

Childhood Burns at the Paediatric Institute Kuala Lumpur

S B Ibrahim, FRCS
M B Omar, MS (Orth)
E C Gan, FRCS
A Rauf, MD
N B Johari, MD
H B Yusof, MD

*Department of Orthopaedics and Traumatology,
Universiti Kebangsaan Malaysia, Jalan Raja Muda Abdul Aziz, 50300 Kuala Lumpur*

Summary

A prospective study of 94 burned children was carried out from January 1993 to October 1994. Scalding was the predominant cause of injury affecting mainly toddlers between 1 and 3 years old. Ninety-six per cent of the injuries occurred at home. There was 1 death following an 81% flame burns. An intense campaign to make parents aware of the hazards is required as almost all the injuries were preventable.

Key Words: Children, Burns, Thermal injury

Introduction

Children are at high risk of sustaining thermal injury because of their natural curiosity and lack of awareness. However, there is a dearth of information in Malaysia concerning paediatric burn injuries. In order to address this deficiency, a prospective study was done to determine the profile of the paediatric burn patient.

Patients and Methods

A prospective study was performed on 94 burned children (less than 12 years old) who were admitted to the Universiti Kebangsaan Malaysia (UKM) unit of the Paediatric Institute Kuala Lumpur over a 22-month period (January 1993 to October 1994).

The patients were divided into four age groups i.e. infants (less than 1 year), toddlers (from 1 to 3 years), preschool (between 3 to 7 years) and school age (from 7 to 12 years).

For historical reasons, orthopaedic surgeons have been managing burns as the Paediatric Institute does not have a specialised burns unit. Major burns which require extensive skin cover are referred to the plastic surgeon. Critically ill patients requiring ventilation are treated by the anaesthetist in the intensive care unit.

Minor burns, less than 10% total body surface area (TBSA) were treated by cleaning the wound and removing the blisters. Exposure treatment using the Naksol spray thrice daily was performed. A scab usually forms within 24-48 hours. Spraying is continued for a few more days until a stable crust is formed.

Major burns of over 10% TBSA received intravenous fluid resuscitation. Third-degree burns were referred to the plastic surgeon for debridement and split-skin grafting.

Results

Sex and age

Sixty-two per cent of the children affected were boys. Toddlers were most vulnerable to injury accounting for 53.2% of the total number of 94 patients. Next most commonly affected were infants (26.6%), followed by preschool and school children (10.6% and 9.6% respectively).

Percentage body surface area burned

Sixty-four per cent of the children sustained less than 10% TBSA burned (Fig. 1). One child sustained 80% burns when a generator exploded.

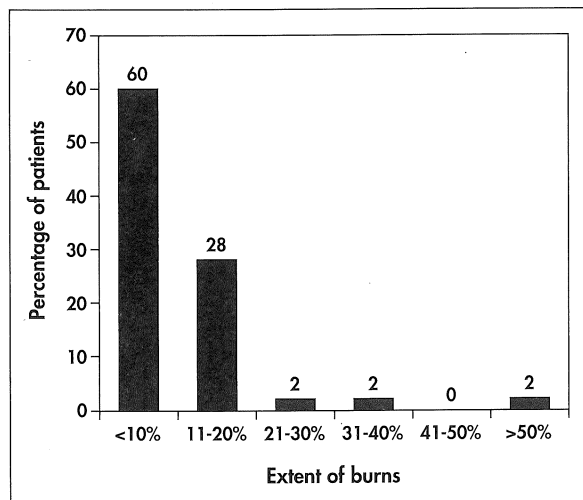


Fig. 1: Extent of burns (n=94)

Etiology

Scalding was the cause in 81% of the injured children. Flame burns injured 11% and contact burns injured 5% of the children (Fig. 2).

Place of burn

The home is the place where the majority (96%) of the injuries occurred (Table I).

Mode of burns

Scalds

Fifty per cent of the children were injured by tipping hot fluid over themselves. Twelve children (13%) fell into either hot water, gravy or oil. In 11 children hot

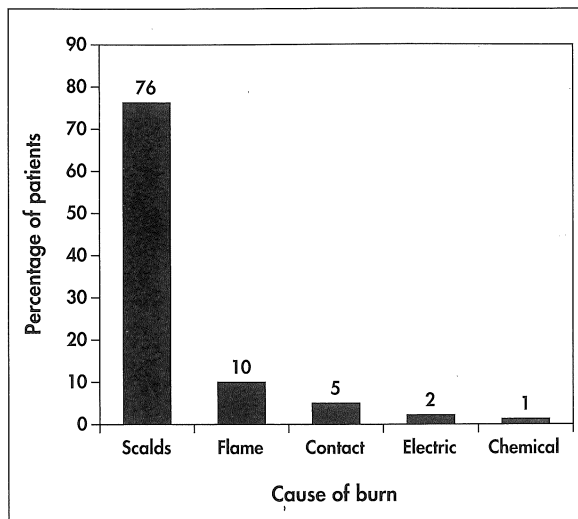


Fig. 2: Cause of burn (n=94)

**Table I
Place of burns**

Place	Number of Children
Kitchen	66
Living / Dining Rooms	16
Bathroom	2
Garden	6
Playground	3
Restaurant	1
Total	94

fluids were accidentally splashed over them by other persons.

