

Burns and scalds in pre-school children attending accident and emergency: accident or abuse?

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Abstract:

Objectives—To assess how frequently and adequately information relating to the possibility of non-accidental injury (NAI) is documented and considered by doctors assessing pre-school children with burns and scalds in the accident and emergency (A&E) department, and to determine the effect of introducing a routine reminder mechanism into the A&E notes, coupled with an improved programme of NAI education and awareness.

Methods—The records of 100 pre-school children attending an A&E department with a burn or scald were reviewed against nine pre-determined standards. Changes in policy were instituted, through a programme of education and the use of a reminder checklist, and the next 100 cases re-audited against the same checklist.

Results—Groups one and two were similar in their demographic characteristics. The reminder checklist was included in 60% of group two notes, and when included was completed in 97%. The child protection register was rarely consulted. There was a statistically significant increase in recording the following: time that the injury had occurred, the consistency of the history, the compatibility of the injury with the history given, the consideration of the possibility of NAI, the general state and behaviour of the child and the presence or absence of any other injuries. The rate of referral for a further opinion regarding the possibility of NAI increased from 0 to 3%, but failed to reach statistical significance.

Conclusions—Prevailing awareness and documentation regarding the possibility of NAI was found to be poor, but a programme of intervention combining education and the use of a reminder checklist improved both awareness and documentation of NAI, as well as referral rates for further assessment. This strategy may prove applicable to children of all ages and injury types, reducing the number of cases of child abuse that are overlooked in the A&E department.

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The true incidence of non-accidental injury (NAI) is unknown,¹ and this makes it impossible to estimate what proportion of children attending an accident and emergency (A&E) department are, in fact, victims of child abuse. In the UK it has been estimated that 3% of all

burns and scalds in children presenting to A&E are the result of abuse,² while 2% of children admitted to a burns unit have been victims of NAI.³

It is apparent that a significant proportion of burns in the pre-school age group will occur as a result of abuse and it is, therefore, essential that the question of NAI is considered in each and every case. In a busy A&E department, where many children are seen each day, it is easy to overlook the possibility of NAI, and for this reason steps should be taken to ensure that proper consideration is given to every patient, with appropriate action in any case of doubt.

The objectives of the study were:

- 1 To assess how frequently and adequately information relating to the possibility of NAI is documented and considered by junior doctors assessing pre-school children with burns and scalds in the A&E department of a typical general hospital.
- 2 To determine the effect of introducing a routine reminder mechanism into the A&E notes, coupled with an improved programme of NAI education and awareness.

Methods

The attendance notes of 100 consecutive children aged less than 6 years who had presented to A&E with a burn or scald were retrieved and retrospectively reviewed. These 100 children were designated as group one. Each record was examined (including both medical and nursing notes) to assess whether the following had been recorded:

- 1 The presence or absence of the patient on the child protection register.
- 2 The time that the injury had occurred.
- 3 The consistency of the history.
- 4 The compatibility of the observed injury with the history given.
- 5 Whether the possibility of NAI had been considered.
- 6 The general state and behaviour of the child.
- 7 The presence or absence of any other injuries.
- 8 Tetanus status.
- 9 Whether a further A&E or paediatric opinion had been sought regarding the possibility of NAI.

Once this audit had been completed a short reminder checklist was devised through a process of consultation between senior medical and nursing staff in A&E and paediatric medicine. The final checklist design is shown in the box.

Initially the checklist was included as an ink stamp, but this was found to be unwieldy and sometimes poorly legible. As a result the stamp

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Reminder checklist for burns and scalds in pre-school children

Any unexplained delay? Yes*/No
 History consistent and compatible? Yes/No*
 Any unexplained injuries? Yes*/No
 Behaviour/interaction appropriate? Yes/No*
 If any answer is marked* you should discuss this case with a senior doctor in A&E or paediatrics

was replaced with a small sticky label, approximately one third of the way through the second assessment period. The wording was, however, unchanged between the two formats.

In addition to the introduction of the checklist a programme of improved education concerning the recognition and management of NAI was undertaken. This consisted of an additional presentation on NAI for all new senior house officers and a further reminder session during the course of their appointment. This was coupled with an attempt to ensure that all subsequent children aged less than 6 years who presented with a burn or scald had a copy of the checklist included in their notes by nursing staff at triage. Following these changes the attendance notes of the next 100 consecutive children under 6 years of age presenting with a burn or scald were reviewed in an identical way by the same single, independent observer. This second series of 100 children was designated as group two. The only difference in the review process for group two was that the presence or absence of a checklist, and whether or not it had been completed, was also recorded for each child.

Results

Each of the two study periods spanned nine months. The number and experience of medical and nursing staff remained approximately constant during this time.

Group one (pre-intervention) comprised 60 boys and 40 girls, while group two (post-intervention) comprised 54 boys and 46 girls. Comparative demographic data relating to the age of the children and the anatomical location of the burn or scald were similar in both groups (data available from the authors on request). The main results are summarised in table 1.

A label or stamp was included in 60 of the 100 patients in group two, and where it was included the label was completed in all but two cases (97%).

