

Pattern of Thermal Burn Case Incidences Studied at a tertiary care hospital in Sasaram, Bihar

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ABSTRACT

Introduction Fire was the most important discovery for mankind. Throughout history it has saved as well as destroyed mankind. Burn injuries rank fourth among injuries suffered by humans. Burn injuries are a major cause of deaths in India with medico legal Implications. The objective of this study was to analyze the epidemiological features, risk factors and mortality of burn victims admitted in emergency department of a tertiary care teaching hospital in Sasaram, Bihar. *Material and Methods* This is a retrospective study of the cases of thermal burn injuries brought to the emergency section of NMCH, Sasaram during the two years' period of the years 2011 and 2012. *Results* Out of 95 cases of thermal burn injuries, there were 62% females. Most of the victims were 21 to 30 year old married people from rural areas. In most of the victims, the burn injury covers 26-50% of the TBSA. 35.8% victims were burned from 12 pm to 5:59 pm. Flame was the most common cause of burn injury. Only 8.4% reported in hospital within one hour. 66% of them were discharged and 16% victims died in the hospital. *Conclusion* Married females of productive age group belonging to rural areas are worst affected in burn injuries. Awareness campaigns targeting safety precautions, opportunities for basic health education and a change in mindset of society towards females are necessary to curb this menace of burn injuries.

Keywords: Burns, Types of burns, Epidemiology, Sasaram

INTRODUCTION

All over the world, doctors have always been consulted for various types of injuries. Among them, burn injuries rank very high as most severe types of injuries suffered by the human body and attributing high morbidity and mortality among victims.¹

Burn is produced by dry heat in the form of flames or heated substance over the body.² Burn is a very unique but common mode of suicide as well as homicide all over the world.³ An estimated 2,65,000 deaths every year are caused by burns related trauma—the vast majority occur in low- and middle-income countries like India.⁴

Burn injuries are a major cause of unnatural deaths in India, specifically among females. Also, the socio-cultural factors play a major role in incidence of burn injuries in India. Some examples are poor maintenance of electric appliances, illiteracy, ignorance, poverty and an important social evil, dowry.⁵

Burn injuries have medico legal significance as they might be considered as common causes of unnatural deaths in India. Moreover, the circumstances leading to these injuries are wrapped in obscurity, mystery, lies and unreliable statements. The various reasons behind this may be personal, domestic, occupational, social tragedy and more recently Dowry.⁶

There are many studies done on various aspects of burn injuries in different parts of the country but none in this region of Bihar. Keeping this fact in mind, we did this study. The objective was to analyze the epidemiological features, etiological factors and mortality etc. of burn victims admitted in emergency department of a tertiary care teaching hospital in Sasaram, Bihar.

MATERIAL AND METHOD

Study Design: Retrospective record based study

Study Setting: Records of Medical Records Department (MRD) in Narayan Medical College and Hospital, Sasaram.

Study Period: January 2011 to December, 2012

Study Population: All the cases of thermal burn injuries brought to the emergency department of Narayan Medical College and Hospital, Sasaram. The study population was from Sasaram and adjoining areas like urban Dehri-on-sone, village Jamuhar, Nahauna etc. Many cases were referred cases from peripheral centres.

Study Unit: Individual patient

Inclusion criteria: We selected all patients whose records were complete with variables necessary for our study.

Exclusion criteria: Incomplete records were excluded.

Study Tool: Data of 95 patients were collected on a pre-structured proforma. A proforma containing information such as age, sex, place of residence, time of occurrence, mode of injury, TBSA involved and other aspects were filled properly.

Ethical Consideration: Ethical clearance was obtained by the institute ethical committee.

Data management and Statistical analysis: Data was entered in MS excel 2007 and analyzed by using descriptive statistics.

