

# Epidemiology of Burns at SMS Hospital Jaipur: Over a Period of Four and Half Year

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## ABSTRACT

**Introduction:** A Burn is defined as insult or trauma to body's tissues resulting from heat, chemical, electricity sunlight or radiation. The most common type is scald burns occurring due to hot liquids, steam, gases and inflammable liquids. Inhalational burns are caused due to inhale of smoke. The ultimate aim in burn management is early and complete healing of wounds which in turn leads to good aesthetic and functional outcomes.

**Material and Methods:** This is a retrospective study conducted at SMS Medical College and Hospital, Jaipur, Rajasthan over a period of four and a half year (January 2009- June 2013). Total 7188 (Seven Thousand One hundred and Eighty) burn patients admitted to the department (including all mode of burn).

**Result:** Out of 7188 burn patients, one thousand six hundred and thirty one (1631) patients suffered by Electrical burns (22.69%), 4872 suffered by flame burns (67.77%) and remaining 685 suffered by scald burns (9.52%). Five thousand three hundred and ten patients were of the age group 11-40 years (73.87%). Of 7188, 4440 were males (61.7%) 2748 were females (38.2%) of all burn admissions.

**Conclusion:** Our study highlights the most common of mode of burn is flame and electrical burn. By this study we want to bring in notice to health peoples that prevention is better than cure in burn patients.

**Keywords:** Epidemiology of burns, flame burn, electrical burn

## INTRODUCTION

A Burn is defined as insult or trauma to body's tissues resulting from heat, chemical, electricity sunlight or radiation. The most common type is scald burns occurring due to hot liquids, steam, gases and inflammable liquids. Inhalational burns are caused due to inhale of smoke.

Burn can be classified in to four types as follows, 1<sup>o</sup> burn involve only the epidermis or outer layer of skin, 2<sup>o</sup> burn involve the epidermis and upper part of dermis, 3<sup>o</sup> burn involve the epidermis, entire dermis and may or may not involve subcutaneous tissue, 4<sup>o</sup> involve the deeper structure like bones, muscle and tendons.

Clinically burns can cause pain, swelling, blistering, redness, charring, scaring and in extensive cases shock and even death. Infection occur as a result of destruction of the protective barrier of skin. Treatment depends on the three main factors namely cause of burn, its extent (i.e. percentage of burns) and its depth.

Antibiotic creams can prevent or treat infections. For more serious burns, treatment may be needed to clean the wound, replace the skin, and make sure the patient has enough fluids and nutrition. Patients with extensive burns frequently die

and those with lesser injuries, physical recovery is slow and painful with development of sequelae later. In addition burn injuries frequently cause deleterious psychological disturbance. Maximum patient of burns presenting in emergency are 5-10%, which are treated on out patient basis with only care of local wound but higher percentage of burns are managed systemically as well as local wound management. Our aim in burn patients management are healing the wound as earliest as possible, so in post healing phase patient has good aesthetic and functional result and resume his/her duties.

## MATERIAL AND METHODS

In the emergency department at our hospital, majority of patients presenting with burns less than (<) 10% do not need hospitalization. The sites involved in the burn process include almost the entire body.

This study was conducted to identify the patterns of burn and demographic and socio-cultural aspects of burn patients and to determine the significance of the problem of burns among all injuries in patients admitted to the Department of Burns and Plastic Surgery SMS Medical College and Hospital Jaipur Rajasthan over a period of four and a half year (January 2009- June 2013)

All 7188 (Seven Thousand One hundred and Eighty) burn patients admitted to the department, a formal history was taken through a self-answered questionnaire- interview with the patients or from the patients attendants when patient was not in a position to answer the questions due to burn severity or inhalational injury as to know the cause of burn, site affected, total body surface area burnt and clinically assess the wound and also to obtain the data regarding registration, age, sex, occupation. In case of children history was taken from their parents.

