



Oral and dental manifestations of child abuse

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Abstract

Introduction: the objective of the study was to review the oral and dental manifestations of child abuse.

Material and methods: we performed a systematic review study following the PRISMA guidelines. We performed 2 searches using MeSH terms in the Medline/PubMed database for the period ranging from 1/1/2000 to 12/31/2019.

Results: The review included 26 articles, of which 65.4% were published in dental journals and 16% in paediatric journals. All oral and dental injuries caused by physical abuse raise suspicion, but none are pathognomonic. They must be distinguished from unintentional injuries, which are common in the paediatric population. To do so, the presence of physical signs considered strong warning signs must be assessed. All oral and dental diseases resulting from neglect are suggestive but not confirmatory of neglect. Therefore, it is necessary to assess whether there are factors considered necessary to diagnose dental neglect, such as other health problems arising from chronic neglect or other indicators of physical and/or sexual abuse. Oral infections by *Neisseria gonorrhoeae* or *Treponema pallidum* are pathognomonic for sexual abuse. All other oral injuries and diseases are considered suspicious or suggestive.

Conclusions: injuries and diseases resulting from child abuse or neglect frequently manifest the oral and intraoral regions. It is essential that paediatricians and dentists be aware of the problem, trained in its detection, and knowledgeable of when and how to document and notify suspected cases. These efforts, as well as the overall work of these professionals, will increase our ability to prevent and detect child maltreatment and to protect and care for children.

Key words:

- Abuse
- Child abuse
- Mouth diseases
- Neglect
- Sexual abuse
- Tooth injuries

Manifestaciones orales y dentales del maltrato infantil

Resumen

Introducción: el objetivo de este estudio es revisar las manifestaciones orales y dentales del maltrato infantil.

Material y métodos: estudio de revisión sistemática siguiendo directrices PRISMA. Se realizaron dos estrategias de búsqueda con términos MeSH en la base de datos Medline/PubMed desde el 1/1/2000 hasta el 31/12/2019.

Resultados: 26 artículos fueron incluidos. El 65,4% se publicaron en revistas de Odontología y el 16% en las de Pediatría. Todas las lesiones orales y dentales por abuso físico son sospechosas, pero ninguna patognomónica. Deben distinguirse de las accidentales, comunes en la edad pediátrica. Para ello, es necesario observar la existencia de indicadores físicos de especial sospecha. Todas las enfermedades orales y dentales por negligencia son sugerentes, pero ninguna patognomónica. Por ello, es necesario observar si existen factores considerados como necesarios para establecer el diagnóstico de negligencia dental, problemas de salud derivados de una negligencia crónica, y otros indicadores de abuso físico o sexual. Las infecciones orales por *Neisseria gonorrhoeae* y *Treponema pallidum* son patognomónicas de abuso sexual. Todas las demás lesiones y enfermedades orales son sospechosas o sugerentes.

Conclusiones: las lesiones y enfermedades por abusos y negligencia infantil se manifiestan con frecuencia en la región oral e intraoral. Es fundamental que los pediatras y los odontólogos tengan conciencia del problema, estén formados en su detección, y conozcan cuándo y cómo documentar y notificar. Tales esfuerzos, así como el trabajo en común de dichos profesionales, fortalecerán la capacidad de prevenir y detectar el maltrato infantil y mejorar la capacidad de cuidar y proteger a los niños.

Palabras clave:

- Abuso
- Abuso sexual
- Enfermedades bucales
- Lesiones dentales
- Maltrato infantil
- Negligencia

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INTRODUCTION

Child abuse is an important global public health problem that manifests in all ethnic, cultural and socioeconomic strata. This bane persists despite numerous awareness and education campaigns to alert the general population and health professionals in particular about its incidence, its red flags, the reporting systems and its sequelae.¹

In the European Region of the World Health Organization (WHO), it is estimated that each year 22.9% of children aged less than 18 years suffers some form of physical abuse and 9.6% some form of sexual abuse. While these figures are large, it is well known that many cases of child abuse are not reported.²

Children can be subjected to multiple types of abuse and their consequences may manifest in the mouth and oral cavity, so that paediatricians and dentists may be the first clinicians to detect abuse. Thus, they must have the necessary knowledge to be able to identify these signs and address the situation appropriately. We ought to remember that all health providers are mandated to report all cases of suspected child abuse. Prepared health professionals that are aware of the problem are one of the pillars of child protection.³

The aim of our study was to review the evidence on the oral and dental signs of child abuse.

