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ORIGINAL ARTICLES

Challenges in Burns Management in a Tertiary Care Center in Albania

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Abstract

Introduction: Burn injuries represent a significant public health concern globally, with a substantial impact on morbidity and mortality rates, particularly in low- and middle-income countries.

This study provides valuable insights into the epidemiology of burn injuries in Albania. It highlights the critical need for targeted interventions to reduce the incidence and severity of burns in the population.

Materials and Methods: This retrospective cohort study examined burn patients at the Department of Burns and Plastic Surgery at Mother Teresa University Hospital Center in Tirana from January 2022 to January 2024. Data were collected from medical records in Tirana, Albania. Formal approval was obtained from the Ethics Committee of Mother Teresa Hospital. The data were recorded in Excel and analyzed using the SPSS statistics program.

Results: This retrospective cohort study included 303 burn patients admitted between January 2022 and January 2024. Data on patient demographics, burn causes, total body surface area (TBSA), and burn severity were collected and analyzed using SPSS software.

The mean patient age was 36.1 years, with children aged 0-10 being the most affected, especially 2-year-olds. The youngest patient was seven months old, and the oldest was 89. Male patients comprised 60.7% of the cohort. The leading cause of burns was scalding from hot liquids (39.9%), followed by flames (20.4%) and electrical burns (8.2%). The average TBSA affected was 23.06%. The mortality rate was 7.3%.

Conclusion: Burn injuries present significant physical and psychological challenges. Despite advancements in burn care, the importance of preventive measures and public awareness campaigns must be addressed. These remain the most effective strategies to reduce burn incidence and severity. These findings underscore Albania's need for improved burn prevention and public safety initiatives.

Keywords: burns, body surface area, burn causes, mortality

Introduction

Burns are caused by unintentional exposure to substances of high temperature, including hot liquids and solid objects radiating heat energy. They place a high burden not only on patients' families but also on national healthcare systems globally. Burn injuries are a significant global public health problem, given their high incidence and potentially devastating physical, psychosocial, and financial impacts on individuals, households, and communities [1-3].

According to WHO (World Health Organization), burns constitute a significant public health problem, especially in low- and middle-income countries where more than 95% of all burn deaths occur. Fire-related burns are the leading cause of death (300.000 deaths per year), more than scalding,

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electrical, and chemical burns, and death from other types of burns. Epidemiologic data are crucial for developing injury prevention strategies and identifying effective burn treatment methods. Burn patients represent a diverse group with varying ages, mechanisms of injury, burn depth, and affected areas. This data is essential for planning prevention programs to lower injury rates and create effective burn care clinical procedures [4].

Burns remains a significant global public health issue, with an estimated 180,000 deaths annually, primarily in low- and middle-income countries. In contrast, many high-income countries have seen a decline in burn-related death rates. However, the disparity is stark, with the rate of child deaths from burns in low- and middle-income countries being more than seven times higher than in high-income countries [5].

Non-fatal burns contribute significantly to morbidity, leading to prolonged hospital stays, disfigurement, and disability, often accompanied by social stigma and rejection. In low- and middle-income countries, burns are among the top causes of disability-adjusted life-years (DALYs) lost. Burn hospitalization varies by country and is influenced by the structure of healthcare payment systems. However, trends indicate shorter hospital stays and a growing number of burns treated in specialized burn centers.

Some of the strategies developed in high-income countries would successfully address the risk factors present for burns in some low- and middle-income country settings, particularly urban environments of middle-income countries. These include strategies such as smoke detectors, regulation of water heater temperature, and enacting and enforcing housing codes to make electrical wiring safer [6].

In low-income countries, particularly in rural areas and among the urban poor, the epidemiology and risk factors for burns differ significantly from those in high-income countries, necessitating distinct preventive strategies. Several key aspects of concern include:

- Ground-level cooking pots: Cooking pots placed at ground level are more easily knocked over, increasing the risk of scald burns, particularly among toddlers and young children.
- Open wood fires: Open wood fires pose a significant burn risk when used for cooking and heating.
- Kerosene stoves and lamps are prone to being knocked over, leading to ignition and subsequent burns.
- Loose-fitting cotton clothing: Wearing such clothing near open fires, especially while cooking, can result in accidental ignition [7].

The outcome of burn injuries depends on several factors, such as the patient's age and sex, burn surface area, depth of burn, burn site, type of burn, time of arrival at the hospital, burn resuscitation, presence of comorbidities, and the presence of a rehabilitative center with trained practitioners [8,9].

