

Dental aspects of 1248 cases of child maltreatment on file at a major county hospital

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Abstract

The frequency of head, face, mouth, and neck injuries due to child maltreatment was investigated in a review of 1248 cases on file in the pediatrics office at Hennepin County Medical Center in Minneapolis, Minnesota, from January, 1985, to December, 1989. There were 485 boys (38.8%) and 763 girls (61.2%) examined. Physical abuse cases (41.0%) outnumbered sexual abuse (35.4%) and neglect episodes (23.6%). The gender ratio was distributed equally except in sexual abuse, where there were 4.7 girls for each boy examined. More than half of the children (52.9%) were in the 0-to-4 year age group. Considering all cases together, 37.5% presented with injuries to the head, face, mouth, and neck. However, that percentage doubled (75.5%) when physical abuse episodes were reviewed alone. The intraoral injuries seen were five tooth fractures, three tongue and tongue frenulum lacerations, two lip frenulum lacerations, 11 injuries to the oral mucosa, eight palatal lesions, two fractures of the mandible or maxilla, loose and missing teeth, and dental neglect. Despite the high frequency of injuries, no dentists examined children at the time of the hospital intake or referred children for suspicion of maltreatment in the population studied. The findings suggest the importance of involving dental professionals in identifying, reporting, and preventing child abuse and neglect. (Pediatr Dent 14:152-57, 1992)

Introduction

The true incidence of child abuse and neglect is unknown. Although society is more aware of the problem than ever, professionals in all areas are still reluctant to deal with it. Dentists, especially pediatric dentists and oral surgeons, are situated favorably to detect child maltreatment because the injuries caused by abuse often are easily identifiable. In addition, abusive caretakers rarely take the child to the same physician, but they are not cautious about dentists. As Sanger and Bross wrote, "the identification of oral facial injuries per se should present little difficulty to the astute dental clinician."¹ However, the reporting incidence by dentists is still low. Several authors²⁻⁶ have described the major reasons that prevent dental professionals from getting involved with the problem, such as ignorance about maltreatment, lack of awareness of legal mandates to report, fear of dealing with angry parents, reluctance to believe parents (or others) could be abusive and/or neglectful, and fear of economic damage to practice by loss of patients.

Several studies have reported that at least half of the injuries to children were found on the head and neck. Adelson⁷ stated that blows to a child's head produced extensive skull fractures because children have fragile osseous structures (though facial bone fractures were uncommon). Cameron et al.'s⁸ analysis of 29 fatal cases of abuse showed that 79.0% of the injuries were inflicted

on the scalp, 52.0% on the forehead, 49.0% on the cheek, and 48.0% on the mandible. Becker et al.³, after reviewing 260 cases of maltreated children hospitalized at the Boston Children's Hospital Medical Center, found that 49.0% of the patients presented orofacial trauma and 16.0% had head injuries. O'Neil et al.⁹ conducted an emergency room survey in a two-year period to determine the prevalence of dental injuries and found that child abuse accounted for 1.4% of all the cases studied, whereas intentional dental injuries were reported in 7.2%.

The most common orofacial injuries reported in the literature are fractured teeth, laceration of the labial frenulum resulting from forced feeding, missing teeth without obvious explanation, displaced teeth, abnormality of appearance and mobility of the tongue, fractures of the maxilla and mandible, and bruised or scarred lips.^{5, 10, 11} Burns of the oral mucosa resulting from forced ingestion of hot and caustic fluids also have been reported.¹⁰ A few dental articles¹²⁻¹⁴ have emphasized the importance of the dental professional in the differential diagnosis of child abuse and neglect.

In one of the first articles that described child maltreatment and dentistry, ten Bensel and King¹⁵ suggested guidelines for the profession and called for research on "the types and incidences of orofacial injuries and their relationship to child abuse." The purpose of

our retrospective study was to determine the frequency of injuries to the head, face, neck, and mouth due to child maltreatment in patients seeking care at a major metropolitan county hospital.

