

## Frequency of Source and Total Body Surface Area (TBSA) Burn Percentage with Outcome in Burn Patients

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### Abstract

**Objectives:** To determine the frequency of source and total body surface area (TBSA) burn percentage with outcome in patients admitted in Pak Italian burn unit, Multan. **Study design:** retrospective study. **Setting:** Pak Italian burn unit, Multan. **Study Duration:** six months from January 2017 to June 2017. **Material and Methods:** Medical records of 260 patients admitted in Pak Italian burn unit, Multan from January 2017 June 2017 were collected and the required information was recorded on a pre designed questionnaire. Data was analyzed using SPSS version 20. **Results:** Mean age of patients presenting with burn was 32.18 with standard deviation of 8.57 years. Out of total 260 patients, the male victims were n= 151(58.1%) victims Flame burn (68.1%) being the most common cause followed by electric burn (16.2 %), scalds (10.4%) and acid burn. Most of the patients (35.4%) have TBSA burn 11-20%. A mortality rate of 16.2% was observed which has a significant relation with TBSA burn ( $p=0.00$ ) but gender and source of burn was not significantly related with mortality. **Conclusion:** Flame burn are the most common cause of burn injury followed by electric burn. Most of the victims are male. **Keywords:** Burn injury, total body surface area burn(TBSA), flame burn, scalds, acid burn.

### Introduction

Burn is an injury to the skin or other body parts caused by extreme heat, flame, electricity and contact with heated objects or chemicals.<sup>1</sup> Burns may be thermal (flame), scald, electrical, or chemical.

According to WHO, burn injuries are the fourth most common traumatic injuries in the world.<sup>2</sup> They are major cause of morbidity and mortality in South Asian countries<sup>3</sup> which contribute over half of the total numbers of fire related burn death world wide.<sup>4</sup> Nearly 95% of the global burn deaths and disabilities are estimated to occur in low and middle income countries of the world.<sup>5,6</sup>

In Pakistan burns are second major cause of disability and 11<sup>th</sup> cause of premature death<sup>4</sup>. Burn injury is like a double edge sword, it hurts patients not only physically but also psychologically.

Though the burns mortality has decreased in the developed countries due to awareness, safety measures and good medical and surgical care, they are still major public health problem in developing countries.

. Burns in children are the result of thermal burns being more common in the age group of 0- 6 years.<sup>7, 8</sup> While in adults, they are more frequent in the age of 10- 29 year of age being twice as common in males as compared to females.<sup>9, 10</sup>

Minor burns just result in sick leaves and are not a reason for major economic burden, on the other hand, major burns are still a challenge to the burn team<sup>11</sup> due to high mortality and morbidity and major economic burden for family as well as state .Several factors determine severity of burn injuries including the proportion of the total body surface burn area (TBSA) burned<sup>12</sup>, depth of burn injury, source of burn and the affected area. Extremes of age, TBSA >40 % and inhalational injury are the risk factors for mortality.<sup>13, 14</sup> TBSA burn was 24.9% in a study conducted by Wise et al <sup>15</sup> while it was 38.04% in a study conducted by Pakistan Institute of Medical Sciences, resulting in death of 14% hospitalized patients.<sup>16</sup> Mortality resulting from burn was found 36.1% in Civil Hospital of Karachi where 35% of victims had more than 60% TBSA burn.<sup>17</sup>

In Pakistan, burn injuries continue to be a challenging problem due to poor medical facilities, lack of specialist care and public awareness. In this study we tried to identify and analyze the demographic feature and percentage of TBSA burn as an outcome in burn victims. The purpose of this study was to determine current burden of the problem in terms of mortality and morbidity and draw attention of higher to develop proper health

care system so that the number of deaths due to burn is brought down.

### Objective

To determine the frequency of source and total body surface area (TBSA) burn percentage with outcome in patients admitted in Pak Italian burn unit, Multan.

