

A 5-year Retrospective Study of Burn Injury at Tarakan Regional General Hospital Jakarta

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ABSTRACT

Introduction: Burn patients deserve more attention because of their high morbidity and mortality rates. According to the World Health Organization, approximately 180.000 deaths per year are associated with burns. We aim to obtain the characteristics of burn patients at Tarakan Regional General Hospital Jakarta as a type A referral center hospital from 2018 to 2022 to examine patient trends, provide appropriate services for burn patients, and reduce the rate of poor quality of life caused by disability and death.

Methods: A cross-sectional method with descriptive study was used. Medical records of patients with burns admitted to Tarakan regional general hospital Jakarta between January 2018 and September 2022 were evaluated. 191 burn patients were reviewed based on age, sex, total burn surface area, burn degrees, etiology, intervention, and discharge status.

Results: The total number of burn patients at the Tarakan hospital Jakarta from 2018 - 2022 was 191, with an increase of 248% from 2018 to 2022. With a gender ratio of 1.03:1, 97 subjects were male, and 94 were female. Most patients have dominated with adults as much as 80.1%. The highest incidence of burns is due to gas explosions, with a total area of burn injury at 21-30% TBSA occurring at 40.84%, and most burns ensue in the second degree as much as 59.69%. In the age group under 18 years, 73.05% of the common cause of burns is scald. The most extensive burns occur on 10-20% of the body surface area, and 73.68% of subjects suffer from second-degree burns. Debridement and wound dressing were done in the operating room on average four times per patient. The mortality rate in Tarakan Regional Hospital is 2.6% due to > 40% TBSA burns.

Conclusion: Burn injury patients at Tarakan regional hospital Jakarta from 2018 to 2022 have increased, with gas explosions being the most common cause in the adult age group while in the children group by scald. Third-degree burns cause most deaths. According to these results, the proper facilities and infrastructure at hospitals in Jakarta may also improve the quality of treatment for burn patients.

KEYWORDS: Epidemiology, burn injury

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INTRODUCTION

Burn patients deserve more attention because of their high morbidity and mortality rates. According to the World Health Organization, approximately 180.000 deaths per year are associated with burns. ⁽¹⁾ Study from Collier J et al. reported Asia had an estimated 117 million burn injuries between 1990 and 2019. Asia accounted for 46% of global burn cases, 47% of deaths, and 46% of disability-adjusted life years (DALYs) in 2019. South and Southeast Asia accounted for 30-40% of all global cases, fatalities, and DALYs. Asia had incidence, mortality, and DALY rates that were 32%, 22%, and 23%

higher than global averages. ⁽²⁾ We aim to obtain the characteristics of burn patients at Tarakan Regional General Hospital Jakarta as a type A referral center hospital from 2018 to 2022 to examine patient trends, provide appropriate services for burn patients, and reduce the rate of poor quality of life caused by disability and death.

METHOD

This study used a cross-sectional method with descriptive study. Medical records of patients with burns admitted to the Tarakan regional general hospital Jakarta between January

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2018 and September 2022 were evaluated. 191 burn patients were reviewed based on age, sex, total burn surface area, burn degrees, etiology, intervention, and discharge status. The inclusion criteria of this study were patients who were recorded in the registration data at Tarakan Regional Hospital in 2018-2022 with complete data. While the exclusion criteria for this study were patients who were recorded with incomplete data. The acquired data were then descriptively evaluated using the digital data processing software IBM SPSS 24. The presentation of data derived from the research

variables in the form of tables, diagrams, or graphs with explanations obtained from data analysis.

RESULTS

This study of burn patients at the Tarakan Jakarta Hospital showed an increase in admitted burn patients from 2018 to 2022. In 2018, 27 burn patients were recorded at the Tarakan Jakarta Hospital, while 94 patients were admitted in 2022 (Chart1).