## RESULTS

Over a period of over a period of four and half year (January 2009 to June 2013), 7188 (Seven Thousand One Hundred and Eighty Eight) patients were admitted to the burns unit SMS Medical College and Hospital. Of them one thousand six hundred and thirty one (1631) patients suffered Electrical burns (22.69%), 4872 suffered flame burns (67.77%) and

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remaining 685 suffered scald burns (9.52%) [Fig:2]. 5310 were of the age group 11-40 years (73.87%) [Table: 1]. Of 7188, 4440 were males (61.7%) 2748 were females (38.2%) of all burn admissions [Fig: 3].

**Social characteristics**

The ages of the burn patients ranged from 0 (Zero) to more than 60 years. Most of the patients (75%) were between 10 and 40 years of age. Males predominated, with an incidence of 62% (4440), compared to female incidence of 38% (2748) cases of total 7188. This was probably due to the larger male population in our study exposed to electric burns in professional activity. (Figs. 2, 3),[Table: 1].

**Aetiology of the burns**

History from patients revealed that the majority of burn injuries, flame and scald occurred at home and electric burns occurred during work with males mostly affected. In more than three fourth (5557 of 7188) of the cases, domestic cooking was the activity responsible for the flame and scald burns. Flame was the commonest agent of burn injuries (4872 of 7188 which comes out to be 67.77 %).in scalds the commonest causative agent was boiling water, followed by cooking oil.

**Clinical assessment**

Most cases were second-degree superficial or deep burns with an extent, using the rule of nine, of 10-40% of the total body surface area. The burn agent was significantly associated with the degree, depth, and severity of the burn wound;- flame burns tended to cause mixed second- and third degree, deep, and severe burns. The site most commonly affected was the face, upper extremity and upper trunk followed by the lower extremity.

**DISCUSSION**

Epidemiological studies have played a pivotal role in burn prevention, owing to the fact that each subset of population has its own peculiar epidemiological characteristics and its knowledge helps in appropriate selection of target groups for preventive action.<sup>4</sup>

The developing world accounts for a vast majority (Approx 90% of burns occurring around the globe). The common reasons attributed are lake of education, overcrowding and an unsafe cooking habits. Southeast Asia accounts for roughly Sixty percent of fatal burn cases around the world with a rate of 11.6 per 1lac. Compared to 1990 the number of fatal burn cases has increased from 2,80,000 to 3,38,000 in 2010.<sup>11</sup>

The external sources causing burns are classified into: thermal (heat related), chemical, electrical and radiation. In the developed world (united states) the common cause of burn are flame (44%), scalds (33%), hot objects (9%), electricity (4%), and chemicals (3%).<sup>6</sup> majority of burn injuries occur at home (69%) or work (9%), mostly accidental in nature and occasionally homicidal (2%) or suicidal (1-2%). These sorces can also result in inhalational injury affecting the airways and/or lungs in about 6% cases.<sup>10</sup>

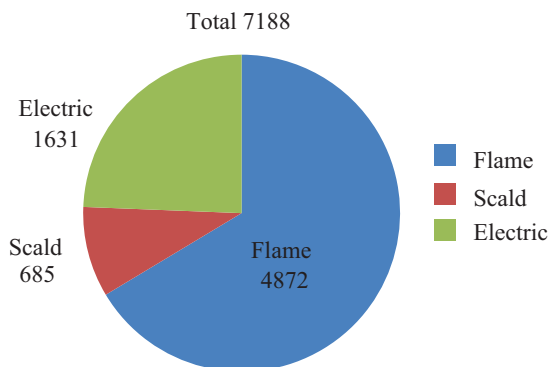
The lower socio-economic strata are more commonly affected by burn injuries. Smoking is a risk factor, although alcohol is not. Risk factors peculiar to developing world include cooking with open fire or on floors, lack of education and

Age Group	Total number of Patients	Male	Female
<10	1224	686	538
10-40	5310	3269	2041
41-60	613	420	193
>60	147	65	82