### Material and Methods

It was a retrospective study conducted in Pak Italian burn unit, Multan. Medical records of 260 patients were analyzed and the required information was recorded on a pre designed questionnaire. Information regarding age, gender, source of burn, TBSA burn and outcome of the patients either discharged or died was recorded. The whole data was entered and analyzed using SPSS version 20. Mean and standard deviation was calculated for age. Frequency and percentages were calculated for gender, percentage of TBSA burn, source of burn and outcome. Stratification of outcome with respect to gender, percentage of TBSA burn and source of burn was done.

### Results

Table no 1: Frequency distribution of gender and source of burn

Gender	Frequency	Percentage
Male	151	58.1
Female	109	41.9
Total	260	100

n=260

Table no 2: Frequency distribution of source of burn

Source of burn	Frequency	Percentage
Flame burn	178	68.5
Electric burn	42	16.2
scalds	27	10.4
Acid burn	13	5
Total	260	100

n=260

Table no 3: Frequency distribution of percentage of TBSA burn

percentage of TBSA burn	Frequency	Percentage
Less than 10%	53	20.4
11-20 %	92	35.4
21-30 %	64	24.6
31-40 %	25	9.6
41-50 %	13	5
51-60 %	13	5
Total	260	100

n=260

Table no 4: Stratifications of outcome with respect to gender

Gender	Outcome		P.VALUE
	Discharge	Died	
Male	127	24	0.893
Female	91	18	
Total	218	42	

n=260

Table no 5: Stratifications of outcome with respect to source of burn

source of burn	Outcome		P.VALUE
	Discharge	Died	
Flame burn	146	32	0.088
Electric burn	40	2	
Scalds	23	4	
Acid burn	9	4	
Total	218	42	

n=260

Table no 6: Stratifications of outcome with respect to percentage of TBSA burn

percentage of TBSA burn	Outcome		P value
	Discharge	Died	
Less than 10%	53	0	0.00
11-20 %	88	4	
21-30 %	54	10	
31-40 %	15	10	
41-50 %	5	8	
51-60 %	3	10	
Total	218	42	

n=260

### Discussion

The study find out that, in Southern Punjab, more males are affected by burn injuries as compared to females with flame burn being the most common cause followed by electric burn, both of which are preventable. Most of the burns occur in young age group with percentage of TBSA directly related to the outcome.

In this study mean age of victims was found to be  $32.18 \pm 8.57$  years which is more than other studies conducted in Pakistan but it is in line with other studies conducted in India.<sup>9, 10, 21</sup> Flame injuries are the leading cause for burn in this study which is in accordance to many studies conducted in various parts of Pakistan.<sup>5, 9, 13</sup> Electric burns are also found more prevalent in this study compared to scalds being the second most common cause in many studies.<sup>5, 7</sup> The observations regarding gender differ from another study conducted in Karachi where male to female ratio was found 2:1.<sup>9</sup> Comparatively less females are affected in our study from the studies conducted in India and Nepal<sup>18, 19</sup> which might be possible due to less reporting and care seeking in females. However a similar male to female ratio was reported by Hashmi M et al in Pakistan and by Kumar S from India.<sup>5, 13, 21</sup>

Most of the individuals in our study (35.4 %) have 11-20% of total body surface area burn which is far less compared to 46% individuals with more than 20% TBSA burn reported by Jain M et al.<sup>21</sup> similarly a higher proportion of TBSA burn was reported in Karachi, Pakistan.<sup>13</sup> this discrepancy might be possible because the patients belonging to the periphery of Southern Punjab with higher proportion of TBSA burn might not be able to access to Pak Italian Burn Unit due to lack of proper transportation.

The mortality rate observed in this study was 16.2 % which is less than mortality observed in some other parts of Pakistan including Karachi where a more than 40% burn victims died.<sup>13, 22</sup> Mortality in this center is also less than reported in some countries of South East Mediterranean Region.<sup>20</sup> However only 5% burn victims die because of burn globally and also in developed countries like America.<sup>9, 10</sup>