Introduction

Burns and scalds are the third most common cause of injury in the industrial world and the most frequent form of injury among the paediatric population, particularly among children less than 5 years of age. They are among the most devastating injuries a child can sustain, and coupled with prolonged aggressive and non-aggressive medical and nursing therapies can result in long-term physical and psychological concerns. Although the extent of the problem is well recognized, ongoing epidemiological data on childhood burn injuries are needed in order to provide vital information for developing strategies aimed at reducing their frequency and severity. Successful strategies have included establishing primary prevention programmes that focus on reducing exposure and secondary strategies that focus on the outcome of burn injuries following early therapeutic action in emergency rooms and burns units.

Assiut is the principal city of Upper Egypt. The district has a population of about 4.5 million. Assiut University Hospital (AUH) is the leading and largest medical institution in the region, attracting patients from throughout Egypt. It has more than 2500 beds, hosts medical and nursing schools and post-graduate training, and serves hundreds of thousands of patients a year.

AUH has significant tertiary care programmes, including open heart surgery and extensive programmes of primary care, outreach, prevention, and education. It has been a leading force in medicine and education in the Upper Egypt for more than 50 years.

AUH attracts missionaries, philanthropists, volunteers, students, and nongovernmental organizations from around the world. It has a renowned plastic surgery department.
Patients and methods

Paediatric burns represent about 55% of all burns treated in our burns unit either as in-patients or out-patients. Of the total number of 1999 burned children who presented to our unit in the 6-yr period 2004-2009, 559 were admitted to our burns unit in accordance with our standard rules and the remaining 1440 were managed as out-patients.

The policy of our burns unit is to admit burned children presenting any of the following features:

- Age below 2 yr
- TBSA > 10%
- Localized deep burns in 2% TBSA or greater
- Facial burn
- Suspected inhalation injury
- Burns of the hand, feet, or perineum
- Chemical or electrical burns
- Associated fractures or chronic illness

With regard to the in-patient group (559 patients) the data were recorded by examining the doctor’s notes, and further details were collected through interviews with parents.

All burned patients received first aid in the reception room of the burns unit. This consisted of the ABC of trauma assessment and management, intravenous line, fluid therapy according to the Parkland formula, cooling of the burned area, and wound dressing using antiseptic ointments. Treatment protocols for the paediatric population differ from those of adults. Early excision and skin grafting are the rule in adult burned patients but not in children - a waiting interval is necessary until demarcation develops, followed by skin grafting.

Results

The total number of burned children presented in the study is 1999. These are divided into two categories:

Group A. Out-patient group (1440). In this group the burn extent was less than 10% TBSA. The mean age was 4.5 yr and the most affected site was the upper limb (40%), followed by multiple regions (25%) and each lower limb and the trunk (13%); the least affected was the chest (9%). The main cause of burn was scalding (75%); flame was the cause in the remaining 25%. The period of wound dressing ranged from 14 to 24 days, with all wounds healing spontaneously with no need for surgery.

Group B. In-patient group (559). In this group the burn extent was more than 10% TBSA or there were more than 2% deep burns, or the burns were in dangerous areas (hand, face, foot, genitalia); this group also includes special types of burn (electrical and chemical, inhalation injury).

Group B was divided into three age groups:

- Group 1 (0-5 yr) - 346 children (61%)
- Group 2 (6-10 yr) - 120 children (22%)
- Group 3 (11-16 yr) - 93 children (17%)

As can be seen, the most affected group was group 1 followed by group 2; group 3 was the least affected. Regarding burn wound size, the patients were also classified into 3 groups:

- Group 1, scalding - 379 cases (68%)
- Group 2, flame - 158 cases (28%)
- Group 3, electrical - 20 cases (3.5%)
- Group 4, chemical - 2 cases (0.5%)

The most common cause was therefore scalding. Regarding sex distribution, burns were more common in boys (360) than in girls (199).

