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## Study of Burn Cases With Special Attention On Survival Period

**Mohammed Iliyas Sheikh***Professor & Head, Forensic Medicine and Toxicology, Surat Municipal Institute of Medical Education & Research (SMIMER), Opposite Bombay Market, Umarwada, Surat – 395010 - Gujarat – India*

### ABSTRACT

The study was conducted at tertiary referral health care center of Surat City on 168 burn cases brought for medicolegal post mortem examination. Especial attention was given to the association between survival period and percentage of burns along with other parameters.

Maximum number of cases observed between 21-30 years followed by 11-20 years. It is observed that younger age group are more prone to the burn injury as compared to the extremes of ages. The female victims were 71.42% while male victims were 28.58%. Death of the burn victims are more common on the spot (22.02%) followed by death within 1 to 3 days (19.08%). It is also observed that female deaths on the spot are more common as compared to male. In admitted cases death in males commonly seen within three days while female survived for more periods as compared to males during treatment. 4.16% female survived more than 15 days. According to percentage of burn it is observed that patient with 81 –100% burns died on the spot (19.08%), while 8.92 % died within 1 – 3 Days. Five patients died on the spot inspite of 61-80% burns over the body.

**Keywords:** Burns, Survival period, Soot particles, percentage of burn etc.

\*Corresponding Author Email: [drmiliyas@gmail.com](mailto:drmiliyas@gmail.com)

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## INTRODUCTION

Burns are the injuries produced by the application of dry heat and moist heat over the body eg. Flame, Radiant heat or Steam & when some heated solid substances come in contact to the body. Injuries produced by Infra red light rays, X-rays and corrosive chemical substances are also classified as burns injuries for medico-legal purposes <sup>1</sup>. Burns are one of the common medical emergencies admitted to any hospital.

The cause of burns vary from place to place, therefore local studies are necessary to update the preventing measures for that area <sup>3</sup>. Studies from developing countries in general <sup>4-6</sup> and from the India presents totally different picture <sup>7-9</sup>, as compared to the studies from Europe and USA <sup>10</sup>.

### **Objectives:**

The study includes all cases of burns except death due to electricity burns. 1110 cases were brought for postmortem examination, out of these 168 cases (15.13%) were of burns.

Depth of burn is determined by combination of the burning agent, temperature and duration of exposure. Jackson has described thermal injury in to three zones <sup>2</sup> namely:

Center zone – Cells with direct heat contact are destroyed by coagulation,

Middle zone - Zone of injured cells, which may survive under ideal circumstances but usually, progress to death known as zone of stasis and Outer zone - Zone of hyperemia.

For estimation of affected area Rule of Nine (9) was applied for both treatment purposes and for description of postmortem findings. In rule of nine the body is divided in 12 parts which include major body surface area eleven equal parts and genital one percent.

## MATERIALS AND METHOD

The study was conducted at tertiary referral health care center of Surat City on 168 burn cases brought for medicolegal post mortem examination, after spot death or brought for treatment and died in hospital during treatment and after death brought for medicolegal postmortem examination to the department.

During this period out of 1110 cases were brought for postmortem examination, 168 cases were of burns. The study includes all burns cases, except the burns as a result of electricity. The data were collected from relatives, investigating officers and from the hospital records.

### **Observations & results:**

The table below shows age and sex wise distribution of burns cases, maximum number of cases observed between 21-30 years followed by 11-20 years. It stat that younger age group more prone to the burn injury as compared to the extremes of ages. The female victims were 120 i.e. 71.42% while male victims were 48 i.e. 28.58%.

**Table 1: Age and Sex Wise Distribution**

Age group	Male	Female	Number	Percentage
0-10	04	06	10	05.95
11-20	05	15	20	11.90
21-30	18	58	76	45.23
31-40	11	28	39	23.24
41-50	04	06	10	05.95
51-60	05	03	08	04.76
61-70	01	02	03	01.78
>71	00	02	02	01.19
Total	48	120	168	100.00

It indicates that male, female ratio is 1: 2.5.