The mortality rate is higher for those that have higher TBSA%, third rather than second-degree burn, and inhalational injury [10,11].

Developing nations show a lower engagement rate than developed countries, probably because other competing diseases must be controlled. Mortality and non-fatal injuries depend on several factors, including age, sex, place of residency, economic status, involved site, depth, TBSA % involved, comorbidity, time of arrival to the emergency department, pre-hospital care, and the presence of trained staff in giving the appropriate level of care [12].

Advances in critical care (fluid resuscitation, nutritional assistance, and antibiotic treatment) and early burn wound excision adoption play a substantial role in this improved survival rate [13].

Materials & Methods:

This retrospective cohort study examined burn patients at the Department of Burns and Plastic Surgery at University Hospital Center "Mother Teresa" (UHCMT) in Tirana from January 2022 to January 2024.

This was a quantitative, retrospective, and descriptive exploratory study centered on numerical analysis and interpretation through statistical methods. It is a case-series type study, which concerns the recruitment of a number (series) of clinical cases hospitalized at UHCMT.

The study evaluates and describes the characteristics of the studied population, including age group, gender, day stay, and the presence of burn areas. The data analyzed included the patient's demographic characteristics, burn causes, total body surface area affected (TBSA) percentage, burn severity, burn location, and burn agent. Data were collected from medical records from the Department of Burns and Plastic Surgery in Tirana, Albania. Formal approval was obtained from the Ethics Committee of UHCMT.

The data were recorded in Excel and analyzed using the SPSS statistics program.

The data were then rechecked to ensure their accuracy and processed with Microsoft Excel and IBM SPSS Statistics 26 (Statistical Package for the Social Sciences) to produce tables and conclusions that were also the objective of this study. Ethical considerations have been carefully handled in this study, which means that the data obtained from the patient's medical records will be used only for research and scientific purposes and will not be disclosed in any form or circumstance that would make possible identification of patients without their wish and informed consent.

Results:

The mean age of the 303 patients admitted to the burn center was 36.1 years, with a standard deviation of 28.7 years (ranging from 7 months to 89 years). The distribution of patients across different age groups was as follows: 0–10 years (98 patients, 33.3%), 11–20 years (21 patients, 6.93%),

21–30 years (16 patients, 5.2%), 31–40 years (22 patients, 7.26%), 41–50 years (24 patients, 7.92%), 51–60 years (43 patients, 14.1%), 61–70 years (37 patients, 12.2%), and 71 years and older (42 patients, 13.8%). The highest incidence of burns occurred in the 0–10 age group, while the lowest incidence was in the 21–30 age group (chi-square test, p=0.000). Of the patients, 119 (29.8%) were female, and 184 (70.2%) were male, with a notable male predominance across all age groups, particularly in the 0–10 age group (refer to Figure 1, 3 and Tab.1, 2, 3).

The leading causes of burns were scalds from water and milk, accounting for 39.9% of cases; burns from flames, making up 20.4%; electrical burns, comprising 8.2%; and a mix of scalds, flames, chemical burns, and other causes, which accounted for 31.5%. When analyzed by age, scalds from hot water were most common in the 0–10 age group, representing 73.5% of cases (see Table 4).

On average, patients had burns covering 23.06% of their body surface area. Most patients (75.5%) had burns affecting less than 30% of their body surface. Specifically, 48 patients (15.8%) had burns covering 31–50% of their body, 21 patients (6.09%) had burns covering 51–70%, and five patients (1.6%) had burns covering more than 71% (refer to Figure 3).

The patients were also categorized based on the affected body regions, including the scalp, face-neck, trunk, extremities, genital area, and combinations of these areas. The extremities were the most commonly affected, with 23% of patients experiencing burns in this region, followed by combinations such as extremities + body (18%) and extremities + face (12%). The incidence of burns in the genital area was 1%. Additionally, scalp burns were reported in 1% of patients, body burns in 3%, and face burns in 1%.