MATERIAL AND METHODS

We conducted a systematic review following the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA).⁴ We performed 2 searches using (Medical Subject Headings) terms in the Medline/PubMed database for articles published between January 1, 2000 and December 31, 2019.

In search 1, we used the query (“Child Abuse”[MeSH]) AND “Tooth Injuries”[MeSH]. In search 2, we used the query (“Child Abuse”[MeSH]) AND “Mouth Diseases”[MeSH]. In both searches, we used the following filters: abstract (hasabstract[text]; languag-

es (English[lang] OR Spanish[lang]); publication dates from 2000/01/01 to 2019/12/31 (“2000/01/01”[PDAT]:”2019/12/31”[PDAT]).

After the screening, we compared the articles identified in each search to exclude duplicates. After reading the abstracts of eligible articles, we excluded those that did not specifically address the topic of the review, and all remaining articles were included.

RESULTS

Figure 1 shows the flow chart of the literature search strategy and the inclusion of studies in the review. Search 1 yielded 41 articles before applying the filters. After applying the filters, we selected 19 articles. Search 2 yielded 60 articles before applying the filters. After the filters, 25 articles remained. When we compared the eligible articles obtained in the 2 searches, we excluded 7 that were duplicated, which left 37 articles. After reading the abstracts of these articles, we excluded 11 articles that did not specifically focus on the subject of the review. In the end, 26 articles were included in the review.

Table 1 presents the country of publication, type of article and specific field of the journal in which the 26 articles included in the review were published. We found that 38.5% ($n = 10$) of the articles were published in the United States. Those published in Spain amounted to 7.7% of the total ($n = 2$). When it came to the type of article, the most frequent types were case reports and reviews, with 6 articles in each of these categories. When it came to the specific field of the journal, 65.4% ($n = 17$) were published in dentistry journals and 16% ($n = 4$) in paediatrics journals.

Table 2 describes the oral and dental lesions observed in cases of physical abuse. All of them are suspicious, but none are pathognomonic. They must be differentiated from unintentional oral and dental injuries, which are relatively common in the paediatric age group. To do so, it is important to search for physical signs that are highly suspicious.⁵⁻¹⁹

Figure 1. Flow chart of the literature search strategies and the article selection process

