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Autopsy based profile of death in burn cases- One-year retrospective study

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Abstract

Background: Fire, since ancient times have kept amusing mankind in various ways. Perhaps it is one of the greatest inventions in the history of all times. It has helped humans to evolve but if mishandled can lead to serious consequences. It is commonly encountered as medical emergencies in any hospital in India. It has continuously effected population resulting in form of prolonged morbidity, disability and even as death of the individual ultimately leading to loss to individual's family, society and to the state. **Materials And Methods** The present retrospective study was carried out in the Department of Forensic Medicine & Toxicology Chengalpattu Medical College and Hospital, Chengalpattu, during the period from 1st January 2021 to 31st December 2021 which includes a total of 24 cases of death due to burn injuries, brought to the mortuary of the hospital for medico-legal postmortem examination. **Results:** During the study period burn in female victims was more evident with accounting 18 (75%) cases as compared to males 6 (25%). 21-30 years age group i.e. 8 (33.3%) was most effected and minimum in the age group of 0-10 years i.e. 1 (4.2%).Accidental deaths were 19 in number (79.2%) Various other demographic aspects of deaths due to burns were included as objective in the study and ultimately provided some remedial measures in order to cope up with current scenario.

Keywords: Burn, Autopsy, Demography, Body surface area, Accidental.

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Introduction

Burn is an injury which is caused by application of heat by conduction, radiation or chemical substance to the external or internal surface of the body which causes destruction of tissue[1]. Deaths are only a part of the problem, for every person who dies as a result of their burns; many more are left with lifelong disabilities and disfigurements. By law all dry heat lesions have been designated as burns[2]. Burn injuries have long been described as among the most serious injuries that may afflict a human being[3]. Burn is a unique but significant mode of suicide and homicide everywhere in the world. Burns are the fourth most common type of trauma worldwide, following traffic accidents; falls and interpersonal violence[4].The most

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common cause of flame burns in modern society is accident[5,6]. Local injury from heat occurs when an external source of heat raises the temperature of tissue above approximately 44.0 degree centigrade for long enough to damage the tissue. Extremes of age are more vulnerable to such injuries. However in India, it is most commonly seen in younger age group and is most common it female as against in developed countries where it is most common in males as is true with any form of trauma.

Materials and Methods

The present retrospective study was carried out in the Department of Forensic Medicine & Toxicology at Chengalpattu Medical College and Hospital, Chengalpattu, during the period from 1st January to 31st December and analysis a total of 24 cases of burn death, brought to the mortuary of the hospital for medico-legal post mortem examination. Details of the cases were collected from the police papers, the inquest reports, hospital records and during autopsy like age, sex, manner, percentage and total body surface area of burn etc. the information was compiled, tabulated and analyzed.

Observation and Result

In the current study, a total of 24 medico legal autopsy was performed in the mortuary of Department of Forensic Medicine & toxicology Chengalpattu Medical College and Hospital, Chengalpattu, during the period from 1st January to 31st December.

During the study period burn in female victims was more evident with accounting 18 (75%) cases as compared to males 6 (25%), and male: female ratio was 1:3 . 21-30 years age group 8 (33.3%) was most effected and minimum in the age group of 0-10 years 1(4.2%). Alleged manner of death due to burn in present study was accidental in nature in 19 cases (79.2%) followed by suicidal in 4 cases (16.7%) and only 1 case (4.1%) were homicidal in nature.

In majority of burn cases 16 (66.7% cases), total body surface area involved was between 40-70%, followed by 4 (16.7%) cases with 70- 90% body surface area. Only 1(4.1%) cases died with total body surface area less than 30%. In areas of body affected due to burn, upper extremities were most commonly affected i.e. in 19 (79.2%) cases, followed by head, neck and face in 18 (75%) cases. Chest & abdomen were involved in 17 (70.8%) cases and involvement of genitalia was 3 (12.5%) cases only.