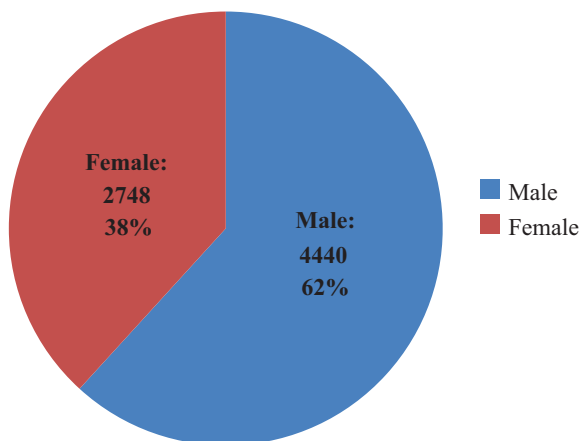
**Table-1:** Age Distribution



**Figure-1:** Hot Water burn in a 3 year female



**Figure-2:** Burn Characteristics



**Figure-3:** Sex Distribution

chronic disease in adults.<sup>7</sup> In india, number of people sustaining burns per year is approx 7,00,000 to 8,00,000 with highest incidence in women of age group 16-35 year of age. very few amongst those affected are treated in specialist unit. The high incidence in women of 16-35 years of age group is related to unsafe kitchens and loose fitting clothing typical of India. Intention-

al burns are a common cause in young women, subsequent to domestic violence and self harm.<sup>8,9</sup>

Age and sex are important epidemiological determinants for injuries, including burns. The present study revealed that nearly three of four of the patients were aged 10-40 years, while those at age > 60 years represented 2% of the cases. The high incidence among young adults may be explained by the fact that they are generally active and exposed to hazardous situations both at home and at work.

As regards sex distribution, the male population proved to be at greater risk of sustaining burns which is contradictory to the other performed studies than the female population and predominance might be explained by the involvement of males with the handling of fire substances or devices both in domestic activities and at occupation.

Considering the agent of the burn injury, flame burns (no. 4872/67%) were the commonest agent, followed by electric (no. 1631/22%) and scald burns (no. 685/9%). Flammable liquids (kerosene and petrol) and gas related materials were the commonest source of flame burns. Burn agents are highly individualized in every country, largely depending on the standard of living and lifestyle.

In the present study, a significant association was found between age and the burn injury agent. Most scald burns were in the age group less than 10 years and were due to boiling water. The incidence of electric burn was around 22 % patients which represented very high number as compared to any other study. Most of the electric burns were caused by ignorance, non-compliance with rules and regulations, and the lack of safe work practices.

Conventionally approx 50% of burns were considered preventable.<sup>6</sup> Prevention programs have played a major role in significant reduction of rates of serious burns.<sup>13</sup> A variety of preventive measures commonly applied include limiting water temperature, smoke alarms, sprinklers, improved construction of building and fire resistant clothings.<sup>6</sup> The recommended temperature setting of water heater is below 48°C (119.8°F).<sup>12</sup> Scalds burn can also be prevented by using thermometer to measure both water temperature and splash guards on stoves.<sup>13</sup> In case of fireworks there is basic and primitive evidence<sup>14</sup> of benefit with guidelines including capping the sale of fireworks to children.<sup>12</sup>

## CONCLUSION

Most burns are preventable. However, prevention is difficult to achieve. The main ways are by legislation and education. Public awareness must be increased by any method possible, from posters to media involvement. The problems of prevention is to determine an effective strategy and to financially support a prevention campaign, and to evaluate the effectiveness of the campaign. The state government should take initiatives regarding provisions for educating general public and to provide free medications and food for the admitted patients so that they can be treated completely without the fear of financial burden. This scheme of free drug and food for the patients has been implemented in our state and patients are extremely benefitted both in terms of treatment received and financially they are not drained. Hence government of every state should try to maximise educating people

to prevent themselves from this disastrous injury and if they are exposed free treatment provisions should be available for them.

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