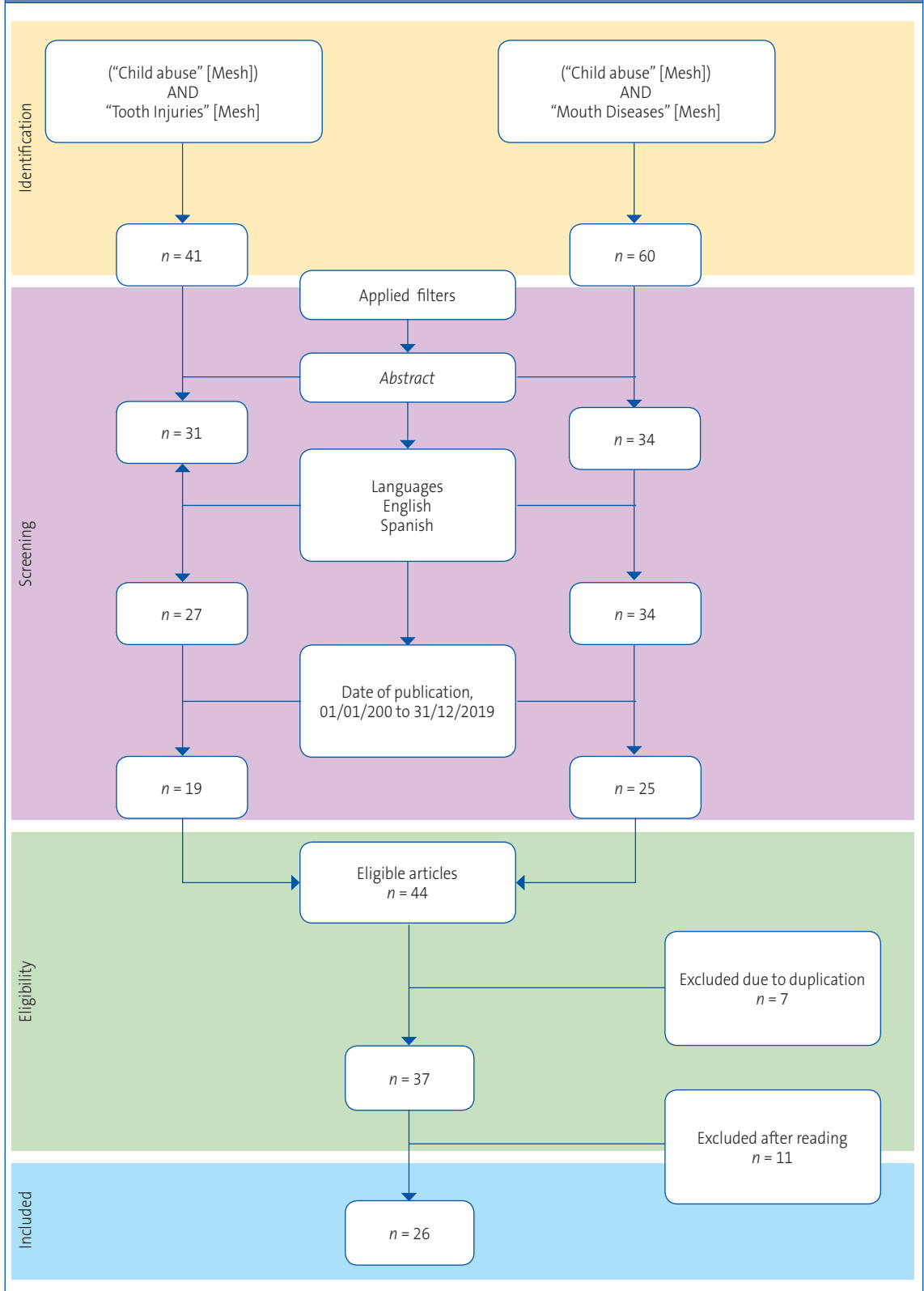


Table 1. Country of publication, type of article and professional field of the journals that published the 26 articles included in the review

Country of publication	n	Type of article	n	Professional journal	n
United States	10	Case report	6	Odontology	17
United Kingdom	3	Review	6	Paediatrics	4
Spain	2	Clinical practice guideline	4	Otorhinolaryngology	3
Canada	2	Comparative study	3	Other specialities	2
Italy	2	Observational study	3		
Portugal	1	Multicentre study	2		
Switzerland	1	Case-control study	1		
Sweden	1	Systematic review	1		
Finland	1				
Brazil	1				
India	1				
China	1				

Table 3 describes the oral and dental diseases found in cases of neglect in childcare and dental care. All of them are suggestive of neglect but none is pathognomonic. Therefore, it is important to assess for the presence of factors considered necessary to establish the diagnosis of dental neglect, whether there are other health problems resulting from chronic physical neglect in nutrition, hygiene, household safety or basic primary care, and whether

there are other physical or behavioural signs physical or sexual abuse.^{5,6,12,13,16,20-25}

Table 4 describes the oral diseases and lesions seen in cases of sexual abuse. Apart from the detection of sperm or semen in the perioral region or oral cavity, the only other finding that can be considered pathognomonic of sexual abuse are infection by *Neisseria gonorrhoeae* or *Treponema pallidum*. All other lesions and diseases are only

Table 2. Oral and dental lesions suggestive of physical abuse

Bruises and lacerations in lips, labial frenulum, gums, tongue, sublingual mucosa, soft or hard palate and oral mucosa caused by direct trauma or eating utensils used in force-feeding
Burns or blisters in the perioral region or oral cavity resulting from force-feeding of scalding liquids or foods
Bruises, scabbing or scarring in the lip corners caused by gagging of the child in an attempt to make them quiet
Dental fractures, dislocations or avulsions caused by direct trauma
Pulp necrosis (grey or pink discolouration of the tooth) caused by past repetitive trauma
Bite marks in the mouth caused by the child's own teeth in the context of physical abuse
Bite marks caused by a human adult: ovoid or elliptical shape with an intercanine width > 3 cm, often with ecchymosis in the centre
Persistent, recurrent, multicoloured and unusual oral lesions that do not fit a specific clinical picture or disease and that are inflicted intentionally to seek medical care
Pharyngeal injuries inflicted intentionally to make the child cough or vomit blood or to create other symptoms requiring medical care

Table 3. Dental and oral health problems suggestive of neglect

Multiple untreated dental caries
Missing teeth
Recurrent gumboils
Granuloma and other periodontal diseases
Tooth discoloration

suggestive or red flags of potential sexual abuse.^{6,12,16,17,26-30}

DISCUSSION

Out of the different types of child abuse, physical abuse, neglect and sexual abuse can cause lesions and diseases that manifest in or around the mouth and oral cavity in approximately 30% of cases.^{3,5,6,11,12} While the prevalence of oral and dental manifestations of child abuse is significant, there is a surprising scarcity of articles on the subject, especially in paediatric journals.

