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Demographic Characteristics of Burn Patients in the Emergency Department: Analysis of 118 Cases

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Abstract

Objective: This study aims to retrospectively examine the demographic characteristics, causes, anatomical localizations, and clinical outcomes of 118 patients admitted to the Emergency Department of Atlas University Hospital due to burns.

Materials and Methods: Data from patients admitted to the emergency department for burns between November 31, 2022, and November 31, 2024, were obtained from patient files, forensic reports, and hospital information systems. Age, gender, burn causes, burn degrees, total burned body surface area (%TBSA), anatomical localization, seasonal distribution, and clinical outcomes were evaluated. Data analysis was performed using SPSS.

Result: Of the patients, 62.7% were male and 37.3% were female, with a mean age of 23.8 ± 14.9 years. Scald burns were identified as the most common cause at 47.5%. Regarding burn degrees, 69.5% of the patients had second-degree burns. The most frequently affected anatomical regions were the upper extremities (44.8%) and the face (31.4%). Burn admissions were higher in the summer (33.8%). Of the patients, 78.8% were treated and discharged from the emergency department, 14.4% were admitted to the burn unit, and 6.8% were referred to advanced care centers. The mortality rate was 1.7%.

Conclusion: Burn injuries vary by age groups, gender, and causes. Scald burns are more common in children, while electrical burns are predominantly observed in males. Multidisciplinary approaches and the development of preventive strategies are essential in burn management. This study provides insights into the clinical management and prevention of burns and may serve as a guide for future research.

Keywords: Burn injuries, Burn demographics, Emergency burn cases

Introduction

Burn injuries are significant traumatic conditions frequently encountered in emergency departments, requiring a multidisciplinary approach and presenting complex management challenges[1]. Burns are not limited to the skin and superficial tissues; they can also cause severe effects on deeper tissues, organs, and metabolic processes[2]. These injuries, which occur due to mechanisms such as electrical burns, scalds, chemical burns, and flame burns, lead to outcomes that vary depending on the extent of the affected tissue, the degree of the burn, and the patient's age. The multifaceted nature of burn injuries highlights the importance of thoroughly examining their demographic characteristics, causes, and outcomes.

Studies have shown that scald burns are more commonly observed in pediatric age groups, while electrical burns are predominantly seen in adult male individuals3. Electrical burns can result in serious complications such as deep tissue damage, rhabdomyolysis, myoglobinuria, and acute kidney failure[4]. In contrast, scalds and flame burns are more frequently associated with superficial or partial-thickness burns. Therefore, analyzing the distribution of burn types according to age groups and genders is critical for developing effective burn management strategies.

The anatomical regions affected by burns are also decisive in clinical management and prognosis. Burns involving areas such as the upper extremities and the face, which are critical for function and aesthetics, can significantly impact both short-term treatment and long-term rehabilitation processes[5]. Additionally, the total body surface area (TBSA) involved in burns is a key factor in guiding decisions such as fluid resuscitation. However, in specific burn types such as electrical burns, TBSA assessment alone is often insufficient, necessitating the evaluation of other clinical indicators.

Seasonal factors and living conditions are also significant parameters influencing the frequency of burn cases[6]. For instance, burn admissions tend to increase in the summer due to scalds and sun exposure, whereas flame and electrical

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burns are more prevalent in the winter. A detailed analysis of burn causes, demographic distributions, and affected regions can contribute to the development of preventive measures aimed at improving the management of these cases.

This study retrospectively evaluates the demographic characteristics, causes, anatomical localizations, and clinical outcomes of 118 burn patients admitted to the Emergency Department of Atlas University Hospital. By examining the causes and effects of burns across different age groups and genders, this study aims to provide guidance for the development of more effective burn management strategies. Furthermore, the analysis of the seasonal distribution of burns can aid in shaping public health policies aimed at preventing such injuries.