Materials and Methods

The population studied comprised 1381 subjects, up to 17 years of age, examined at Hennepin County Medical Center (HCMC) in Minneapolis, Minnesota, for suspicion of maltreatment, from January, 1985, to December, 1989. From this population, 133 records were eliminated due to lack of definitive assessment, illegible handwriting, confusing assessment, or use of reporting forms other than the one provided by the hospital. According to the hospital protocol, the forms have to be filled out on location by a physician (either resident or staff) and/or a registered nurse and sent to the pediatrics office to be typed and filed by a designated secretary within 24 hr after the initial evaluation. The forms contain social, historical, and demographic data on the child and the family as well as a description and drawings of the findings after the exam.

The protocol for management of child maltreatment at HCMC defines neglect as "failure by parent, guardian or other person responsible for a child's care to supply a child with necessary food, clothing, shelter, or medical care when reasonably able to do so." Physical abuse is considered "any injury inflicted by parent, guardian or other (responsible person)...other than by accidental means" or "physical injury that cannot be explained reasonably by the history of injuries provided." The hospital does not adopt a definition of sexual abuse due to its broad nature; each case is reviewed separately and an evidentiary examination is performed "on all children with history or findings consistent with sexual assault/abuse within 72 hr of arrival to HCMC as determined by the medical/nursing staff."¹⁶

For the purpose of the study, the data were divided into two major parts (demographics and physical exam) and subdivided into topics (age, gender, city of residence, marital status of the parents, types of injury, location, severity, etc.). Cases were identified solely by hospital number and the data entered directly into a computer (IBM, Boca Raton, FL) using the software DBase III Plus (Ashton-Tate, Torrance, CA). Measures were taken to guarantee standard entry of information for all forms. All maltreatment data are reported incidences as they relate to number of reported occurrences over a five-year period for this population. Descriptive statistics were used to analyze the data. The study was approved by both the Human Subjects Research Committee at HCMC and the University of Minnesota Committee on the Use of Human Subjects in Research.

Results

The most interesting finding was that of 1248 cases of all types of abuse reviewed, 37.5% included injuries to the head, face, mouth, or neck. However, that percentage doubled (75.5%) when the 511 cases of physical abuse were studied separately. It is important to note that dentists did not examine or refer any children in this study.

There were 485 boys (38.8%) and 763 girls (61.2%) examined. More than half (52.9%) were in the 4-year and younger age group. Fig 1 presents the age distribution of the children considering the three types of maltreatment altogether. Table 1 (next page) shows the number of cases by age group and type of abuse. There were 15 forms in which the age of the child was not registered; they were not included here.

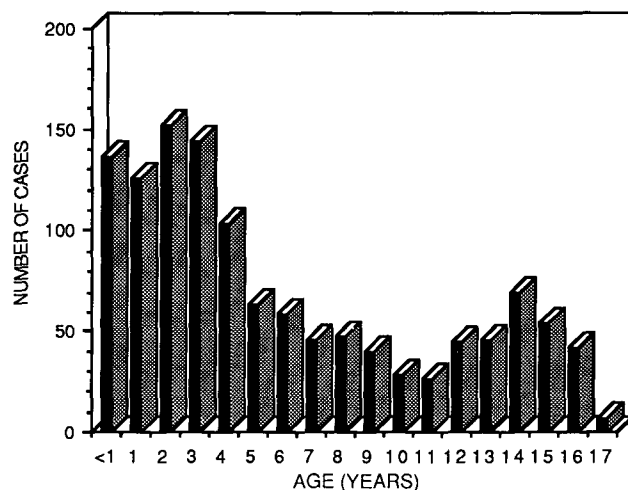


Fig 1. Age distribution of subjects in years for all cases of physical abuse and neglect.

