

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Jackeline Nogueira de Paula Barros

**PERFIL DO TRAUMATISMO EM DENTES DECÍDUOS E PERMANENTES DE CRIANÇAS
E ADOLESCENTES ATENDIDOS NO CENTRO DE VIGILÂNCIA E MONITORAMENTO
DE TRAUMATISMO DENTO-ALVEOLAR DA FACULDADE DE ODONTOLOGIA DA
UNIVERSIDADE FEDERAL DO RIO DE JANEIRO**

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Dissertação de Mestrado apresentada ao Curso de Mestrado Profissional em Clínica Odontológica da Faculdade de Odontologia da Universidade Federal do Rio de Janeiro (FO-UFRJ), como parte dos requisitos para a obtenção de título de Mestre em Clínica Odontológica.

Orientadores:

Prof^aDr^a Lucianne Cople Maia de Faria

Prof^a.Dr^a Tatiana Kelly da Silva Fidalgo

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Profa. Dra. Katia Regina Hostilio Cervantes Dias

DO-Professora Titular do Departamento de Clínica Odontológica da FO-UFRJ

Prof. Dr. Marcelo de Castro Costa

DO-Professor Associado do Departamento de Odontopediatria e Ortodontia da FO-UFRJ

Dra. Lívia Azeredo Alves Antunes

DO-Professora Adjunta do Departamento de Formação Específica FO-UFF Nova Friburgo

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“O saber a gente aprende com os mestres e os livros. A sabedoria se aprende é com a vida e com os humildes”.

Cora Carolina

RESUMO

BARROS, Jackeline Nogueira de Paula. **Perfil do Traumatismo dentário em dentes decíduos e permanentes de crianças e adolescentes atendidos no Centro De Vigilância e Monitoramento De Traumatismo Dento-Alveolar da UFRJ**. Rio de Janeiro, 2017. Dissertação (Mestrado em Odontologia – Área de concentração: Odontopediatria) – Faculdade de Odontologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2017.

O trauma dental é considerado uma urgência odontológica de alta prevalência e um grave problema de saúde pública mundial, com alto impacto na qualidade de vida e de elevado custo no tratamento. Este estudo retrospectivo teve como objetivo avaliar o perfil dos traumatismos em dentes decíduos e permanentes de pacientes de 0 a 15 anos atendidas no Centro de Vigilância e Monitoramento de Traumatismos Dentários da UFRJ. Os dados sobre gênero, idade, tipo de trauma, dentes e tecidos mais afetado foram obtidos dos prontuários e após tabulação, foram analisados descritivamente e pelo teste do χ^2 ($p < 0.05$) sendo incluídos 333 dentes traumatizados, dos quais 70% eram decíduos e 30% permanentes. A média de idade das crianças com dentes decíduos e permanentes afetados foi de $3,35 \pm 2,02$ e $9,09 \pm 2,44$ anos, respectivamente. Indivíduos do gênero masculino tiveram mais dentes permanentes (64,4%) que decíduos (55,6%) traumatizados ($p = 0.085$). Os incisivos centrais superiores, tanto decíduos (68,9%), quanto permanentes (69,4%) foram os mais acometidos. Dentes decíduos apresentaram maior frequência ($p < 0.001$) de trauma em tecido de suporte (73,3%) e menor frequência em tecidos duros (40,7%) quando comparados aos permanentes (51,5% e 60,6%, respectivamente) ($p = 0.001$). O trauma mais frequente no tecido de suporte nos decíduos foi a subluxação (27,2%; $p = 0.001$) e nos permanentes, a luxação lateral (42,0%; $p < 0.001$). Nos tecidos duros, houve maior ocorrência de trauma em dentes permanentes do que em decíduos ($p = 0.001$), no entanto não foi observado diferença entre os tipos de dentes quando avaliados cada tipo de injúria independentemente ($p > 0.005$). Quando os dentes decíduos foram acometidos, houve maior frequência de trauma em mucosa gengival (31%; $p = 0.022$) e nos permanentes, lesões traumáticas no mento foram os mais prevalentes (20,8%; $p = 0.009$). Houve relato de recorrência de trauma em 26,3% das crianças com dentes decíduos e em 20,2% com permanentes traumatizados. Conclui-se que há diferenças importantes entre o perfil de traumatismo nos dentes decíduos e permanentes, assim sugerindo-se abordagem preventiva e terapêutica distinta para ambos os grupos avaliados.

DESCRITORES: Crianças, Traumatismo dentário; Dentes decíduos; Dentes permanentes.

ABSTRACT

BARROS, Jackeline Nogueira de Paula. **Profile of dental trauma in primary and permanent teeth of children and adolescents attended at the Center for Surveillance and Monitoring of Dento-Alveolar Trauma of UFRJ.** Rio de Janeiro, 2017. Dissertação (Mestrado em Odontologia – Área de concentração: Odontopediatria) – Faculdade de Odontologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, 2017.

Dental trauma is considered a highly prevalent dental emergency and a serious public health problem worldwide that has a great impact on quality of life and a high cost for treatment. This retrospective study aimed to evaluate the dental trauma profile in deciduous and permanent teeth from patients between 0 and 15 years old attended at UFRJ. The data regarding gender, age, classification of the trauma, teeth and more affected tissues were obtained from dental record. After tabulation, the data were analyzed descriptively and by the χ^2 test ($p < 0.05$). Data from 333 traumatized teeth were included, of which 70% were deciduous and 30% were permanent. The mean age of children with primary and permanent affected teeth was 3.35 ± 2.02 and 9.09 ± 2.43 years, respectively. Male subjects presented more traumatized permanent teeth (64.4%) than primary ones (55.6%), ($p = 0.085$) The upper central incisors, both primary (68.9%) and permanent (69.4%) were the most affected. Primary teeth presented a higher frequency ($p < 0.001$) of supportive tissue trauma (73.3%) and lower frequency ($p = 0.001$) in hard tissues (40.7%) compared to permanent ones (51.5% and 60.6%, respectively). The most frequent trauma in the supportive tissue was the subluxation (27.2%; $p = 0.001$) and for permanent lateral luxation (42%; $p < 0.001$). In the hard tissues, permanent teeth presented higher prevalence of trauma than primary ($p = 0.001$), however there was not found statistical difference when each fracture injury was evaluated individually ($p > 0.005$). When the primary teeth were affected, there was a greater frequency of trauma in the gingival mucosa (31%; $p = 0.022$) and in the permanent ones, traumatic lesions in the chin were the most prevalent (20.8%; $p = 0.009$). There was a recurrence of trauma in 26.3% of the children with primary teeth and in 20.2% with traumatized permanents. It is concluded that there is a distinction between trauma profile in primary and permanent teeth, thus suggesting a distinct preventive and therapeutic approach for both groups evaluated.

KEY WORDS: Children, Dental trauma, Primary teeth, Permanent teeth.