Patient Admission per Year Between 2018-2022

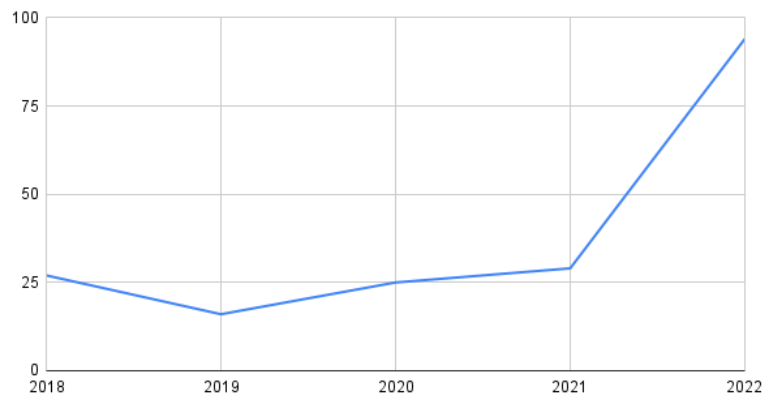


Chart 1

Out of a total of 191 burn patients, 97 were male and 94 were female (Chart 2). The sample was dominated with the adult group by 153 patients (80.10%), while the children's group recorded as many as 38 patients (19.90%) (Chart 3).

Epidemiology of burn patient's gender at Tarakan Hospital Jakarta from 2018 to 2022

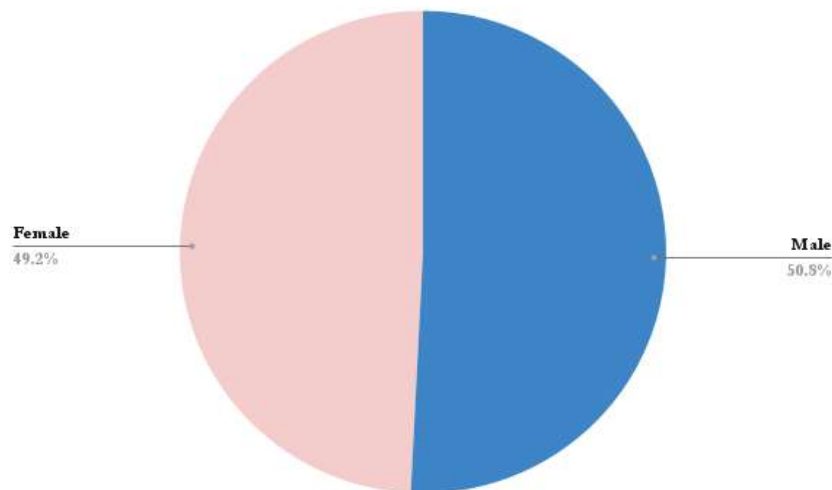


Chart 2

Epidemiology of burn patient's age at Tarakan Hospital Jakarta from 2018 to 2022

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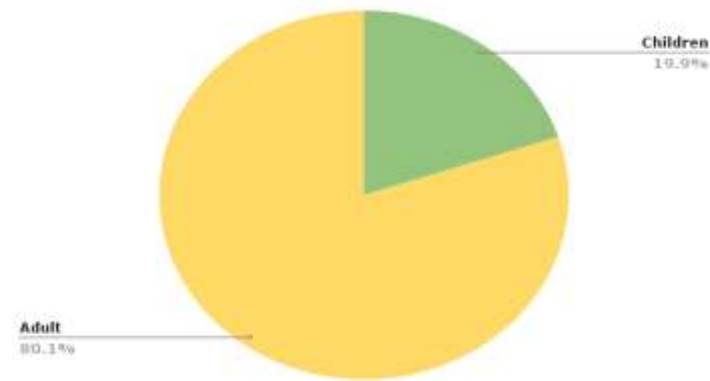


Chart 3

The most common causes of burns in Tarakan Jakarta Hospital were dominated by gas explosions with 60 patients (31.41%), followed by flame with 46 patients (24.1%), scald with 46 patients (24.1%), contact with 26 patients (13.61%), and electricity by 13 patients (6.81%) (Chart 4). In adults, the most common causes of burn injuries were gas explosions as

many as 57 people (37.25%), while in children age group the most common cause by hot water, as many as 27 people (71.05%). (Chart 5).

