

# Scald Burns in Children. An Analysis with Special Attention to the Roma Ethnic Group in East Slovakia

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## Abstract

**Objectives:** A retrospective analysis of scald burns in children in a region with a significant prevalence of Roma ethnicity living in poor socioeconomic situation. **Patients:** During 3 year period 273 children were admitted to the Clinic of Burns and Reconstructive Surgery of our hospital; 201 of them were with scald burns accounting for 73.6% of all pediatric burn admissions. More than half (58.7%) of the 201 children with scald burns were of Roma ethnicity. **Results:** The average BSAB of the children with scald burns was 10.8%; mean length of hospital stay 11.5 days. 58.7% of the children with scald burns was of Roma ethnicity. The non-scald admissions of children had a similar pattern but these children were older and with an even higher prevalence of Roma patients (75%), a slightly lower average BSAB (9.8%) and a significantly longer need of hospital treatment (average 15.7 days). **Conclusion:** The frequency of scald burn injuries in very young Roma children in our region is very high. Prevention of scald burns is possible only through targeted and well-organized education of this vulnerable population.

## Keywords

Scald Burns, Pediatric Burns, Roma Ethnicity

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## 1. Introduction

Burns in children are relatively frequent and most of them are scald burns in very young age. Low socioeco-

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nomic status associated with low level of education and health awareness is an unambiguous risk factor of all types of injuries including burns and scald burns in different regions of the world [1]-[11]. In the Clinic of Burns and Reconstructive Surgery (CBRS) of the Kosice-Saca hospital we observed an increasing number of pediatric scald burns admissions in the last years, too. Among the children with scald burns and also with burns of other etiology was a very high prevalence of Roma children living mostly in low socioeconomic conditions. Therefore we conducted a retrospective study to analyze scald burns demography with special attention to the Roma ethnic group. In addition we evaluated the etiology and therapy of scald burns and compared it with burns of other etiology.

## 2. Material and Methods

From 1<sup>st</sup> of August 2009 to 31<sup>st</sup> of July 2012 there were 273 pediatric patients (up to age 15 years) admitted to the burn clinic. The study was carried out as an anonymous retrospective one from the patients' medical records. The classification of patients according to their ethnicity is a sensitive one and for this reason the study was approved both the ethical committee of the Medical School, Safarik University and the 1<sup>st</sup> Private Hospital Ltd., Košice-Šaca, Slovakia. The data about the ethnicity of patients were treated anonymously and separated from their medical records. In this study only patients admitted to our special unit were involved. Minor burns treated in different outpatient clinics in the region without hospital admission were not included into the study.

Statistical methods were carried out with Stats Direct version 2, 7, 8 software. Normality of variable distribution was verified by Shapiro-Wilk test. For comparison of age distribution we used t-test for nonaequal variance because F test of variance was significant. For comparison of BSAB and hospital stay nonparametric Kruskal-Wallis test was applied. Results were considered when alpha ( $p$ ) value was  $<0.05$ .

## 3. Results

From the whole groups 201 patients were admitted for scald burns, accounting for (73.6%) of all pediatric burn admissions and 72 burns (26.4%) were caused with flame, electricity and hot objects. More than half (58.7%) of the 201 children with scald burns were of Roma (Gypsy) ethnicity. Boys were affected more frequently with both types of burns as girls and the difference between the sexes was a bit more higher in non-scald burns as compared with scald burns but without statistical significance. The age distribution of children with scald burns was much lower than that of other types of burns. The median age of scalded children was 2 years and only ten of them were in the range of 9 - 15 years (Figure 1). The differences in age between scalded children and children with other type of burns was highly significant ( $p < 0.0001$ ,  $df = 271$ ; 95% CI from  $-5$  to  $-3$ ). The basic demographic data are presented in Table 1. The origin of the scald burn injury is represented in Figure 2. Hot water, soup and hot drinks caused the majority of the scald burns in these youngsters. All burns were treated according to the standard and evidence-based medical protocols to prevent scar formation and other late complications of scalds [12]. During the observed period no fatal outcome was observed in children with burns.