Flame burns

One non-accidental cause of the injury was sustained when a burning piece of cloth was thrown at a child. One maternal suicide led to another child being accidentally burned. Three children were injured while playing near burning rubbish. One child each was burned while playing with matches, petrol, lantern, and firecrackers. A house on fire injured 1 child.

Contact burns

All the 5 children were injured while walking or

running barefoot outside the house. Three were burned by charcoal embers. One child stepped on a hot septic tank cover and another stepped on a burning joss-stick.

Electrical burns

Two children injured their fingers after touching the electrical socket of an aquarium and a wall.

Chemical burns

One child was injured after handling caustic soda.

Size of family

The majority of the children (82%) came from families with less than 5 children (Table II).

Table II
Size of family

Number of Children per Family	Percentage
1-2	50%
3-4	34%
5-6	13%
7-8	3%
Total	100%

Family income

Sixty-two children (66%) were from families with a monthly income of less than RM1000.00. Twenty-nine children (31%) had a family monthly income of between RM1000.00 - RM3000.00. Only 3 children (3%) came from families with a monthly income of more than RM3000.00.

Bacteriology

Wound cultures and sensitivity were positive in 29 patients (31%). *Staphylococcus aureus* accounted for 55% of the infection (Fig.3). Nine patients (31%) had methicillin-resistant *Staphylococcus aureus* (MRSA) infection.

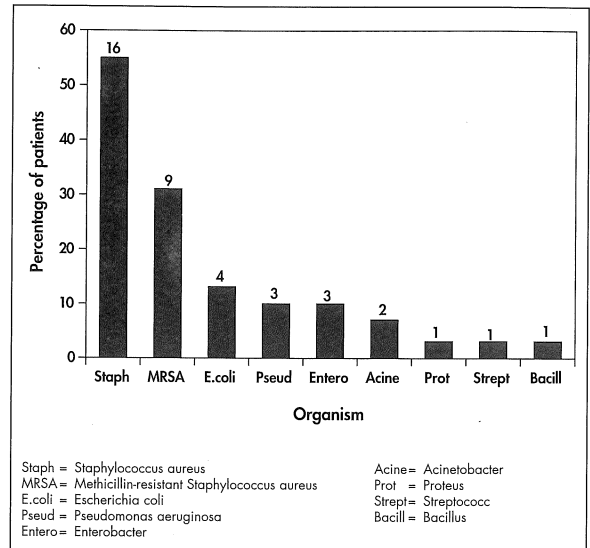


Fig. 3: Bacteriology (wound cultures)

Surgery

Eight children (8.5%) underwent debridement and split thickness skin grafting.

Duration of stay

Forty-eight children (51%) were hospitalised for less than a week. Twenty-four children (26%) stayed between one and two weeks, seven children (7%) between two and three weeks and three children (3%) between three and four weeks. Only 4 children were hospitalised longer than six weeks.

Table III
Complications

Number of patients	Type of Complication
29	Wound infection
5	Septicemia
1	Febrile fit
1	Acute renal failure
1	Pneumonia
1	Death

Complications

The commonest complication was wound infection (29 children). Five children had septicaemia resulting in one mortality (Table III).

Discussion

Scalds are the commonest cause of thermal injury in children accounting for 81% of the cases.

This is similar to findings in other Asian countries^{1,2,3}. In contrast, flame burns were the predominant cause of burns in Zaria, Nigeria because of the common use of firewood as the main fuel for domestic needs⁴.

The exposure method has been used to treat partial thickness burns using the Naksol spray. Naksol is a 9.6% ethanol solution containing 0.03% plant extract⁶. There is pain initially on spraying but with repeated sprayings and the use of oral paracetamol, the pain is minimised⁷.

The overall mortality in this series was 1%. Comparisons of overall mortality rates between centres are misleading because of differences in patient population, extent and depth of burns. The percentage survival related to the TBSA injured is a more accurate

indicator of the level of care in a burn unit. Table IV shows the mortality rate between different centres for burns greater than 10% TBSA.

The single mortality in our study occurred in a child with 81% partial and full-thickness flame burns. This was similar to the findings in Jaipur, India² and Singapore¹ where the mortality was 100% for burns greater than 60% and 70% respectively. In contrast, the mortality rate in Canada⁵ was 56% for burns greater than 70% TBSA.

It has generally been believed that the majority of burned children came from large families and were from the lower socio-economic group⁸. Our study found that most of the children (66%) came from the lower socio-economic group (monthly family income less than RM1000). In contrast, about half of the children (49%) came from small families (Table II).

Conclusion

Almost all the injuries sustained in the study occurred at home and are preventable. A public home safety education programme is required to increase awareness of thermal injury. The role of the mass media especially television would be very useful to convey this message.

Table IV
Mortality rate

TBSA	Number of patients	Number of deaths	Percentage mortality	Hospital
> 10%	86	25	29.1%	SMS Hospital Jaipur, India (2)
> 15%	61	16	26.2%	UKM, Hospital Kuala Lumpur (7)
> 15%	51	4	7.8%	University Hospital, Kuala Lumpur (8)
> 10%	343	9	2.6%	Singapore General Hospital (1)
> 10%	34	1	2.9%	UKM, Paediatric Institute Kuala Lumpur (present study)

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