Oro-facial trauma in child abuse fatalities

V M Phillips, Y van der Heyde

Many children die as a result of abuse and neglect each year. Early recognition and effective intervention are crucial factors in the fight against this. Child mortality rates increased in South Africa between 1998 and 2004, with child abuse deaths constituting part of these statistics. Autopsies on children who have died of unnatural causes are often not specific as to the possibility of child abuse. This article presents the extra-oral and intra-oral signs of child abuse from a study of the autopsies of child mortality cases seen at Salt River Medico-Legal Laboratory in Cape Town from 1998 to 2004 with reference to the South African child mortality rates.

S Afr Med J 2006; **96:** 213-215.

Infant and childhood mortality rates in South Africa increased dramatically between 1998 and 2004. The 1998 Demographic and Health Survey[1] found that the infant mortality rate was 45 per 1 000 live births for the preceding 10 years. The South African National Burden of Disease (NBD) Study[2] estimated that in the year 2000 there were just over half a million deaths, of which 106 000 were deaths of children under the age of 5 years and a further 7 800 deaths of children aged 5 - 14 years. The NBD study estimated that in the year 2000 the infant (under 1 year) mortality rate rose to 60 per 1 000 live births and the under-5 mortality rate to 95 per 1 000. The main cause of the increased mortality rates was HIV/AIDS. These statistics also include childhood deaths due to homicide and violence.

In 1988 the South African Police Services handled over 37 000 reported cases pertaining to child abuse. In Johannesburg, Childline and Johannesburg Child Welfare handled an average of 380 cases of child abuse per month, while the Tygerberg Clinic at Tygerberg Hospital treated approximately 1 800 cases in 2001.[3] In the USA an estimated 3 000 children die as a result of abuse and neglect each year, a rate of approximately 2.1 deaths per 100 000 children in the general population.[4] Of the 106 000 deaths among children under 5 years of age in South Africa in 2000, 654 resulted from homicide and violence.[2] The number of children who died as a result of violence in Cape Town in 2003 was estimated at 50 per 100 000 of the child population.[5]

In a survey of 1 155 paediatric dentists in the USA in 1979[6] the principal oral injuries in cases of suspected child abuse were (in descending order of frequency) fractures of the teeth (32%), oral bruises (24%), oral lacerations (14%), fractures of the mandible and maxilla (11%), and oral burns (5%). Other studies[7] report that lesions in which the oral mucosa is torn away from the gingiva may be the most common injury to the face, and may occur in as many as 50% of child abuse cases. Becker *et al*.[8] reported that of the 14 cases in their series of intra-oral injuries, 43% were contusions and ecchymoses, 28.5% were abrasions and lacerations, and 28.5% were a result of trauma to the teeth. A study by Naidoo[9] at a children's hospital in Cape Town found that injuries to the face occurred in 59% of child abuse cases, the lips being traumatised in 54% of cases of mouth trauma, the oral mucosa in 15% and the teeth and gingiva each in 12%.

Autopsy documents used in South Africa require that all injuries be recorded, but they do not seek to clarify whether injuries in children are related to or are as a result of suspected child abuse.

The object of this study was to examine the child mortality rates for children in Cape Town as published by the Medical Research Council (MRC) of South Africa[2] based on autopsy reports from the Salt River Medico-Legal Laboratory between the years 1998 and 2004, and to identify the number of injuries to the head and neck area associated with child abuse.

Materials and methods

The NBD study[2] published by the MRC on the causes of death in South African children was used to establish the rates of childhood deaths due to violence.

The autopsy records of the deaths of 1 809 children under the age of 15 years admitted to the Salt River Medico-Legal Laboratory between 1998 and 2004 were examined. The cause of death, physical injuries and autopsy findings were recorded. The extra-oral and intra-oral lesions were recorded for each case.

Results

Of the 1 809 paediatric autopsy cases examined, 893 were natural deaths and 916 were deemed unnatural deaths. Of the unnatural deaths, 24 were attributed to child abuse (2.62%). There were 11 males and 13 females. The age range was between 1 month and 11 years. Six of the victims were under 1 year of age. The main cause of death was head injuries

Department of Oral and Maxillofacial Pathology, University of the Western Cape
V M Phillips, BDS, MChD, Dip Maxfac Radiol, FCPath SA (Oral Path)

Department of Forensic Medicine, University of Cape Town
Y van der Heyde, BSc, MB ChB, Dip For Med SA, MMed Path (Forens)