Etiology of burn injury at Tarakan Hospital Jakarta between 2018-2022

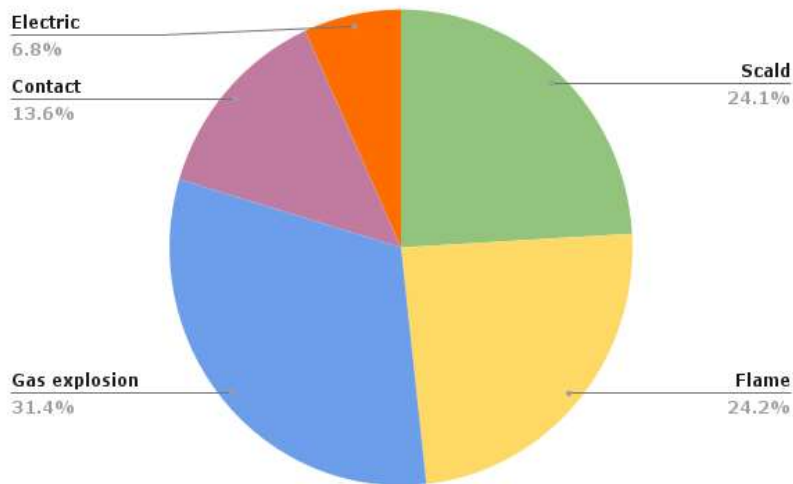


Chart 4. Etiology and age group of burn patients at Tarakan Regional Hospital between 2018-1022

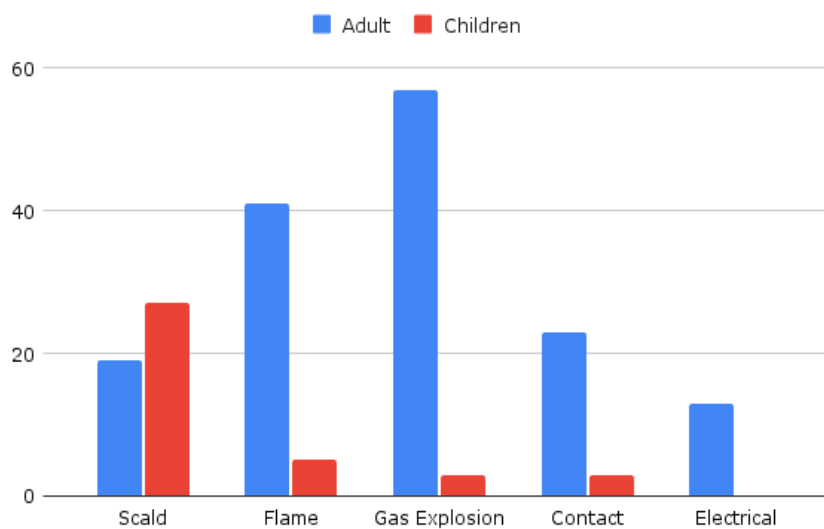


Chart 5

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In adult age group, second-degree burns are the most common with 86 patients (56.21%) and a burn of 21-30% of body surface area in 67 people (43.79%). In children age group, 28 patients (73.68%) had second-degree burns, and 16

(42.11%) of 38 children had a 10-20% burn of total body surface area.

Epidemiology of burns based on burn degree and age group at Tarakan Regional Hospital Jakarta from 2018 to 2022

Table 1. Epidemiology of burns based on burn area (TBSA) and age at Tarakan Regional Hospital Jakarta between 2018-2022

	Grade I	Grade II	Grade II-III	Grade III	Total
Children	0	28 (73.68%)	8 (21.05%)	2 (5.26%)	38 (100%)
Adult	0	86 (56.21%)	62 (40.52%)	5 (3.27%)	153 (100%)
Total	0	114 (59.69%)	70 (36.65%)	7 (3.66%)	191 (100%)

Table 2.

	<10% TBSA	10-20% TBSA	21-30% TBSA	31-40% TBSA	>40% TBSA	Total
Children	8 (21.05%)	16 (42.11%)	11 (28.95%)	2 (5.26%)	1 (2.63%)	38 (100%)
Adult	12 (7.84%)	40 (26.14%)	67 (43.79%)	25 (16.34%)	9 (5.88%)	153 (100%)
Total	20 (10.47%)	56 (29.32%)	78 (40.84%)	27 (14.14%)	10 (5.24%)	191 (100%)

When the degree of burn and the area of the burn are conveyed to the cause of the injury, the result shows that the burn area >40% of the body surface is mostly caused by gas explosion in as many as five patients (8.70%) (Table 3). The most significant third-degree burns are caused by electricity 15.38% and flames 4.35% (Table 4).

Epidemiology of extensive burns (TBSA) on the causes of burns at Tarakan Regional Hospital Jakarta between 2018-2022

Table 3.

