Patterns of Burns Cases Brought to M G H, Khammam

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Abstract

The present study was carried out in the Department of Forensic Medicine, Mamata Medical College, Khammam, Andhra Pradesh; India and 154 burns cases admitted in MGH during one year study period from Jan 2011 to Dec2011. The age group of 21-30 years 115 [74.67%] cases was most commonly affected .Female preponderance was seen in all age groups as compared to male victims, with male to female ratio 1:5. The married females 125[87.14%] were from rural area [62.33%], were encountered during winter season and occurred during night time. Most of the victims survived for a period of 12 to 24 hours 98[63.63%].In 44[28.57%] cases, total body surface area involved was more than 75% .The thermal burns 121[78.57%] were most commonly noted followed by electrical burns 21[13.63%] and scalds8 [2.19%].Head, face & neck 132 [85.71%] region of body was most commonly affected followed by chest 21 [13.63%] region of body. In 129[83.76%] cases, kerosene was involved leading to fatal burns. Accidental burns132 [85.71%] cases were most common followed by suicidal 12 [7.79%] and homicidal burns8 [5.19%].Majority of deaths due to burns were observed within 1 week98 [63.63%] and died from neurogenic shock76 [49.35%] followed by septicemia 40[25.97%] and taxaemia14 [9.09%]. Majority of victims who died from burns, signs of vitality were found at autopsy. The purpose of this study was to focus on the socio-demographic profile, pattern of burns and to study the medico legal and social causes. The results of this study provide the necessary information to develop proper burn prevention programs, thereby reducing the frequency of burns and burns–related deaths.

Key words: *scald, burn, patterns of burn, demographical profile, causes of death,*

Introduction:

Burns are injuries produced by application of dry heat such as flame, radiant heat or some heated solid substance like metal or glass to the body. Local injury to the body by heat may result from dry heat, application of hot bodies, licking by flames resulting in simple burns, moist heat leading to scalds, and corrosive poisons resulting corrosive burns.[1]Burns are a global public health problem, accounting for an estimated 1,95,000 deaths annually. Burns are an important cause of injury to young children, and married woman, being the third most frequent cause of injury resulting in death.[2]

The term burn is restricted to the local effects of dry heat, by law all dry heat lesions have been designated as burns and substantially affecting every population and mostly every developing country. Burns are the fourth most common type of trauma worldwide and have tremendous medico-legal importance as they may be considered to be the commonest cause of unnatural deaths in India, causing considerable morbidity and mortality. Burns have always been considered as one of the most destructive injuries, causing not only deaths but also major economic and psychological impacts and long term somatic sequelae as well.

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Aims and Objectives: To study

Socio-demographic profile of burns victims and pattern of burns injuries in a tertiary care hospital.
The relationship to area of burnt and total percentage of burns sustained.
The causative factors and their preventive measures

Material and methods:
The present study was carried out for a period of one year from Jan 2011-Dec 2011 in the Department of Forensic Medicine, Mamata Medical College attached with Mamata General Hospital, Khammam; Andhra Pradesh. Details of the cases were collected in a Proforma from patients, accompanied persons, interview of friends, relatives and letters left over by the victims, hospital records, inquest reports, police papers and the autopsy reports.

Observation and Results:
During the study period, a total of 2565 medico-legal cases were admitted out of which 154 burn injury cases were admitted in burn unit.
As per the age of the victims, most of the victims 115[74.67%] were between 21-30 years of age followed by31-40 years age group 16[10.38%], minimum 11[7.14%] were from 11-20 years age and least were 3[1.94%] from 41 -50 years age and no cases were reported in the extreme age groups outside 51-70 years. Scalds were seen in 1-10 years age group as depicted in table no.1

Female victims, 130 [84.41%] were out-numbered as compared to male 24 [15.58%] with male to female ratio is being 1:5.41. Most of the victims 134[87.01%] were married and 20[12.98%] were unmarried with married unmarried ratio of 6.7:1 Of the females, 125 [81.16%] were married and 5[3.24%] unmarried in contrast to males 9[5.84%] married and 15[9.74%] unmarried.