Corresponding author: *V M Phillips (vmphillips@uwc.ac.za)*

(*N* = 10), followed by blunt abdominal trauma (*N* = 7), neglect (*N* = 3), burns (*N* = 2), strangulation (*N* = 1) and multiple injuries (*N* = 1). Sexual abuse was evident in 6 cases. Ten of the 24 cases involved head injuries (Table I), and 5 of these children were under 1 year of age. Five had skull fractures and underlying brain tissue laceration,[3] showed cerebral oedema, 1 had a subdural haemorrhage and 1 had intracerebral haemorrhage. Four cases had facial and oral injuries. Mouth injuries included bruised lips, lacerated lips, torn frenula, bruised alveolar mucosa and avulsed teeth (Figs 1 and 2). Facial injuries included various lacerations, bruises, burn marks and scars on the forehead, and around the eyes, chin and ears (Figs 3 and 4). All cases had multiple other injuries on the arms, legs and torso.

Table I. Causes of death in child abuse cases (1998 - 2004)

Causes of death	Number of deaths (*N* = 24)
Head injury	10
Blunt abdominal trauma	7
Neglect	3
Burns	2
Strangulation	1
Multiple injuries	1

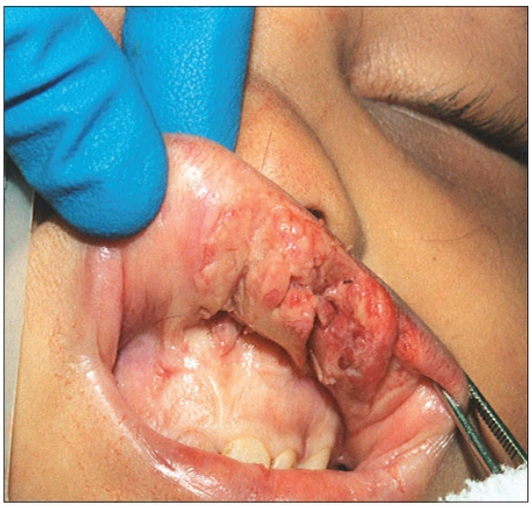

Fig. 1. Laceration of the lip and bruising of the mucosa.

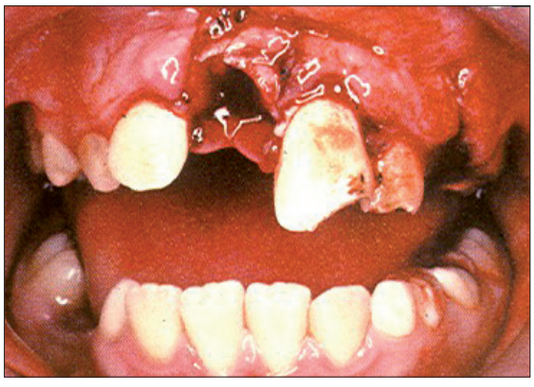

Fig. 2. Avulsed right central incisor and fractured edges of the adjacent teeth with tearing of the mucosa.

Fig. 3. Recent and old injuries behind the left ear of a child victim.

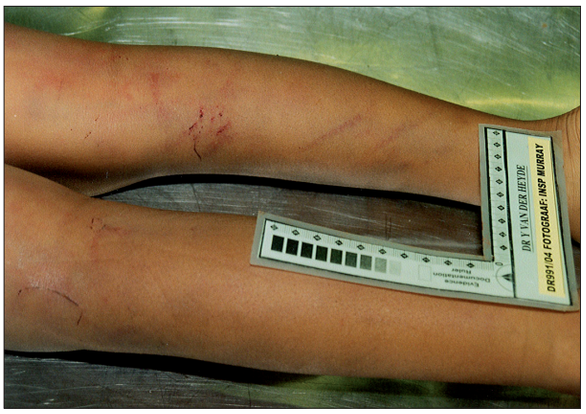

Fig. 4. Numerous linear bruises on the legs as a result of beating with a wooden rod.

Discussion

The NBD study[2] showed that in the year 2000 the proportion of childhood deaths due to injury in the greater Cape Town area ranged between 5% and 19%. Of these injuries the majority were due to motor vehicle accidents, but a significant number were a result of violence. Matzopoulos[5] stated that the child mortality rate in Cape Town in 2003 was 50 per 100 000 due to violence compared with the world rate of 32 per 100 000 for the same age group. However, these statistics do not stipulate the number of deaths that result from child abuse. In many cases an opinion as to whether or not the documented injuries are related to child abuse is not rendered on the autopsy report

submitted to the South African Police Services. Furthermore, to the best of our knowledge, no section on data collection forms issued to various forensic services by the National Mortality Surveillance System in South Africa allows for capture of child abuse fatality data. Interpretation of the injuries observed in a child rests with the forensic pathologist or medical examiner.