Table 1 Comparison of the results of the independent assessment of A&E attendance notes before and after the intervention. All figures quoted are percentages

Parameter assessed	Group one (before intervention) (%)	Group two (after intervention) (%)	Percentage change (95% confidence intervals)
Label included in notes	Not applicable	60	Not applicable
CPR status recorded	5 (all negative)	4 (all negative)	-1 (-6.7 to +4.7)
Time of injury recorded	30	66	+36 (+23.1 to +48.9)
Consistency of history	6	59	+53 (+42.2 to +63.8)
Compatibility of injury	1	56	+55 (+45.0 to +65.0)
NAI apparently considered	6	65	+59 (+48.6 to +69.4)
General state recorded	45	68	+23 (+9.7 to +36.3)
Other injuries recorded	14	64	+50 (+38.4 to +61.6)
Tetanus status recorded	74	66	-8 (-20.7 to +4.7)
Senior opinion for ?NAI	0	3	+3 (-0.3 to +6.3)

Discussion

In 1980 Solomons undertook a retrospective audit of pre-school children presenting with a fracture, burn, contusion or intracranial injury, and found that 60% of notes contained inadequate data on which to determine retrospectively whether child abuse had ever been considered.⁴ Sixteen years later Boyce and coworkers reported similar findings following a review of the notes of 1018 children.⁵ In 1997 Clark was able to show that the introduction of a checklist of 13 factors into the history and physical examination of burnt children significantly improved the rate of referral to, and intervention by, social services.⁶

A recent paper by Sidebotham and Pearce demonstrated that clarification of protocols, staff training and increased communication improved the identification of possible NAI in an A&E department.⁷ Training and feedback were found to be particularly beneficial, though the overall rate of referral of children thought to be at risk remained low.

It is clear that the intervention of increased education coupled with the introduction of a reminder checklist had a significant impact on the consideration and documentation of possible NAI in this patient group. It is, however, impossible to determine to what extent the improvement was attributable to the component parts of the intervention, or even the study itself, and it will be important to continue regular monitoring to ensure that the observed improvement is sustained over time.

Although group two showed a statistically significant improvement in documentation this will not automatically lead to improvements in the accurate detection of child abuse. We therefore also examined referral rates for a further opinion regarding the possibility of NAI. These were found to increase from 0% to 3% after the intervention. Although this fails to achieve statistical significance at the 95% confidence level it seems probable that this is a type two error, and that with a larger sample size the difference would indeed reach significance.

The methodology of this study can be criticised in a number of ways. Firstly, there is the problem that group one is effectively a historical control for group two. This design was, however, the only realistic approach to the problem. Staffing levels were kept constant, but clearly there were some changes, particularly at the senior house officer level, between groups one and two. A single reviewer (JRB) assessed all the A&E attendance notes, but while this person was independent of the department where the study took place they were not blinded to which group the patient belonged to, introducing a potential source of bias.

In only five cases in group one and four cases in group two was the child protection register consulted. In all nine cases the child was not on the register. On consultation with triage staff in the A&E department it became apparent that the register was not consulted more frequently because it was both difficult and time consuming to do so. There exists a good deal of current controversy regarding the

value of routine consultation of the child protection register in the A&E department.⁸

Tetanus status was used as a marker of overall performance among A&E staff, and served as a control for the other measured parameters. It was selected as it receives particular emphasis in the A&E setting, and because we were interested in whether increased vigilance regarding NAI would have an adverse effect on other important considerations. Despite the fact that patients with burn injuries are accepted as being at risk from tetanus,⁹ the status of the patient was recorded in only 74% of group one patients and 66% of group two. This decrease of 8% is not statistically significant at the 95% confidence level, but does offer some support to the suggestion that increased attention to one aspect of the consultation will be to the detriment of others.

In developing the checklist we encountered conflict between a desire to ensure that all of the most relevant questions were included while avoiding the production of something so unwieldy that it would be ignored by staff working in a busy department. Various authors have proposed a series of key questions,¹⁰ but we were pleased to discover that having reduced the checklist to just four points it was completed in 97% of cases. This suggested that it was both simple and quick to use.

One particularly interesting observation was that the A&E notes of patients in group two showed improved NAI documentation even when the checklist was omitted. Thus although the checklist was included in the A&E notes rather less often than we had hoped (60%), the general level of heightened awareness that was created by the intervention seemed, at least in part, to compensate for this.

This study opens several avenues that merit further consideration. It would be useful to know whether this principle can be extended to all children and all injuries, and also to find a way of ensuring that the checklist is included more frequently. Automation of the process would be ideal, but is not currently practical at our hospital. It was observed that the checklist was less likely to be included where the injury was more severe, as the burn itself acted as a distraction. Nevertheless, a higher proportion of more severely burned children are victims of NAI,¹¹ and so this group requires special vigilance.

These results have been presented to staff in the department, and it is hoped that this process will reinforce the need for continuing awareness, while improving overall compliance.

Conclusions

Prevailing awareness and documentation regarding the possibility of NAI was found to be poor in our A&E department, even for the relatively high risk group of pre-school children with burns and scalds.

A programme of intervention, combining education and the use of a reminder checklist, improved both awareness and documentation of NAI, as well as referral rates for further assessment.

This strategy has been adopted in our department, and we hope that it will lead to a reduction in the number of cases of missed child abuse.

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Contributors

Jonathan Benger initiated this audit, participated in study design, collected and analysed data and drafted the writing of the paper. Steve McCabe participated in study design, analysed and interpreted data and edited the paper. Jonathan Benger acts as guarantor for the study.

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