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Research Article

TRENDS OF BURN CASES AT MEDICAL COLLEGE AND HOSPITAL IN CENTRAL INDIA DURING THE PERIOD OF MAY 2007 TO APRIL 2009

Pawar Vishwajeet^{1*}, Murkey Pankaj², Tirpude Bipinchandra³

¹Asst. Prof. Dept. of FMT SRTRGMCH, Ambajogai Dist BEED

²Prof. Dept. of FMT MGIMS, Sewagram Wardha

³Prof. and Head Deptt of FMT MGIMS, Sewagram Wardha

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*Corresponding Author: Pawar Vishwajeet

Asst. Prof. Dept. of FMT SRTRGMCH, Ambajogai Dist BEED

ABSTRACT

Total 348 burn cases were admitted at a medical college and hospital in Central India and studied during the period from May 2007 to April 2009. Out of which 196 patients died during treatment. Most of the burn cases were from rural area. Females outnumbered males as there were (62.64%) females and (37.36%) males with overall male to female ratio of 1:1.67. Maximum incidence was in the young adults between the age group of 20-39 years, comprising of (54.59%) cases. Most of the burn cases belong to low socio-economic status. In both sexes majority of the burn cases were married. Most of the burn cases sustain flame burns followed by scalds and electric burns. Flame burns were predominantly observed in females. As per history at the time of admission, most of the burn cases were accidental, followed by suicidal and homicidal. Among accidental and suicidal burns majority of the cases were females and all the homicidal burn cases were females. Maximum patients have dermo-epidermal burns. Maximum (54.02%) burn cases had involved more than 50% of total body surface area. Overall case fatality rate was (56.32%). Case fatality was higher in females (68.80%) followed by males (35.38%). Case fatality was low in burns involving less than 30% of total body surface area. Case fatality was highest in suicidal burn cases (82.60%) followed by homicidal (66.66%) and accidental (50%). Commonest cause of death was septicemia alone or in combination with other causes constituting (84.69%) cases of total thermal burns.

Keywords: Burn cases, Economic status, Flame, Case fatality, Homicidal, Suicidal, Accidental.

INTRODUCTION

Medical profession is the most noble but a complicated one as it deals with human being. A doctor is under obligation to treat the patients with due care, sincerity and skill. At the same time in moments of crisis, he has to take immediate decisions and once something is done it cannot be undone, which might be possible in other faculties of science.

Medico-legal work an essential segment of comprehensive services rendered by medical college and its associated hospitals, has traditionally been carried out by general medical officers posted in casualty till late.

Burn injury is one of the common medical emergencies admitted to any hospital and is an important public health problem throughout the world. Burning has been occurring since time immemorial. India has ancient culture where fire is worshipped traditionally as "AGNIDEV". If used with precaution it is of great help to mankind and when precautions not observed, it creates disaster instead of helping, resulting in burns of human body and property.

"Bride burning" phenomenon supposedly a derivative of eroded moral standards of a society where material gains even through wedlock justified any depravity, for insufficient "dower" have in the latter half of this decade been cited as the prime motivation of killing the young bride, so as to remarry again for gainful proposition of the bride. The investigation of dowry death and bride burning is very difficult mainly because of complex situation such as the false counter allegation from complainants and accused parties.

AIMS & OBJECTIVES

1. To find out the **Incidence** of Burn cases at a medical college and hospital in Central India, during the period from May 2007 to April 2009.
2. To study the **impact of various factors** on Burn cases in this area.
3. To know the **trends** of Burn cases admitted in the hospital.
4. To analyze the Burn cases according to **manner of event**.
5. To determine the **case fatality rate** and the factors affecting it in Burn cases.

6. To study the *salient gross postmortem finding* and cause of death in different type of Burn cases.

MATERIALS AND METHODS

A) Study design:

This study is being carried out at a medical college and hospital in Central India during the period from May 2007 to April 2009.

B) Source:

The material for this study comprised of all types of medico-legal cases/Burn cases admitted and brought to the casualty during the period from May 2007 to April 2009.

C) Sample size:

Total 348 burn cases have been studied, out of which 196 cases died in the hospital during the treatment.