Physicians examined almost all the patients (97.9%) and determined that the history given by the person(s) accompanying the child was consistent with the physical findings in 906 cases (72.5%). Both parents were the perpetrators in 94 cases (7.5%), whereas only one parent was responsible in 790 cases (63.3%). More than half of all cases (54.8%) happened at home, mainly physical abuse (67.3%) and neglect (61.0%).

Physical abuse cases (41.0%) outnumbered sexual abuse (35.4%) and neglect episodes (23.6%). Seventy-eight per cent were assessed as suspected cases while 22.0% were confirmed as maltreatment after the examination. Boys and girls were distributed evenly in physical abuse and neglect cases; however, there were 4.7 girls for every boy examined for sexual abuse. Fig 2 (next page) presents the distribution of maltreatment by gender of the children.

Table 1. Distribution of cases by age and type of maltreatment

Age	Physical Abuse		Sexual Abuse		Neglect	
0-4 years	258	(51.4%)	207	(47.2%)	196	(67.1%)
5-11 years	111	(22.2)	142	(32.2)	56	(19.2)
12-17 years	133	(26.5)	90	(20.5)	40	(13.7)
Total	502	(100%)	439	(100%)	292	(100%)

N = 1233

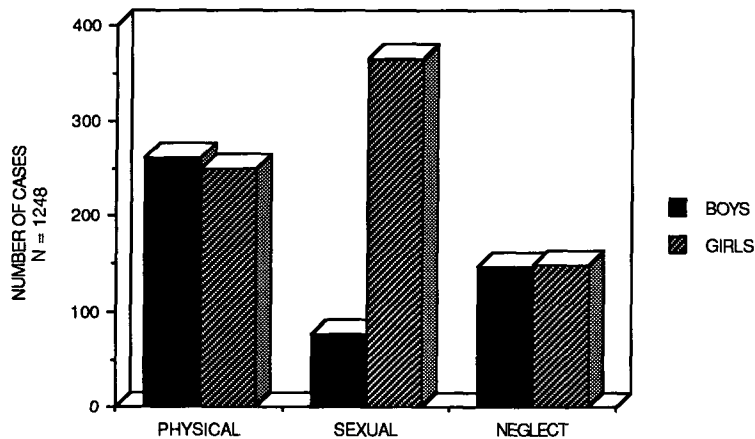


Fig 2. Distribution by gender and the type of maltreatment.

The number of times each part of the body was injured is shown in Table 2. The total (2015) exceeds the number of cases because many children had multiple injuries; the percentages were calculated in relation to the total. The parts of the body most often injured were, in decreasing order, the face, the lower and upper limbs, the genitals, the head, the back, the buttocks, the thorax, the abdomen, the neck, and the mouth. Injuries seen were: 581 scratches; 297 bruises and welts; 283 ecchymoses, erythemas and hematomas; 209 abrasions and contusions; 94 burns and scaldings; 84 sprains, dislocations and lacerations; 43 wounds, cuts, and punctures; 36 bone fractures, 14 bites; and three internal injuries. No injuries were seen in 253 cases. The most common instruments of abuse were hands (829 cases), followed by belts, paddles, broomsticks, baseball bats, and electrical cords (488 cases).

Injuries seen on the head included 10 skull fractures, three subdural hematomas, four concussions, five cases of traumatic alopecia and subgaleal hematomas, 11 retinal hemorrhages, and abrasions, bruises, burns, and lacerations. The facial area sustained 143 injuries to the cheeks, 77 to the ears, 70 to the eyes, 50 periorbital ecchymoses or hematomas, 49 injuries to the nose, and 37 to the lips; few were noted on the jaws and chin. The neck was the site for 41 bruises and ecchymoses, 13

abrasions, seven burns, five erythematous lesions, and four scratches. Table 3 (next page) shows the number of times the head, face, mouth, and neck were injured per type of maltreatment.

