from the rural parts of India.(2)

As regards the cause of death of burn patients are concerned there are some immediate causes like shock, suffocation, accidental injuries & some delayed causes like Septicemia, renal failure etc.(3)

Many factors decide the fate of burn patients but the important predisposing factors like age, sex, percentage of burn on the body, physical characteristics of patient, place of incidence & socio-economic status play a major role in the outcome of success. Burn is an important thermal injury which is encountered mostly in our hospital. Therefore these criteria are selected for study purpose in a referral hospital.

Aims & Objectives

The present study is taken up with an aim to identify the predisposing factors that are responsible for production of fatality in burn patients of this locality.

The objective is to point-out the most important predisposing factor to the treating physician which when taken care of will reduce the rate of mortality of the burn patients in long run. Subsequently it will also help us to create awareness to the public.

Materials & Methods

The prospective study is carried out in the Department of FMT, MKCG. Medical College, Odisha over a period of 2 year starting from 1st May 2008 to 30th June 2010 with active support & help from the Department of General Surgery/Plastic Surgery.

Inclusion criteria: Out of all the burnt cases only the patients admitted as inpatient to the surgical ward within said period.

Exclusion criteria: The rest which were disposed of from OPD.

The percentage of burn injury is calculated by using either the Rule of nine or Rule of palm or even by Lund & Browder charts depending upon the age of patient. Each case after obtaining consent was studied according to a pre-designed pro-forma.

All the data were collected in a chart & subsequently the findings are compared with the findings of other workers in due course. Valiant effort is made to specify the most important factor responsible for fatality in burn patients pertaining to this hospital.

Results

A total number of 170 cases admitted to both female and male surgical ward during this period of two years were taken as study material. All the cases were studied and the details of which are given in tabular form:

Table 1: Sex wise distribution of burn cases

Sex	Number of patient affected	Number of Patient died	% of patient died
Male	60	6	10
Female	110	50	45.45

Total	170	56	32.94

Table 1 revealed that most of the burn cases are seen in females with proportionate high death rate.

Table 2: Age Distribution

Age in years	Number of patient affected	Number of Patient died	% of death
0 -10	20	10	50
11-20	58	18	31
21-30	41	6	14.63
31-40	33	11	33.3
41-50	10	3	30
51-60	8	8	100
>60	0	0	0
Total	170	56	32.94

Table 2 depicts that, 56 patients out of total number of 170 cases admitted during the period of study died amounting to a mortality of 32.94%. It is observed that mostly the individuals aged between 11-20 years have suffered. The fatality is more when age is at the extremes followed by a fatality of 33.3% in 31-40 yrs.

Table 3 describes that there is 100% chance of fatality when the total body surface area burnt is above 80%.

Table 3: Relation of cases with % of burns

% of TBSA affected	Number of patient affected	Number of Patient died	% of death
0-10	10	0	0
11-20	9	0	0
21-30	30	3	10
31-40	54	5	9.25
41-50	11	2	18.18
51-60	12	5	41.66
61-70	8	6	75
71-80	6	5	83.33
81-90	10	10	100
91-100	20	20	100

It is observed from the table 4 that out of 170 cases, in 130 cases incidence took place in living place (76.47%) and proportionately the death rate is 38.46%.

Table 4: Burn cases in relation to site of incidence

rSite of Incidence	Number of patient affected	Number of Patient died	% of patient died
Working Place	40	6	15
Living Place	130	50	38.46

Table 5: Body built distribution wise burn cases

Body built	Number of patient Affected	% of patient Affected	Number of Patient died	% of patient died
Thin	60	35.29	34	56.66
Medium	82	48.23	20	24.39
Stout	28	16.47	2	7.14

It is observed from the above table that majority of the sufferers are medium body built persons (48.23%) followed by thin built persons (35.29%), but the fatality is more in thin built rather than medium built.

Table 6: Socio-economic status in relation to patient affected by burns

Socio-economic	Number of patient Affected	Number of Patient Died	% of patient Died
Low	70	27	38.57
Medium	88	28	31.81
High	12	1	8.33

The above picture depicts that more number of cases belongs to medium socio-economic status group followed by low socio-economic status group. But the percentage of death is more in low socioeconomic groups.