Operational Definitions

Burn Injury: A burn injury was diagnosed as defined by WHO's ICD-10 classification system [T20-32]. These included smoke, fire and flames (X00-09), contact with hot substances (X10-19), electric current (W85-87) and corrosive substances (X46-49). This also includes scalds and burns due to electric heating appliances, flame, chemical burns and other thermal burns.⁷

Total Body Surface area (TBSA): TBSA was estimated by the "Rule of nines" or Lund and Browder charting.⁸ Generally in more than 20% of TBSA, hypovolemic shock is managed by the Parkland formula (4 ml RL X kg X % TBSA burn (½ in 1st 8 hrs, ¼ in 2nd 8 hrs and ¼ in 3rd 8 hrs).

OBSERVATION AND RESULTS

There were a total of 95 cases of thermal burn injuries seen over a period of two years. There were 59 (62%) female victims and 36 (38%) male victims [Fig 1]. Females clearly outnumbered males thereby constituting a female to male ratio of 1.64: 1. Peak incidence (34.74%) was seen between 21 to 30 years of age followed by those between 11 to 20 years of age (23.16%) [Fig 2].

Irrespective of gender, most of the victims were married (72%) giving a married – unmarried ratio of 2.5:1 [Fig 3]. Out of total female victims, 78% were married and 22% unmarried in contrast to males 61% married and 39% unmarried. Majority of the cases were from rural areas (77%) with a rural to urban ratio of 3.32: 1 [Fig 4]. As for the religion of victims, 92% came from Hindu community while 8% were from muslim community [Fig 5].

Irrespective of gender, in most of the victims (55.8%) the burn injury covers 26-50% of the total body surface area (TBSA) followed by ≤ 25% of the TBSA (20%) [Fig 6]. According to time of incidence of burn, 35.8% victims got burnt from 12 pm to 5:59 pm. Only 6.3% victims got burn injury from 12 am to 5:59 am [Fig 7]. Flame was the most common (79%) cause of burn injury while 14% of victim got electric burn [Fig 8]. When enquired about the source of burn, maximum got injured by Chulha / bonfire [Fig 9].

When we asked victims about the duration of stay in hospital, only 5 of them stayed for less than or equal to five days while most of them (68 cases) stayed for more than five days [Fig 10]. Most (31.6%) of the victims reported in hospital within two to six hours while only 8.4% reported within one hour [Fig 11]. When we analyzed the final outcome of burn victims, it was seen that 66% of them were discharged although many of them had some form of disability. 7% of the victims left the treatment in between and left against medical advice (LAMA) and 12% of them were referred for various reasons to the higher centers. 15

(16%) patient died in the hospital with various complications [Fig 12].