**Table 2: According To Cause Of Death**

Cause of death	Number	Percentage
Shock	85	50.59
Septicemia	73	43.46
Toxemia	08	04.76
Others	02	01.19
Total	168	100.00

The above table shows that Shock – The cause of death out numbers. Which include death due to primary shock, secondary shock and neurogenic shock followed by septicemia and toxemia. In two cases along with other injuries burn was also present.

**Table 3: Distribution according to marital status**

Sex	Married	Unmarried	Total
Male	38 (22.63%)	10 (5.95%)	48 (28.58%)
Female	107 (63.69%)	13 (7.73%)	120 (71.42%)
Total	145 (86.32%)	23 (13.68%)	168 (100%)

Out of 168 cases 145cases were married and more than 75% were females. Unmarried comprises only 13.68% of the total cases studied.

**Table 4 - site of incidence**

Place	Number	Percentage
Home	159	94.64%
Factory	09	05.36%
Total	168	100.00%

The above table shows that burns commonly occur at home (94.64%).

**Table 5 Agent Involved In Burns**

Agent	Number	Percentage
Stove blast	130	77.38%
Hot water	12	07.14%
Kerosene	26	15.48%
Total	168	100.00%

It is evident from above table that stove blast is commonly inflicting burns while cooking the food, followed by use of kerosene. In the stove, inflammable material commonly used is Kerosene. The kerosene which is used in different ways i.e. homicidal, or suicidal purposes,

in these conditions either the kerosene was throw over the body by another person or by the person himself/herself bolting the room from inside, sprinkling kerosene and lighting the flame with match stick. The hot water spillage was observed only in 12 cases and commonly at factory.

**Table 6: Manner of Death**

Manner of death	Male	Female	Total	Percentage
Suicide	08 (03.57%)	18 (11.94%)	26	15.51%
Accident	39(23.21%)	97(57.74%)	136	80.95%
Homicide	01(0.59%)	01(0.59%)	06	03.57%
Total	48(28.58%)	120(71.42%)	168	100.00%

The above table shows that accidental deaths due to burns are more common followed by suicidal and homicidal deaths.

**Table 7: Soot Particles In Trachea**

Sex	Present	Absent
Male	13 (7.73%)	31(18.45%)
Female	39(23.23%)	85(50.59%)
Total	52(30.96%)	116(69.04%)

It is indicated that soot particles were observed only in 30.96% cases while absent in 69.04%. This suggests that it is not necessary that in all ante mortem burns there must be presence of soot particles, this findings are correlated with findings of other authors. These particles are more observed in spot death cases as compared to admitted cases.

**Table 8: Month Wise Distribution**

Month	Number	Total postmortem	Percentage
May	23	151	15.23
June	26	172	15.11
July	18	124	14.31
August	23	131	17.55
September	22	143	15.38
October	25	130	19.23
November	18	111	16.21
December	13	148	08.78
Total	168	1110	--

The above table indicates monthly distribution of burn cases during study period, maximum number of cases observed in October (19.23%) followed by 17.55% cases in August. Average number of burns cases were 21 per month i.e.15.13% of total number of postmortem during this period.

**Table 9: Survival Period In Relation To Sex**

Period	Male	Female	Total	Percentage
Spot	08 (04.76%)	29(17.26%)	37	22.02
< 12 hours.	11(06.54%)	15(08.92%)	26	15.47
12-24 hours.	03(01.78%)	07(04.16%)	10	05.95
1- 3 days	07(04.16%)	25(14.88%)	32	19.08
3 – 5 days	08(04.76%)	17(10.11%)	25	14.88