Discussion

170 admitted cases were taken as cohort for study. During the process of our study it has been observed that out of 170 cases, 110 cases were of females (64.7%) whereas the rest of the cases belong to male which suggest that females are the main sufferers of burn injuries irrespective of any cause. As regards the age is concerned, the maximum sufferers irrespective of sex were from the age group 11-30 yrs. The reason of female being the most sufferers at a young age may be mainly attributed to early marriage, habit and to a lesser extent due to fatty predisposition. Similar findings has also been observed by studies taken earlier by different authors like Kumar V. et al, Prem N. Sharma et al and Reddy in different regions of India.

It has been observed that only 30 individual with more than 80% total body surface area affected and succumb to the injury in spite of the best available treatment. At the same time 84 persons got admitted with 20-40% of the surface burns out of which 8 persons died amounting to 9.52% mortality. This suggest that the percentage of surface area involved is probably the key factor in deciding the fatality of the injured which coincides with the age old saying that the fatality is more when percentage of burn is more than 50%. This finding has also been observed by Prem N. Sharma et al.

Subsequently, it has been observed that in 130 out of 170 cases the incidence took place in living place. This high incidence in living place mostly affecting females may be due to reason that they mostly confined themselves to the household activities and domestic confines and at the same time they are unemployed. This fact coincides with the findings observed by Romano C et al where he

observed that an incidence of 19% in occupational settings and also in a study taken by Song C et al in Singapore revealed 33.4% of total admission was from occupational incidence.

Our study revealed that thin built and medium built persons almost suffered equally. But peculiarly the mortality is comparatively very high in thin built individuals than medium built ones. On the contrary 28 cases out of 170 cases were of stout built 2 of them succumbed during the treatment. The high mortality in thin built individuals could be due to less of muscle power and offered resistance.

The socio-economic status of the people of this region is average or less than average. When we took up socio-economic status as one of the factor we have observed that the middle income groups followed by the low income group were the sufferers. It has been observed that the mortality is slightly higher in low income group in comparison to medium income group. The reason for this may be attributed mainly to the higher percentage of burn in middle income group & better treatment by the treating doctors. This observation has also been pointed out by Edelman S et al in 2006.

Conclusion

Burn injury is one of the leading causes of death in India & most of the cases are reported from rural India. Because of its complex & varied nature, many at time cases are not reported specially from the urban & suburban areas. In our study each factor has got some influence on the outcome of the fatality of the patient. However, the factors like feminine gender; extreme age; habitat & most importantly the percentages of burn are the factors which are mainly responsible for the outcome of the mortality of the patients.

Deaths arising out of burns are on rise. Our study is just in search of the key factors which are responsible for the fatalities in these cases. A broader study consisting of many patients over a period of years is required to specify the prime factors which are directly linked to the fatality, so that their application in future by the doctors during treatment will be of much help in reducing the mortality.

Conflict of Interest: Nil

Funding: Nil

References

1. Kumar V, Mohanty MK, Kanth S, Fatal burns in Manipal area: a 10 year study. Journal of Forensic and Legal Medicine, 2007 Jan 14(1) 3-6.
2. Batra AK, Burn mortality Recent trends & socio-cultural determinants in rural India, Burns May 2003;29(3),270-275.
3. K.S. Narayana Reddy, Thermal deaths, 2014, 33th edn, Page 321-322.
4. Prem N. Sharma, Rameshwar L. Bang, Ibrahim E. Ghoneim, Sarla Bang, Promila Sharma, Mohammed K. Ebrahim. Predicting factors influencing the fatal outcome of burns in Kuwait. Burns, 2005 Mar 31(2)188-192.
5. Romano C et al, Comparison of occupational & home accidents as a cause of severe burns. The experience of a large burn center in a industrial city. G Ital Med Lav 1989 May-Jul 11(3-4) 123-128.
6. Song C, Chua A. Epidemiology of burn injuries in Singapore from 1997 to 2003.Burns 2005 Jan Suppl 1 S18-S26.
7. Edelman LS. Social & economic factors associated with the risk of burn injury. Burns, 2007 Dec 33(8), 958-965.