

# Importance of a Dedicated Burns Unit: A Comparative Study on The Clinical Outcome of Burns Patients with and without a Burns Unit

Premlal A P<sup>a</sup>, Minu Catherine Abraham<sup>b</sup>, Anu Anto Kallerey<sup>c</sup>  
Roshjo Roshan Attokaren<sup>c</sup>

a. Department of Plastic and Reconstructive Surgery, Government Medical College, Trivandrum;

b. Resident in Internal Medicine, Bronx Healthcare System, NY, USA;

c. Department of Plastic and Reconstructive Surgery, Government Medical College, Kozhikode\*

## ABSTRACT

Published on 30<sup>th</sup> December 2023

**Background:** Burns is an endemic health hazard in a country like India rough estimate of the total number of burn admission in India with a population of over 1 billion, is 7,00,000 to 8,00,000 annually. This high incidence makes it an endemic health hazard. Burns speciality units are being established for dedicated burns care.

**Objectives:** this study was to done to compare the outcomes between patients admitted to a dedicated burns unit and a general care unit.

**Methods:** Record based cross sectional study was conducted analysing the clinical outcome of patients admitted with burns from June 2014 to December 2016. The study compared the morbidity and mortality rates of patients admitted with burns in Govt. Medical College, Thiruvananthapuram before and following the introduction of an exclusive Burns ICU care facility. Data was entered in Excel sheets and analysed using SPSS software.

**Results:** ICU admissions were most common among females (56.4% ie 128 patients). The commonest age group was between 20-40 years. Majority of the burns victims suffered from accidental burns with 65% requiring ICU care and 62.4% admitted to the wards. The most common cause of burns was fire accounting for 70 – 80%. In patients with 40 - 60 % burns there was a significant difference in outcome with better mortality when treated in a dedicated burns ICU in comparison to the patients treated in a non-burns speciality unit, with chi square test giving a P value of 0.0306.

**Conclusion:** A burns unit with Dedicated ICU care improves the morbidity and mortality among burns patients. In the ICU with minimal facilities itself, Patients sustaining burns of 40 - 60 % TBSA, significant improvement in survival is noted. An upgraded ICU with good intensive care will surely improve the survival rate of burn victims

**Keywords:** Burns care, Burns ICU, Burns mortality

\*See End Note for complete author details

## INTRODUCTION

Burn injuries are a serious problem to developing countries like India.<sup>1</sup> Important demographic factors that make such injuries common are the high population density, poverty and to an extent, illiteracy.<sup>2</sup> A rough estimate of the total number of burn admission in India with a population of over 1 billion, is 7,00,000 to 8,00,000 annually.<sup>3</sup> This high incidence makes it an endemic health hazard.<sup>2</sup> Various social, economic, and cultural factors further complicate the management, reporting, and prevention of burns.<sup>4</sup>

The goal in management of an acute burn is to limit the extent of the systemic insult.<sup>5</sup> Intensive care management should not be seen as rescue for failed initial treatment but as a preventive measure in patients at high risk of organ failure.<sup>5</sup> Intensive care units have the resources for improved monitoring and expertise in managing acute physiological change.<sup>5</sup>

Thermal injury induced lesions in the adult population that ideally require at least three days of intensive care treatment post injury are classified as major injury.<sup>6</sup> There are studies that suggest survival rates up to 50%

*Cite this article as:* Premlal AP, Abraham MC, Kallerey AA, Attokaren RR. Importance of a Dedicated Burns Unit: A Comparative Study on The Clinical Outcome of Burns Patients with and without a Burns Unit. Kerala Medical Journal. 2023 Dec 30;16(1):7-10.  
| DOI: <https://doi.org/10.52314/kmj.2023.v16i1.611>

### Corresponding Author:

Dr. Anu Anto, Assistant Professor, Department of Plastic and Reconstructive Surgery, Government Medical College, Kozhikode. E-mail: [anunto.kallerey84@gmail.com](mailto:anunto.kallerey84@gmail.com)

