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Epidemiology and screening of intentional burns in children in a Dutch burn centre

Sara Bousema [a], Helene G. Stas [b], Marjolijn H. van de Merwe [b,c], Irma M.M.H. Oen [a], Martin G.A. Baartmans [b], Margriet E. van Baar [d,*]

[a] Burn Centre Rotterdam, Maasstad Hospital, Rotterdam, The Netherlands
[b] Division of Pediatrics, Maasstad Hospital, Rotterdam, The Netherlands
[c] Child Abuse Team (Veilig thuis Zuid-Holland Zuid), Dordrecht, the Netherlands
[d] Association of Dutch Burn Centres, Burn Centre Rotterdam, Maasstad Hospital, Rotterdam, The Netherlands

The Dutch Burn Repository group, Maasstad Hospital Rotterdam, J. Dokter, A. van Es, C.H. van der Vlies, M.E. van Baar

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ABSTRACT

International estimates of the incidence of non-accidental burns (NAB) in children admitted to burn centres vary from 1% to 25%. Hardly any data about Dutch figures exist. The aim of this study was to evaluate the incidence, treatment and outcome of burns due to suspected child abuse in paediatric burns. We described the process of care and outcome, including the accuracy of the SPUTOVAMO screening tool and examined child, burn and treatment characteristics related to suspicions of child abuse or neglect.

A retrospective study was conducted in children aged 0–17 years with a primary admission after burn injuries to the burn centre Rotterdam in the period 2009–2013. Data on patient, injury and treatment characteristics were collected, using the Dutch Burn Repository R3. In addition, medical records were reviewed.

In 498 paediatric admissions, suspected child abuse or neglect was present in 43 children (9%). 442 screening questionnaires (89%) were completed. In 52 out of 442 questionnaires (12%) the completed SPUTOVAMO had one or more positive signs.

Significant independent predictors for suspected child abuse were burns in the genital area or buttocks (OR = 3.29; CI: 143–7.55) and a low socio-economic status (OR = 2.52; 95%CI: 1.30–4.90).

The incidence of suspected child abuse indicating generation of additional support in our population is comparable to studies with a similar design in other countries.

* Corresponding author at: Burn Centre, Maastad Hospital, PO Box 9100, 3007 AC Rotterdam, the Netherlands.
E-mail address: BaarM@maasstadziekenhuis.nl (M.E. van Baar).

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1. Introduction

International estimates of the incidence of non-accidental burns (NAB) in children admitted to burn centres vary from 1% to 25% [1–7]. Thombs et al. reported that 5.8% of all admitted children aged 0 to 12 from seventy burn centres in the USA were suspected as having child-abuse related injuries [7]. Data from burn units in the UK show an incidence of 3% [1]. Figures from Canada and France were comparable to the UK data [8]. The most recent publication on this topic from the USA showed that 24% of the children admitted with burn injuries was suspected of abuse after evaluation by a multidisciplinary review team [6].

In the Netherlands, hardly any empirical data is available estimating the incidence of NAB in children. Sie et al. reported that in 3 out of 152 children up to 7 years of age admitted for scalds to the buttocks or genital area the trauma was seriously suspected of being inflicted [9]. The wide range of reported incidences can be explained by differences in definition, experience of observers and study sample. Earlier studies showed that NAB were common in young children with scalds affecting the extremities (glove and stocking burns), buttocks, perineum or both [4,6,7,10]. Next to burn injuries, these children are at higher risk to suffer from additional injuries like fractures [11–13]. In addition, children who were suspected of NAB had an increased rate of mortality and received longer hospital admission [7,14].

Several characteristics of NAB have been previously described. Regarding to burn size, the results of previous studies do not match. Some studies conclude that there was no significant difference in burn size between accidental burns and NAB [3,10], whereas other studies state that abuse related burns were significantly larger [6,7]. Lastly some say that children whose burns were suspected to be non-accidental were significantly more likely to have a smaller burn size [2].

The relation of gender with the incidence of NAB is not clear; some articles report an excess of boys in children with NAB, while other sources found no significant differences in boys and girls [3,4,10,14,15]. Low socioeconomic status is associated with child abuse and neglect, also in burn victims [14,16,17].

The majority of the studies on NAB in children are retrospective single centre studies in relatively small groups (range $n = 155$ to $n = 507$) [1–4,15]. However Thombs et al. conducted a retrospective nationwide study in a large sample ($n = .15802$) [7]. Recently, Wibbenmeyer determined factors associated with abuse in children presenting with burn injuries in a prospective trial ($n = 68$). A decade ago, Benger et al. concluded that the documentation regarding the possibility of NAB in pre-school children was poor [18]. The introduction of a screening checklist or flowchart has been shown to increase the awareness and documentation of NAB and the referral rate to social services [18–20]. Several instruments are used worldwide to detect child abuse. In the past years, all admitted children to the burn centre Rotterdam were screened for abuse using a screening questionnaire (SPUTOVAMO) containing most elements of the SPUTOVAMO-R questionnaire [21]. This tool addresses the following injury characteristics: 'type of injury, location, and appearance, time, cause, perpetrator, witnesses, measures and old injuries' (see appendix).

Recent studies in the Netherlands have shown that screening for child abuse with similar screening tools in emergency departments is effective in increasing the detection of suspected child abuse [21–23].

The aim of this study is to evaluate the incidence, treatment and outcome of burns due to suspected or confirmed abuse or neglect in children after burn injuries. Thereby we describe the process of care and outcome in terms of additional support because of suspected or confirmed abuse or neglect, including the accuracy of the screening tool and we examine which child, burn, and treatment characteristics are related to the provision of additional support.

2. Methods

2.1. Study design and population

In this retrospective cohort study we reviewed records from all children aged 0–17 years with a primary admission after burn injuries to the burn centre Rotterdam in the period 2009–2013.

2.2. Screening procedure

The SPUTOVAMO questionnaire that is used in the burn centre Rotterdam contains most elements of the SPUTOVAMO-R used by Sittig et al. [21]. Both questionnaires are displayed in the appendix.

The questionnaire is included in each medical record of children aged up to 18 years. In our hospital the questionnaire was expanded during the study period from six to eight questions (see appendix). In the burn centre Rotterdam the SPUTOVAMO is filled out by a burn care or ER professional at time of admission to the burn centre. The questionnaire is considered to be positive when at least one of the questions is deviant.

2.3. Work up after the initial screening

In case of concern, additional information on risk factors is further obtained by verifying medical history, information from general practitioner and other hospitals, social and emotional risk factors and possible registration of the child or siblings at social services. Thereby, a head-to-toe examination should be executed. In case of concern, based on the questionnaire or other signals during admission, a workup for possible child abuse or neglect includes a consultation of a paediatrician and/or the expert on child abuse. This work-up is conducted according to a nationwide mandatory code on reporting child abuse ('Meldcode huiselijk geweld en kindermishandeling'). The order of these actions depends on the clinical situation. In addition, a multidisciplinary burn centre child abuse team (including a nurse, a paediatrician, the expert on child abuse, a psychologist, a member of social welfare, a burn specialist and a pedagogic worker) evaluates every suspected case.

In case of on-going suspicion or when the history of the accident is unclear, parents are informed about the workup

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