LIST OF TABLES

Table 1: Distribution of the Traumatic dental injury, according primary and permanente affected.....	31
Table 2: Distribution of the Traumatic dental injury, according to the type of tooth: Deciduous and Permanent.....	32
Table 3: Distribution of the location of soft tissue and types of injury in the extra- and intra oral regions, according to the type of tooth: Deciduous and Permanent.....	33

LISTA DE ABREVIATURAS E SIGLAS

CEP Comitê de ética em pesquisa

CVMT Centro de Vigilância e Monitoramento de Traumatismo dento-alveolar

DTSC Dental Trauma Surveillance Center

UFRJ Universidade Federal do Rio de Janeiro

HUCFF Hospital Universitário Clementino Fraga Filho

OMS Organização Mundial de Saúde

WHO World Health Organization

SPSS Statistical Package for the Social Sciences

TDI Traumatic dental Injury

TCLE Termo de Consentimento Livre e Esclarecido

USA United States America

LISTA DE SÍMBOLOS E EXPRESSÕES

= Igual

± Mais ou Menos

> Maior que

< Menor que

% Porcentagem

SUMÁRIO

1	Introdução	16
2	Proposição	20
2.1	Objetivo Geral	20
2.2	Objetivo Específico	20
3	Metodologia estendida (Desenvolvimento do Estudo)	21
3.1	Desenho do estudo e Critérios de Elegibilidade	21
3.2	Coleta de dados.....	21
3.3	Análise dos dados.....	22
4	Artigo Científico.....	23
5	Conclusão.....	42
6	Referências Bibliográficas.....	43
7	Anexos	49
7.1	Carta de aceite do CEP.....	49
7.2	Normas da revista para submissão do artigo.....	51

1 INTRODUÇÃO

Os traumatismos dentários são uma urgência odontológica frequente, principalmente em crianças e adolescentes, além de ser considerado um grave problema de saúde pública mundial (Otuyemi et al., 1996; Petersson et al., 1996; Andreasen et al., 1972; Glendor et al., 2008; Berger et al., 2009; David et al., 2009; Navabazan et al., 2010; Martins et al., 2012; Mahmoodi et al., 2015). Essa alta prevalência pode ser diferente de acordo com as várias regiões geográficas estudadas e geralmente está relacionada às distintas condições culturais, comportamentais, sanitárias, econômicas, as práticas profissionais, as características ecológicas, além da falta de comparabilidade entre as metodologias apresentadas nos estudos realizados, cuja idade e a classificação do trauma são outros fatores de variabilidade (Bastone et al., 2000; Cortes et al., 2001; Soriano et al., 2007; Glendor et al., 2008; Berger et al., 2009; Damé-Teixeira et al., 2013; Azami-Aghdash et al., 2015).

A sua frequência variável, entre 4,1% (Nik-Hussein et al., 2001) a 62,1% (Viegas et al., 2010), atinge a qualidade de vida não somente das crianças e adolescentes, como também das pessoas envolvidas, devido principalmente ao alto impacto psicossocial (Beger et al., 2009; Antunes, 2012; Rodrigues et al., 2015), e ao elevado custo do tratamento (Glendor, 2000; Borum et al., 2001; Glendor et al., 2001; Glendor et al., 2007; Andreasen et al., 2012), o que pode levar a danos irreparáveis a longo prazo e a várias complicações, caso não seja diagnosticado e tratado precocemente. (Al-Nazhan et al., 1995; Cardoso et al., 2004; Gulinelli et al., 2008; Cavalcanti et al., 2009; Bendo et al., 2010; Porrit et al., 2011; Scarpelli et al., 2011; Piovesan et al., 2011; Martins et al., 2012; Carvalho et al., 2012).

As causas mais comuns de traumatismos dentários em crianças e adolescentes estão relacionadas a quedas, colisões com outras pessoas e objetos e atividades esportivas, lazer, acidentes de trânsito, agressões físicas, iatrogenias, entre outras (Al-Nazhan et al., 1995; Nicolau et al., 2001; Huang et al., 2009; Diaz et al., 2010; Gupta et al., 2011; Zhou et al., 2013).

No caso específico das crianças pequenas, cuja faixa etária mais prevalente encontra-se entre 1 e 3 anos de idade (Mestrinho et al., 1998; Cardoso et al., 2004; Gulinelli et al., 2008; Granville-Garcia et al., 2010), as quedas estão relacionadas principalmente à falta de coordenação motora e discernimento ainda imaturos, requerendo assim, maiores cuidados por parte dos responsáveis (Andreasen et al., 1972; Sassen, 1982; Davi et al., 2009; Azami-Aghdash et al., 2015).

Já no caso das crianças maiores e adolescentes, a faixa etária entre 8 e 12 anos é a mais prevalente e as atividades esportivas contribuem com essa maior prevalência (Marcenes et al., 2000; Glendor et al., 2008; Schuch et al., 2013; Zhang et al., 2014; Corrêa-Faria et al., 2015). Além da atenção, outras medidas como educação e segurança, (Sigurdsson et al., 2013) e o uso equipamentos de segurança e protetores bucais são preconizados (Bemelmans et al., 2000; Winters et al., 2001; Labella et al., 2002; Kumamoto et al., 2004; Shirani et al., 2010).

O local físico aonde ocorre o maior número de traumatismos dentários é a casa, em se tratando de crianças pequenas, e a escola, quando são consideradas as crianças maiores e os adolescentes (Onetto et al., 1994; Altay et al., 2001; Shayegan et al., 2007; Bücher et al., 2013; Folakemi et al., 2015). A maioria das lesões dentárias envolve os dentes anteriores, principalmente os incisivos centrais superiores, tanto em decíduos quanto em permanentes, e esse fato pode ser explicado devido à sua localização mais proeminente e por serem os primeiros a erupcionarem na arcada dentária (Garcia-Godoy et al., 1981; Onetto et al., 1994; Schatz et al., 1994; Chen et al., 1999; Malikaew et al., 2006; Navabazam et al., 2010; Bendo et al., 2010; Govindarajan et al., 2012). Geralmente essas lesões afetam um único dente, mas certos tipos de trauma podem favorecer lesões múltiplas e associadas levando a uma piora no prognóstico do trauma (Gassner et al., 1999; Da Silva et al., 2004).

Entretanto, quando o trauma acontece durante a dentição decídua graves problemas poderão ocorrer nos dentes permanentes subjacentes como hipoplasia, descoloração, atraso no tempo de erupção e malformação dentária, entre outros (Brin et al., 1984; Carvalho et al., 2012),

pois muitas vezes problemas nessa dentição tendem a ser negligenciados pelos responsáveis (Cunha Bonini et al., 2009; Noori et al., 2009).