Hospital stay was classified into four groups:

- Group 1 (less than one week) - 135 cases (24%)
- Group 2 (1-2 weeks) - 185 cases (34%)
- Group 3 (2-3 weeks) - 91 cases (16%)
- Group 4 (more than 3 weeks) - 148 cases (26%)

The highest percentage was thus in group 2 (hospital stay 1-2 weeks). The mean hospital stay was 14.7 days. Regarding mode of referral, all the patients were transferred to us through the national ambulance system from the central hospitals in the surrounding cities and villages in Upper Egypt.

The place of the accidents was the home in all cases, with a parent or guardian present at the time. The room where accidents were most frequent was the kitchen, followed by the bathroom, especially in the case of children living in slum areas where water supply systems are deficient and kerosene stoves are used to boil water. This makes children more prone to stumbling over boiling water and suffering scald burns.

Urban setting versus rural. There were 193 children (34.2%) from urban areas and 366 (65.8%) from rural areas.

Seasonal variations. There was a much increased incidence of childhood burns during winter and spring (308 cases, 55%) compared to summer and autumn (251 cases, 45%). This is due to the boiling of water for baths or the lighting of fires for warmth.

Daily and hourly variations. There was a significant
increase in the incidence of burn admissions on Fridays (which is the official weekly holiday in Egypt), when all family members are at home. The incidence that day was almost 1.25 times more than the average daily incidence. In the course of the day the incidence rose gradually in the early morning and reached peaks at 2 p.m. (16.7%), 4 p.m. (19.3%), and 6 p.m. (16.1%), after which it started to decrease at night.

Socioeconomic factors. All these young patients came from low-income families: 420 (75%) had illiterate parents and in 139 cases (25%) the parents were educated.

Mortality and morbidity. The number of deaths in this study was 73 (13.1% of all children presenting to the unit). Of these, in 59 cases the burns were in over 40% TBSA and in nine cases in 20-40% TBSA; five patients died of inhalation injury.

Treatment. Out of the 559 cases, there were 73 deaths during the period of study, while the remaining 486 children received standard care - 148 needed split-thickness skin grafts, while the remaining 338 healed spontaneously by epithelialization with varying degrees of burn scar. All patients during and after treatment wore pressure garments to improve scar quality. Physical rehabilitation started immediately in the early days post-burn injury in the form of passive and active exercise of the fingers, with a plastic splint over the hands in neutral position and a rigid splint over the joints to antagonize and prevent the development of contracture.

Discussion

This results of this study were consistent with those of other studies carried out in developed and developing countries as regards the greater number of male than female patients, as also regarding socioeconomic factors and seasonal variation, which were the same in developing and developed countries. These studies reflected the hazards of raising children in overcrowded houses with poor hygienic facilities. During wintertime, burn accidents increase significantly due to the need for boiling water. The traditional kerosene stove, which is used extensively in slum areas in Upper Egypt for boiling water and cooking, lacks any safety measures. Children stumble on these kerosene stoves, which usually stand on the ground and are the cause of flame burns.

The most common place of injury is the home and the most common day is Friday, which in Egypt is the weekly holiday. The commonest time is 2-4 p.m., which corresponds to the time when the house is most crowded and families are busy preparing the main meal of the day.

Previous studies in Bangladesh, Turkey, South Africa, and the United Kingdom stressed the increasing incidence of childhood burns under 5 years of age. Our study shows the same incidence. Children under 5 constitute the largest number because those of them who live in slum areas where water supply systems are deficient and kerosene stoves are used to boil water are more prone to stumble over boiling water and suffer scald burns or immersion burns.

Regarding the comparison between rural and urban areas, there was a significantly higher percentage of rural inhabitants (65.8%) in our study than city dwellers because our burns unit is located in a part of Upper Egypt that is surrounded by large numbers of villages and farmhouses.

Regarding hospital stay (mean duration, 14.7 days), this can be considered acceptable because most of our patients presented burns in over 20%, which is considered to constitute a major burn, while the relatively short period of stay may be attributed to the presence of experienced burn surgeons who performed early wound coverage assisted by a highly trained nursing staff.