Most of the victims were from Hindu community 144[93.50%] followed by Muslim 22[14.28%] and 18[11.68%] least were belong to Christian community. Of total 154, most of the victims 96 [62.33%] came from rural area and rest 58 [37.66%] were from urban area.

Occupation wise, most of the victims125 [85.16%] were house wives followed by labour 14[9.09%] and least 8 [5.19%] employed. According to educational status, majority of victims were literate 95[61.68%] whereas illiterate 59[38.31%].Literates including higher educated 44[28.57%], secondary educated 36[23.37%], 11[7.19%] intermediate and graduate educated 4[2.54%]

Majority of cases 121[78.57%] were belonging to middle socio-economic class followed by lower 28[18.18%] and next were from high socioeconomic class 5[3.24%]. Maximum number of victims had mixed 68[44.15%] type of clothes at the time of injury followed by synthetic49 [31.81%] and cotton37 [24.02%].

As per seasonal variation, highest proportion occurred in winter 76[49.35%], followed by summer 51 [33.61%] and minimum 27 [17.53%] were from rainy seasons depicted in table no.2 .Regarding variations in burn injury with time of day, maximum150 [97.40%] number of burns occurred in between 6pm to 6am while minimum5 [2.59%] number of burns occurred between 6am-6pm.According to accident place, majority of burns142 [92.20%] took place at home followed by outdoor locations 10[18.51%] and a small percentage at work place2 [1.29%].

As noted in our study accidental burning 132[85.71%] was commonest manner of deaths due to burning followed by suicidal 12[7.79%] and homicidal 8[5.19%] burning. All Suicide and homicide cases are common in female while accidental 24 burn cases were common in male.

As per survival period, 116 of total death cases, the majority 98[63.63%] of deaths due to burns occurred within a week of the incident. During this period the maximum65 [42.20%] number of deaths occurred within 24 hours.18 [11.68%] deaths occurred in more than 2weeks after the incident. All most all of the victims received treatment and no spot dead and brought dead victims were reported in this study.

As per pattern of burns, Thermal [flame] burns 121[78.58%] was most common major cause of burns followed by electrical burns 21[13.63%] next scald 8[5.19%] and 4[2.54%] least were chemical burns as depicted in table no.3. Analysis of mode of flame burn injuries revealed that 129[83.76%] burns were due to fire, pouring of kerosene over body and 21 victims sustained electrical burns accidentally. Scalds were reported to be the major cause of thermal injuries in children. Chemical burns were seen in 4 victims. In 129[83.76%] cases, kerosene was involved leading to fatal burns.

Neurogenic shock was the most common cause of death in76 [49.355] cases followed by septicaemia 40[25.97%], asphyxia8 [5.19%] and inhalation injury 6[3.89%. Hypovolemic shock and toxaemia 14[9.09%] and multi organ failure10 [6.495] were other causes as depicted in table no.5

Head, face & neck region of body was found to be most commonly affected in112 [79.22%] victims followed by chest 12 [7.79%], next upper limb 10[6.49%] and abdomen & lower limb each 8[5.19%] region of body as depicted in table no.4

The distribution of mortality according to sex, the overall mortality of victims is 116[75.32%] with males comprising 4[2.59%] and females 112[72.72%]

The relation between percentage of TBSA (total body surface area) burnt and sex, it is evident that majority of 76[49.35%] victims had burns from 26 to 50% TBSA followed by 26%-51-75% range 44[28.57%], next 20[12.98%] up to 76-100% range and least 14[9.09%] were up to 25% of TBSA involved. Most of the male victims had burns up to 25% TBSA and in contrast most of the female victims had burns more than 75% TBSA as depicted in table no.6

Our data declared that the majority of the victims76 [49.35%] who died from burns, signs of vitality [soot in airways and digestive tract] were found at autopsy.