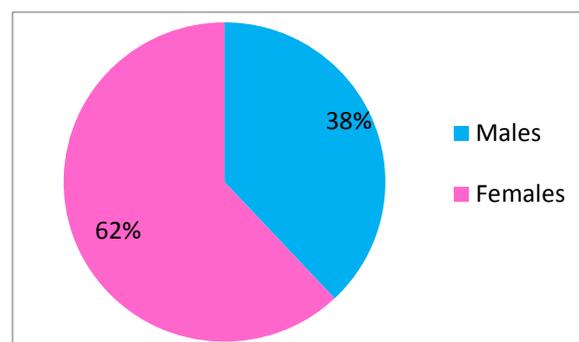


Figure 1: Sex wise distribution of cases of Burn

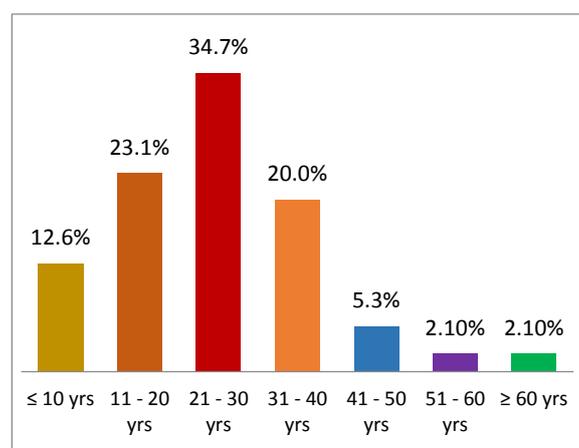


Figure 2: Age-Wise distribution of Cases

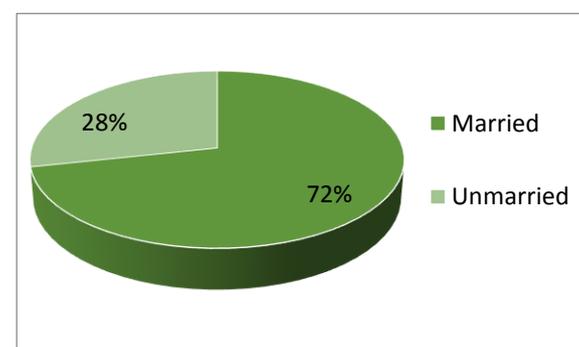


Figure 3: Marital status

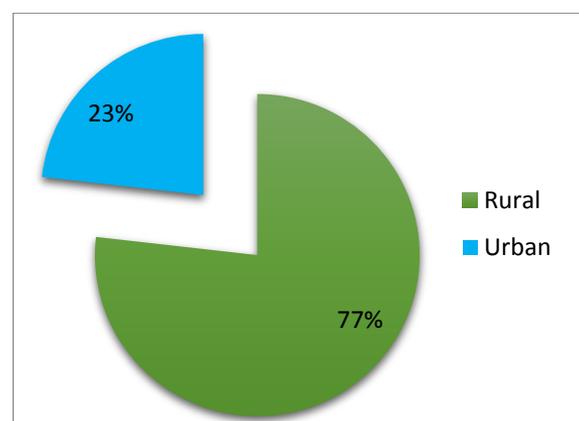


Figure 4: Residence wise distribution of cases:

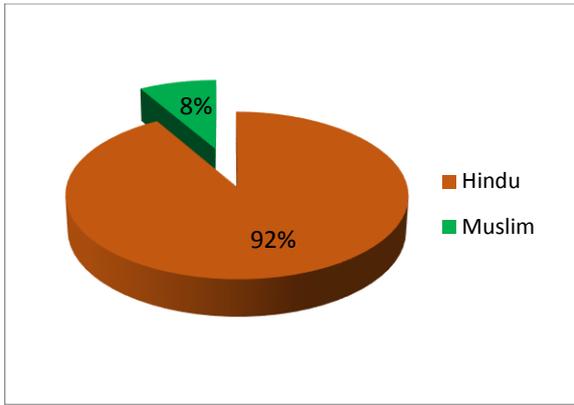


Figure 5: Religion wise distribution of cases

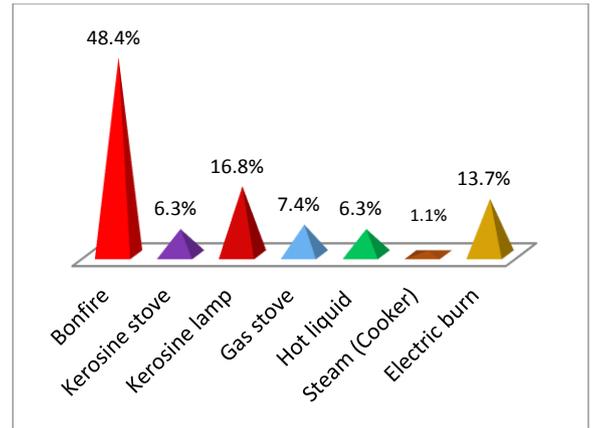


Figure 9: Source of burn

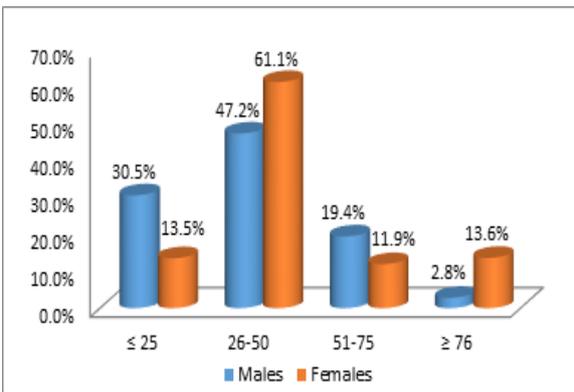


Figure 6: Distribution of cases according to TBSA (%)