OBSERVATIONS AND RESULTS

Table 1: Showing Year-Wise Incidence of Burn Cases

Year	No. of cases	Percentage
May 2007 to April 2008	166	(47.70%)
May 2008 to April 2009	182	(52.30%)
Total	348	100%

Table 2: Showing Age and Sex Wise Incidence of Burn Cases

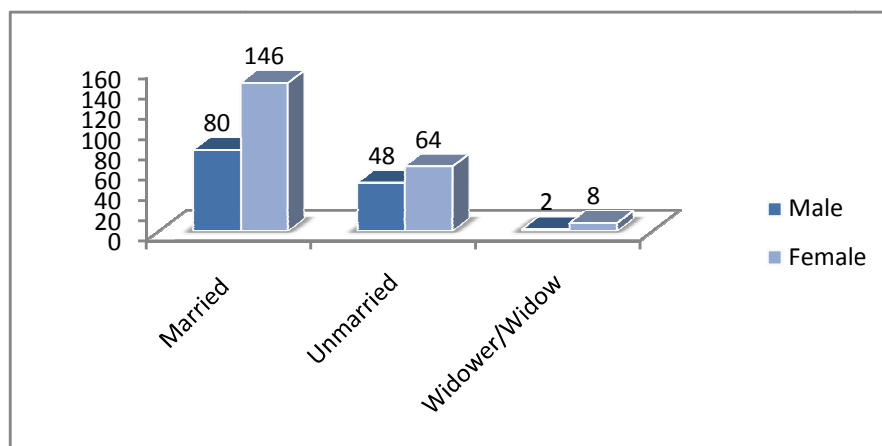
Age in years	Male cases	Female cases	Total cases	Sex ratio
0-9 yrs	20(15.38%)	16(7.33%)	36(10.34%)	1.25:1
10-19 yrs	10(7.69%)	44(20.18%)	54(15.51%)	1:4.4
20-29 yrs	36(27.69%)	72(33.02%)	108(31.03%)	1:2
30-39 yrs	28(21.53%)	54(24.77%)	82(23.56%)	1:1.9
40-49 yrs	24(18.46%)	18(8.26%)	42(12.06%)	1.3:1
>50 yrs	12(9.23%)	14(6.42%)	26(7.47%)	1:1.16
Total	130(37.35%)	218(62.64%)	348(100%)	1:1.67

Table 3: Showing Rural/Urban Incidence of Burn Cases

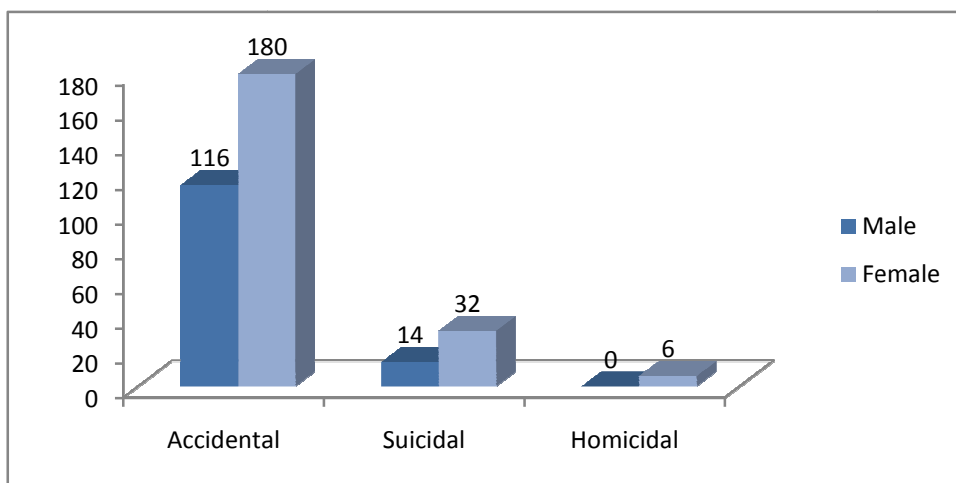
Rural/Urban	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
Rural	110	(84.61%)	190	(87.15%)	300	(86.20%)
Urban	20	(15.38%)	28	(12.84%)	48	(13.79%)
Total	130	100	218	100	348	100%