A grande maioria dos estudos epidemiológicos concorda que os traumas em tecidos de suporte são os que mais acontecem quando os dentes decíduos são atingidos durante o trauma, enquanto os tecidos dentários são os que estão mais sujeitos ao traumatismo dentário quando se tem dentes permanentes associados e isso pode ocorrer devido ao fato de haver maior resiliência óssea, o que favorece o deslocamento dentário, em crianças pequenas, comparado as crianças maiores e adolescentes que estão mais susceptíveis a fraturas dentárias (Soriano et al., 2007; Cavalcanti et al., 2009; Carvalho et al., 2012; Schuch et al., 2013; Schatz et al., 2013).

Segundo alguns autores, as fraturas e/ou luxações ainda podem vir associadas a traumas de tecidos moles, que muitas vezes funcionam como verdadeiros amortecedores do trauma dental (Andreasen et al., 1970; Saroglu et al., 2002; Ritwik et al., 2015) e outros ainda associam estes ao trauma maxilofacial, o que torna o quadro clínico mais complexo (Santos et al., 2010; Kallel et al., 2015), porém independentemente do caso a profilaxia antitetânica adequada é de suma importância (Losso et al., 2011; Ministério da saúde, 2005).

Com relação a injúria de tecido mole, Soares et al., 2016 demonstraram uma maior prevalência de lesões intra bucais em crianças do gênero masculino na faixa etária de 0-3 anos em detrimento das lesões extra orais mais prevalentes em crianças maiores e adolescentes e apontou a laceração em lábios a mais frequente, provavelmente devido à sua localização, ou seja, recobrimdo grande parte dos incisivos.

Existem ainda os fatores considerados predisponentes a ocorrência de trauma dentário em crianças e adolescentes tais como gênero, idade, tipo de dente (decíduo ou permanente). Já o tipo de tecido mais acometido (dentário, de sustentação ou tecido mole) e a recorrência de trauma são dados pouco explorados na literatura. Logo identificar tais fatores de risco é essencial (Andreasen et al., 1970; Hamilton et al., 1997; Marcenes et al., 2001; Cortes et al.,

2001; Årtun et al., 2005; Gulinelli et al., 2008; Fakhruddin et al., 2008; Ramos et al., 2008; Cavalcanti et al., 2009; Thelen et al., 2010; Bendo et al., 2010; Francisco et al., 2013; Aldrigui et al., 2014).

Dentre os fatores de risco, destacam-se o gênero, o qual a maioria dos estudos aponta uma maior prevalência no gênero masculino ao feminino, e pode ser explicado devido a natureza mais ágil em atividades esportivas e/ou lazer nas ruas ou preferências por jogos e esportes mais agressivos (Marcenes et al., 2001; Cortes et al., 2001; Berger et al., 2009; Navabazam et al., 2010; Govindarajan et al., 2012; Azami-Aghdash et al., 2013; Corrêa-Faria et al., 2015), porém pesquisas mostram que essa prevalência vem diminuindo devido ao crescente interesse entre as meninas em praticar modalidades esportivas antes predominadas pelos meninos e pelo surgimento de jogos eletrônicos online, cuja mudança do padrão de comportamento das crianças e adolescentes na era digital, torna essa diferença cada vez mais insignificante (Traebert et al., 2003; Cunha Bonini et al., 2009; Wendt et al., 2010; Firmino et al., 2014). Outro fator existente é o da história recorrente do trauma dentário, que apesar de ser considerado um importante fator de risco, ainda é pouco estudado entre os autores, podendo ser subestimado, principalmente em se tratando de traumas leves, pois muitas vezes crianças e pais não se recordam do ocorrido. (Andreasen et al., 1970; Andreasen et al., 1972; Glendor et al., 2000).

Apesar do grande número de trabalhos envolvendo traumatismos dentários, ainda existem alguns questionamentos a respeito do perfil de traumatismos em dentes decíduos e permanentes, especialmente em serviços de centros referenciados. Dado o exposto, muito se tem a avançar sobre os estudos do traumatismo dentário e o conhecimento do perfil a ocorrência de trauma dentário em crianças e adolescentes se faz necessário, pois possibilitaria a elaboração de políticas públicas sobre prevenção mais eficaz, além de abordagens terapêuticas e de educação mais adequada para cada caso.

2 PROPOSIÇÃO

2.1 OBJETIVO GERAL

Avaliar o perfil do traumatismo em dentes decíduos e permanentes de crianças e adolescentes atendidos no Centro de Vigilância e Monitoramento de Traumatismos Dento-alveolares da Faculdade de Odontologia da Universidade Federal do Rio de Janeiro (CVMT/UFRJ).

2.2 OBJETIVOS ESPECÍFICOS

- Determinar fatores predisponentes aos traumatismos dento-alveolares nos dentes decíduos e permanentes tais como gênero, idade e tipo específico de dentes mais frequentemente acometidos;
- Comparar os tipos de traumatismos em: tecidos duros dentários, tecidos de suporte e de tecido mole nos dentes decíduos e permanentes;
- Identificar diferenças no perfil de recorrências de traumatismo dento-alveolar nos dentes decíduos e permanentes.

3 METODOLOGIA ESTENDIDA (DESENVOLVIMENTO DO ESTUDO)

3.1 Desenho do Estudo e critérios de elegibilidade

Trata-se de estudo do tipo retrospectivo no qual prontuários de crianças, de 0 a 15 anos, atendidas no Centro de Vigilância e Monitoramento de Traumatismos Dento-alveolares da Faculdade de Odontologia da UFRJ (CVMT/UFRJ) foram avaliados no período de 2014 a 2016.

3.2 Coleta de dados

Após aprovação do Comitê de Ética em Pesquisado em Seres humanos do Hospital Universitário Clementino Fraga Filho (HUCFF) sob o número 202/14 (Anexo I), a coleta de dados dos prontuários foi realizada por dois pesquisadores, treinados (por meio do uso de imagens clínicas e radiográficas projetadas) e informações a respeito de fatores predisponentes, tais como o gênero, idade, tipo de dente, foram obtidas. Informações relativas aos tecidos afetados (tecidos dentários duros, de suporte e moles), tipos de injúrias e recorrência do trauma também foram coletados e tabulados em um banco de dados. Segundo critérios de elegibilidade, foram excluídos prontuários de crianças e adolescentes com alguma síndrome e/ou alterações neuromotoras, aqueles que tiveram dentes perdidos por cárie, prontuários com dados incompletos, pacientes em que os exames radiográficos não foram possíveis de serem realizados e pacientes que se recusaram a participar do estudo.

Para o preenchimento dos prontuários (situação prévia ao levantamento do presente estudo), os traumatismos dentários foram descritos segundo critério de classificação de Andreasen et al., 2007 em:

- Tecido dentário: Trinca de esmalte, fratura de esmalte, fratura de esmalte e dentina não complicada e complicada, fratura corono-radicular não complicada e complicada, fratura radicular.

- Tecido de Suporte: concussão, subluxação, luxação lateral, luxação extrusiva, luxação intrusiva, avulsão e fratura alveolar.
- E os tecidos moles como: Contusão, abrasão e Laceração.