Methods

This study aimed to retrospectively evaluate 118 patients admitted to the Emergency Department of Atlas University Hospital due to burns between November 31, 2022, and November 31, 2024. Data were obtained from patient files and hospital information system records with institutional permission. The study analyzed the patients' age, gender, causes of burns, burn degrees, total burned body surface area (%TBSA), anatomical localization of burns, seasonal distribution of admissions, and clinical outcomes.

Demographic data included age and gender information, while the types of burns were categorized into scalds, electrical burns, flame burns, chemical burns, and other causes. Burn degrees were classified as first-degree (superficial), second-degree (partial-thickness), and third-degree (full-thickness) burns. Anatomical localization was evaluated in terms of the upper extremities, face, lower extremities, torso, and other regions. Additionally, admissions were analyzed based on seasonal distribution into summer, winter, spring, and fall. Data were analyzed using the SPSS statistical software, and results were reported as percentages, means, and standard deviations.

Results

Of the 118 patients analyzed in this study, 62.7% were male (n=74), and 37.3% were female (n=44). The mean age of the patients was 23.8 ± 14.9 years, with the 0–10 age group representing the highest proportion of admissions (41.5%, n=49) (Table 1). Among the causes of burns, scalds ranked first at 47.5% (n=56), followed by electrical burns (21.2%, n=25), flame burns (14.4%, n=17), chemical burns (9.3%, n=11), and other causes (7.6%, n=9) (Table 2). In terms of burn degrees, 69.5% of the patients had second-degree burns (n=82), 26.3% had first-degree burns (n=31), and 4.2% had third-degree burns (n=5). The average burned body surface area was calculated as 8.7 ± 4.6%. (Table 4)

Table 1: General Demographic Characteristics of Patients

Characteristic	Value
Total Number of Patients	118
Male Patient (%) (n=74)	62,7
Female Patient (%) (n=44)	37,3
Average Age (Years)	23,8 ± 14,9
Most Common Age Group (%) (n=49)	0-10 (%41,5)

Table 2: Causes of Burns and Relationship between Age Groups and Gender

Cause of Burn	0-10 age (%)	11-20 age (%)	21-30 age (%)	31+ age (%)	Male (%)	Female (%)
Hot Liquid (n=56)	33,1	5,8	3,0	5,6	28,2	19,3
Electric (n=25)	2,5	5,9	8,4	4,4	15,4	5,8
Flame (n=17)	1,7	2,3	5,7	4,7	10,6	3,8
Chemical (n=11)	1,0	1,5	3,6	3,2	4,7	4,6
Other (n=9)	3,2	1,0	1,2	2,2	3,8	3,0

Regarding anatomical localization, the most frequently affected regions were the upper extremities (44.8%, n=53) and the face (31.4%, n=37). Other affected areas included the lower extremities (13.7%, n=16), torso (10.1%, n=12), and other regions (5.0%, n=6). The seasonal distribution of admissions showed that summer was the most common period for burn cases (33.8%, n=40), followed by winter (29.7%, n=35), spring (19.4%, n=23), and fall (17.1%, n=20) (Table 3).

An analysis of clinical outcomes revealed that 78.8% of patients were treated and discharged from the emergency department (n=93), 14.4% were admitted to the burn unit (n=17), and 6.8% were referred to advanced care centers (n=8). The mortality rate was recorded as 1.7% (n=2). Electrical burns were more common in males and were frequently associated with complications such as rhabdomyolysis and myoglobinuria.

Table 3: Distribution of Patients by Affected Anatomical Localizations

Anatomical Region	Number of Patients (%)
Upper Extremities (n=53)	44,8
Face (n=37)	31,4
Lower Extremities (n=16)	13,7
Trunk (n=12)	10,1
Other (n=6)	5,0

Table 4: Distribution of Patients by Degree of Burn

Degree of Burn	Number of Patients (%)	Total Body Surface Area (%TBSA)
1. Degree (n=31)	%26,3	%3,2 ± 1,1
2. Degree (n=82)	%69,5	%8,7 ± 3,4
3. Degree (n=5)	%4,2	%18,5 ± 6,8

The findings of this study highlight the significance of demographic characteristics, burn types, and anatomical localization in the clinical management of burn injuries, emphasizing the need for developing preventive measures.