Table 4: Showing Socioeconomic Status of Burn Cases

Socioeconomic status	Male		Female		Total	
	Cases	%	Cases	%	Cases	%
Lower	112	(86.15%)	190	(87.15%)	302	(86.78%)
Middle	18	(13.84%)	20	(9.17%)	38	(10.90%)
Higher	-	-	8	(3.66%)	8	(2.98%)
Total	130	(100%)	218	(100%)	348	(100%)



No. 1 Figure showing marital status of burn victims sex-wise



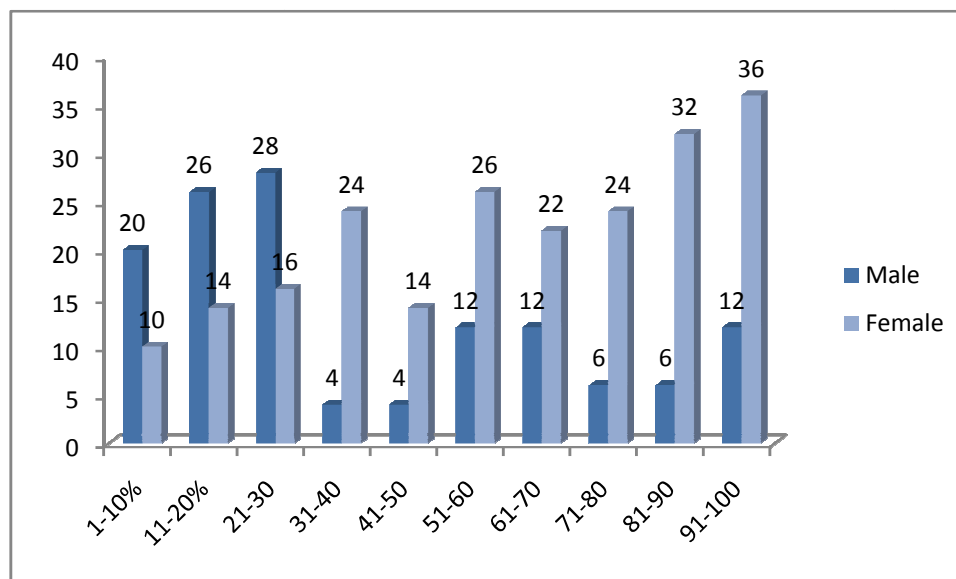
No. 2 Figure showing manner of burns sexwise

Table 5: Showing Age and Sex-Wise Manner of Burns

Age Gr. in Yrs	Accidental cases			Suicidal cases			Homicidal cases		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-9	20	16	36(12.16%)	-	-	-	-	-	-
10-19	8	42	50(16.89%)	2	2	4(8.69%)	-	-	-
20-29	32	52	84(28.37%)	4	16	20(43.47%)	-	4	4 (66.66%)
30-39	22	46	68(22.97%)	6	8	14(30.43%)	-	-	-
40-49	20	14	34(11.48%)	4	2	6(13.04%)	-	2	2(33.33%)
50yrs & above	10	14	24(8.10%)	2	-	2(4.34%)	-	-	-
Total	112	184	296	18	28	46	-	6	6

Table 6: Showing Sex-Wise Cases Fatality Rate in Burn Patients

Sex	Total patients	Deaths	Case fatality rate
Male	130	46	(35.38%)
Female	218	150	(68.80%)
Total	348	196	(56.32%)



No.3 Figure showing extent of body surface burns in different sexes

Table 7: showing cause of death

Cause of death	Total cases	%
Septicemia	106	(54.98%)
Shock	28	(14.28%)
Pulmonary embolism	2	(1.02%)
Combination of other causes	60	(30.61%)
Total	196	(100%)

DISCUSSION

Total 348 burn cases were admitted at a medical college and hospital in Central India during the period from May 2007 to April 2009. Out of total 348 cases, 176 patients died during treatment.