The average BSAB of the whole group was 10.8% and mean length of hospital stay 11.5 days. The difference in BSAB between scalded children and children with other types of burns was not significant but both the length of the hospital stay and the need of surgical intervention of scalded children were significantly lower as compared with the other types of burns (Table 2).

In Table 3 the description of burns according to ethnicity is presented. Ethnicity did not influence the age distribution and the extent of the burns in the children. The only significant difference was in the length of the hospital stay (Kruskall-Wallis test  $p = 0.002$ ,  $DF = 119$ ).

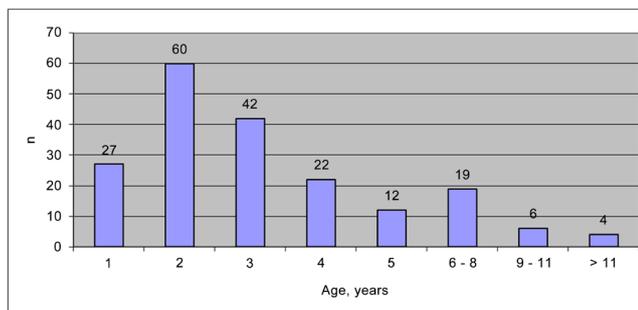
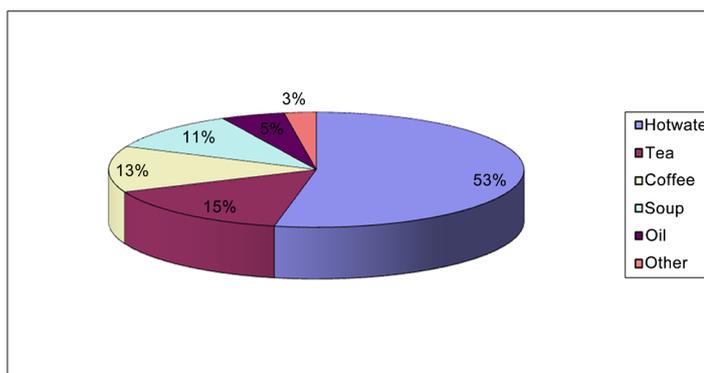


Figure 1. Age distribution of children with scald burns.

**Table 1.** Demographic data in children with burns.

Group n (%)	Sex: Boys/Girls n (%)	Ethnicity: Roma/Non n (%)	Age, Years Median
ALL 273 (100%)	174/99 (63.7%/36.3%)	172/101 (63.0%/37.0%)	2
SCALD 201 (73.6%)	122/79 (60.7%/39.3%)	118/83 (58.7%/41.3%)	2
OTHER 72 (26.4%)	52/20 (72.2%/27.8%)	54/18 (75.0%/25.0%)	7

Note: Due to uneven distribution of age median values are presented.



**Figure 2.** The distribution of causes in patients with scald burns.

**Table 2.** Mean and median BSAB, length of hospital stay and the need of surgical intervention in children with burns.

Group n	BSAB (%), Mean; Median	Hospital Stay Days Mean; Median	Need of Surgery Yes/No
ALL 273	10.8; 9.0	11.5; 9.0	105/168
SCALD 201	11.1; 10.0	9.9; 7.0	61/140
OTHER 72	9.8; 7.0	15.7; 12.0	44/28

Note: Due to uneven distribution of BSAB and hospital stay data average and median values are presented.

**Table 3.** Mean and median age, BSAB, hospital stay and need of surgical intervention in children with burns according to ethnicity.

Group Type of Burns/Ethnicity, n	Age (Years) Mean; Median	BSAB (%) Mean; Median	Hospital Stay, (Days) Mean; Median	Surgery n (Yes %)
Scald, Roma, 118	2.48; 2.0	11.0; 9.0	11.9; 9.0	41 (34.7%)
Scald, Majority, 83	2.35; 1.0	11.3; 10.0	7.1; 6.0	20 (24.0%)
Other, Roma, 54	6.48; 6.0	9.9; 7.0	15.5; 11.5	33 (61.1%)
Other, Majority, 18	6.72; 7.5	9.3; 5.0	16.0; 14.0	11 (61.1%)

Note: Due to uneven distribution of age, BSAB and hospital stay average and median value are presented.