Discussion:

In the present study most of the victims were between 21-30 years of age. These are consistent with other studies.[1-7] These age group is young active group and which are commonly involved in fatal burn accidents due to lack of adequate safety measures and awareness while working**.**

In our study, out of 154 burn cases, 130 [84.41%] were females and 24[15.58%] were males.[8,9,10] Similar findings are observed by authors.[5-9] This female predominance may be due to gender difference, sociocultural factors and dowry problem

Married people 134 [87.01%] were outnumbered un- married people 20 [12.98%]. These are consistent with authors.[3-6] Married people were usual victims of burns as compared to unmarried persons. In India suicidal and homicidal burn victims were more common in married females. The reason for this may be custom of dowry and marital disharmony which compel the married females either to commit suicide or they may be got burn injuries by their in-laws and husband

Maximum number of victims 68[44.15%] had mixed type of clothes at the time of injury. Similar findings are observed by authors.[2,3] The cooking activities involving fire associated with wearing loose synthetic material leads to accidental burns.

As per the religion, most of the 144[93.50%] victims were belong to Hindu community while compare to other community. These are consistent with authors.[5,6] The reason for the Hindu predominance is that, in this part of the country Hinduism is the most commonly followed religion.

Rural population [62.33%] outnumbered urban population [37.66%]. Similar findings are observed by authors.[7,18] The traditional kerosene stove which is extensively used in the rural for cooking, hot water for bathing, casual handling of kerosene with minimal safety measures, living low standards of socioeconomic status these are the reasons for increased incidence of burn cases among rural population.

As per educational status, majority of 59[38.31%] victims were illiterates. These are consistent with authors.[5,6,9] High incidence of burn injuries in illiterate people than literate because illiteracy is usually associated with ignorance, poor socioeconomic status and lack of knowledge about preventive measures

Majority of 121[78.57%] victims were belonging to middle socio-economic class. Similar findings are made by authors.[6-9,18] The middle socioeconomic group usually follows the modernization of living styles making persons more prone for burn injuries.

Occupation wise, 125[81.16%] house wives have topped among other occupations .These are consistent with authors.[9-12] Burns are more common in housewives than other occupation because housewives are more exposed to injury prone environment while cooking. Use of kerosene pressure stove, dowry problem, marital dismormony and wearing of loose clothes makes them more prone for burn injuries.

Seasonal variations in our study showed that burn injuries occurred mostly in winter season76 [49.35%] followed by summer51 [33.16%] which are similar to authors finding.[12,17] This might be due to the fact that in winter, there is more need for hot water for bathing and people come in contact with warm items.

Maximum number of cases occurred during evening time. These are consistent with authors. Maximum number of burns150 [97.40%] occurred in between 5pm to 11 pm while minimum number of burns 4[2.59%] occurred between 11pm-5am when most of people are sleeping. It is clear that one is busy during evening hours in cooking and a mistake with fire in hurry can result in burns.

Regarding place of accident, majority accidents142 [92.20%] occurred in houses. Similar findings are made by authors.[11,17] Majority of burns occur at home it may be because of majority of victims were house wives less work sources, poor housing conditions, not taking safety measures at home

As per manner**,** most of the burn injuries were accidental in nature132 [85.71%] followed by suicidal 12[7.79%] and homicidal burns 8 [5.19%]. Similar findings were made by authors.[6-18] Suicide cases are common in female while accidental is common in male. Accidental burns are common may be because of ignorance, poor standards of safety measures, cooking at floor level and wearing of loose nighty, sarees or dupatta.

As per degree of burns, most of the victims 65[42.20%] showed dermo-epidermal burns. This was consistent with authors.[5-8] Most of the victims are wearing mixed type of loose nighty, sarees or dupatta clothes at the time of injury

As per pattern of burns, the flame burns 121[78.57%] was most common major cause of burns followed by electrical burns 23[14.93%] and scalds 8 [5.19%] and chemical burns were 2[1.29%]. Similar results are observed by authors.[2-18]

Kerosene was major factor [129[83.76%] which is involved in causing flame burn as stove bursting 55[35.71%], fall of kerosene oil lamp32 [20.77%], clothes catching fire22 [14.28%] and pouring of kerosene over body20 [12.98%].These findings were consistent with Indian authors.[10-18] Kerosene is routinely used for domestic purpose as it is cheap and easily available especially for poor people living in rural parts of India.