The mortality rate (13.1%) was lower than in centres in Africa and in some centres in the Far East. This is due to the meticulous monitoring and care provided by well-trained nurses, as also to early and adequate wound management. This percentage may be higher than that found in other centres in the United Kingdom, as this study included a larger number of burned children and also a longer time of study (6 years).

Conclusion

The epidemiological profile of childhood burns in our region could be used as the basis for an intensive campaign in the mass media for regulation and improvement of the safety of household products. The most important findings of this study were that the childhood burn rate in our region was on the increase and that this was not a matter of public awareness and seasonal variation alone but an indicator of the risks to the paediatric population due to the family’s low socioeconomic status, which forces both parents out to work, leaving the children unattended for long periods of time.

Recommendations

- Policymakers should evaluate the need for a specific paediatric burns unit
- Burns prevention programmes in Egypt should be reassessed to determine their efficacy and their capacity to target high-risk populations
- Culturally appropriate burns prevention programmes should target each population group accordingly
- Parents should be exposed to prevention programmes in an effort to reduce scald injuries
- Prevention programmes for the population of Upper Egypt should specifically target children and parents during the winter months.
RÉSUMÉ. En Égypte les brûlures en âge pédiatrique constituent un problème important, surtout dans les familles de faible statut socioéconomique. Ces familles vivent dans des appartements surpeuplés où elles utilisent des réchauds au kérosène, mais sans l’hygiène appropriée ni les mesures de sécurité adéquates. Un nombre total de 1999 enfants brûlés (1440 traités en clinique externe avec la surface corporelle totale brûlée [SCTB] inférieure à 10%, plus 559 enfants brûlés avec une SCTB supérieure à 10% traités en régime interne) se sont présentés à l’unité des brûlures du Centre Hospitalier Universitaire d’Assiout au cours de la période de six ans 2004-2009. Dans le groupe des enfants traités en régime externe (1440 enfants), le site le plus fréquent était le membre supérieur (40% des patients) et le moins fréquent était la poitrine (9%). La cause la plus commune (75%) était l’ébouillan-tement, suivi par les flammes (25%). L’âge moyen des enfants dans ce groupe était de 4,5 ans. Les enfants traités en régime hospitalier, en nombre 559, ont été classés en trois groupes d’âge: groupe 1 (âge au-dessous de 5 ans), groupe 2 (5-10 ans) et groupe 3 (11-16 ans). Le groupe 1 était le plus touché par les brûlures, avec 61% des cas, et le groupe 3 le moins touché (17%). La cause la plus fréquente des brûlures était l’ébouillan-tement et la moins commune la brûlure chimique (1%). Pour ce qui concerne le sexe, les garçons représentaient 64,5% des cas et les filles 35,5%. L’extension de la brûlure variait de 10 à 50% a été classée en trois groupes: groupe 1 (10-15%), groupe 2 (16-20%) et groupe 3 (plus de 20%). La plupart des enfants ont été classés dans le groupe 3 (41% des cas en milieu hospitalier). Le taux de mortalité était 13,1%. L’objectif de cette étude était d’identifier les caractéristiques épidémiologiques des cas accidentels de brûlure comme base pour un programme de prophylaxie miré à protéger les enfants les plus petits contre le risque de l’ébouillan-tement et les enfants plus grands contre les dangers de jouer avec le feu et ceux du travail infantile. L’étude a porté sur l’incidence, la cause, le lieu et le temps des brûlures. Les aspects démographiques, la sévérité des brûlures, les facteurs socioéconomiques et le taux de mortalité ont également été inclus dans cette étude des enfants brûlés âgés de 0-16 ans dans la période de 6 ans 2004-09 dans la région de la Haute-Égypte.

Mots clés: épidémiologie, prophylaxie des brûlures, Égypte

BIBLIOGRAPHY


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