5 – 7 days	03(01.78%)	12(07.14%)	15	08.92
7 – 9 days	03(01.78%)	05(02.97%)	08	04.76
9 – 11 days	01(0.59%)	03(01.78%)	04	02.38
11 – 13 days	01(0.59%)	01(0.59%)	02	01.19
13 – 15 days	01(0.59%)	01(0.59%)	02	01.19
> 15 days	00	07(04.16%)	07	04.16
Total	46(27.38%)	122(72.62%)	168	100.00

The above table indicates that death in the burn victims are more common at the spot (22.02%) followed by death with in 1 to 3 days (19.08%). It is also observed that female deaths on the spot are more common as compared to male. In admitted cases death in males commonly seen with in three days while female survived for more periods as compared to males during treatment. 4.16% female survived more then 15 days.

**Table 10 -survival period in relation to percentage of burn.**

Period	0 –20	21 –40	41 –60	61 – 80	81 – 100	Total
Spot	-	-	-	5(2.97%)	32(19.08)	37
< 12 hours.	-	1(0.59%)	3(1.78%)	11(6.54%)	11(6.54%)	26
12-24 hours.	-	1(0.59%)	-	3(1.78%)	6(3.57%)	10
1- 3 days	-	1(0.59%)	4(2.38%)	12(7.14%)	15(8.92%)	32
3 – 5 days	-	1(0.59%)	11(6.54%)	7(4.16%)	6(3.57%)	25
5 – 7 days	-	1(0.59%)	4(2.38%)	5(2.97%)	5(2.97%)	15
7 – 9 days	-	-	3(1.78%)	2(1.19%)	3(1.78%)	08
9 – 11 days	-	-	2(1.19%)	1(0.59%)	1(0.59%)	04
11 – 13 days	-	-	-	1(0.59%)	1(0.59%)	02
13 – 15 days	-	-	1(0.59%)	-	1(0.59%)	02
> 15 days	-	-	5(2.97%)	2(1.19%)	-	07
Total	-	5(2.95%)	33(19.64%)	49(29.17%)	81(48.24%)	168

It is evident from above table that deceased suffering from 81 –100% burns died on the spot 19.08%, while 8.92 % died with in 1 – 3 Days. Five patients died on the spot inspite of 61-80% burns over the body. It is also observed that one person died with in 12 hours had < 40% burns, while another survived only 5-7 days. Only seven deceased survived more than 15 days after treatment, out of which five had 41-60% burns and two patients had 61-80% burns died after words.

Not a single patient survived more than 15 days having more than 80% burns. One 24 years old female had received 100% burns was survived for 6 days. While one male 23 years had received 90-95% burns was survived for 12 days.

It is common belief among the surgeons that unaffected area of the body is inversely proportional to the survival probability of that patient of burn.

## RESULTS AND DISCUSSION

It is observed from this study that females and of young age groups are more affected from burns as compared to males, the findings are consistent with observations of Bangal et al <sup>11</sup>.

Flame burns are commonest and they were mainly due to the cloth catching fire while cooking, these findings are consistent with observations of others Kumar et al<sup>12</sup>. Accidental deaths due to burns are more common than suicidal and homicidal deaths (Naik R.S.)<sup>13</sup>. The accidental burns were at home. Almost all reports revealed 60- 85% are domestic burns<sup>14-16</sup>. In burn accidents domestic pressure stove is commonly involved while cooking food and outcome of these accidents is very bad as these burns are extensive. Such accidents are reported from other developing countries as well. In view of better scenario in developed countries (standing while cooking, gas, or electrical based appliances) such accidents are practically nil. Such burns are more common in the families of low social class and residing in overcrowding area<sup>18</sup>. Community education to prevent such accidents with stove has successfully reduced the mortality to nil<sup>19</sup>.

This suggests the unsafe environmental conditions at home. Female deaths are more in this study; it may be due to marital disharmony, maladjustment with in-laws and dowry deaths (homicidal) that is documented in some communities.