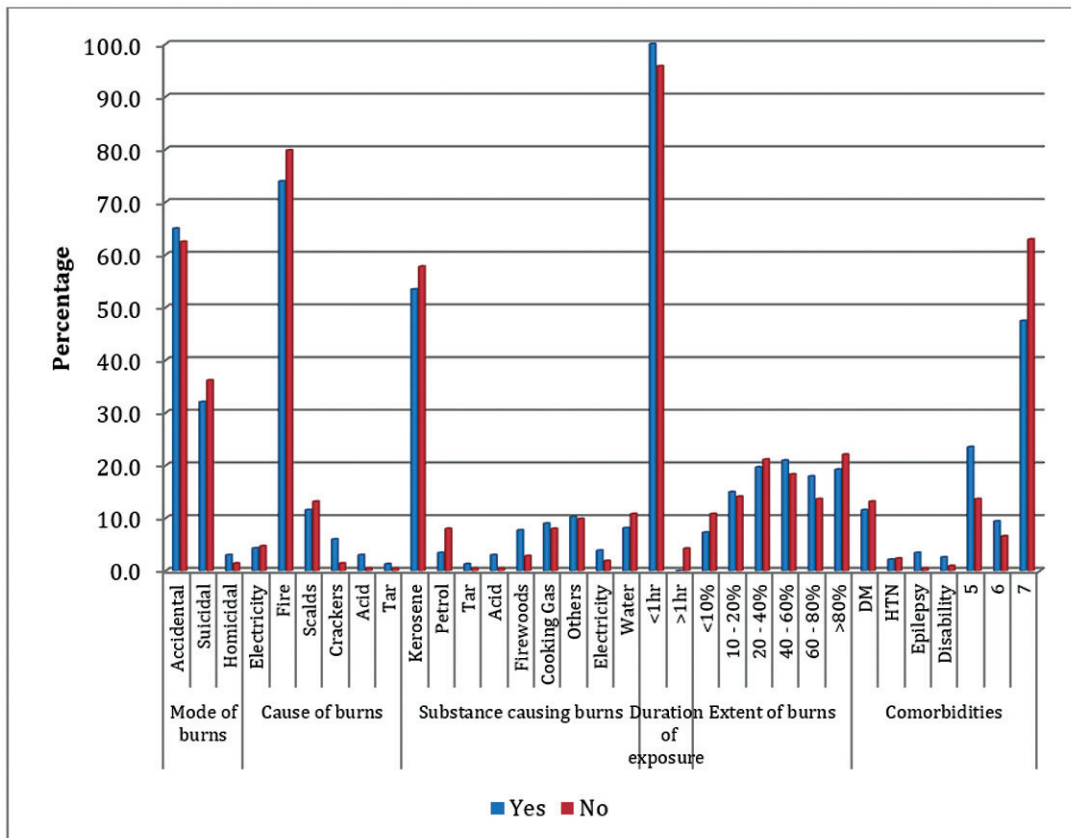


Figure 1. Comparison of aetiology of burn based on ICU admission

in young adults who have suffered total body surface area burns of 80% without inhalational injury.<sup>7,8</sup> Multiple organ failure was a common entity in patients who died 3 days post injury<sup>9</sup> and hence it becomes of utmost importance to increase the efficiency of the initial chain of medical care for these patients.

Since the 1950s there has been an increasing interest to ascertain the type of facilities required to treat major burn victims. Evaluation of mortality after burns and hospitalization time crucial to attaining inpatient treatment are the two most important criteria to roughly predict the number of beds a burns unit would require.

The disaster management ability of the health system is an indicator of its efficiency. An article on “Clinical profile of a firework disaster in Kerala: lessons learnt” based on a firecracker accident in Kerala in India also aided in the realisation of the importance of a burns care facility.<sup>9</sup>

The following study was undertaken to analyse the outcomes of burns victims before and after commissioning of the burns ICU at a tertiary care medical centre. The clinical outcome of patients admitted at a tertiary care centre before and after the establishment

of a burns care unit categorized based on the percentage of burns was assessed.

## METHODOLOGY

We conducted a record-based cross-sectional study analysing the clinical outcome of patients admitted with burns from June 2014 to December 2016. This study compared the morbidity and mortality rates of patients admitted with burns in Govt. Medical College, Thiruvananthapuram before and following the introduction of an exclusive Burns ICU care facility.

A total of 446 patients were studied of which 214 were treated in wards 15 months before the commissioning of the ICU and 232 in Burns ICU Patients admitted 15 months after its establishment were included and data was compared.

Data collection was using data from case records of patients included in study. Quantitative variables were expressed as mean standard deviation and qualitative variables as proportion. Data was analysed using SPSS software. Chi Square test was used as a test for significance of data.