Quando um elemento dentário sofresse mais de um tipo de injúria, esse poderia ser computado em mais de uma situação.

Ainda para o preenchimento dos prontuários, todos os pacientes foram examinados por alunos de pós-graduação da Faculdade de Odontologia da UFRJ previamente treinados e, sob a supervisão de um professor expert, para a obtenção do diagnóstico em traumatismo dentário.

3.3 Análise dos dados

Os dados foram tabulados em planilha criadas no programa Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, EUA) versão 20.0 e analisados de forma descritiva por meio de suas frequências, e estatisticamente, pelo teste não paramétrico do Qui-quadrado com o nível de significância de 5% ($p < 0,05$) e intervalo de confiança de 95%.

4 ARTIGO CIENTÍFICO

Profiles of trauma in primary and permanent teeth of children and adolescents attending the Faculty of Dentistry of the Federal University of Rio de Janeiro

Jackeline Nogueira de Paula Barros¹

Thayssa Augusto Assis de Araújo¹

Thais Rodrigues Campos Soares¹

Michele Machado Lenzi¹

Patrícia de Andrade Risso²

Tatiana Kelly da Silva Fidalgo³

Lucianne Cople Maia¹

¹ Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Federal University of Rio de Janeiro, Brazil

² Department of Preventive and Community Dentistry, School of Dentistry, State University of Rio de Janeiro, Brazil

³ Department of Dental Clinics, School of Dentistry, Federal University of Rio de Janeiro, Brazil

Correspondence to:

Lucianne Cople Maia

Disciplina de Odontopediatria da Faculdade de Odontologia da UFRJ

Rua Professor Rodolpho Paulo Rocco, 325 - Cidade Universitaria, Rio de Janeiro, RJ, Brazil

CEP: 21941-971

Phone/Fax: +55 21 25622098 ; e-mail: rorefa@terra.com.br

ABSTRACT

Background/Aim: This retrospective study aimed to evaluate the dental trauma profile in primary and permanent teeth from patients between 0 and 15 years old attended the Faculty of Dentistry of the Federal University of Rio de Janeiro. Material and Methods: Data regarding gender, age, trauma classification, tooth type, and affected tissues were obtained from dental records. The data were analyzed descriptively and by the χ^2 test ($p < 0.05$). Results: Data associated with 333 traumatized teeth (70% primary and 30% permanent teeth) were included. The mean ages of children with affected primary and permanent teeth were 3.35 ± 2.02 and 9.09 ± 2.43 years, respectively. Males presented more permanent teeth with trauma (64.4%) than primary ones (55.6%; $p = 0.085$). The upper central incisors, both primary (68.9%) and permanent (69.4%), were the teeth most commonly affected. Primary teeth showed a higher frequency ($p < 0.001$) of supportive tissue trauma (73.3%) and lower frequency ($p = 0.001$) of hard tissue trauma (40.7%) than those in permanent ones (51.5% and 60.6%, respectively). The most frequent trauma in the supportive tissue was subluxation (27.2%) and permanent lateral luxation (42.0%). In the hard tissues, permanent teeth presented a higher prevalence of trauma than primary ones ($p = 0.001$), however this difference was not statistical significant when each type of fracture injury was evaluated individually ($p > 0.005$). With affected primary teeth, there was a greater frequency of trauma in the gingival mucosa (31.0%; $p = 0.022$); in the permanent ones, traumatic lesions in the chin region were the most prevalent (20.8%; $p = 0.009$). Trauma was recurrent in 26.3% of primary teeth and in 20.2% permanent teeth. Therefore, primary and

permanent teeth showed distinct trauma profiles, suggesting that distinct preventive and therapeutic approaches are needed for these two groups.

KEYWORDS: Children, Dental trauma, Primary teeth, Permanent teeth

INTRODUCTION

Dental trauma is considered a highly prevalent dental emergency and a serious public health problem worldwide that has a great impact on quality of life and a high cost for treatment (1–4). Primary teeth of children between 1 and 3 years old (5) and permanent teeth of children and adolescents aged from 8 to 12 years are most frequently affected (6). In addition, gender and children and adolescents with a history of multiple episodes of dental trauma contribute disproportionately to this high prevalence (7).

Most lesions in both primary and permanent teeth involve the anterior teeth, and mainly the upper central incisors (8). Usually these lesions affect a single tooth, but certain types of trauma can affect multiple teeth and are associated with a worse prognosis (9; 10).

In addition, studies suggest that trauma in supportive tissues is more prevalent with primary teeth, whereas dental tissues are more commonly associated with trauma in permanent teeth (11). Nevertheless, the frequency of both types of trauma associated with soft tissue in children and adolescents is high. Therefore, anti-tetanus prophylaxis should not be neglected in this population (12).

Despite the large number of studies on dental trauma, there are still questions regarding the profiles of trauma in primary and permanent teeth, especially in patients who attend reference dental center. Understanding these profiles would enable the implementation of more effective prevention and treatment programs, as well as the design of therapeutic and educational approaches that are more appropriate for individual cases. Therefore, in this study, we determined the profiles of dental trauma in primary and permanent teeth of children and adolescents treated at the Dental Trauma Surveillance Center at Universidade Federal do Rio de Janeiro (DTSC/UFRJ).

MATERIAL AND METHODS

In this retrospective study, we examined medical records of children and adolescents with one or more traumatized teeth. Study participants were between 0 and 15 years of age, both genders, and received dental care at DTSC/UFRJ after referral or direct solicitation. The sample was selected by convenience.

After the approval of the Ethics Committee on Human Beings of the University Hospital Clementino Fraga Filho (HUCFF) (no. 202/14), data on gender, age, tooth type, affected tissues, types of injuries, and trauma recurrence were collected from the dental records of patients attending DTSC/UFRJ between 2014 and 2016.

Dental trauma characteristics were described according to the following classification criteria, outlined by Andreasen et al. (13):

Dental tissue: Enamel crack, enamel fracture, enamel fracture, uncomplicated and complicated dentin fracture, uncomplicated and complicated corono-radicular fracture, and root fracture.

Supportive tissue: concussion, subluxation, lateral luxation, extrusive luxation, intrusive luxation, avulsion, and alveolar fracture.

Soft tissues: Contusion, abrasion, and laceration, with the possibility of more than one type of injury at the same time.

Children and adolescents with dental records showing syndrome and/or neuromotor changes or teeth lost due to caries, whose data was incomplete, those for whom radiographic examination was not possible, and those who refused to participate were excluded from the study.

All of the patients were examined by graduate students of the Faculty of Dentistry of UFRJ who had previously trained under the supervision of an expert professor to diagnose dental trauma.

After collection, the data was tabulated in a spreadsheet created in Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA) version 20.0 and analyzed descriptively in

terms of frequencies and statistically by non-parametric χ^2 test, with a significance level of 5% ($p < 0.05$) and 95% confidence interval.