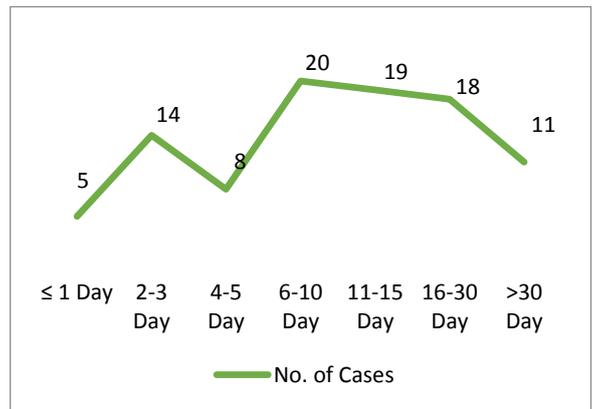


Figure 10: Duration of stay in hospital

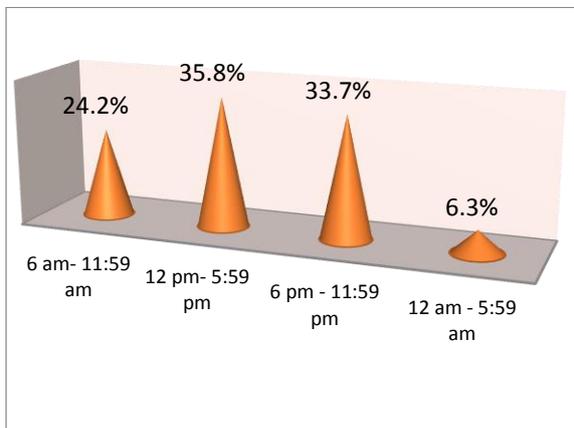


Figure 7: Time of incidence of burn

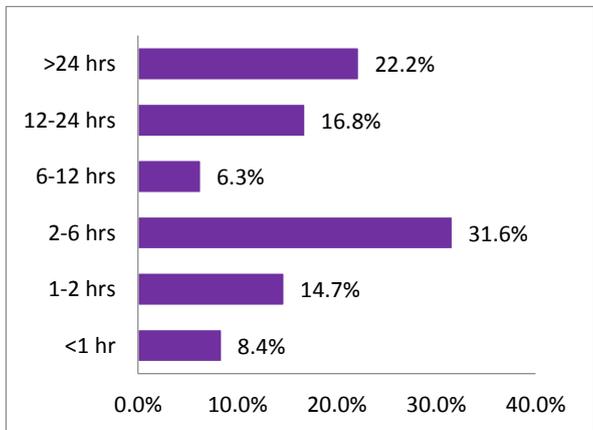


Figure 11: Time taken to report

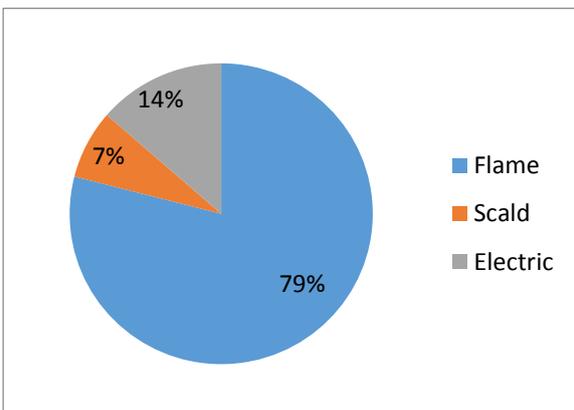


Figure 8: Type of burn injury

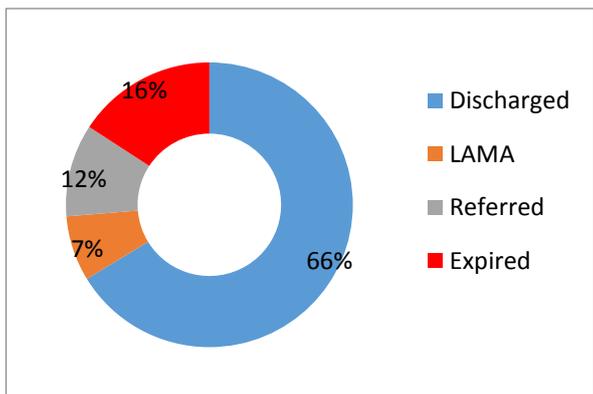


Figure 12: Outcome

DISCUSSION

In developing country like India, various social factors play significant role in predisposing women for burn injuries. Some of them are cooking foods, social and family stress, marital disharmony etc. In our study also, most of the victims were females. Others studies supported our findings.⁹⁻¹¹ Majority of the patients in our study were of the age group of 21 to 30 years, indicating greater exposure to burn agents in this age group than any other age group. These results are consistent with the other studies done previously.^{12,13}

According to marital status, our study revealed that married males and females outnumbered unmarried male and females. The preponderance of married female burn victims may be attributed to various social factors and family problems. This finding is in accordance to a study done by Ambade and Godbole.¹⁴

Majority of the cases (77%) in our study were from rural areas. A similar study reports 68% cases for rural areas.¹⁵ In most of the victims (55.8%) the burn injury covers 26-50% of the total body surface area (TBSA). This is seen same for males as well as females. Although other studies have proved that female victims had burns more than 75% of TBSA.¹⁶

According to time of incidence of burn, most of the victims were burned from 12 pm to 5:59 pm. Similar finding was seen in study done by Singh *et al.*¹⁷ Flame was the most common cause of burn injury seen in our study. Same result has been reported from other studies done in India.¹⁸⁻²⁰ Studies done outside India also support this fact.^{21,22} When we asked victims about the duration of stay in hospital, only 5 of them stayed for less than or equal to five days while most of them (68 cases) stayed for more than five days. Similar findings were seen in other studies.