In the present study, 218 (62.64%) cases were females and 130 (37.35%) cases were males. Over all female to male ratio was 1.67:1. It indicates that females are more vulnerable to burn injuries. Similarly, most of the other studies have reported higher incidence in females with female to male ratio, 1.5:1 Chandra from Delhi⁶, 1.4:1 Ganguli from West Bengal¹², Sharma²² 1:1, 1.9:1 Tirpude et al from Sewagram²⁴, 1.6:1 from Bangal et al from Sewagram³. This is due to female predominance in kitchen work, but some Indian authors like Datey from Delhi⁸, Dandapat from Orissa⁹ have reported male dominance in burn patients, with male to female ratio of 1.48:1 and 1.3:1 respectively. In most of the Western studies Eldich from U.S.A¹¹ also reported male predominance in burn patients. Except in the age group of 0-9 years and >50 years, all other age groups, female predominance was seen. Other workers like Chandra from Delhi⁶ and Sharma B.K. et al²² have also reported that at all age, females outnumbered males and this was observed due to involvement of females in kitchen work even at younger age group.

In this study, young adult females between the age group of 20-39 years constituted 190 (54.59%) of total burn cases because during this period, females exposed to kitchen work and both the sexes are exposed to socioeconomic stress and strain of life and bride burning cases occur commonly in this age group. Ganguli from West Bengal¹² reported (60.66%) cases between 13-40 years; Ghuliani from Sewagram¹³ reported (53.23%) cases in 15-39 years of age group. However Clarkson reported highest incidence at extremes of age group. Other Indian studies like Naik et al from Sewagram¹⁹, Chandra from Delhi⁶ have also reported that young females between 15-39 years were constituted more in burn cases.

In this study, maximum 226 (64.94%) cases were married while 102 (32.18%) cases were unmarried including children and 10 (2.87%) cases were widower/widow. Among married females (30.13%) cases sustain burns within 5 years of marriage and (68.38%) cases sustain burns within 7 years of marriage. Other workers like Ghuliani¹³, Naik et al from Sewagram¹⁸ also reported that maximum incidence was among married female in their early years of marriage, this is because of their marital maladjustment, bride burning cases in recently married females.

In the present study, majority of the cases were accidental 296 (85.05%), nearly similar findings were reported by Ganguli

from West Bengal¹², Kaviya from Rajasthan¹⁶ and Sawhney et al from U.P.²¹ Many other workers have also reported higher incidence of accidental burns. Sawhney²¹, Wase²⁶ also reported that accidental burns were mostly in females (60.81%) cases and most of them were young adults between 20-39 years of age group (51.35%) cases. Among accidental cases maximum 296 (86.48%) were flame burns, and out of all accidental flame burn cases 210 (82.03%) cases burns was due to clothes catching fire while cooking or working with kerosene stove, gas chullha. It may be results of over pumping of kerosene pressure stove leading to sudden rise of flame, clothes catching fire while moving or sitting near open unguarded fire source, handling fire under the influence of alcohol etc. This was reported by Shrama from Kanpur²², Gupta R.K. et al¹⁵ having high incidence of flame burn accidents due to the ignition of clothes.

In the present study, (13.21%) cases were suicidal burns, as compared to (23.89%) found by Gupta from Kanpur¹⁵, (8.2%) cases by Wase²⁶. Maximum suicide cases were among females 32 (69.56%) cases. Many other Indian workers have mentioned about high incidence of suicides in females. In this study, maximum incidence of burn was seen between 20-39 years of age. Marital conflict, dowry problems, alcoholism of husband and wife beating behavior, extramarital relation of husband or wife, frustration due to failure of love are the main factors for suicide.

In this study, (1.72%) cases were homicidal, as compared to (2.83%) cases (3.20%) cases reported by Sawhney²¹ and (3.07%) cases by Wase²⁶. All case were females. Maximum cases were in the age group of 20-29 years.

In this study, maximum 188 (54.02%) cases had burns involving more than 50% of total body surface area and 160 (45.97%) cases had burns involving less than 50% of total body surface area, on the other hand, Ganguli from West Bengal¹² and Sharma B.K.²² have reported (81%) and (63%) cases respectively involving less than 50% of the body surface area, while (19%) and (37%) cases with burns over 50% of the body surface area respectively. Thus, incidence of extensive burns in the present study was more as compared to other studies. In this study, flame burns were more extensive in nature as compared to scalds and electric burns. (59.74%) of total flame burns involved more than 50% of total body surface area.