RESULTS

Among the 251 records examined, 19 were excluded because of incomplete data. In total, 232 medical records were analyzed, with 129 associated with males and 103 with females. These records represented 333 traumatized teeth: 232 primary (70%) and 101 permanent (30%) (Table 1). The mean ages of children with primary and permanent teeth affected were 3.35 ± 2.02 and 9.09 ± 2.44 years, respectively. Males had a greater number of traumatized permanent teeth (64.4%) than deciduous ones (55.6%) traumatized, whereas females had fewer traumatized permanent teeth (35.6%) than primary ones (44.4%). However, this difference was not statistically significant ($p < 0.085$). Upper central incisors, both primary (68.9%) and permanent (69.4%), were the teeth most affected by trauma. The distribution of affected teeth is shown in Table 2.

When permanent teeth were traumatized, a higher frequency of affected hard tissues was observed (60.6%) than with traumatized primary teeth (40.7%; $p = 0.001$). On the other hand, when primary teeth affected, a greater frequency (73.3%) of supportive tissue trauma ($p < 0.001$) was observed than with permanent teeth (51.5%).

Among cases of dental tissue trauma, there was a higher prevalence of lesions associated with permanent teeth than with primary teeth ($p = 0.001$). However, when evaluating the types of dental tissue injury independently, no difference was found between the dental types analyzed ($p > 0.05$). The types of damage observed are summarized in Table 1.

Regarding supportive tissue trauma, there was a higher prevalence of subluxation ($p = 0.001$) and alveolar fracture ($p = 0.022$) in primary teeth, whereas lateral luxation ($p < 0.001$) and avulsion ($p = 0.005$) were more common in permanent teeth. There was no difference in the prevalence of concussion ($p = 0.056$), extrusion ($p = 0.399$), or intrusion ($p = 0.128$) between primary and permanent teeth (Table 1).

Regarding soft tissues, there was no significant difference in the prevalence of extra-oral ($p = 0.113$) and intra-oral injuries ($p = 0.305$) with either primary and permanent traumatized teeth.

When specific regions of these injuries were evaluated, there was a higher prevalence of injury in the chin (20.8%; $p = 0.009$) and nose (8.0%; $p = 0.035$) regions when permanent teeth were traumatized compared to when primary teeth were affected. In addition, gums (31.1%; $p = 0.022$) were more often injured at the time of trauma to primary teeth than at other times.

Among the types of injuries most affected in the chin region, abrasion (47.6%) was the most common, whereas, in the nasal region, contusions were more frequently observed (75.0%)

with permanent teeth. With primary teeth, the most prevalent injuries were contusions (81.4%) in the gingival mucosa. The types of damage observed are summarized in Table 3.

Recurrence was reported in 26.3% of children with traumatized primary teeth and in 20.2% of those with traumatized permanent teeth ($p = 0.169$).

Table 1: Distribution of the Traumatic dental injury, according primary and permanente affected

Traumatic dental Injury, according to the affected tissue	Thooth type				p-Value
	Deciduous		Permanent		
	Absolut Value	Relative Value %	Absolut Value	Relative Value %	
HARD TISSUE	90	40.7	60	60.6	(p =0.001)*
Enamel Crack	4	4.5	4	6.8	0.407
Enamel Fracture	42	47.7	23	39.0	0.190
Non complicated Fracture	29	33.0	28	47.5	0.055
Complicated Fracture	7	8.0	6	10.2	0.428
Crown Root Fracture	4	4.5	0	0	0.125
Root Fracture	5	5.7	1	1.7	0.226
SUPPORT TISSUE	162	73.3	51	51.5	(p<0.001)*
Concussion	34	21.0	5	10.0	0.056
Subluxation	44	27.2	3	6.0	0.001*
Lateral Luxation	26	16.0	21	42.0	<0.001
Extrusion	7	4.3	1	2.0	0.399
Intrusion	33	20.4	6	12.0	0.128
Avulsion	18	11.1	14	28.0	0.005*
Alveolar Fracture	12	8.5	0	0	0.022*

Note: The same tooth could have more than one condition.
Chi-squared test (*Statistical significance $P < 0.05$)

Table 2: Distribution of the Traumatic dental injury, according to the type of tooth: Deciduous and Permanent.

Deciduous Teeth	Absolut Value	Relative Value %	Permanent Teeth	Absolut Value	Relative Value %
51	85	36.6	11	35	34.5
52	18	7.8	12	8	7.9
53	4	1,7	21	35	34.7
61	75	32.3	22	7	6.9
62	22	9.5	23	2	2.0
63	3	1.3	24	2	2.0
71	6	2.6	31	2	2.0
72	3	1.3	32	1	1.0
81	8	3.4	41	5	5.0
82	6	2.6	42	4	4.0
83	1	4.0			
84	1	4.0			
Total	232	100.0		101	100.0

Table 3: Distribution of the location of soft tissue and types of injury in the extra- and intra oral regions, according to the type of tooth: Deciduous and Permanent.

SOFT TISSUE	Soft Tissue				p-Value
	Deciduous		Permanent		
	Absolut Value	Relative Value %	Absolut Value	Relative % Value	
EXTRA-ORAL	72	32.0	40	39.6	0.113
Upper lip	46	20.6	17	17.0	0.274
Lower lip	49	21.8	15	34.1	0.062
Nose	6	2.7	8	8.0	0.035*
Chin	21	9.9	20	20.8	0.009*
Cheek	9	4.0	2	2.0	0.284
Front	0	0.0	1	1.0	0.312
INTRA-ORAL	84	37,3	34	33,7	0.305
Lips	59	26.2	18	17.8	0.064
Vestibule	38	17.0	16	16.0	0.477
Gum	70	31.1	20	19.8	0.022*
Jugal mucosa	2	0.9	0	0.0	0.476
Palate	3	1.3	1	1.0	0.635

Note: The same tooth could have more than one condition.
Chi-squared test (*Statistical significance $P < 0.05$)

DISCUSSION

In the present study, among 333 traumatized teeth, 70% were primary teeth and 30% were permanent ones. This can be explained by the greater demand for care by younger children at DTSC/UFRJ, which acts as a reference center in the city of Rio de Janeiro. Preschool-aged children are often not served by the municipal public health system because of their youth and behavioral complexity. In addition, the patient sample was selected for convenience, based on previously described eligibility criteria. These factors may have contributed to the higher frequency of traumatized primary than traumatized permanent teeth included in the study.

Previous epidemiological studies have identified factors that predispose a child for dental trauma, such as gender, age, and tooth type (14). The majority of these studies has found males, associated with more aggressive behavior and a preference for violent games, to have with a higher prevalence of trauma in both types of teeth (4). However, the present study does not support these findings because, although there was a higher frequency of trauma in permanent teeth than in primary teeth in males, this difference was not statistically significant when compared to the results of females from previous studies (15).