**Table 1. Comparison of region affected based on ICU admission**

Region	ICU Admission		P Value
	Yes N (%)	No N (%)	
Head and neck	167 (71.4)	142 (66.7)	0.283
Face	169 (72.2)	137 (64.3)	0.073
Right UL	189 (80.8)	167 (78.4)	0.535
Left UL	184 (78.6)	159 (74.6)	0.319
Ant chest	172 (73.5)	149 (70)	0.405
Post chest	124 (53)	111 (52.1)	0.853
Ant Abd wall	159 (67.9)	140 (65.7)	0.618
Post Abd wall	114 (48.7)	101 (47.4)	0.783
Right LL	151 (64.5)	140 (65.7)	0.791
Left LL	144 (61.5)	128 (60.1)	0.755
Genitalia	82 (35)	84 (39.4)	0.337

## RESULTS

ICU admissions were most common among females (56.4% ie 128 patients). The commonest age group was between 20-40 years. On comparing both genders it was seen that burns among the female population (147 patients ie 69%) required more ICU admissions as compared to their male counterparts (66 patients ie 31%).

Of the total burns patients admitted, 80% (357) belonged to the BPL category with the majority being unemployed (40% ie 203 patients) or manual labourers (30% ie 151 patients). Less than 10% of the burns population were college-educated. It was also noted that less than 20% of the burns population were under the influence of alcohol at the time of admission. No significant differences were seen in the number of burn victims admitted in the wards and the ICU in the above-mentioned aspects.

Majority of the burns victims suffered from accidental burns with 65% ie (152) requiring ICU care and 62.4% ie 133 admitted to the wards. This was followed by suicidal burns with 32.1 % (75 patients) in the ICU and 36.2% ie 77 patients in the ward. Homicidal burns barely accounted for 2-3% of the burns victims requiring admission (**Figure 1**).

The most common cause of burns was fire accounting for 70 – 80%. Upper limbs, head and neck and face where the most commonly involved site involved whereas genitalia, posterior trunk and posterior abdominal wall were the least commonly involved sites (**Table 1**).

It was seen that in patients with 40 - 60 % burns there was a significant difference in outcome with better

**Table 2. Table Comparison of outcome(mortality) based on ICU admission**

Extent of burns	Clinical outcome	ICU Admission		P Value
		Yes N (%)	No N (%)	
<40%	Survived	76 (82.6)	81 (88)	0.298
	Death	16 (17.4)	11 (12)	
40 - 60%	Survived	25 (47.9)	11 (28.2)	0.031
	Death	23 (52.1)	28 (71.8)	
>60%	Survived	1 (1.2)	3 (4.1)	0.248
	Death	84 (98.8)	71 (95.9)	

mortality when treated in a dedicated burns ICU in comparison to the patients treated in a non-burns speciality unit, with chi square test giving a P value of 0.0306. Providing of proper ICU care to major burn victims will result in improved survival rate and reduced mortality (**Table 4**).

## DISCUSSION

According to a study by Sulunke.et.al, on the survival of burns patients in a tertiary care centre in India, females suffer burns more frequently than males.<sup>1</sup> in our study 54.7% patients were females and of the patients requiring ICU admission 69% were females. the common age group was between 20 - 40 years which is corresponding to other studies on burns management.

According to an Epidemiological study of burn injuries by Shankar G.et.al 41% patients came under the extremely poor socioeconomic category.<sup>10</sup> In our study, 80 % of patients belonged to the BPL category.

The overall mortality in this study was found to be 59.4% ie 251 patients. In a study by C J Ede.et.al on

**Table 3. Comparison of clinical outcome based on ICU admission**

Extent of burns	Clinical outcome	ICU Admission		P Value
		Yes N (%)	No N (%)	
<40%	Completely Cured	58 (59.2)	66 (67.3)	0.082
	Temporarily/Permanently Disabled	17 (17.3)	15 (15.3)	
	Death	23 (23.5)	17 (17.3)	
40 - 60%	Completely Cured	8 (16.3)	8 (20.5)	0.0306
	Temporarily/Permanently Disabled	17 (30.6)	3 (7.7)	
	Death	24 (53.1)	28 (71.8)	
>60%	Completely Cured	0 (0)	3 (3.9)	0.256
	Temporarily/Permanently Disabled	1 (1.1)	0 (0)	
	Death	86 (98.9)	73 (96.1)	

Treated in	Death	Survived
Burns ICU	24	25
General care	28	11

P value of the Chi square test is calculated to be 0.0306

“a comparative study of outcomes of burns across multiple levels of care” there was no significant difference in mortality rates between burns speciality and non-burn speciality centres.<sup>11</sup> But our study assessed the difference in outcome between Burns ICU care and non-Burns ICU care and found that in 40 - 60 % Total burns surface area (TBSA) burns the survival showed significance with a P value of <0.05. Whereas in other category burns there was no significance found between speciality burns care and non-dedicated burns unit management (Table 2 & 3).