^{23,24} When we analyzed the final outcome of burn victims, it was seen that 66% of them were discharged while 7% of the victims left the treatment in between and left against medical advice. Bariar *et al* in their study found that 41% patients were discharged while 19.5% left against medical advice.²⁵ The overall mortality in our study was 16%. Similar mortality rates were seen in different studies.²⁶

CONCLUSION AND RECOMMENDATION

Burn injuries constitute a serious problem with a very high mortality among victims although these injuries are preventable. The basic health education regarding protection from burns should be imparted from the primary school level and then again reinforced at every level by using different interactive ways. There has to be a multi-disciplinary and coordinated approach to plan and implement prevention programmes to curb this menace from society. We have to educate the masses through social media about various aspects of burn injuries. We have to make people aware about the hazards of negligence by releasing epidemiological data related to burn victims. If these injuries are caused by any unlawful means, culprits should be booked and Government must take coercive steps and punish the culprits in fast track courts to give a message to the society about its commitment towards control of such crimes. NGO's, social groups and responsible citizens

also have to come forward to put in sincere efforts towards this common goal. Adequate steps are necessary not only to minimize burn mortality but also to reduce its morbidity. Reduction of incidence at least in cases where human error and greed plays a role is the need of the hour. We need to do more analytical studies into the cause of death and reasons behind patients leaving treatment without advice.

Limitation of the study: There may be a regional bias since this study includes patients predominantly from a district in Bihar, a northern state of India. Also many more aspects associated with burn victims could have been studied.

Conflict of interest: None declared

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