Regarding age, Ritwik et al. (16) found a higher prevalence of dental trauma in primary teeth in children between 2 and 4 years of age and in permanent teeth in children between 8 and 10 years of age, which agrees with the findings of this study, which showed that the highest prevalence of trauma in primary teeth was in children with a mean age of 3.35 ± 2.02 years and in permanent teeth was in children with a mean age of 9.09 ± 2.44 years. This difference is likely because young children have immature motor coordination (17).

There is a consensus in the literature that the upper incisors are the teeth most affected by trauma, both in deciduous and in permanent teeth and without a distinction in sides of the mouth affected. This study corroborates these previous results. The risk associated with the upper incisors is likely because of their prominent location in the dental arch, along with predisposing factors in some children, such as inadequate lip coverage of the anterior teeth and marked prominence of the upper incisors (18–19). However, for Atabeck et al. (20), differences were noted when sides were compared, with a higher occurrence of trauma on the right side when primary teeth were involved and a higher prevalence on the left side with trauma to permanent teeth.

In the present study, among the injuries that affect dental tissues, a higher prevalence of traumatic lesions was found in permanent teeth than in primary teeth, but when evaluating the type of injury independently, no statistically significant difference between primary and permanent was found. This result may be because of the patients sampled, because they were treated at a reference center for dental trauma in pediatric dentistry at the Federal University.

However, when evaluating only the occurrence of injury in permanent teeth, we observed fractures of enamel and dentin without pulp involvement (47.5%) most commonly, which agrees with the results of Mahmood et al. (3) and disagrees with those of Sari et al. (21), which indicated that enamel fractures were the most common fractures in permanent teeth. However, in primary teeth, we found that the most frequent dental injury was enamel fractures (47.7%), in agreement with a study by Folakemi et al. (22), but disagreeing with a study by Ekanayake et al. (23), which indicated that the most prevalent injuries in primary teeth were

complicated enamel and dentin fractures. However, this previous study was conducted in a hospital unit in Sri Lanka that receives more severe cases of dental trauma than our center.

There was a higher prevalence of trauma associated with supporting tissues (73.3%) in primary teeth than in permanent teeth, and the most common type of supporting tissue injury was subluxation (27.2%), which was similar to results of study by Dang et al. (24), but differed from those in a study by Ritwik et al. (16), who observed that extrusive luxation was most prevalent in their study population. Lateral luxation (42.0%) in the supporting tissues was the most common injury in permanent teeth, corroborating the findings of Dang et al. (24) but contrasting with those of Gulianelli et al. (25), who found that avulsion as the most prevalent injury in permanent teeth. This difference can be explained by the fact that avulsion, considered a severe injury, is often performed in emergency hospitals, and these cases are only later referred to DTSC/UFRJ.

The lesions that occurred most frequently in permanent teeth were found in dental tissues (60.6%), and the ones in deciduous teeth were found in supporting tissues (73.3%). This was also observed by Zhang et al. (11) and Sari et al. (21), but not by Gulianelli et al. (25), who found a higher prevalence of injury in supportive tissues with both types of teeth. The most plausible reason for those results is that higher bone resilience is found in primary teeth, which associated with energy, angle and direction of traumatic impact favoring displacements to the detriment of fractures (26).

With soft tissue injuries, there was no difference in their prevalence between intra- and extra-oral regions and no difference between their prevalence in primary and permanent teeth. However, when evaluating the regions most affected by dental trauma types independently, and the types (81.4%) located in the gum tissues (31.1%) when trauma occurs in the primary and in the permanent teeth, there was a higher occurrence of lacerations (40.0%) in the region of chin (20.8%), prevalence considered to be high.

Although records of soft tissue lesions have been reviewed in only a few studies, Díaz et al. (27) corroborates our findings, in part, in that gingival (gum) contusions were the most prevalent in deciduous teeth and lacerations were the most prevalent injuries in permanent ones. However, according to these same authors, the lips were the most common region for injury in permanent teeth, which contrasts with the results of the present study, in which the chin region was the most common location for injury in permanent teeth.

A recent and well-conducted study on soft tissue lesions by Soares et al. (12) showed that the prevalence of dental injury of 56.2%, the most affected group was boys between 0 and 3 years of age, and intra-oral injuries (lip contusion, 27.5%) were more common than extra-oral (upper lip contusion, 20.7%). A study by Ritwik et al. (16) agreed with this high prevalence (73.0%) of soft tissue injury. Zhang et al. (11) found that the most frequent injury was laceration, although the anatomic regions where these injuries occurred was not indicated.

It is clear from this analysis that lips, because of their location covering part of the anterior upper incisors, can act as an impact absorber, reducing the possibility of dental fracture

and increasing the risk of dislocation and alveolar fracture. This might support the current findings of a greater prevalence of gingival contusions in deciduous teeth than primary teeth (26). However, estimates of soft tissue trauma may be underestimated because of their healing over time; therefore, they may not be recognized at the time of examination (28).

Some children and adolescents may experience a single episode of dental trauma, whereas others appear to be prone to multiple episodes of dental trauma and at high risk of developing certain lesions and complications. Thus, an important risk factor for dental trauma is a history of previous dental trauma. In our study, recurrence of dental trauma in primary teeth and permanent teeth were 26.3% and 20.2%, respectively, which is in line with results of studies by Glendor et al. (7). These numbers may be greater in patients with motor limitations, overjets greater than 5 mm, lips with inadequate closure, and other predisposing factors (19).

Although our results agree with those of most similar studies, it is still a challenge to examine all risk factors when few studies are comparable, either because of differences in methodologies or a lack of standardization methodologies in epidemiological research (18).

A possible limitation of this study is the retrospective character of the study and thus the possibility of memory bias, because there is often a lapse of time between trauma and the search for care. Therefore, prospective longitudinal studies, although more expensive, are needed to more accurately determine the incidence and risk of traumatic dental injury (28). It is worth remembering, however, that, even in longitudinal studies, this incidence rate may be underestimated because people with mild traumatic dental injury may fail to seek care.

Therefore, prospective studies of short duration would be a better option than longer term studies, because this would minimize the disadvantages of both study types (28).

Finally, in this epidemiological study, we determined the profiles of traumatized tooth (permanent or primary) according to type in patients treated at the DTSC, which will facilitate the elaboration of more effective public policies to prevent, treat, and educate for the most appropriate care in each trauma case.

Such approaches should support the inclusion of pediatric dentistry specialists in emergency hospitals because these facilities are in most cases the first to receive serious dental trauma. These professionals are highly qualified to work with children whose therapeutic and behavioral complexities must be considered to ensure quality care.

In addition, the creation of mechanisms that increase the accessibility of referral services for dentoalveolar trauma to children and adolescents should be supported, because these professionals have in-service training and are accustomed to monitoring trauma patients until they can be safely discharged. Trauma in primary teeth can reverberate to the successive permanent teeth and lead to severe complications over time if not treated appropriately early.

Moreover, consultations with pediatric dentists should be mandatory during pre and postnatal care to better educate mothers on the management of dental injuries. The importance of early possible professional care should be stressed, as well as the need for compliance with laws on the use of mouth guards, helmets, and other personal protective equipment during sports activities, especially in older children.