	<10% TBSA	10-20% TBSA	21-30% TBSA	31-40% TBSA	>40% TBSA	Total
Scald	11 (23.91%)	28 (60.87%)	6 (13.04%)	1 (2.17%)	0	46 (100%)
Flame	2 (4.35%)	6 (13.04%)	23 (50%)	11 (23.91%)	4 (8.33%)	46 (100%)
Gas explosion	3 (5%)	5 (8.33%)	37 (61.67%)	10 (16.67%)	5 (8.70%)	60 (100%)
Contact	3 (11.54%)	15 (57.69%)	7 (26.92%)	0	1 (3.85%)	26 (100%)
Electrical	1 (7.69%)	2 (15.38%)	5 (38.46%)	5 (38.46%)	0	13 (100%)
Total	20 (10.47%)	56 (29.32%)	78 (40.84%)	27 (14.14%)	10 (5.24%)	191 (100%)

Epidemiology of burn degree and etiology at Tarakan Regional Hospital Jakarta between 2018-2022

Table 4.

	Grade II	Grade II-III	Grade III	Total
Scald	39 (84.78%)	7 (15.22%)	0	46 (100%)

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Flame	20 (43.48%)	24 (52.17%)	2 (4.35%)	46 (100%)
Gas explosion	31 (51.67%)	27 (46.67%)	1 (1.67%)	60 (100%)
Contact	21 (80.77%)	3 (11.54%)	2 (7.69%)	26 (100%)
Electrical	3 (23.08%)	8 (61.54%)	3 (15.38%)	13 (100%)
Total	114 (59.69%)	69 (36.65%)	8 (3.66%)	191 (100%)

Due to our hospital's limited Burn Unit facilities, all burn patients must undergo debridement and wound dressing procedure at Central Surgical Installation (IBS). The average debridement and wound dressing were performed four times

per burn patient from 2018 to 2022, with the most debridement being performed on three patients eight times.

A total of 185 patients (96.86%) discharged from the hospital, five patients (2.62%) deceased due to >40% burns, and one patient (0.52%) went home at their request. (Chart 3).

Discharge status of burn patients at Tarakan Regional Hospital Jakarta between 2018-2022

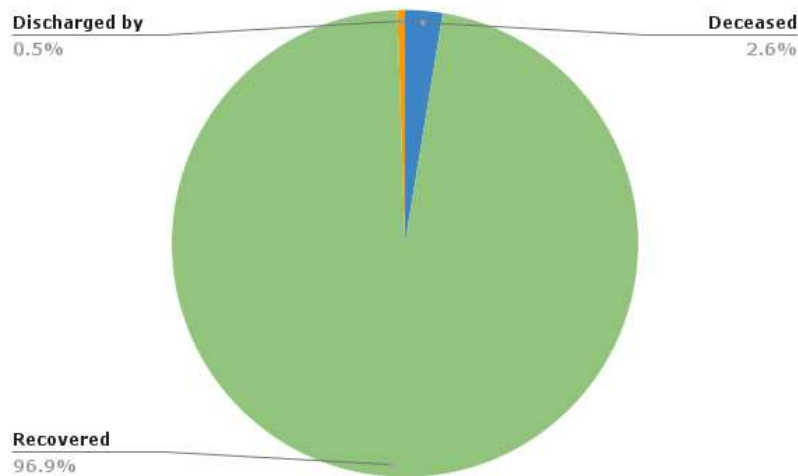


Chart 5

The mortality rate in burn patients with burn surface area can be seen in Table 5, where five patients who died (50%) experienced >40% burn injury of total body surface area. Three people experienced cases of deceased patients (28.57%) with third-degree burns (Table 6).

Mortality rate of burn patients and total body surface area at Tarakan Regional Hospital Jakarta from 2018 to 2022

Table 5.

	Recovered	Deceased	Discharged by req.	Total
<10%	20 (100%)	0	0	20 (100%)
10-20%	55 (98.21%)	0	1 (1.79%)	56 (100%)
21-30%	78 (100%)	0	0	78 (100%)
31-40%	27 (100%)	0	0	27 (100%)
>40%	5 (50%)	5 (50%)	0	10 (100%)
Total	185 (96.86%)	5 (2.62%)	1 (0.52%)	191 (100%)

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Mortality rate of burn patients and burn degrees at Tarakan Regional Hospital Jakarta between 2018-2022

Table 6.