N	**Valid**	303
	Missing	0
Mean		36.1243
Median		39.0000
Mode		2.00
Std. Deviation		28.71552
Range		88.35
Minimum		.65
Maximum		89.00

Table 1 - Descriptive statistics of patients' age

		Frequency	**Percent**	**Valid Percent**	**Cumulative Percent**
Valid	F	119	39.3	39.3	39.3
	M	184	60.7	60.7	100.0
	Total	303	100.0	100.0	

Table 2 - Descriptive data on patients' gender

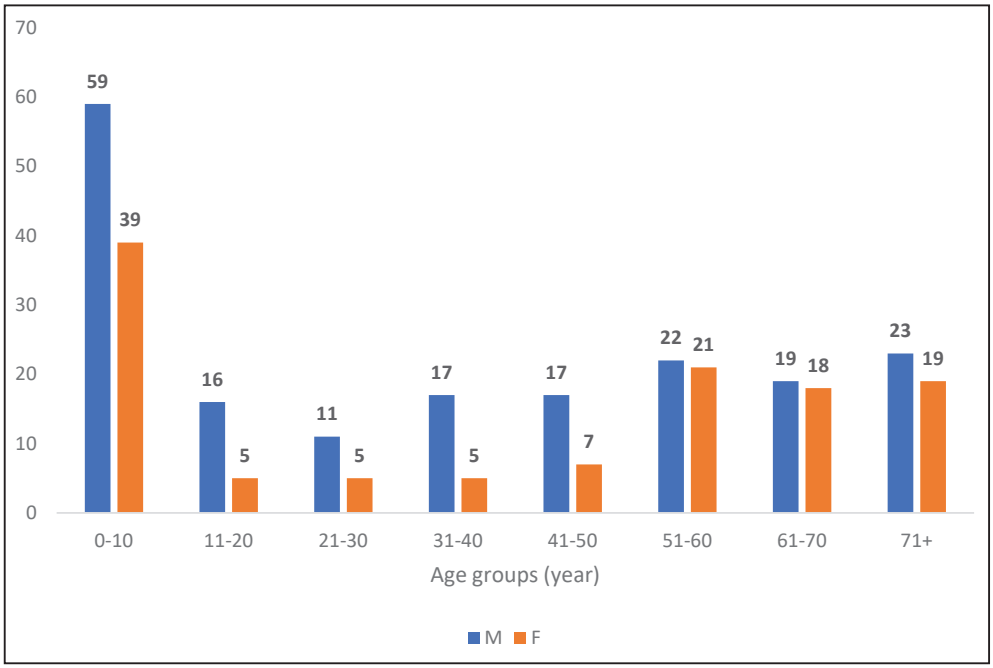

Figure 1. Distribution of burn cases according to age and gender

		Frequency	%	Valid %	Cumulative %			Frequency	%	Valid %	Cumulative %
Valid	.65	1	.3	.3	.3	Valid	45	1	.3	.3	56.4
	.75	2	.7	.7	1.0		46	3	1.0	1.0	57.4
	.80	1	.3	.3	1.3		47	1	.3	.3	57.8
	.90	1	.3	.3	1.7		48	3	1.0	1.0	58.7
	1	21	6.9	6.9	8.6		50	3	1.0	1.0	59.7
	1.30	1	.3	.3	8.9		51	2	.7	.7	60.4
	1.40	1	.3	.3	9.2		52	2	.7	.7	61.1
	1.50	6	2.0	2.0	11.2		53	6	2.0	2.0	63.0
	1.60	1	.3	.3	11.6		54	6	2.0	2.0	65.0
	2	34	11.2	11.2	22.8		55	2	.7	.7	65.7
	3	9	3.0	3.0	25.7		56	2	.7	.7	66.3
	4	5	1.7	1.7	27.4		57	5	1.7	1.7	68.0
	4.50	1	.3	.3	27.7		58	9	3.0	3.0	71.0
	5	6	2.0	2.0	29.7		59	5	1.7	1.7	72.6
	6	2	.7	.7	30.4		60	4	1.3	1.3	73.9
	7	2	.7	.7	31.0		61	8	2.6	2.6	76.6
	8	2	.7	.7	31.7		62	4	1.3	1.3	77.9
	10	2	.7	.7	32.3		63	2	.7	.7	78.5
	11	3	1.0	1.0	33.3		64	6	2.0	2.0	80.5
	12	2	.7	.7	34.0		65	1	.3	.3	80.9
	13	3	1.0	1.0	35.0		66	3	1.0	1.0	81.8
	14	2	.7	.7	35.6		67	3	1.0	1.0	82.8
	15	2	.7	.7	36.3		68	6	2.0	2.0	84.8
	16	2	.7	.7	37.0		69	1	.3	.3	85.1
	17	3	1.0	1.0	38.0		70	3	1.0	1.0	86.1
	19	2	.7	.7	38.6		71	1	.3	.3	86.5
	20	2	.7	.7	39.3		72	2	.7	.7	87.1
	21	1	.3	.3	39.6		73	3	1.0	1.0	88.1
	22	2	.7	.7	40.3		74	3	1.0	1.0	89.1
	23	1	.3	.3	40.6		75	7	2.3	2.3	91.4
	24	3	1.0	1.0	41.6		77	3	1.0	1.0	92.4
	25	2	.7	.7	42.2		78	3	1.0	1.0	93.4
	26	2	.7	.7	42.9		79	3	1.0	1.0	94.4
	27	4	1.3	1.3	44.2		80	4	1.3	1.3	95.7
	28	1	.3	.3	44.6		81	2	.7	.7	96.4
	31	3	1.0	1.0	45.5		82	4	1.3	1.3	97.7
	33	2	.7	.7	46.2		83	1	.3	.3	98.0
	35	3	1.0	1.0	47.2		84	1	.3	.3	98.3
	36	3	1.0	1.0	48.2		85	1	.3	.3	98.7
	37	3	1.0	1.0	49.2		86	2	.7	.7	99.3
	38	2	.7	.7	49.8		88	1	.3	.3	99.7
	39	3	1.0	1.0	50.8		89	1	.3	.3	100.0
	40	3	1.0	1.0	51.8		Total	303	100.0	100.0	
	41	1	.3	.3	52.1						
	42	3	1.0	1.0	53.1						
	43	3	1.0	1.0	54.1						
	44	6	2.0	2.0	56.1						