Finally, it is of the utmost importance that, in addition to improving dental trauma care in public services, teachers, caregivers, and children themselves are also included in continuing health education programs with lectures, activities, and online resources such as videos and interactive games to reduce dental trauma, thus improving the quality of life of many people who have experienced dental trauma.

INTEREST CONFLICTS

The authors declare no conflicts of interest.

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5 CONCLUSÃO

Segundo o proposto e de acordo com os resultados encontrados nesse estudo, conclui-se que:

- Podemos afirmar que há distinção no perfil do traumatismo entre dentes decíduos e permanentes, sugerindo-se abordagens preventivas e terapêuticas para os grupos avaliados.
- Não houve diferença significativa entre os gêneros, as idades mais prevalentes em decíduos e permanentes variaram entre $3,35 \pm 2,02$ e $9,09 \pm 2,44$, respectivamente e os incisivos centrais superiores foram os mais afetados pelos traumatismos, independente do dente ser decíduo ou permanente.
- Nos tecidos duros dentários houve maior prevalência de traumas em permanentes, porém ao analisar as injúrias independentemente as mais frequentes em decíduos foram as fraturas de esmalte e em permanentes as fraturas de esmalte e dentina não complicadas, no entanto essas injúrias não apresentaram diferenças significativas. Já, nos tecidos de sustentação, houve maior prevalência de traumas em decíduos e as subluxações são as injúrias mais prevalentes neste tipo de dente, enquanto as luxações laterais são mais prevalentes nos dentes permanentes. Com relação aos tecidos moles quando os dentes decíduos foram acometidos, houve maior frequência de trauma em mucosa gengival e nos permanentes, lesões traumáticas no mento foram mais prevalentes.
- Houve relato de recorrência de trauma em 26,3% das crianças com dentes decíduos e em 20,2% com permanentes traumatizados.

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7 ANEXOS:

7.1 ANEXO I – Carta do CEP

HOSPITAL UNIVERSITÁRIO
CLEMENTINO FRAGA FILHO
(HUCFF/ UFRJ)



PARECER CONSUBSTANCIADO DO CEP

DADOS DO PROJETO DE PESQUISA

Título da Pesquisa: Avaliação dos fatores que aumentam as chances de ocorrer traumatismo dentário em crianças e adolescentes.

Pesquisador: LUCIANNE COPLE MAIA DE FARIA

Área Temática:

Versão: 1

CAAE: 37000714.3.0000.5257

Instituição Proponente: UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

Patrocinador Principal: UNIVERSIDADE FEDERAL DO RIO DE JANEIRO

DADOS DO PARECER

Número do Parecer: 881.117

Data da Relatoria: 16/10/2014

Apresentação do Projeto:

Protocolo 202-14, do grupo III, recebido em 28.9.2014. Foram postados os seguintes documentos:

1. folha de rosto
2. carta de apresentação
3. carta de anuência do chefe do departamento
4. carta de anuência do diretor da faculdade
5. TCLE
6. TALE
7. ficha trauma
8. curriculum pesquisadores
9. projeto de pesquisa com questionários
10. termo de responsabilidade do pesquisador
11. declaração de infra-estrutura
12. lista de documentos

Endereço: Rua Prof. Rodolpho Paulo Rocco Nº255 Sala 01D-46
Bairro: Cidade Universitária **CEP:** 21.941-913
UF: RJ **Município:** RIO DE JANEIRO
Telefone: (21)3938-2480 **Fax:** (21)3938-2481 **E-mail:** cep@hucff.ufrj.br

HOSPITAL UNIVERSITÁRIO
CLEMENTINO FRAGA FILHO
((HUCFF/ UFRJ))



Continuação do Parecer: 881.117

3. Projeto resumido
4. Projeto detalhado
5. TCLE e Termo de Assentimento bem elaborados.

Recomendações:

Rever o desenho do estudo: esse não é um estudo caso-controle.

Conclusões ou Pendências e Lista de Inadequações:

Nenhuma

Situação do Parecer:

Aprovado

Necessita Apreciação da CONEP:

Não

Considerações Finais a critério do CEP:

1. De acordo com o item X.1.3.b, da Resolução CNS n.º 466/12, o pesquisador deverá apresentar relatórios semestrais que permitam ao CEP acompanhar o desenvolvimento dos projetos.
2. Eventuais emendas (modificações) ao protocolo devem ser apresentadas, com justificativa, ao CEP, de forma clara e sucinta, identificando a parte do protocolo a ser modificada.

RIO DE JANEIRO, 22 de Novembro de 2014

Assinado por:
Carlos Alberto Guimarães
(Coordenador)

Endereço: Rua Prof. Rodolpho Paulo Rocco N°255 Sala 01D-46
Bairro: Cidade Universitária **CEP:** 21.941-913
UF: RJ **Município:** RIO DE JANEIRO
Telefone: (21)3938-2480 **Fax:** (21)3938-2481 **E-mail:** cep@hucff.ufrj.br

7.2 ANEXO II – NORMAS DA REVISTA PARA QUAL O ARTIGO SERÁ

SUBMETIDO

Dental Traumatology

Dental Traumatology

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Author Guidelines

Content of Author Guidelines:

1. General, 2. Ethical Guidelines, 3. Submission of Manuscripts, 4. Manuscript Types Accepted, 5. Manuscript Format and Structure, 6. After Acceptance gás.

Useful Websites: [Submission Site](#), [Articles published in Dental Traumatology](#), [Author Services](#), [Wiley-Blackwell's Ethical Guidelines](#), [Guidelines for Figures](#)

1. GENERAL

Dental Traumatology is an international peer-reviewed journal which aims to convey scientific and clinical progress in all areas related to adult and pediatric dental traumatology. It aims to promote communication among clinicians, educators, researchers, administrators and others interested in dental traumatology. The journal publishes original scientific articles, review articles in the form of comprehensive reviews or mini reviews of a smaller area, short communication about clinical methods or techniques and case reports. The journal focuses on the following areas **as they relate to dental trauma:**

Epidemiology and Social Aspects/Periodontal and Soft Tissue Aspects

Endodontic Aspects Pediatric and Orthodontic Aspects Oral and Maxillofacial Surgery/Transplants/Implants Esthetics / Restorations / Prosthetic Aspects Prevention and Sports Dentistry Epidemiology, Social Aspects, Education and Diagnostic Aspects.

Please read the instructions below carefully for details on the submission of manuscripts, the journal's requirements and standards as well as information concerning the procedure after a manuscript has been accepted for publication in *Dental Traumatology*. Authors are encouraged to visit [Wiley-Blackwell Author Services](#) for further information on the preparation and submission of articles and figures.

2. ETHICAL GUIDELINES

Dental Traumatology adheres to the following ethical guidelines for publication and research.