Oral lesions resulting from physical abuse are observed in 12% to 31% of children that experience this type of maltreatment, while intraoral lesions are observed much less frequently (2-11%), leading some researchers to suggest that these lesions frequently go unnoticed. Oral and intraoral lesions caused by physical abuse are more frequent in children aged less than 8 years, especially in infants and pre-schoolers, with no differences based on sex. Abused children that have oral or intraoral lesions are at increased risk of having additional undetected lesions resulting from abuse.^{5,10-12}

The most frequently identified oral and intraoral lesions (46-95%) are bruises and cuts in the lips, labial frenulum, gums, tongue, sublingual mucosa, hard and soft palate and oral mucosa caused by direct trauma or eating utensils used in force-feeding and burns or blisters in the perioral region or oral cavity caused by force-feeding of hot foods or scalding liquids.⁵⁻¹⁹

Unintentional oral and dental injuries are relatively frequent in the paediatric population and must be differentiated from injuries resulting from abuse.¹¹ No oral or intraoral lesion is pathognomonic of physical abuse, so the presence of physical manifestations that raise suspicion of potential abuse needs to be assessed: lesions whose extension, depth, location, distribution or pattern/type are incompatible with the age or developmental capabilities of the child; lesions that are inconsistent with the history given the provider; lesions in different stages of healing or scarring; frequent and recurrent lesions in children aged less than 6 years; lesions in infants aged less than 9 months or that cannot move independently yet.^{6,11,12,16-19}

Lesions in the mouth cavity caused by physical abuse in the context of Munchausen syndrome by proxy (faking disease or injury on another) are rare, but this syndrome must be taken into account given the dire consequences that it may have on the child. Usually, the children are aged less than 5 years and the lesions are usually inflicted by the mother voluntarily, intentionally, knowingly in planned and recurrent episodes. The perpetrator is motivated by a psychological need to assume the role of being ill through the child. The purpose of these actions are to seek health care to start a diagnosis and treatment process. This behaviour does not yield any economic or social benefit, but rather the psychological “reward” of being in contact with health care staff and receiving the sympathy, solidarity and compassion extended to the caregivers of a “poor ill child”⁶

Table 4. Specific diseases and oral lesions suggestive or that raise suspicion of sexual abuse

Infection by <i>Neisseria gonorrhoeae</i>
Infection by <i>Treponema pallidum</i> (chancres associated with syphilis)
Infection by human papillomavirus, especially types 6, 11, 16 and 18.
Infection by <i>Chlamydia trachomatis</i> (lymphogranuloma venereum), types L1, L2 or L3
Infection by herpes simplex virus, type 1 and especially type 2
Petechiae, erythema and/on erosions in the oral cavity, particularly at the junction between the soft and hard palate, caused by forced oral sex
Bite marks inside the mouth caused by the child's own teeth during sexual abuse
Bite marks caused by human adult: ovoid or elliptical shape with an intercanine width > 3 cm and often with central ecchymosis

Dental neglect is defined as the wilful failure of parent or guardian to seek and follow through with treatment necessary to ensure a level of oral health essential for adequate function and freedom from pain and infection.⁶

Failure of parents or guardians to seek or provide adequate dental care may be due to factors such as isolation of the household, lack of money, difficulties with transport, ignorance or not perceiving the value of dental care.²²⁻²⁴ Therefore, a series of factors are considered necessary to establish the presence of dental neglect: the child being harmed or at risk of harm from lack of dental care; the recommended dental care offering significant benefits to the child; the expected benefit of dental care significantly outweighing any potential adverse effects, so that it would be logical for parents to choose providing care over withholding it; parents or guardians understanding the information given by the provider on the problems of the child and having access to adequate dental care. In addition, oral and dental problems and diseases resulting from dental neglect are usually accompanied by other health problem associated with chronic physical neglect in nutrition, hygiene, household safety or primary care health services (vaccinations, healthy-child checkups, etc). These features are also frequently associated with other physical or behavioural signs of physical or sexual abuse. Therefore, these problems are frequently detected by dentists once the child has entered the child protection system and is referred to a dental provider for treatment.^{6,12,16,21-25}