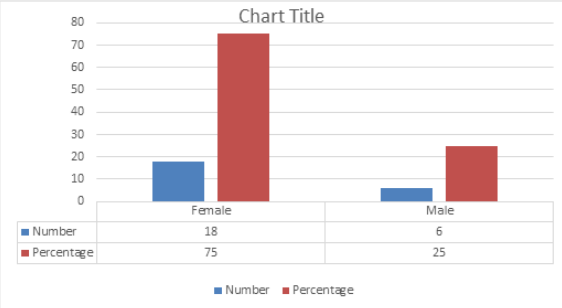

Figure 1: Sex wise distribution of cases.

Table 1: Age wise distribution of cases

Age	Number	Percentage
0-10	1	4.2%
11-20	2	8.3%
21-30	8	33.3%
31-40	6	25%
41-50	3	12.5%

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51-60	2	8.3%
61-70	2	8.3%
71-80	0	0%
81-90	0	0%
91-100	0	0%
Total	**24**	**100%**

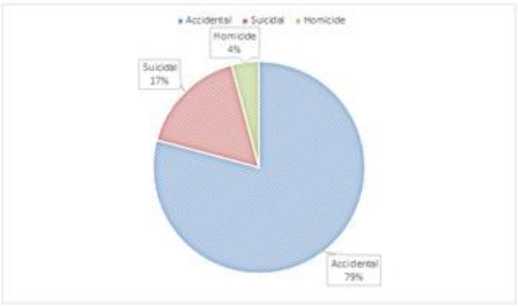

Figure 2: Manner wise distribution of cases.

Table 2: Body surface area involved

Body surface area involved	Number	Percentage
10-20%	0	0%
20-30%	1	4.2%
30-40%	2	8.3%
40-50%	6	25%
50-60%	8	33.3%
60-70%	2	8.3%
70-80%	3	12.5%
80-90%	1	4.2%
90-100%	1	4.2%
Total	**24**	**100%**

Table 3: Distribution of burn injuries on the body.

Area of the body burnt	Number	Percentage
Head,neck,face	18	75%
Chest,abdomen	17	70.8%
Back	15	62.5%
Upper extremity	19	79.2%
Lower extremity	13	54.2%
Genitals	3	12.5%

Discussion

In the present study, there is a predominance of female victims than males in burn cases and a majority of them were in the reproductive age group 21-30 years, which is similar to the findings of other similar studies[7-10].

In the present study, majority (66.6%) of the victims had 40-70% of total body surface area (TBSA) burn. Studies from Angola[11] revealed 100% mortality over 40% TBSA, and similarly 80% mortality rate in burn over 40–50% TBSA has been reported from Jaipur[12].

In present study upper extremities were most commonly affected in 19 (79.2%) cases, followed by head, neck and face in 18 (75%). Similar findings were observed in the study

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done by Chawla R et al[13] and Ande JD et al[18] with most of the cases involving upper limbs (93.5%), followed by chest and abdomen (86.11%), lower limbs (63.8%) and genitalia (14.81%). In contrast to the present study, Buchade D et al found that Head, face & neck region was most commonly affected in 206 (86.91%) cases, followed by chest in 174 (73.41%) cases.

In the present study alleged homicidal burn was found in 1 (4.1%) cases out of total 24 cases. In this study most of injuries are accidental in nature i.e. 19 (79.2%), followed by suicidal burn 4 (16.7%). Chaudhary BL et al[15] found accidental burns in 72.94% cases, followed by suicidal in 17.39% and homicidal in 9.66% cases. Buchade D et al[7], also found that most common manner of the burn was accidental in 147 (62.02%) cases, followed by suicidal in 62 (26.16%) and homicidal in 28 (11.82%) cases. Mangal HM et al[16] conducted study on 300 cases and observed that in most of the burn victims the manner of death was accidental in 183 cases (61%), followed by suicidal in 105 cases (35%) and homicidal in only 12 (4%) cases. Similar observations were seen by Das KC8 and Bangal RS.[17]

Conclusion and recommendations

Despite the modernization, the domestic fire is the major cause of burns with maximum involvement of female.

The government along with various working groups and the NGOs, including the doctors need to put in more sincere effort. The NGOs and social groups must arrange a periodic effort in educating the rural peoples. Steps should be taken not only to minimize burn mortality but also to prevent and reduce their incidence at least in cases where human errors and human greed plays a role.