Patients had more than 80% burns died either on the spot or with in 1-3 days hospital stay, in spite of all possible treatment in the hospital. Easy and economic access to kerosene oil as the fuel for cooking and lighting purposes is commonly used in every house where a facility for gas is not available.

Survival of burn patient depends on many factors and may change throughout the course of the patient's hospitalization. With all advances in BURN CARE there has been little gain in decreasing the mortality of the patient with near total body area affected with burns especially in the young and the elderly patients.

#### **Advice for Prevention of Burn & Death**

- Wearing of nonflammable cloth while cooking.
- Adequate working of stove and other things used for lightening.
- Proper ventilation of cooking area.
- Isolation of each burn patient or facilities of burn ward in each hospital.
- Manipulation of immune defense mechanism by
  - Adequate nutrition.
  - Covering the inner area.
  - Allograft and Immunosuppression.
  - Silicon sheet covered with collagen glycosaminoglycan.

#### **REFERENCES**

1. Franklin C.A., Modi's Medical Jurisprudence & Toxicology, 1988,P 231-231.

2. Jackson D. MCG (1953), The diagnosis of the depth of burning, *British J. Surgery*, 40, P -588.
3. El Danf A, Aishtash S, Filbbos P. et al. Analysis of 105 patients admitted over a 2 year period to a modern burn unit in Saudi Arabia. *BURNS* 1991; 17: 02.
4. Saleh S., Gadalla S., Fortney J.A. et al. Accidental burn deaths of Egyptian women of reproductive age, *BURN*, 1986; 12:241.
5. Haberal M, Oner Z, Bayraktar U. et al, Epidemiology of adults and children burns in a Turkish burn center. *BURN*, 1987; 13:136.
6. Haq A. Pattern of burn injuries at a Kenyan provincial hospital, *BURN*, 1990; 16: 185.
7. Dately S, Moorthy NS, Taskar AD. A study of burn injury cases from three hospitals. *Indian Journal of Public Health*, 1981; 25: 117.
8. Sen R, Banerjee C. Survey of 1000 admissions to a burn unit SSKM hospital, Calcutta, *BURNS*, 1981; 7:357.
9. Ghullani KK, Tyagi NK, Narang R. et al. An epidemiological study of burn injury. *Indian Journal of Public Health*, 1988; XXXII; 24.
10. Rossignol AM, Locke JA, Burke JF. Paediatric burns injuries in New England, USA. *BURNS*, 1990; 16: 14.
11. Bangal R.S., Thermal injuries – A study of mortality patterns, *JIAFM*, Vol. XII, No. 1 & 2, P 1 – 4.
12. Kumar et al, Epidemiological study of burn cases and their mortality experiences amongst adults from a tertiary level care center, *Indian Journal of Community Medicine*, Vol. XXII, No. 4, 1997: 160 – 167.
13. Naik R.S. et al, A medico - legal profile of burn cases, Paper presented in conference of IAFM, 5-7, February 1997.
14. Davies JW, The problem of burns in India, *BURNS*, 1990; (supplement): S4 –52.
15. Lyngdorf P, Sorensen B, Thomsen M. The total numbers of burn injuries in a Scandinavian population – a prospective analysis. *BURNS*, 1986; 12: 567.
16. Sarma BP. Sarma N, Epidemiology, morbidity, mortality and treatment of burn injuries – a study in a peripheral industrial hospital. *BURNS*, 1994; 20:253.
17. Benmeir P, Sagi A, Greber. Et al. An analysis of mortality in patients with burns covering 40 % BSA or more: a retrospective review covering 24 years, (1964 – 88). *BURNS*, 1991; 17: 402.

18. Smith J.W., Aston S.J. – Grabb and Smith’s plastic Surgery, 4<sup>th</sup> edn., 1991, P 682 – 683.
19. Cuschieri A., Giles G.R., Moosse A.R., Essential Surgical practice, 2<sup>nd</sup> edn.,1988, P 326-327.

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