Although the oral cavity is a frequent site of sexual abuse in children, visible oral lesions and diseases are infrequent and difficult to detect. The only features that can be considered pathognomonic of sexual abuse are oral infections by *Neisseria gonorrhoeae* or *Treponema pallidum*. All other suspicious lesions or diseases are suggestive of sexual abuse, but not sufficient for diagnosis.^{6,12,16,17,22,26-30}

Oral infection by *Neisseria gonorrhoeae* in sexually abused children is infrequent before puberty, while in adolescents, the observed frequency is of up to 12%. It manifests with multiple ulcers associ-

ated with intensely red mucosal surfaces covered by a whitish pseudomembrane. It usually manifests in the form of pharyngitis, but it may also manifest as tonsillitis, gingivitis, stomatitis or glossitis. It is usually asymptomatic but in some cases may cause itching or a burning feeling or be painful.^{6,26}

Oral infection by *Treponema pallidum* is extremely rare. It manifests with a painless, indurated and hard necrotic ulcer with raised edges that lasts 3 to 6 weeks, usually manifesting in the tonsil region and associated with ipsilateral lymphadenopathy, and less frequently in the pharynx or other regions of the oral cavity or perioral region.²⁶

The incidence in children of infection by human papillomavirus as a sexually transmitted disease has been increasing in recent decades. The most frequently involved serotypes are 6 and 11, followed with a much lower frequency by serotypes 16 and 18. The positive predictive value of this infection for potential sexual abuse is 36% for children aged 4-8 years and 70% for children aged more than 8 years. The incubation period after exposure ranges from 1 to 20 months, lasting a mean of 2-3 months. It manifests with condyloma acuminatum, verrucae vulgaris or squamous papilloma, usually painless, in the perioral area or any mucosal surface of the oral cavity or pharynx.²⁶⁻³⁰

Oral infection by serotypes L1, L2 or L3 of *Chlamydia trachomatis* in sexually abused children is infrequent before puberty, with the frequency increasing to up to 14% in adolescence. It manifests with an ulcer in the oral cavity or pharynx that can be very painful and that resolves without treatment. Two to six weeks, the patient develops a painful inflammation of the lymph nodes that are near the original lesion.^{6,26}

Oral infection by herpes simplex virus manifests as gingival exanthema, oral bleeding and clusters of small fluid-filled vesicles that appear throughout the oral mucosa, including the tongue, palate and perioral skin that progress to pustules. These vesicles and pustules can rupture, giving rise to very painful ulcers 1-5 mm in diameter that tend to coalesce, with scalloped borders and surrounded

by redness. The most frequent serotypes are 1 and above all 2.²⁶

In suspected cases of abuse or neglect, oral and dental lesions and diseases must be documented in writing along with any other behavioural signs of abuse exhibited by the minor or the parents/guardians. The provider must take pictures of the lesions and, in case of suspected sexual abuse, collect samples of the oral mucosa and tongue with a sterile cotton swab, allowed to dry in room air and stored appropriately for future analysis in the laboratory. The precision in the diagnosis of sexually transmitted infections of the oral cavity increases if samples are collected within 24 of exposure in prepubertal children and within 72 hours in adolescents. This documentation can be useful in the legal procedures for child protection, and also to assess the response to treatment.^{6,12,16,19,22}

Paediatricians and dentists are legally obligated to report any case of confirmed or suspected child abuse to welfare services, child protection services or the youth justice system. However, there are still barriers that keep a significant proportion of these health professionals from reporting. The main barriers to the detection and notification of cases are insufficient training on the subject, fear of having wrong suspicions, the potential impact on their

clinical practice, fear of the consequences reporting may have on the minor, not knowing what documentation and procedures are necessary, and fear of having to do a statement in legal proceedings.^{5,6,11,12,16,19,22}

CONCLUSIONS

Lesions and diseases resulting from child abuse and neglect frequently manifest in the mouth and oral cavity. It is essential that paediatricians and dentists be aware of the issue, be trained on how to detect them, know when and how to document suspicious clinical features and how to report suspected abuse or neglect. These efforts, as well as the overall work of these professionals, will increase our ability to prevent and detect child maltreatment and to protect and care for children.

CONFLICTS OF INTEREST

The authors have no conflicts of interest to report in relation to the preparation and publication of this article.

ABBREVIATIONS

PRISMA: Preferred Reporting Items for Systematic Reviews and Meta-analyses • **WHO:** World Health Organization.

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