SHORT REPORT

Profile of children with head injuries treated at the trauma unit of Red Cross War Memorial Children's Hospital, 1991 - 2001

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Objective. To describe the profile of childhood head injury patients treated in a trauma unit.

Design. A retrospective record-based study.

Setting. The trauma unit of the Red Cross War Memorial Children's Hospital.

Subjects. Children (under 13 years of age) presenting with head injuries between January 1991 and December 2001.

Results. Of the almost 94 000 records, more than one-third were children presenting with head injuries. Fifty-nine per cent were boys, with more than half the sample under 5 years of age. The majority of children presented with superficial lacerations and abrasions, mostly affecting the scalp and skull. Injuries were mainly caused by falls from a variety of heights, and traffic-related injuries. Almost two-thirds of traffic-related injuries involved children as pedestrians being struck by a motor vehicle. More than 60% of injuries occurred in or around the child's own home.

Conclusions. Head injuries in children are a significant cause of morbidity. Prevention, especially in the home and on the streets, needs urgent attention.

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The public health importance of injuries remains a neglected problem in developing countries.[1-2] Injuries are a leading cause of childhood mortality and morbidity, and head injuries are the most common cause of this mortality and morbidity.[3,4] In the UK almost a million patients are treated for head injury in hospitals annually.[5] Of these, 50% were found to be younger than 16 years of age. Approximately 1% of all deaths in the UK are due to head injuries. The death rate is much higher in the 5 - 35-year-old age group, where 15 - 20% of deaths were caused by head injuries.[5] The common causes of head injury generally are falls, road traffic crashes and assaults.[6] The present study analyses the profile of children attending the Red Cross War Memorial Children's Hospital (RXH) for head injuries between January 1991 and December 2001.

Materials and methods

In April 1987 the Child Accident Prevention Foundation of Southern Africa (CAPFSA) was founded, with the primary goal of preventing accidental deaths, injuries, disabilities and suffering among children in South Africa through research, education, environmental change and recommendations for legislation. CAPFSA joined other countries that regard preventive education as the way to combat childhood injuries, rather than spending money solely on the establishment of expensive trauma facilities at hospitals and clinics.

Since 1991 a trauma record form has been completed for every patient visiting the trauma unit at RXH. These forms were captured in a Microsoft Access database. This is a retrospective analysis of children (under 13 years of age) with head injuries attending the trauma unit at the RXH between January 1991 and December 2001. Children with no age recorded were included in the analysis as it was safe to assume that almost all these children were under 13 years of age. Children presenting with head injuries were extracted from a database of about 94 000 records for the purposes of this analysis. Analyses included the age and gender distribution of the children, the cause and location of the injury, medical status, the part of the head injured and type of injury, and the treatment provided. A comparison of types of head injuries sustained by gender, age and cause was also carried out.

Results

A total of 37 610 records of children with head injuries were included in the analysis. Fifty-nine per cent were boys; however, data on gender were missing in 16% of records. Half the sample were under 5 years of age, with 20% under 2 years of age. The mean age of the children was 4.9 years (standard deviation (SD) 3.5 years). Data on age were missing in 31% of records.

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Table I. Frequency distribution of the anatomy and pathology of head injuries

Anatomy of injury	Percentage	Pathology of injury	Percentage
Scalp	25.3	Superficial laceration	23.1
Skull	20.2	Abrasion	19.9
Face (other than facial bones)	17.5	Closed tissue	19.2
Mouth/oropharynx	11.4	Closed fracture	6.1
Brain, closed injury	8.6	Burns	6.0
Eye(s)	6.0	Foreign body	5.9
Nose	4.5	Concussion	5.8
Ear	4.1	Others	14
Mandible	1.2		
Facial bones	0.9		
Brain, open injury	0.3		

Table I shows that head injuries most often involved the scalp (25%), skull (20%) and parts of the face other than the facial bones (18%). The brain was injured in 9% of children. Table I also shows that superficial lacerations (23%) were the most common injury sustained, followed by abrasions (20%) and closed tissue-type injuries (20%). Closed fractures were found in 6% of children.

Table II shows that falls were the most common cause of the head injuries (41%), followed by traffic-related injuries (19%) and being struck by or against an object (13%). Of the traffic-related injuries, 65% involved pedestrians struck by a motor vehicle and 13% involved cycles (bicycles and motorcycles). Sharp instruments and firearms were implicated in 2.7% and 0.2% of head injuries respectively. The child's own home was the most common location for injuries (61%), with 71% of these occurring inside the home. One-fifth of head injuries occurred on road or pavements.

Table II. Frequency distribution of the cause of head injuries

Cause	Frequency (*N*)	Percentage
Falls	15 511	41.2
Off bed	2 552	6.8
Stairs/steps	1 132	3.0
Playground equipment	1 248	3.3
Others heights	6 367	16.9
Others	4 212	11.2
Moving vehicle-related	7 167	19.1
MVA pedestrian	4 660	12.4
MVA passenger (restrained)	283	0.8
MVA passenger (unrestrained)	792	2.1
MVA passenger (bakkie/mini-bus)	385	1.0
Cycle	902	2.4
Other	145	0.4
Struck by or against object	4 930	13.1
Foreign bodies	2 529	6.8
Other	7 470	19.9

MVA = motor vehicle accident.

On admission 1.8% of the children were unconscious and 1.1% in shock. In terms of the abbreviated injury score (AIS), 81.9% were minor injuries, 16.3% moderate, 1.6% severe and 0.2% mortal. Only 3.3% needed simple and 0.8% complex resuscitation. Child abuse was the cause in 0.8% of the head injuries, while it was suspected in 2.8%. The injuries were self-inflicted in 6.3% of cases.

Few children needed a general anaesthetic (3.6%) and 14% a local anaesthetic. Most patients needed advice/medication (41%) or a dressing/simple plaster of Paris (26%). Almost three-quarters of the children were then discharged home or to the local general practitioner, 13% to outpatients and 10% to a community health centre.

There was no difference in the types of head injuries sustained by boys and girls. Older children (5 - 12 years of age) were more likely to experience closed fractures and burns than younger children. Of the head injuries caused by falls off the bed, 9.8% caused concussion and 6.3% a closed fracture. Of the children injured as pedestrians, 6.6% suffered closed fractures and 8.4% concussion.

Discussion

This short report highlights the public health importance of head injuries in young children. Of all injury cases presenting at the trauma unit more than one-third involved the head. There is an urgent need to reduce the occurrence of head injuries through improved prevention strategies. Most childhood injuries occur in the child's own home and in pedestrian traffic-related accidents. To make any progress towards reducing the incidence of childhood injuries, prevention strategies in the home and on the roads must be urgently implemented.

A recent systematic review on the effectiveness of reducing physical hazards in the home concluded that there was insufficient evidence to determine the effectiveness of these

strategies.[7] Home environment strategies found to be effective are mainly related to smoke alarms and packaging of drugs and poisons.[8] Traffic-related strategies have been found to be effective in reducing pedestrian injuries.[9] These include reduced speed limits in residential suburbs, roundabouts, sidewalks, pedestrian refuge islands, skills training, and legislation such as compulsory seat belt use.[9,10] The effectiveness of many of these strategies has been evaluated in high-income countries and their application in low- and middle-income countries needs to be measured.[11]

Head injuries are a significant contributor to childhood mortality and morbidity. It is essential that this not be a forgotten epidemic.[12]

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