Five tooth fractures were recorded but no tooth avulsion or intrusion was reported. There were two fractures

of the mandible and maxilla, three tongue or tongue frenulum lacerations, two lip frenulum lacerations, 11 injuries to the oral mucosa, and eight palatal lesions. Dental neglect, paresthesia, and loose and missing teeth also were reported.

Discussion

Several explanations are given for the many discrepancies in published child maltreatment data: legal differences from state to state, degree of public and professional awareness, involvement of the community, and personal interpretation of what constitutes abuse and neglect. These factors cause a gap in the official data which prevents "a complete picture of the extent and character of recognized child abuse and neglect in the United States."¹⁷ Therefore, the data used in this study are not different from others because they "reflect reported cases... rather than true incidence,"¹⁷ supporting the general belief that the problem is far more extensive than thought.

Table 2. Number of times each part of the body was injured

Location	Number of Times	Percentage
Face	339	17.0
Lower limbs	316	16.0
Upper limbs	293	15.0
Genitals	249	12.0
Head	190	9.0
Back	152	8.0
Buttocks	141	7.0
Thorax	136	7.0
Abdomen	88	4.0
Neck	69	3.0
Mouth (intraoral)	42	2.0
Total	2015	100.0

Table 3. Number of times the head, face, mouth, and neck were injured per type of maltreatment

	Head		Face		Mouth		Neck	
Physical abuse	124	(65.3%)	217	(64.0%)	22	(52.4%)	49	(71.0%)
Sexual abuse	17	(8.9)	42	(12.4)	6	(14.3)	11	(16.0)
Neglect	49	(25.8)	80	(23.6)	14	(33.3)	9	(13.0)
Total	190	(100.0%)	339	(100.0%)	42	(100.0%)	69	(100.0%)

Many studies^{9, 15, 17-21} showed the preponderance of the number of boys in their samples. Other authors^{7, 8} suggested that there was no gender predilection. In this study, the gender ratio reflected the tendency shown by the U.S. Department of Health and Human Services:²² no differences in gender for neglect and a ratio of nearly four females to one male in sexual abuse (Fig 2).

A bimodal distribution (Fig 1) existed in the studied population with larger groups represented by the 0 to 4 years (52.9%) and the 12-16 year groups (20.4%). This finding is consistent with most studies.^{7, 8, 10, 20, 21, 23-25} Infants and young children are more likely to be abused because of their defenselessness, physical fragility, inability to escape from an angry parent, and lack of social contacts to keep them away from the caretaker for periods of time. Adolescents usually challenge parental authority, many times triggering violent responses.

The high percentage of children who presented injuries to the head, face, mouth, and neck (75.5% of all physical abuse episodes) is similar to that of other reports in the literature. Cameron et al.⁸ called attention to the fact that bruises on the head, face, and neck were obvious in more than half of the cases they studied. Fabian and Bender,¹⁸ surveying predisposing factors for head injuries in 86 children, found that 57.0% had evidence of skull fracture. In our study, 10 skull fractures were reported. O'Neill and coworkers²³ considered skull fractures a late stage of maltreatment; soft tissue trauma was the earliest sign of physical abuse. Lauer et al.,²⁴ in their study at the San Francisco General Hospital, reported that 22.3% of the cases had skull fractures and 8.4% had subdural hematomas. Buchanan and Oliver²⁶ found that 3.0% of 140 mentally handicapped children were completely normal before violent abuse. Becker and colleagues³ reported that head, face, and intraoral trauma was found in 65.0% of the cases they reviewed at the Boston Children's Hospital, twice the number of injuries found in other parts of the body. The figures in the present study are higher than in any other work in the literature, with the exception of that of Cameron et al.⁸

The face was harmed more often than any other part of the body (Table 2). The high number of injuries to the head and face supports the idea that their easy accessibility and psychological importance make them frequent targets for the abusers.^{25, 27} However, the data from the

reporting forms suggest that the least harmed place was the mouth. This finding raises speculation that: 1) the number of intraoral injuries may be higher than reported due to the high frequency of harm to the head and face, and 2) many intraoral injuries may have been overlooked due to the examining professionals' unfamiliarity with the oral cavity.