### LIMITATIONS OF STUDY

The type of burns referred to before the establishment of a dedicated burns unit may have been different from the time after which a dedicated unit was established as more severe cases may be referred after the commissioning of the burns dedicated unit

### CONCLUSION

A burns unit with Dedicated ICU care improves the morbidity and mortality among burns patients. In the ICU with minimal facilities itself, Patients sustaining burns of 40 - 60 % TBSA, significant improvement in survival is noted. An upgraded ICU with good intensive care will surely improve the survival rate of burn victims

### END NOTE

#### Author Information

1. Dr Premlal A P, Professor  
Department of Plastic and Reconstructive Surgery,  
Government Medical College, Trivandrum
2. Dr Minu Catherine Abraham  
Resident in Internal Medicine,  
Bronx Healthcare System, NY, USA

3. Dr Anu Anto Kallerey  
Assistant Professor, Department of Plastic and  
Reconstructive Surgery, Government Medical  
College, Kozhikode
4. Dr Roshjo Roshan Attokaren  
Senior Resident, Department of Plastic and  
Reconstructive Surgery, Government Medical  
College, Kozhikode

**Conflict of Interest:** None declared

### REFERENCES

1. Salunke N, Tapare VS, Parande MA, Tambe MP. Survival analysis of burn patients attending a tertiary care hospital of Western Maharashtra, India. *Med J DY Patil Vidyapeeth* 0;0:0.
2. Ahuja, Rajeev B, and Sameek Bhattacharya. “Burns in the Developing World and Burn Disasters.” *BMJ : British Medical Journal* 329, no. 7463 (August 21, 2004): 447–49.
3. Gupta, J. L., L. K. Makhija, and S. P. Bajaj. “National Programme for Prevention of Burn Injuries.” *Indian Journal of Plastic Surgery : Official Publication of the Association of Plastic Surgeons of India* 43, no. Suppl (September 2010): S6–10.
4. Karan, Abraar, Vanda Amado, Pio Vitorino, David Kulber, Atanasio Taela, and Daniel A. DeUgarte. “Evaluating the Socioeconomic and Cultural Factors Associated with Pediatric Burn Injuries in Maputo, Mozambique.” *Pediatric Surgery International* 31, no. 11 (November 2015): 1035–40.
5. Ansermino M, Hemsley C. Intensive care management and control of infection *BMJ* 2004; 329 :220
6. Vivó, C., R. Galeiras, and Ma D. P. del Caz. “Initial Evaluation and Management of the Critical Burn Patient.” *Medicina Intensiva* 40, no. 1 (2016): 49–59.
7. Ryan, C. M., D. A. Schoenfeld, W. P. Thorpe, R. L. Sheridan, E. H. Cassem, and R. G. Tompkins. “Objective Estimates of the Probability of Death from Burn Injuries.” *The New England Journal of Medicine* 338, no. 6 (February 5, 1998): 362–66.
8. Saffle, J. R., B. Davis, and P. Williams. “Recent Outcomes in the Treatment of Burn Injury in the United States: A Report from the American Burn Association Patient Registry.” *The Journal of Burn Care & Rehabilitation* 16, no. 3 Pt 1 (1995): 219–32; discussion 288–289.
9. Premlal AP, Mohan M, Beevi K, Komalarani T. Clinical profile of a firework disaster in Kerala: lessons learnt. *International Surgery Journal*. 2018 Jul 24;5(8):2771-6.
10. Saffle JR, Sullivan JJ, Tuohig GM, Larson CM. Multiple organ failure in patients with thermal injury. *Crit Care Med*. 1993 Nov;21(11):1673-83.
11. Shankar, Gowri, Vijaya A Naik, and Rajesh Powar. “Epidemiological Study of Burn Injuries Admitted in Two Hospitals of North Karnataka.” *Indian Journal of Community Medicine : Official Publication of Indian Association of Preventive & Social Medicine* 35, no. 4 (2010): 509–12.