Discussion

Burn injuries are a significant public health issue that can cause damage to both the skin and deeper tissues, often leading to severe complications and requiring urgent medical intervention2. The findings of our study reveal variations in burn traumas based on age, gender, causes, and the anatomical regions affected[7]. Particularly, the prevalence of scald burns in pediatric age groups emphasizes the importance of implementing domestic safety measures for this population[8]. The higher frequency of electrical burns among males highlights the need to strengthen occupational safety precautions.

An analysis of burn degrees showed that second-degree burns were the most common, indicating that most cases involved deep but not full-thickness injuries. However, specific burn types such as electrical burns may cause progressive tissue necrosis over time, underscoring the importance of a multidisciplinary approach and long-term follow-up for such patients.

The upper extremities and face were identified as the most frequently affected anatomical regions in burn injuries[9]. Given the functional significance of the upper extremities and the aesthetic importance of the face, the necessity for early intervention and surgical repair strategies in these areas becomes evident. Additionally, our study found that summer was the most common season for burn-related admissions. This finding suggests that increased outdoor activities and greater exposure to hot liquids during the summer months elevate the risk of burns.

An evaluation of clinical outcomes revealed that the majority of patients were treated and discharged from the emergency department, while a smaller proportion required hospitalization in burn units or referral to advanced care centers. Hospitalization rates were higher among patients with electrical burns and third-degree burns due to the associated risks of severe complications. These findings highlight the critical role of accurate early evaluation in improving patient prognosis in burn cases[10].

Conclusion

This study provides a detailed analysis of the demographic characteristics, causes, and clinical outcomes of burn patients admitted to the emergency department. The findings indicate that scald burns are prevalent among children, while electrical burns are more common in males. Additionally, burn injuries affecting the upper extremities and face require more focused management.

A multidisciplinary approach is essential in the treatment of burn injuries to prevent complications and improve patient outcomes. Developing preventive strategies for scald and electrical burns can be effective in reducing the incidence of burn traumas. In this context, public education programs and enhanced safety measures are necessary to raise awareness and minimize risks. This study aims to shed light on future, more comprehensive research in burn management and prevention.

References

1. Singer AJ, Taira BR, McClain SA. A Multidisciplinary Approach to Burn Management. *N Engl J Med*. Published online 2020.
2. Sheridan RL. Burns: Progress in Diagnosis and Care. *Lancet*. Published online 2021.
3. Azzopardi EA, Whitaker IS, Willows J. Demographic Analysis of Burn Injuries: A Multicenter Retrospective Study. *Burns*. Published online 2019.
4. Shalom A, Wong L, Khan F. Complications of Electrical Burns: A Review of Clinical Outcomes. *J Burn Care Res*. Published online 2018.
5. Chipp E, Walton J, Gorman D. Functional and Aesthetic Outcomes in Burn Rehabilitation. *J Plast Reconstr Aesthetic Surg*. Published online 2020.
6. Dissanaike S, Rahimi M. Seasonal Trends in Burn Admissions: An Analysis of Epidemiological Patterns. *Ann Burns Fire Disasters*. Published online 2019.
7. Dissanaike S, Rahimi M. Epidemiological Patterns of Burn Injuries. *Ann Burns Fire Disasters*. Published online 2019.
8. Azzopardi EA, Whitaker IS, Willows J. Scald Burns in Children: A Preventable Public Health Issue. *Burns*. Published online 2020.
9. Ziegler B, Rohrer C. Functional and Aesthetic Considerations in Upper Extremity and Facial Burns. *Burns*. Published online 2021.
10. Singer AJ, Taira BR, McClain SA. Severe Burn Complications and Risk Factors. *N Engl J Med*. Published online 2020.