As per survival period, 116 of total death cases, the majority 98[63.63%] of deaths due to burns occurred within a week of the incident. During this period the maximum65 [42.20%] number of deaths occurred within 24 hours.18 [11.68%] deaths occurred in more than 2weeks after the incident. There is positive correlation between percentage of TBSA and duration to survive. Similar findings are observed by authors.[15-18]

Neurogenic shock was the most common cause of death in76 [49.355] cases followed by septicemia 40[25.97%], asphyxia 8 [5.19%] and inhalation injury 6[3.89%]]. Hypovolemic shock and toxemia 14[9.09%] and multi organ failure10 [6.495] were other causes. These are consistent with other authors.[12,14,15]

Head, face & neck region of body was most commonly affected in112 [79.22%] victims followed by chest 12 [7.79%], next upper limb 10[6.49%] and abdomen and lower limb each 8[5.19%] region of body. These are consistent with other authors.[16,17,18]

In present study majority of the victims had more than 50% of TBSA burns indicating the incompatibility with life even at a tertiary care hospital. Moreover, in 12.98% of the suicidal victims TBSA were more than 80%as compared to total victims where it was 38%.it again shows the definite mortality in suicide even in referral Center. These are similar to authors.[6-19]

Our data declared that the majority of the victims76 [49.35%] who died from burn, signs of vitality [soot in airways and digestive tract] were found at autopsy. These findings are consistent with authors.[12,18]

Preventive measures:

The social aspect of burns could be taken care of by increasing literacy levels, empowering women, proper counselling and educating people about safety measures. The appropriate legislations and their proper implementations can reduce the incidence of domestic accidents. The epidemiological factors of burn injuries vary in different countries and knowing socio-demographic profile, pattern of burn injuries may help in planning and implementing prevention programs. The approach has to be multi-disciplinary, and coordinated.

Conclusion:

The married females in the age group 20-30 years are more prone to burns. Flame burns are most common cause of burns. Electric burns are more common in males. Burn injuries are more common in rural population, occurred at homes, encountered during winter season and a higher occurrence of fatal burns in the night. Kerosene is the most common causative factor responsible and accidental in nature. Most of the deaths occur within a week of the incidence and neurogenic shock remains the major cause of burn deaths. In most of the burn deaths, burns extend above 60% of TBSA and victims who died from burns signs of vitality were found at autopsy.

References:

1. Othman N, Kendrick D. Epidemiology of burn injuries in the East Mediterranean Region: a systemic review. BMC Public Health 2010;10:83
2. Ambade VN .Study of burn deaths in Nagpur, CentralIndia. Burns 2006;32[7]:902-8
3. Bhagyashri Hungda, Arun Joshi, Ashok Kumar Shetty, Ajay Kumar S.