In a survey of dentists in Massachusetts,[8] 8% of dentists, 22% of oral surgeons and 18% of paediatric dentists saw cases of suspicious oro-facial trauma, but only 4 of 22 confirmed child abuse cases were reported to the responsible authorities. In another survey of paediatric dentists,[6] only 9% had ever filed a report, and 7% said they would not do so under any circumstances. The most common reasons for not reporting suspected child abuse were fear of litigation, uncertainty about the diagnosis, unfamiliarity with symptoms of child abuse, and possible loss of patients, having a deleterious effect on the practice. The low rate of reporting confirmed child abuse cases among dentists was similar to that among physicians.[8,10]

The pattern of oro-facial and head and neck injuries in our study is similar to that observed in other reported cases. The common findings were numerous lesions in different stages of healing on the face, ears, arms, legs and torso in all cases. The cases with mouth injuries showed swollen or lacerated lips, avulsed teeth and lacerated frenula. All of the deaths resulted from either cranial or abdominal trauma.

Unusual trauma to the limbs or oral structures can occur due to religious or tribal beliefs; these include slapping of the skin or extraction of canine teeth to treat childhood diseases.[11]

Conclusion

The most common cause of death in child abuse is head injury, followed by blunt abdominal trauma leading to peritonitis. Facial and mouth injuries are often seen with the teeth, lips and gums bruised or lacerated. Scarring in these areas indicates chronic abuse. The ears are often traumatised and show evidence of recent and chronic abuse. All of the cases in this study died as a result of either abdominal or head injury. The actual number of child abuse cases is not known as many cases go unreported. Furthermore, the number of child abuse fatalities may also be under-estimated as many health care workers do not refer cases for medico-legal postmortem examination. Numerous cases of childhood death as a result of malnutrition, suffocation or neglect are not documented or investigated as possible child abuse. Inadequacy of the autopsy documents and lack of reporting by medical and dental practitioners of suspected cases of child abuse cast doubt on the validity of the number of child abuse cases examined at the Salt River Medico-Legal Laboratory. This is a likely reason for the paucity of data on child abuse fatalities.

The manner in which data on child abuse are collected needs to be addressed. It is hoped that this study will remind all health care workers not only of the injuries associated with child abuse, but also that in terms of the Child Care Amendment Act (Act 86 of 1991) it is a statutory obligation to report cases of abuse to either a police official or a social worker.

References

1. Department of Health, Medical Research Council, Macro International. *South African Demographic and Health Survey 1998*. Full Report. Pretoria: Department of Health, 2002.
2. Bradshaw D, Groenewald P, Laubscher R, *et al*. *National Burden of Disease Estimates for South Africa, 2000*. Cape Town: South African Medical Research Council, 2003. **http://www.mrc.ac.za/bod/bod.htm**
3. Van der Westhuizen N. South Africa's children in trouble. *Nursing Update* 2001; **25:** 5.
4. Tsang AD. Detecting child abuse and neglect - are dentists doing enough? *J Can Dent Assoc* 1999; **63:** 387-391.
5. Matzopoulos R. Childhood injury mortality in South Africa and Cape Town: Selected findings from the 5th annual report of the National Injury Mortality Surveillance System 2003. Child Safety Seminar, Cape Town, 8 June 2005.
6. Malecz RE. Child abuse, its relationship to paedodontics. *Journal of Dentistry for Children* 1979; **46:** 193.
7. Council on Dental Practice. *The Dentist's Responsibility in Identifying and Reporting Child Abuse*. Chicago: American Dental Association, 1987: 5.
8. Becker DB, Needleman HL, Kotelchuck M. Child abuse and dentistry: oro-facial trauma, and its recognition by dentists. *J Am Dent Assoc* 1978; **97:** 24.
9. Naidoo S. A profile of the oro-facial injuries in child physical abuse at a children's hospital. *Child Abuse Negl* 2000; **24:** 521-534.
10. Kessler DB, Hyden P. Physical, sexual and emotional abuse of children. *Clin Symp* 1991; **43:** 4.
11. Kaplan JM. Pseudo-abuse- the misdiagnosis of child abuse. *J Forensic Sci* 1986; **31:** 1420.