The most important step in reducing the burn incidence is through mass education. Following the safety instructions like putting the lights off while going out, wearing tight and cotton cloths while cooking, not leaving a fire source unattended etc. will definitely help to reduce the incidence of burn injuries, as most of the accidental burn cases are preventable.

Psychiatric illness, chronic diseases or addictions such as alcoholism may contribute to deaths by burn injuries. Proper counselling and consistent encouragement to improve quality of life of such persons may help to prevent suicides by burn injuries.

Kerosene is commonly available for household cooking and hence used by suicides as an accelerant. Smell of kerosene perceived on autopsy should be carefully noted as it serves an important evidence in court-of-law.

Shock and septicemia are the causes of death following burn injuries. Proper rehydration and prevention of hospital acquired infection is the key to prevent deaths in burn cases. The present study is concluded with the hope that the given suggestions will help in reducing the number of burn injuries.

Conflict of Interest: Nil.

References

1. Reddy K.S.N. Thermal Deaths', The Essentials of Forensic Medicine and Toxicology, 2017, 34th ed, p297.
2. Pillay V. V. 'Injuries due to Heat, Lightening, Electrocution and radiation' 2017, 18th ed, p270.
3. Reddy K. S. N. 'Thermal Deaths', The Essentials of Forensic Medicine and Toxicology, 2009, 29th ed, Devi K. Suguna, Hyderabad, p283.
4. Saukko Pekka, Knight Bernard. Burns and Scalds, Knight's Forensic Pathology, 2004, 3rd ed, Oxford University Press Inc, New York, p322.
5. Van Rijn. J.L. Olga, Bouter. L.M., Meertens R.M. The aetiology of burns in developed countries, 1989[4], available from www. Aetiology of burn injuries. Com.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE 02, 2023

6. Vij Krishan. "Thermal Deaths", Text Book of Forensic Medicine and Toxicology, 2008; 5th ed, Elsevier, A Division of Reed Elsevier India Pvt. Ltd.p159.
7. Buchade D, Kukde H, Dere R, Savardekar R. Pattern of Burn Cases Brought to Morgue, Sion Hospital Mumbai, A Two Year Study. JIAFM. 2011;33(4):309-310.
8. Das. K.C. A study of burn cases in medico-legal autopsy. MD thesis, 1998; Gauhati University, Guwahati, Assam, India.
9. Nath, D. A statistical study of pattern of ante mortem burn injuries. MD thesis, 2007; Gauhati University, Guwahati, Assam, India.
10. Mazumder A, Patowary A. A Study of Pattern of Burn Injury Cases. JIAFM. 2013;35(1):44-46
11. Adamo C, Esposito G, Lissia M, Vonella M, Zagaria N, Scuderi N. Epidemiological data on burn injuries in Angola: a retrospective study of 7230 patients. Burns. 1995;21:536–538.
12. Gupta M, Gupta OK, Yaduvanshi RK, Upadhyaya J. Burn epidemiology in Pink city scene. Burns. 1993;22:47–51.
13. Chawla R, Chanana A, Rai H, Aggarwal AD, Singh H, Sharma G: A Two-year Burns Fatality Study. J Indian Acad Forensic Med. 2010;32(4) 292-297.
14. Ande JD, Kumar SV, Satyadev M, Tirumala N, Guguloth K, Chandana N: Pattern of Thermal Burn Injuries and their outcomes at Burn Care Unit of Tertiary Hospital, Warangal, Andhra Pradesh, India. Int J Pharm Sci Lett. 2013;3(6):288- 295.
15. Chaudhary BL, Yadav P, Kumar M, Rahul B: Mortality Profile of Burn Injuries: A Postmortem Study in Lady Hardinge Medical College, New Delhi. J Indian Acad Forensic Med. 2013;35(2):123-126.
16. Mangal HM, Pathak A, Rathod JS. The Fire is Both "A Blessing & Scourge to the Mankind." JIAFM. 2007;29(4):75- 77.
17. Bangal RS: Thermal Injuries-A study of mortality patterns. JFMT. 1995;XII(1&2):1-4.