

Accidental head injuries in children under 5 years of age

K. Johnson^{a,*}, T. Fischer^a, S. Chapman^a, B. Wilson^b

Departments of ^aRadiology, and ^bAccident and Emergency, Birmingham Children's Hospital, Birmingham, UK

Received 24 June 2004; received in revised form 31 August 2004; accepted 7 September 2004

KEYWORDS

Paediatrics; Trauma;
Wounds and injuries

AIM: To evaluate the type and nature of head injuries sustained by children under the age of 5 years who present to a busy accident and emergency (A&E) department following an accidental fall.

MATERIALS AND METHODS: This study included all children under the age of 5 years, who over an 8-month period were referred to our A&E Department with head injury following an accidental fall. Data were collected regarding the height of the fall, whether or not stairs were involved, the type of surface that the child landed on and the height of the child. This was correlated with any soft-tissue injury or skull fracture.

RESULTS: A total of 72 children (aged 4 months to 4.75 years) fulfilled all the criteria for an accidental fall. The heights of the falls ranged from less than 50 cm to over 3 m, with the majority below 1 m. Of the falls, 49 were onto a hard surface and 23 were onto a soft surface. Of the 72 children, 52 had visible evidence of head injury, 35 (71%) of 49 being the result of falls onto hard surfaces and 17 (74%) of 23 onto soft (carpeted) surfaces. There was no significant difference in the type of surface that resulted in a visible head injury. A visible head injury was seen in all children who fell from a height of over 1.5 m and in 95% of children who fell over 1 m. Of the 72 children, 32 (44%) had skull radiographs performed in accordance with established guidelines and 4 (12.5%) were identified as having a fracture. Of the 3 linear parietal fractures 2 were inflicted by falls of just over 1 m (from a work surface) and 1 by a fall of 80 to 90 cm onto the hard-edged surface of a stone fire surround. The 4th was a fracture of the base of skull following a fall from more than 3 m (from a first-storey window).

CONCLUSIONS: In the vast majority of domestic accidents children do not suffer significant harm. Skull fractures are rare and probably occur in less than 5% of cases. To cause a skull fracture the fall needs to be from over 1 m or, if from a lesser height, then a small-area impact point should be considered an integral component of the injury.

© 2005 The Royal College of Radiologists. Published by Elsevier Ltd. All rights reserved.

Introduction

Inflicted non-accidental head injury is a major cause of morbidity and mortality in the UK. The clinician and the radiologist both have an important

role in detecting this aspect of child abuse. They also have a role in determining possible causation of the injuries and approximate timings.^{1,2}

Following presentation to the medical services, the perpetrators of inflicted head injuries often suggest accidental causes for their child's head injury. The radiologist has to be able to determine, wherever possible, whether the mechanism reported by the carer could account for the radiologically detected injuries. To enable the radiologist to do this, he or she needs to be aware

* Guarantor and correspondent: K. Johnson, Radiology Department, Birmingham Children's Hospital, Steelhouse Lane, Birmingham B4 6NH, UK. Tel.: +44 121 333 9735; fax: +44 121 333 9726.

E-mail address: karl.johnson@bch.nhs.uk (K. Johnson).

Table 1 Indications for skull radiography

Boggy swelling > 5 cm in diameter
Full-thickness laceration
Deep penetrating injury
Suspected compound or depressed fracture
Falls from a significant height (greater than twice the height of child) onto a hard surface or with a tense fontanelle
Under 18 months of age

of which head injuries could reasonably be expected to follow domestic accidental falls and other impact injuries.³⁻⁵

The purpose of our study was to prospectively evaluate the type and nature of head injuries sustained by children under the age of 5 years who presented to a busy accident and emergency (A&E) department following an accidental fall.

Materials and methods

All children under the age of 5 years, who over an 8-month period had been referred to our A&E Department with head injury following an accidental fall, were reviewed. The history and examination obtained for each child followed normal departmental protocols. None of the children reviewed experienced any alteration in clinical practice as a consequence of the study.

A fall was defined as accidental if it fulfilled all of the following criteria.

- The fall was witnessed by one of child's carers and the history was corroborated by a second reliable observer. This second observer could be another carer, friend of the witness or an older sibling.
- The child was presented to the A&E Department within hours of the incident occurring.
- The mechanism and nature of the fall was, within the opinion of the examining paediatrician, compatible with a domestic accident.

On admission to the A&E Department a full history was obtained. This included the height of the fall, whether or not stairs were involved and the type of surface that the child landed on. A hard surface was defined as one with no perceptible cushioning effect; this included all floors, apart from carpeted floors, and all outdoor falls. Carpeted floor was considered to be a soft surface, regardless of its thickness or the nature of the underlay.

At clinical examination the height of the child and the presence of any visible injury was recorded. A visible injury included any cutaneous redness or

bruising to the skin, soft-tissue swelling, scratches and lacerations. The size of any swelling was recorded, as this would affect the decision to refer for skull radiography. The indications for skull radiography were based on established Trust guidelines that had been modified from those published by the Royal College of Radiologists (Table 1).⁶

The clinical outcome for all children was recorded, and if a child had to remain in hospital for clinical observation this was highlighted. All carers were advised about returning to hospital if their child developed any neurological symptoms.

An analysis was made of the type of injury the child sustained and its relationship to the height of the fall and the surface onto which the impact occurred. Follow-up of all children was for 6 to 9 months.

Results

There were 72 children aged between 4 months and 4.75 years (mean 3.5 years) who fulfilled all the criteria for an accidental fall. The group comprised 42 boys and 30 girls. The heights of the falls ranged from less than 50 cm to over 3 m, with the majority being below 1 m. Of the falls, 49 were onto a hard surface and 23 were onto a soft surface. A total of 52 children had visible evidence of a head injury, 35 (71%) of 49 being the result of falls onto hard surfaces and 17 (74%) of 23 onto soft surfaces. There was no significant difference in the type of surface that resulted in a visible head injury. A visible head injury was seen in all the children who fell from a height of over 1.5 m and in 95% of children who fell over 1 m.

Skull radiography was performed for 32 (44%) children, all of whom fulfilled the indications documented in Table 1. In 8 (25%) of the children undergoing skull radiography, the indication was age less than 18 months, and in 24 (75%) children it was a boggy swelling greater than 5 cm in diameter. Of the remaining children, 20 had no visible injury and 20 had an injury deemed to be insignificant.

A comparison of the number of children falling

Download English Version:

<https://daneshyari.com/en/article/9337218>

Download Persian Version:

<https://daneshyari.com/article/9337218>

[Daneshyari.com](https://daneshyari.com)