On the face, the cheeks had the highest number of injuries, followed by the eyes, ears, nose, and lips. Bruises on the ears (usually present on both earlobes) are rarely accidental.¹⁰ Some authors^{8, 27} consider scarring of the lip and the presence of blood clots or a deviated septum in the nose to be important findings.⁴ In their hospital survey, O'Neil et al.⁹ found that laceration of the lip was the most common injury to the oral cavity. The neck presented bruises, ecchymoses, abrasions, erythemas and scratches, among other injuries. These injuries always should be viewed with suspicion. The neck is difficult to harm; injuries may present life-threatening situations that should be reported for further evaluation. In addition to skull fractures, injuries to the head included traumatic alopecia and cephalohematomas from hair pulling, which many times are hidden by braids. All these injuries can be detected easily if the dentists run their fingers through the hair, palpate cranial and facial bones, inquire about any visible wounds, and check exposed skin and extremities. Schmitt²⁸ reported that among nonfatal cases in the first year of life, 95.0% had serious intracranial injuries resulting from vigorous shaking in an attempt to make babies stop crying. Kittle et al.⁴ suggested asking children to raise their hands; if patients have been injured in the ribs and clavicle, the movement will cause pain. In this study, the upper limbs were injured 293 times. It is very important to examine the hands because children use them to protect other parts of the body from abuse. Johnson et al.²⁹ reported a case in which the parent burned the child's thumb to stop him from sucking it. As O'Neill et al.²³ pointed out, the identification of those injuries in the office will prevent further and more serious damage to the children.

Among the common features of neglect that were reported in this study were lack of hygiene, including

oral hygiene, and extensive caries (much of it due to bottle feeding). This reflects a delay in seeking dental and medical care or may indicate a history of no health care at all. Several articles have described the features of dental neglect.^{11, 30-32} They discuss important social aspects that would lead to the failure to provide dental care, and the need to distinguish between "ignorance of the problem and educated neglect."³¹ If parents or other caretakers are informed about a dental problem and they still do not pursue a solution, then neglect may be confirmed and a report sent to the child protection services to ensure follow-up care and evaluation of the family needs.

The most common intraoral features seen in this study were injuries to the palate and mucosa, in agreement with the findings of Becker and coworkers.³ There also were jaw and tooth fractures, tongue and lip frenulum lacerations, and tongue lacerations. Loose and missing teeth were reported, although no details were given. Consultation with a dentist would clarify those issues and bring the attention of the examining physicians to other oral health factors.

It is striking that no dentists participated in examining any of the patients whose cases were reviewed, though there is always a general practice or an oral surgery resident on call at HCMC, as well as a pediatric dentistry resident on 24-hr back-up. A national survey on the characteristics of multidisciplinary teams around the country showed no participation of dental professionals.³³ The only reference in the literature regarding the presence of a dental professional in a child maltreatment team was made by Badger.³¹ The involvement of dentists and dental students on teams would be beneficial in two ways: they would become more aware of their role and they would aid in the education of physicians and other professionals who in turn would "benefit from consultations with dentists, especially those having experience or expertise with children... in evaluation of physical and sexual abuse or neglect."³⁰ Teams need professionals of all fields to achieve "greater levels of competence" serving as "a source of support so that no one person need grapple with such heavy issues in isolation."³⁴ As Fontana³⁵ put it, the problem would be best approached with full cooperation among medical, social and legal organizations, since it is so complex that no individual can handle it alone.

Conclusions

Two major conclusions were derived from this retrospective study:

1. Injuries to the head, face, mouth, and neck in patients treated at a major metropolitan county hospital were very frequent, present in 75.5% of

the physically abused children and in 37.5% of all cases reviewed in this study.

2. Despite the high number of injuries to the head and face, the reported number of injuries to the mouth was very low.

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