Tab 3. Descriptive data of patients' age

		Frequency	%	Valid %	Cumulative %
Valid		1	.3	.3	.3
	BG	15	4.9	4.9	5.3
	E	25	8.2	8.2	13.5
	F	62	20.4	20.4	33.9
	FB	17	5.6	5.6	39.5
	FG	35	11.5	11.5	51.0
	FH	3	1.0	1.0	52.0
	FK	2	.7	.7	52.6
	FZ	2	.7	.7	53.3
	NG	1	.3	.3	53.6
	QX	37	12.2	12.2	65.8
	UX	100	32.9	32.9	98.7
	Z	4	1.3	1.3	100.0
	Total	**304**	**100.0**	**100.0**	

Tab 4. Causes of burns

Burned area	No.	%	Burned area	No.	%
Body (B)	10	3%	E + B	55	18%
Capitis (C)	2	1%	E + B + G	5	2%
Extremity (E)	71	23%	E + F	37	12%
Face (F)	4	1%	E + F + B	13	4%
Genital (G)	4	1%	E + F + B + C	9	3%
B + C	6	1%	E + F + N + B	24	8%
B + F	4	1%	E + F + N + B + C	9	3%
B + F + N	5	2%	E + G	8	3%
B + G	5	2%	E + N	4	1%
E + C	13	4%	E + N + B	5	2%
E + C + B	5	2%	E + N + C	5	2%

Table 5. Distribution of burn cases according to burned area

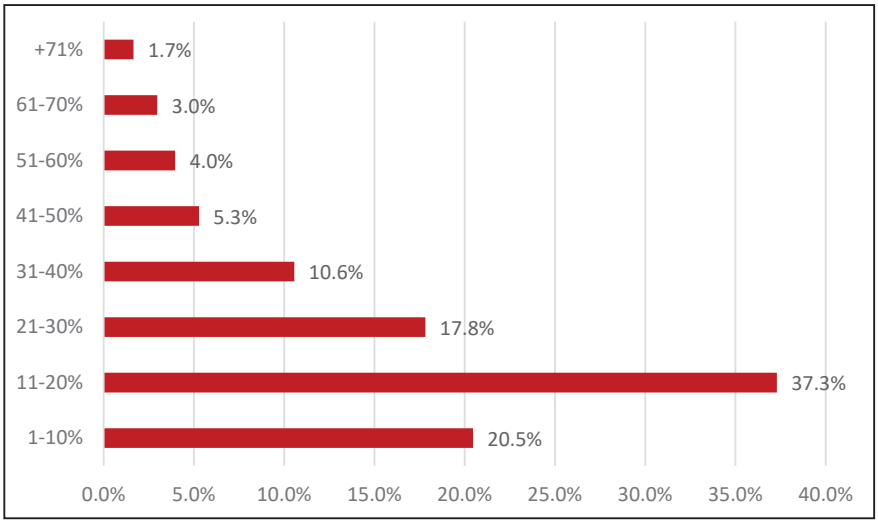

Figure 2. Distribution of burn cases according to burned area percentage (TBSA)

Discussion

Burn injuries persist as an urgent public health challenge, particularly in low- and middle-income countries like Albania. This study offers crucial insights into the epidemiological characteristics of burns treated at a tertiary care center, underscoring the pressing need for prevention, management, and rehabilitation improvements.