In the present study, majority of the cases (88.50%) were flame burns, (8.04%) cases were scalds and (3.44%) cases were electric burns. Similar findings were observed in studies of many other workers like Sharma B.K.²² reported (77%) flame burns, (14%) scalds and (2%) electric burn. This is probably because of more number of children included in their

studies as scalds are more common in children. In the present study, maximum flame burns were in females, (67.53%) as compared to males (32.46%) and maximum cases were observed in young adults between the age group of 20-39 years, comprising (57.14%) of all flame burn cases.

Case fatality rate varies in different studies greatly and cannot exactly be compared with this study because of multiple factors like selection of type of cases and efficiency of management of burns etc. In the present study, over all case fatality rate was (56.32%), while Sharma et al²² and Bangal et al³ reported comparatively low mortality i.e (45.50%) and (35.21%) respectively. In the present study case fatality is more in females (68.80%) which are comparable to Sawhney²¹, who also reported high mortality of females (58.46%) cases. Datey from Delhi⁸ also observed much higher mortality in adults than children. In this study, out of the total deaths maximum cases were due to flame burns (96.93%) cases as compared to Ghuliani³⁵ and Gupta R.K. et al¹⁵ who reported (95.23%) and (84.93%) cases respectively. Case fatality was 100% in patients with burn involving more than 60% of the body surface area and similar observation were reported by Ghuliani et al from Sewagram¹³. Case fatality was (9.08%) in cases of burns involving 21-30% of total body surface area. It was (55.55%) of cases of burns involving 41-50% of total body surface area.

In the present study septicemia either alone or in combination with others was the commonest cause of death (84.69%) as compared to 68% reported by Bangal et al from Sewagram³ and Gupta R. K. et al from Kanpur¹⁵, who reported (52.22%) cases. Tirpude et al from Sewagram²⁴ reported septicemia alone or in combination with other causes was the commonest cause of death in case of burn injury which is consistent with the present study. Shock either alone or in combination with the others was 68 (34.69%) cases. Acute Renal failure in combination with other causes was responsible in 16 (8.16%) cases. Pulmonary causes alone or in combination with other causes is seen in 12 (6.12%) cases. Septicemia and shock alone was responsible for cause of death in (54.08%) and (14.28%) cases respectively.

CONCLUSION

Total 348 burn cases were admitted at a medical college and hospital in Central India and studied during the period from May 2007 to April 2009. Out of which 196 patients died during treatment.

- Most of the burn cases were from rural area.
- Females outnumbered males as there were (62.64%) females and (37.36%) males with overall male to female ratio of 1:1.67.
- Maximum incidence was in the young adults between the age group of 20-39 years, comprising of (54.59%) cases.
- Most of the burn cases belong to low socio-economic status.
- In both sexes majority of the burn cases were married.

- Most of the burn cases sustain flame burns followed by scalds and electric burns. Flame burns were predominantly observed in females.
- As per history at the time of admission, most of the burn cases were accidental, followed by suicidal and homicidal.
- Among accidental and suicidal burns majority of the cases were females and all the homicidal burn cases were females.
- Most of the accidental burns resulted from clothes catching fire during cooking or working near the kerosene stove, chulla, falling or breaking of kerosene lamp on the person while sleeping.
- In almost all the cases of suicidal burns, usual method of committing suicide was sprinkling of kerosene on the body and cloth. Maximum cases were females.
- Maximum patients have dermo-epidermal burns.
- Maximum (54.02%) burn cases had involved more than 50% of total body surface area.
- Overall case fatality rate was (56.32%). Case fatality was higher in females (68.80%) followed by males (35.38%).
- Case fatality was low in burns involving less than 30% of total body surface area.
- Case fatality rate was highest in flame burn cases as compared to scalds and electric burns
- Case fatality was highest in suicidal burn cases (82.60%) followed by homicidal (66.66%) and accidental (50%).
- Most of the cases died between 4 to 7 days of sustaining burn injuries.
- Commonest cause of death was septicemia alone or in combination with other causes constituting (84.69%) cases of total thermal burns.

As majority of the cases were accidental and seen in young females, the truth of histories of accidental burns is questionable. Even a good number of suicidal and homicidal cases might be given a colour of accidental burns to protect family prestige and harassment at the hands of police. This was evident in many cases from the contradictory histories, which was inconsistent with dying declarations etc.

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