#### 4. Discussion

Our results in general are in concordance with those of other studies. Low age (1 - 3 years) and male gender are the basic risk factors of burns in children [1]-[11]. Scalds are the most frequent causes of burn injury with a variable range from 55% to 88% of all pediatric burns. In most studies different markers of low socioeconomic status appear as further important risk factors of pediatric burns and other injuries [13] [14]. Low socioeconomic status is however a very broad term including such items as, single parent families and birth order “(which means more children in the family) and, material deprivation” [5]. The last marker is probably associated with the lack of warm tap water access in the households.

The same basic factors are behind the scald injuries referred in our study. The difference is in the high occurrence of scald burns in children belonging to a special ethnic group. The number of Roma people and children living in the East Slovakia region for which the CBRS is responsible in the field of burn care is not known precisely. According to official statistics based on their own enrollment in the Slovak national census was only 1.7% which is clearly an unambiguous understatement (in polls many of them register as “Slovak” or “Hungarian”).

The Institute of Informatics and Statistics of the Slovak Republic [15] provides a more reliable estimate of about 7% but the most reliable value according to epidemiologists [16] [17] is between 8% - 12%. According to unofficial and unpublished opinion of social care institutions the percentage of Roma people can be as high as 15% - 20%, which is probably an overstatement. Another confounding factor is that Roma families have usually more children as compared with families of the majority population [18] which itself is a risk factory of different injuries including scald injury. Therefore it is possible to make only a rough estimation of the increased risk of scald burns in Roma children. Despite all uncertainties according the number of Roma population in the region and the number of their children the risk to get scalded in Roma children is extremely high, accordingly to our estimation more than 10 (Table 4). In a study from Denmark [19] the difference of scald risk between children of non-Western and Western origin was near three, considerably lower than in our study.

Our results are in concordance with the results of two studies from the same region dealing with other types of diseases. Recently Kolvek *et al.* [20] conducted a study on the incidence of end-stage renal disease and found almost three times increased risk of this condition in Roma populations as compared with non-Roma population. Kolarcik *et al.* [21] analyzed the occurrence the injuries and other pathologic conditions in Roma adolescents. They analyzed also the social and economic background of the health care differences between them and adolescents of the majority population. They found increased number of injuries in Roma as compared with the other children although the difference was not statistically significant.

In our study we analyzed a specific type of injury clearly associated with the specific low socioeconomic status and the difference was significant. In addition to the much higher incidence of burn injury in Roma children as compared with children belonging to the majority population there were four notable differences among the subgroups:

1. The age of children who suffered scald burns is much lower as compared to those with other type (flame, contact, electricity and chemical) burns independently on their ethnicity.
2. The hospital stay of scald burns is shorter as of other type burns independently on the ethnicity of the children.
3. Despite the similar extent of the scald burns and age distribution Roma children remained longer at the CBRS as compared with their counterparts from the majority population. This is probably due to their poor general health and nutritional condition.
4. Roma children with scald burns needed more surgical intervention as compared with children with the majority population.

The causes of this dismal situation are outside the scope of medical care but prevention through targeted and culturally sensitive education is clearly its main point [22]-[28]. One should realize also the fact that the prevention of scald burns is not ideal also in the majority population. Our retrospective study covered 36 months and during this period every month 5 - 6 children were admitted to our clinic with scald burns, 3 - 4 of them Roma ethnicity and 2 - 3 of them others.

## 5. Conclusion

The frequency of scald burn injuries in very young Roma children in our region is extremely high despite the

**Table 4.** An estimation of the scald burns risk in children of Roma ethnicity.

Source	Estimated Prevalence of Children Roma/Majority %	Scald Burns, This Study, Roma/Majority %	Relative Risk of Scald in Roma Children
Census 2001	≅1.7/98.3		82.6
Infostat	≅7/93	118/83 (58.7%/41.3%)	18.9
Refs. [14] [15]	≅10/90		12.6

fact that scald burns are easily preventable. Prevention in this vulnerable population should be specifically targeted and organized. Emphasis should be put on improved parental awareness and also on information highlighting the inability of small children to manage the risk of burns and other unintentional injuries.

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## Abbreviations

BSAB: Body Surface Area Burned;

CBRS: Clinic of Burns and Reconstructive Surgery.

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