	Recovered	Deceased	Discharge by req.	Total
Grade II	111 (97.37%)	2 (1.75%)	1 (0.88%)	114 (100%)
Grade II-III	69 (98.57%)	0	0	69 (100%)
Grade III	5 (71.43%)	3 (28.57%)	0	8 (100%)
Total	185 (96.86%)	5 (2.62%)	1 (0.52%)	191 (100%)

DISCUSSION

The epidemiology of burn patients at Tarakan Jakarta Hospital in 2018-2022 has increased by 248%. This shows an increase in the incidence of burn injuries. The number of burn injury patients samples was 191, where the adult age group was the largest group with a total of 153 patients (80.10%), while the children's age group stood at 38 patients (19.90%). It can be concluded descriptively that second-degree burns are the group with the highest number, namely 114 (59.69%), the adult group numbering 86 (56.21%), and the children group, namely 28 patients (73.68%). These results indicate that there is in accordance with research conducted at Sanglah General Hospital, Denpasar in 2018-2019 which showed that the majority of patients had second-degree burns, as many as 107 people (87.7%).⁽³⁾

A study at the Wahidin Sudirohusodo Hospital Makassar in a period of 5 years (2006-2009) also showed that the most common burns were second-degree burns, with a percentage of 56.7%.⁽⁴⁾

The etiology of burns based on their age group at Tarakan Jakarta Hospital in 2018-2022 showed that burns caused by gas explosions were the highest cause with a total of 60 patients (31.41%), and the highest age group is dominated by adults with 57 patients (37.25%). The data obtained correlates to epidemiological data of burn patients at Cipto Mangunkusumo Hospital in 2013-2017, with the most common cause being gas stove explosions of 253 (35.7%).⁽⁵⁾ In the children age group, most burns were caused by scald, namely 27 people (71.05%). This is also identical to the study conducted at Wahidin Sudirohusodo Hospital Makassar in 2006-2009, where in the age group 1-10 years with 30 cases, most burns are caused by scald. (4) Belie O. stated that the Burn and Trauma Center at Lagos State University Teaching Hospital encountered 37 people (67%) who had extensive burns of 21-40% TBSA by gas explosions. These details differ from our data's results, where burns caused by gas explosions generate the most extensive burn area, up to >40% TBSA, with a total of five patients (8.33%).⁽⁶⁾

Based on the causality of burns and burn degree, most third-degree burns are caused by electricity 15%. Following the epidemiology of burn patients caused by electricity at RSUP Dr. M. Djamil Padang in 2016-2019, 13.5% of patients were categorized as third-degree burns.⁽⁷⁾

The data of burn degree with burns mortality rate at Tarakan Hospital Jakarta in 2018-2022 shows that third-degree burns are the highest cause of mortality, namely three people (28.57%). The results of this study are in accordance with a study conducted by Christoe CD et al. in 2018, who concluded that the depth of burns affects burn mortality, because the more profound the damage to the skin, the slower the regeneration, the easier infections can occur, and the higher the risk of the death.⁽⁸⁾

All burn patients underwent debridement and wound dressing at the Central Surgery Installation (IBS). On average, debridement and wound dressings were performed four times per patient. This often causes problems with patient insurance claims that limit necessary treatments for burn patients. The development of the Burn Unit can reduce the number of interventions in burn patients and shorten the patient's hospitalization time by implementing holistic multidisciplinary care. The success of this model is reflected by a 95.1% increase in survival of burn patients since 2007 and a reduction in length of stay by nearly half in the last years in the United States Burn Unit.⁽⁹⁾

The weakness of this study was that the data were taken retrospectively, and the research was not carried out analytically because the sample obtained was diminutive, and there were still devoid data in the data between groups. The first-degree burn injury was not registered in this study because the sample did not meet the criteria. Many data were excluded because the registration data needed to be uniform. The lack of data is also due to a decrease in patient admissions in 2019-2020 due to the COVID-19 pandemic.

CONCLUSION

Burn patients at Tarakan Hospital Jakarta in 2018-2022 have an increased incidence, with the most common causes in the adult age group by gas explosions and the children group by scald. Third-degree burns with a burn area of >40% TBSA cause most of the deaths. Debridement and wound dressings for burn injury patients were performed at the Tarakan Hospital on average four times. Based on these results, proper facilities and infrastructure at Jakarta hospitals can also play an essential role in improving the quality of care for burn patients.

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