

Clinical Audit

Burns in Children: Epidemiological, Clinical, Therapeutic and Outcome Aspects at the Albert Royer Children's Hospital in Dakar

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Keywords

Burn wound
Domestic accident
Thermal injury
Wound care

Abbreviations

TBSA - Total body surface area

Abstract

Introduction: Childhood burns are common injuries that carry significant morbidity. In this article, the outcome of pediatric burns in Senegal is audited.

Methods: This is a retrospective, descriptive study carried out over 20 months, from May 1, 2021, to December 31, 2022, at the pediatric surgery department of the Albert Royer Children's Hospital in Dakar. Demographic and clinical parameters were studied.

Results: During the study period 78 skin burns were treated as in-patients. This formed 10.02% of all hospital admissions during that period. The mean age was 43 months (range 6mo - 15yr). The sex ratio was 1.16. Burns occurred in the morning in 38% of cases. The mean delay of medical consultation was 72 hr. Spillage of hot liquid was the commonest etiology in 85% of cases. Transportation had been done by non-medical vehicles in 95% of cases. The mean extent of burns was 11% of total body surface area. All of them were second degree burns. Multiple body parts were burnt in 83% of patients. The mean length of hospitalization was 9 days. Anemia was found in 29.5% of children. The mortality rate was 6.4%.

Conclusion: Skin burns are common in Senegalese children, and are most often due to domestic accidents. In our resource-limited setting, the morbidity and mortality remains high. Preventive measures appear to be the practical way of reducing them.

INTRODUCTION

Despite improvements in burns care in the recent years, the frequency and severity of these injuries remain a real challenge in certain areas, particu-

larly among young people. The number of children burned worldwide is estimated to be more than 500,000 per year.⁽¹⁾ Burns is a global public health problem. However, its incidence varies in different

countries depending on the socio-economic status. According to the W.H.O, burns causes more than 250,000 deaths each year worldwide, and more than 90% of which are in low- and middle-income countries.⁽²⁾

In sub-Saharan Africa, the incidence of burns is one of the highest in the world with an incidence of 245 cases per 100,000 people, and it is 3 times the global average incidence.⁽³⁾ Mortality due to burns is also high, at an estimated rate of 10% in East Africa.⁽³⁾ In Senegal, a study on domestic accidents showed that burns were the second most common injury following fractures.⁽⁶⁾ Its relative frequency remains high and is 13-24% of all recorded accidental injuries.⁽⁴⁻⁷⁾ The objective of this work is to report the clinical profile of pediatric burns and its therapeutic outcome in a resource-poor setting.

METHODS

We conducted a retrospective, descriptive study over a period of 20 months, from the May 1, 2021 to the December 31, 2022. All children hospitalized for burns in the pediatric surgery department of the Albert Royer National Children's Hospital in Dakar were included. Demographic parameters studied were the frequency of burns, age, sex, circumstances, time and place of accident, location, extent and depth of the burns, nature of treatment, morbidity, and mortality.

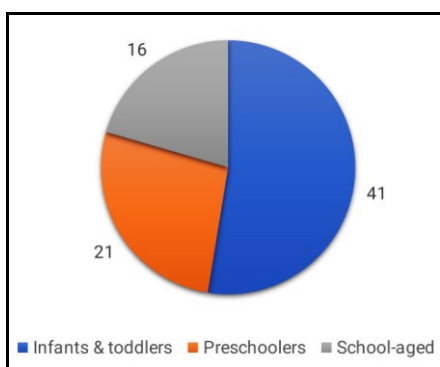


Fig 1. Age distribution of burns

RESULTS

Epidemiological Aspects

During the study period, 78 cases of burns were enrolled, representing 3.4 cases per month and 10% of hospital admissions during the period. There were 42 boys (54%) and 36 girls (46%) with a mean age of 43 months (range 6mo – 15yr). Infants represented 53% of patients. (Fig. 1)

Clinical Aspects

In 30 patients (38%), the injury occurred between 6 a.m and 12 noon. The mean delay in seeking medical consultation was 72 hr (range 30 min-60 days) and 30 patients (38%) consulted within 3 hr of the injury. The domestic accident was the cause in 77 cases (99%), and a work place accident (1%) was noted. The burns were of thermal origin in 76 patients (96%) and electrical in 2 patients (4%). Spillage of hot liquid was the etiology in 66 (85%) patients. (Fig. 2)

Twenty-four patients (31%) were referred from another facility and 75 (95%) were shifted by non-medical transportation. The mean extent of burns was 11% of total body surface area (TBSA) (range 1-40%). Fig.3 depicts the extent of burns. All of them were second-degree burns, superficial in 9 (12%) and deep in 69 (89%) In 65 cases (83%), the lesions affected multiple sites, the isolated locations were the limbs in 5 cases (6%), the thorax, buttocks, and face in 2 cases each (3%), the abdomen, head, and neck in 1 case each (1%).