The demographic findings of this study are in line with global trends, where children under ten years of age bear a disproportionate burden of burn injuries, primarily due to scalds from hot liquids. This mirrors the vulnerability of this age group and the crucial need for targeted preventive measures, such as public awareness campaigns and safety regulations in households. In contrast, working-age males were more affected by flame and electrical burns, often associated with occupational hazards. These results underscore the importance of workplace safety and stricter enforcement of occupational health standards.

One significant finding of this study is the high incidence of burns involving less than 30% of total body surface area (TBSA), with scalds being the most common cause. Despite this, the 7.3% mortality rate highlights the ongoing need for advancements in burn care. Timely and effective interventions, including fluid resuscitation, early wound excision, and infection control, are crucial for improving outcomes. Moreover, the presence of severe burns involving over 50% TBSA in a small subset of patients underscores the necessity for specialized burn units equipped to handle complex cases.

The study also revealed significant gender disparities, with males accounting for 70.2% of the cohort. This aligns with existing literature, which attributes the higher prevalence in males to greater exposure to risk factors, including occupational hazards and risk-taking behaviors. Conversely, females were predominantly affected by burns resulting from falls or domestic accidents, underscoring the need for targeted safety interventions in domestic settings.

Challenges in burn management are multifaceted, extending beyond clinical treatment to encompass psychological support and long-term rehabilitation. Burn injuries often lead to permanent disfigurement, functional limitations, and social stigma, necessitating a multidisciplinary approach for holistic recovery. The absence of comprehensive rehabilitative services in Albania hampers the potential for full recovery and reintegration of burn patients into society.

Implications for Public Health and Policy

The findings of this study emphasize the importance of proactive prevention strategies to reduce the incidence and severity of burns. These include:

Educational Campaigns: Increasing public awareness about burn hazards and first-aid measures.

Safety Regulations: Enforcing stricter domestic and workplace safety regulations, such as using safer cooking methods and proper electrical wiring insulation.

Infrastructure Improvements: Establish specialized burn centers with advanced critical care and rehabilitation resources.

Despite advancements in burn care globally, Albania faces significant challenges in aligning with international standards. Addressing these gaps through investments in healthcare infrastructure, workforce training, and public health initiatives is essential for improving outcomes and reducing the burden of burn injuries on the healthcare system.

Conclusion

Burn injuries present substantial challenges both physically and psychologically, and they remain a critical public health issue in Albania. This study, conducted at the UHCMT in Tirana, highlights burn patients' demographic and clinical profiles over two years, offering key insights into the epidemiology and impact of burns in the country. The findings underscore the significant burden of burn injuries, particularly among young children, with scalds from hot liquids being the most common cause. The study also reveals a higher prevalence of burns among males and a notable percentage of patients with burns covering a significant portion of their body surface area.

Despite advancements in burn treatment, including improvements in critical care and early burn wound excision, the mortality rate among hospitalized patients remains a concern. The study's mortality rate of 7.3% underscores the need for continued improvements in burn care, particularly in rapid intervention and specialized treatment. This study's results emphasize the importance of targeted prevention strategies and public awareness campaigns in reducing the incidence and severity of burn injuries in Albania. Preventive measures, such as safety regulations, educational initiatives, and community outreach programs, could significantly mitigate the risk factors identified in this study, particularly among vulnerable populations like young children.

In conclusion, while the study highlights the significant strides in burn care, it also calls for a more proactive approach to burn prevention and public education. By addressing the root causes and enhancing the overall quality of burn care, Albania can reduce the incidence and the impact of burn injuries, ultimately improving patient outcomes and reducing the burden on the healthcare system.

COI Statement: This paper has yet to be submitted in parallel, presented fully or partially at a meeting, podium, or congress, published, or submitted for consideration beforehand.

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