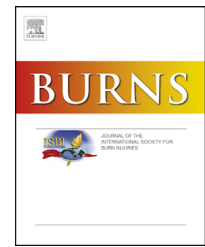


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# Childhood burns in Sulaimaniyah province, Iraqi Kurdistan: A prospective study of admissions and outpatients



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## ABSTRACT

**Background:** While it is globally observed that young children are at a higher risk of burn injuries, little is known about childhood burns in Iraqi Kurdistan. This study was undertaken to describe the epidemiology of burns amongst pre-school children in this region.

**Methods:** A prospective study was undertaken from November 2007 to November 2008 involving all children aged 0–5 years attending the burns centre in Sulaimaniyah province for a new burn injury whether treated as an outpatient or admitted to hospital.

**Results:** 1,122 children attended the burns centre of whom 944 (84%) were interviewed (male 53%, female 47%). Mean age was 1.9 years with children aged 1 year comprising 32% and those aged 2 years comprising 21% of the sample. The incidence of burns was 1044/100,000 person-years (1030 in females and 1057 in males). Mechanisms of injury included scalds (80%), contact burns (12%) flames (6%) and other mechanisms (2%). Almost 97% of burns occurred at home including 43% in the kitchen. Winter was the commonest season (36%) followed by autumn (24%). There were 3 peak times of injury during the day corresponding to meal times. The majority of burns were caused by hot water (44%) and tea (20%) and the most common equipment/products responsible were tea utensils (41%). There were 237 admissions with an admission rate of 95 per 100,000 person-years. Scald injuries accounted for most admissions (84%). Median total body surface area affected by the burn or scald (TBSA) was 11% and median hospital stay was 7 days. In-hospital mortality was 8%. Mortality rate was 4% when TBSA was  $\leq 25\%$ , and 100% when TBSA was over 50%.

**Conclusion:** Burn incidence is high in young children especially those aged 1–2 years. Preventive interventions targeted at families with young children & focusing on home safety measures could be effective in reducing childhood burns.

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## 1. Introduction

Burns are very common especially in low and middle income countries where mortality from burns is eleven times higher than in the high-income countries [1]. Published literature on burn injuries indicates that children comprise a considerable proportion of burn admissions and the majority of those children are young. A Chinese study analysing 10 years burn admission data reports that 44% of all burn admission are to children and 70% of these children were younger than 3 years [2]. A study from several American states reports that 70% of childhood burn admissions were under five years of age [3]. Children aged 0–5 years comprise 26% of all burn admissions in South Korea [4], 40% in Nepal [5] and 25% in Iran [6]. According to latest WHO report on child injuries, 95,000 children die from burns each year the majority being below 5 years of age [1]. A review of burn injuries in the Eastern Mediterranean region reports that up to 36% of all burns and 78% of childhood burns occur in children aged 0–5 years [7].

During the past 30 years the Iraqi population has been struggling to cope with the impact of wars, sanctions and internal conflicts with poor public services and deteriorating living standards. There is little published data about Burn injuries in Iraqi Kurdistan particularly amongst young children. A study on burn epidemiology in Iraqi Kurdistan has reported a high annual incidence rate of 389 per 100,000 per year in all ages [8]. Another study on admitted hospitalized patients reports that 66% of all admissions were to children aged 0–6 years [9]. Detailed information on the epidemiology of burn injuries in the young children of this region is not available in the published literature. Therefore the current study was undertaken to calculate the incidence of burn injuries, admission and mortality rates and describe epidemiologic characteristics of burns in children 0–5 years of age in this region. This information is essential to provide a better understanding of the problem and to plan preventive services.

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## 2. Methods

This prospective study was undertaken in the Burns and Plastic Surgery Centre of Sulaimaniyah (burns centre) which is the only burns centre in Sulaimaniyah province (one of the three provinces of Iraqi Kurdistan) and serves its entire population of 1.7 million (at the time of the study). The burns centre which is a public hospital under the Department of Health has 70 beds for admissions in addition to a very busy outpatient department that provides services for new patients as well as follow-up services for patients requiring further dressing and treatment. The study included both admissions and outpatients. Children 0–5 years of age who sustained an acute burn injury (T20–T32 according to ICD-10) between 3rd of November 2007 and 2nd of November 2008 were included in the study.

All participants (parents of children and sometimes siblings) were recruited and interviewed by one of the authors (NO) at the outpatient department during their first visit or subsequent follow-up visits to the burns centre or on the wards after admission in case of hospitalized children.

Information was collected using a form specifically prepared for the study including information on socio-demographics and burn characteristics. For hospitalized patients, other data were extracted from hospital records including dates of admission and discharge, length of hospital stay, presence of inhalation injury, complications, wound infection, operations and outcome. Burns size was measured using Lund and Browder method.

The data was entered into a database in EpiData version 3 [10] and analysed in Stata version 9 [11]. P values were reported as such if they were larger than or equal to 0.001 but smaller P values were reported as <0.001. Numeric variables were reported as means and standard deviation or medians and inter-quartile ranges (IQR) depending on normality. Associations between categorical variables were explored using Chi-square tests. Associations between groups of non-normally distributed continuous variables were explored using Mann-Whitney U test and Kruskal-Wallis test depending on the number of groups being compared. Informed consent was obtained from the caregivers and their autonomy and confidentiality were respected. The study was approved by the ethics committees of the medical schools of Sulaimani University and the University of Nottingham

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## 3. Results

During the one year prospective data collection a total of 1122 children aged 0–5 years with a new burn attended the burns centre of whom 944 were interviewed by the researcher amounting to a participation rate of 84%.

Table 1 shows characteristics of participants. The participants included 498 males (53%) and 446 females (47%). Age was not normally distributed and ranged from one month to 5.9 years (median 2, IQR 1.2, 3 years). Burn injuries most commonly occurred in winter (36%) and least commonly in summer (19%). Almost 97% of burns occurred at home and 86% of burns resulted from accidents, the immediate cause of which was the child. Twenty one percent of patients were admitted to hospital and the in-hospital mortality rate was 8%.

### 3.1. Incidence

The incidence of medically reported burn injuries was 1044 per 100,000 per year; 1030 in females and 1057 in males (rate ratio 0.97, 95% CI 0.85–1.12,  $P = 0.70$ ). The majority of the burns (53%) occurred in children aged 1–2 years. The annual mortality rate was 3.8 deaths per 100,000 children per year; 5.1 in females, 2.6 in males (rate ratio 1.97, 95% CI 0.49–7.9,  $P = 0.33$ ).

### 3.2. The mechanism of burn injuries

The mechanisms of burn injuries are shown in Table 2. Overall, scalds were the most common mechanism of injury accounting for 80% of the participants followed by contact burns (12%) and flame injuries (6%). Hot water alone was responsible for 44% of all burns and tea alone was responsible for 20% of all burns. There were few cases caused by chemicals, electricity and explosives.

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