2.1. Authorship and Acknowledgements

Authors submitting a paper to the journal do so on the understanding that the manuscript has been read and approved by all authors and that all authors have agreed to submit the manuscript to the Journal. ALL authors MUST have made an active and significant contribution to the development of the concept and/or design of the study, and/or analysis and interpretation of the data and/or the writing of the paper. ALL authors must have critically reviewed its content and must have approved the final version that is submitted to the journal for consideration for publication. Participation solely in the acquisition of funding or the collection of data does not justify authorship.

Dental Traumatology adheres to the definition of authorship set up by The International Committee of Medical Journal Editors (ICMJE). According to the ICMJE, the criteria for authorship should be based on: 1) substantial contributions to the concept and design of, or acquisition of data or analysis and interpretation of data, 2) drafting the article or revising it critically for important intellectual content, and 3) final approval of the version to be published. Authors should meet conditions 1, 2 and 3.

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Experimentation involving human subjects will only be published if such research has been conducted in full accordance with ethical principles, including the World Medical Association Declaration (version, 2008 <http://www.wma.net/en/30publications/10policies/b3/index.html>) and the additional requirements, if any, of the country and/or institution where the research has been carried out. Manuscripts must be accompanied by a statement that the experiments were undertaken with the understanding and written consent of each subject and according to the above mentioned principles. A statement regarding the fact that the study has been independently reviewed and approved by an ethical board should also be included. In the online submission process, it is a requirement that all authors submitting manuscripts to Dental Traumatology must answer in the affirmative to a statement 'confirming that all research has been carried out in accordance with legal requirements of the study country such as approval of ethical committees for human and/or animal research or other legislation where applicable.' Editors reserve the right to reject papers if there are doubts as to whether appropriate procedures have been used.

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Clinical trials should be reported using the CONSORT guidelines available at www.consort-statement.org. A [CONSORT checklist](#) should also be included in the submission material.

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All manuscripts submitted to Dental Traumatology will be reviewed by two experts in the field. Dental Traumatology uses a double blinded review process – hence, the names of the reviewers will not be disclosed to the author(s) who have submitted the paper and the name(s) of the author(s) will not be disclosed to the reviewers.

To allow double blinded review, please submit (upload) your main manuscript and title page as separate files.

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Review Papers: *Dental Traumatology* commissions specific topical review papers and mini reviews of small areas of interest. The journal also welcomes uninvited reviews. Reviews should be submitted via the online submission site and are subject to peer-review.

Comprehensive Reviews should be a complete coverage of a subject discussed with the Editor-in-Chief prior to pre and submission. Comprehensive review articles should include a description of search strategy of the relevant literature, the inclusion criteria, method for evaluation of papers, level of evidence, etc.

Mini Reviews cover a smaller area and may be written in a more free format.

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conclusions). The Introduction should be kept short. Thereafter the case is described followed by a short Discussion. Case reports should have adequate follow-up to demonstrate the outcome of the treatment provided or the long-term prognosis of the presented problem. Typically, cases with treatment should have at least 4-5 years follow-up radiographs, photographs, etc to show the outcome. Case reports are subject to peer review.

Case Reports illustrating unusual and clinically relevant observations are acceptable, but their merit needs to provide high priority for publication in the journal. They should be kept within 3-4 printed pages and need not follow the usual division into material and methods etc, but should have an abstract. The introduction should be kept short. Thereafter the case is described followed by a discussion.

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Meetings: advance information about and reports from international meetings are welcome, but should not be submitted via the online submission site – these should be sent directly to the Editorial Office: EDToffice@wiley.com

5. MANUSCRIPT FORMAT AND STRUCTURE

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Scientific papers should not be written in the 1st person – that is, avoid using “we”, “our”, etc. As examples, Use the ‘current study’, “the results”, “samples were tested”, instead of “our study”, “our results”, “we tested”, etc.

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The title of the paper should be concise and informative with major key words. The title should not be a question about the aim and it should not be a statement of the results or conclusions.

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(i) Clinical trials should be reported using the CONSORT guidelines available at www.consort-statement.org. A **CONSORT checklist** should also be included in the submission material. All manuscripts reporting results from a clinical trial must indicate that the trial was fully registered at a readily accessible website, e.g., www.clinicaltrials.gov.

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Results should clearly and simply present the observations/results without reference to other literature and without any interpretation of the data. Present the results in a logical sequence in the text, tables and illustrations giving the main or most important findings first. Do not duplicate data in graphs and tables.

Discussion usually starts with a brief summary of the major findings. Repetition of parts of the Introduction or of the Results sections should be avoided. Statements and interpretation of the data should be appropriately supported by original references. A comment on the potential clinical relevance of the findings should be included. The Discussion section should end with a brief conclusion but the conclusion should not be a repeat of the results and it should not extrapolate beyond the findings of the study. Link the conclusions to the aim of the study.

Do not use sub-headings in the Discussion section, The Discussion should flow from one paragraph to the next in a cohesive and logical manner.

Main Text of Review Articles should comprise an introduction and a running text structured in a suitable way according to the subject treated. A final section with conclusions may be added.

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5.3. References

As the Journal follows the Vancouver system for biomedical manuscripts, the author is referred to the publication of the International Committee of Medical Journal Editors: Uniform requirements for manuscripts submitted to biomedical journals. *Ann Int Med* 1997;126:36-47.

The references should be numbered consecutively in the order in which they are first mentioned in the text. Identify references in the text, tables, and legends by Arabic numerals (in parentheses). Use the style of the examples below, which are based on the format used by the US National Library of Medicine in Index Medicus. For abbreviations of journals, consult the 'List of the Journals Indexed' printed annually in the January issue of Index Medicus. Authors can also review previous articles published in the journal to see the style used for references.

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Examples of reference styles used by *Dental Traumatology*

Journal Articles: Lam R, Abbott PV, Lloyd C, Lloyd CA, Kruger E, Tennant M. Dental trauma in an Australian Rural Centre. *Dent Traumatol* 2008; 24: 663-70.

Text book chapters:

Andreasen J, Andreasen F. Classification, etiology and epidemiology. IN: Andreasen JO, Andreasen FM, eds. *Textbook and Color Atlas of Traumatic Injuries to the Teeth*. 3rd Edn. Munksgaard, Copenhagen. 1994;151-80.

Thesis or Dissertation:

Lauridsen, E. Dental trauma – combination injuries. Injury pattern and pulp prognosis for permanent incisors with luxation injuries and concomitant crown fractures. Denmark: The University of Copenhagen. 2011. PhD Thesis.

Corporate Author:

European Society of Endodontology. Quality guidelines for endodontic treatment: consensus report of the European Society of Endodontology. *Int Endod J* 2006;39:921-30.

American Association of Endodontists. The treatment of traumatic dental injuries. Available at: URL: 'http://www.aae.org/uploadedfiles/publications_and_research/newsletters/endodontics_colleagues_for_excellence_newsletter/ecfe_summer2014_final.pdf'. Accessed September 2015.