Epidemiology of burn Deaths in North Karnataka MLUD, 2012:12[1] 46-48.
4. Mohanthy MK.Self-inflicted burn fatalities in Manipal, India. Med Sci Law 2005; 45[1]:27-30.
5. Shanmugakrishnan RR, NarayanV, PTKS Manian.Epidemiology of burns in a teaching hospital in South India. Indian J Plast Surg 2008;41[1]:34-7
6. Hungund B, Joshi A, Shetty AK, Kumar SA. Epidemiology of Burn Deaths in North Karnataka. Medico-Legal Update. 2012; 12(1):46-48.
7. Dhiraj B, Hemant K, Rajesh D, Ramesh Savardekar. Pattern of Burns Cases brought to Morgue, Sion Hospital, Mumbai: A Two year study. JIAFM. 2011; 33(4):309-310.
8. Shankar G, Naik Vijaya A, Rajesh Powar, Ravindra Honnugar, Mallapur MD. Epidemology and Outcome of Burn Injuries. JIAFM.2012, 34[4]:312-314.
9. N.P.Zanad, H.V.Godbole.Study of Fatal Burn Cases in Medico-legal Autopsies.JIAFM, 2007, 27[3]:42-9.
10. Pravin N Yerpude, Keerthi S Jogdand.A Hospital based study of burn patients in an apex Institute of Maharashtra. Indian journal of Forensic Medicine and Toxicology.2011;5[2]:85-88.
11. Usama B Ghaffar, Munnawar Husain and Shameem J Rizvi. Thermal Burn: An Epidemiological Prospective Study Indian Acad Forensic Med, 30[1]2007:10-14.
12. Vaghela prithuviraj singh C, Ahir Ghanshyam N, Patel Malay. Epidemiology of Fatal Burn Cases in G.K. General Hospital, Bhuj. National Journal of Community Medicine.2012; 3[2]:326-329.
13. Anju Rani, C Behera, Sunil, P C Dikshit. Patterns of Scald Burns in Central Delhi. A retrospective study. J Indian Acad Forensic Med October-December 2012,vol.34.34,No.4:295-298
14. Dalbir Singh, Prabir k .Jash, Seema Tyagi. Recent Trends in Burn Mortality in Northwest India and Its Preventive Aspects.JIAFM.1997:19[4]:79-88.
15. Gowri Shankar, Vijaya A Naik. Epidemiological study of Suicidal and Homicidal Burn injuries Admitted in Tertiary Care Hospitals Belgaum District, Karnataka State, India. Medico-Legal Update. 2012:12[1]:11-12.
16. Mostafa M.Afify, NaglaaF, Ghada M. Abd El Azzim, NeveinA, El Desouky. Fatal burn injuries: A five year retrospective autopsy study in Cairo city, Egyptian journal of Forensic Science[2012]2,117-122
17. M.Subramanyam: Epidemiology of burns in a district hospital in Western India, Burns.1996:22[6]:439-42.
18. Richa Guptha, Vikas Kumar, S K Tripathi. Profile of the Fatal Burn Deaths from the Varanasi Region, India. Journal of clinical and diagnostic research .2012; 2[6]:608-611.
19. V V Pillay Forensic Medicine and Toxicology.2013:16th Edition, Paras Publishers. Injuries due to Heat: pp230

Table no.1: Age & Gender wise distribution

Age (Years)	Male	%	Female	%	Total
1 – 10	6	3.89	3	2.31	9(6.20%)
11 – 20	9	5.84	2	1.54	11(7.38%)
21 – 30	8	5.19	107	82.30	115(87.5%)
31 – 40	1	0.64	15	11.54	16(12.18%)
41 – 50	0	0	3	2.31	3 (2.32%)
51 – 60	0	0	0	0	0
>60	0	0	0	0	0
Total	24	15.58	130	84.42	154 (100%)

Table.no.2: Seasonal variation

Season	Months	No. of Cases
Winter	Nov, Dec, Jan, Feb	76 (49.34%)
Summer	Mar, Apr, May, Jun	51(33.15%)
Rainy	Jul, Aug, Sept, Oct	27(17.51 %)
Total		154 (100%)

Table no.3: Type of burns distribution

Type of burn	No. of Cases	%
Thermal	121	78.57
Electrical	23	14.93
Chemical	2	1.29
Scalds	8	5.19
Total	154	100

Table no.4: Surface area burnt

Area of body burnt	No. of Cases	%
Head, Face & Neck	112	72.73
Chest	12	7.79
Abdomen	8	5.20
Back	4	2.60
Upper Limbs	10	6.49
Lower Limbs	8	5.19
Genitals	0	00
Total	154	

Table no 5. Causes of burn deaths

Cause	No. of Cases	%
Burn Shock	76	49.35
Toxemia	14	9.09
Septic Shock	40	25.97
Acute Tubular Necrosis	10	6.49
Complications	6	3.89
Smoke Suffocation	8	5.19

Table no.6 body surface area involved

% of burn	No. of cases	%
Upto 25	14	9.10
25 – 50	76	49.35
51 – 75	44	28.57
76 – 100	20	12.98
Total	154	100