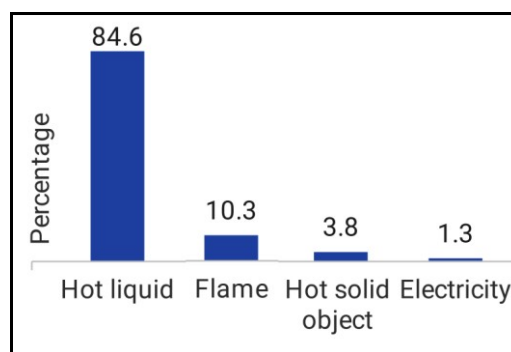


Fig 2. Etiology of burns

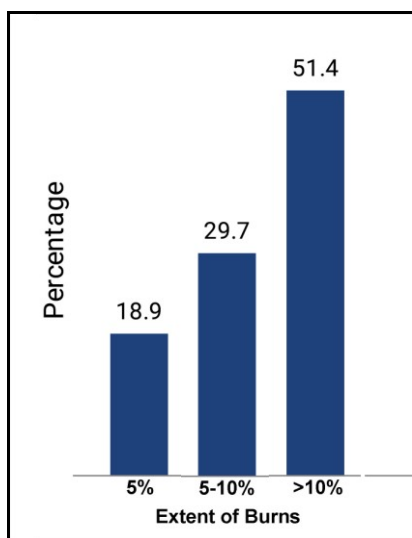


Fig 3. Extent of burns

Therapeutic and Follow-up Aspects

All patients received local wound care along with analgesics. Capillary refilling time was monitored in children with greater than 10% TBSA burns. Wound dressing was done daily in 69 patients (89%). The dressing was occlusive in 42 patients (55%) and exposed in 18 patients (23%). Splinting was needed in 10 patients (12%) and physiotherapy in 4 (5%). Systemic antibiotics were used in 88%, and blood transfusion in 9% of cases. Surgical treatment (4%) consisted of skin graft, blepharoplasty, and release of scar contracture.

Table 1. Post-burn complications

Complications	n (%)
Anemia	34 (44%)
Local infection	8 (10%)
Malnutrition	6 (08%)
Metabolic complication	4 (05%)
Scar Depigmentation	8 (10%)
Scar Contractures	8 (10%)
Hypertrophic scar	8 (10%)
Septic shock	2 (03%)
Others	5 (06%)

The mean duration of hospitalization was 9 days (range 1–59 days). At a mean follow-up of 5 mo (range 2–24m), a total of 59 complications were recorded. (Table 1) There were 5 deaths (6.4%).

DISCUSSION

Burns care is an important component of pediatric surgical practice. In 2021, we reported that burns was the second commonest domestic accident.⁽⁶⁾ In our series, the hospital frequency of burns was 10% of all admissions to pediatric surgery department. This is slightly lower than the frequency of 14% reported by others.⁽⁸⁾

In our study, infants were the most commonly affected, with a mean age of 43 months. Our results are consistent with literature data wherein the average age of burn victims is reported to be 3-5.5 years.⁽⁹⁻¹²⁾ This age-specific high frequency can be explained by the characteristic features of that age-group such as incompletely developed psychomotor skills, tendency to explore environment and remaining at home without attending school.⁽¹³⁾

The sex ratio of 1.16 in our study corroborates with that of published literature.^(1,14,15) Male predominance appears to be due to greater physical activity of boys who often engage in adventurous games.⁽⁷⁾

In our series, the majority of accidents occurred inside the house, mainly in the kitchen (42%) which is similar to published literature.^(1,15-17) This could be linked to the fact that in large families with limited resources, the same room is shared for several activities thus allowing toddlers to play around in the kitchen. Sub-optimal cooking equipment due to poverty may also lead to increased domestic accidents.

Similar to published reports burn accidents often occur in the morning and evening times.^(16,18-20) In our culture, these periods correspond to meal

preparing time and household activities. Consistent with general observation, in our series, thermal burns were the commonest injury, occurring in 96% of cases.^(10,16,21-26)

The mean extent of burns in our series was 11% TBSA. Langer⁽²⁷⁾ from Germany also reported a mean extent of 11.9% TBSA. Other have reported a mean extent of 4-10%.^(1,10,16,21,26,27) We noted deep second degree in 89%. Other African studies reported second degree burns in 92 - 94%.^(16,21) This is explainable by the fact that spilt hot liquids seldom produce third degree burns. Lack of knowledge of first aid and long delay in seeking medical treatment may have also contributed to this.

Initial resuscitation must be intensive if the extent of burn exceeds 10% TBSA. In a setting where sophisticated monitoring gadgets are unavailable, capillary refilling time is a useful prognostic indicator. Patients with impaired capillary refilling are at the risk of renal failure, sepsis, and death.⁽²⁸⁾ Antibiotic therapy in our setting was empirical rather than been guided by culture sensitivity of bacteria. Empirical antibiotics, though not ideally recommended, are not uncommon in Africa.^(29,30) Non-availability of 24/7 culture facilities, transportation to hospital in commercial vehicles with possible contamination and delayed clinical presentation with established wound infection justify empirical antibiotics in out settings.

In our series, the mean duration of hospitalization was 9 days. Rafik from Morocco reported a mean hospital stay of 8 days.⁽²¹⁾ On the other hand, Ada et al⁽¹⁸⁾ from our center previously reported a mean stay of 14.5 days. The length of stay could be influenced by the rate of healing, depth and extent of burns, long delay in seeking medical care, and the occurrence of complications.

In our series, as in several other studies,^(23,25) anemia, wound infection and malnutrition were the most common complications. At a mean follow-up of 5 mo, 18.5% of burn victims develop-

ed sequelae, the most common of which was scar depigmentation (10%). The frequency of hypertrophied scar and keloids was similar to the published literature.⁽³¹⁾ They frequently depend on the depth and location of the lesions and the quality of wound management.

Mortality from burns is a real problem throughout the world, especially in developing countries with limited resources.⁽³²⁾ In our series, 5 patients died, giving an overall mortality of 6.4%. This rate is lower than the range found in the African literature, which varies between 9.3 - 41.2 %.^(16,21,23,25) Yet, our mortality is higher than that of reported from developed countries,⁽¹⁹⁾ which is typically 0.49 - 9.08 %.

CONCLUSION

Pediatric burns forms 10% of our practice and it mainly affects infants. Most of the injuries were deep second-degree due to spilt hot liquids. Morbidity and mortality of our series is still high as compared to that of the developed countries. Awareness and the creation of pediatric burn care services are expected to improve the prognosis.

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