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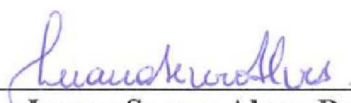
Felipe Lappann Leal

**PROGRESSÃO DE LESÕES CARIOSAS NÃO CAVITADAS EM
ADOLESCENTES DE PORTO ALEGRE-RS**

Santa Maria, RS
2018

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Dissertação apresentada ao Curso de Mestrado do Programa de Pós-Graduação em Ciências Odontológicas, Área de Concentração em Odontologia, ênfase em Dentística, da Universidade Federal de Santa Maria (UFSM, RS), como requisito parcial para obtenção do título de **Mestre em Ciências Odontológicas**.

Orientadora: Profa. Dra. Luana Severo Alves
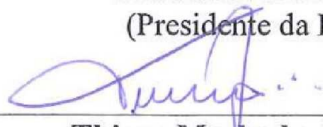
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Aprovado em 20 de fevereiro de 2018:

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Santa Maria, RS
2018

PROGRESSÃO DE LESÕES CARIOSAS NÃO CAVITADAS EM ADOLESCENTES DE PORTO ALEGRE-RS

AUTOR: Felipe Lappann Leal
ORIENTADORA: Luana Severo Alves

As lesões cariosas não cavitadas inativas (LNCI), por definição, são consideradas lesões "paralisadas", sendo entendidas como cicatrizes de episódios passados de atividade de cárie. Por outro lado, lesões de cárie não cavitadas ativas (LNCA) estão sob perda mineral e demandam alguma intervenção para controlar sua progressão. O objetivo desse estudo foi analisar o comportamento clínico de LNCI e LNCA em escolares de Porto Alegre, RS, a fim de verificar a validade do critério de avaliação de atividade de cárie. Foi realizado um levantamento epidemiológico para avaliar as condições de saúde bucal de escolares de 12 anos. Neste levantamento, 1.528 escolares foram examinados entre setembro de 2009 e dezembro de 2010, constituindo uma amostra representativa da população de escolares de 12 anos do município. Entre agosto de 2012 e maio de 2013 (tempo médio de seguimento de 2,5 anos), 801 escolares foram reexaminados e assim obteve-se um componente longitudinal. A coleta de dados incluiu a aplicação de questionários e exame clínico, que incluiu o registro do índice de sangramento gengival, limpeza profissional, secagem e registro do índice de cárie dentária (lesões não cavitadas e cavitadas, inativas e ativas). O desfecho primário deste estudo foi progressão, definida como a presença de sombreamento em dentina, cavidade, restauração ou extração no exame final. A associação entre as variáveis preditoras e o desfecho foi avaliada através de modelos de regressão binomial negativa (não-ajustados e ajustados) gerados com equações de estimativas generalizadas, seguindo uma abordagem hierárquica. O status da superfície dentária na linha de base (hígida, cárie-inativa ou cárie ativa) foi considerada a variável preditora principal. Um total de 19.438 dentes permanentes e 46.238 superfícies dentárias foi incluído no estudo. Foram observadas taxas de progressão de 1,0%, 9,0%, e 12,6% para superfícies hígidas, LNCI e LNCA, respectivamente. A análise de risco demonstrou que lesões cariosas inativas e ativas apresentaram um risco aproximadamente 5 vezes maior de progressão do que superfícies hígidas ao longo do estudo (razão de incidência [RI] ajustada=5.35, 95% intervalo de confiança[IC]=4.20-6.80 e RI ajustada=4.97, 95% IC=3.44-7.19, respectivamente). Pode-se concluir que o padrão de progressão de lesões cariosas não cavitadas inativas e ativas foi similar nesta população de adolescentes de Porto Alegre-RS, sendo significativamente maior que as superfícies hígidas.

Palavras-chave: Análise de Risco. Cárie Dentária. Dentição Permanente. Estudo Longitudinal. Progressão de Doença.

ABSTRACT

PROGRESSION OF NON-CAVITATED CARIES LESIONS AMONG ADOLESCENTS FROM PORTO ALEGRE-RS

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Inactive non-cavitated (INC) caries lesions, by definition, are considered as "arrested" lesions, being understood as scars from past episodes of caries activity. On the other hand, active non-cavitated (ANC) caries lesions are under mineral loss and require some intervention to control their progression. The objective of this study was to analyze the clinical behavior of INC and ANC caries lesions among schoolchildren of Porto Alegre, RS, in order to verify the validity of the caries activity assessment criterion. An epidemiological survey was carried out to evaluate the oral health conditions of 12-year-old schoolchildren. In this survey, 1,528 schoolchildren were examined between September 2009 and December 2010, composing a representative sample of the population of 12-year-old schoolchildren in the municipality. Between August 2012 and May 2013 (mean follow-up time of 2.5 years), 801 schoolchildren were reexamined and thus a longitudinal component was obtained. Data collection included the application of questionnaires and clinical examination, which included gingival bleeding index, professional cleaning, drying and recording of dental caries index (non cavitated and cavitated, inactive and active lesions). The primary outcome of this study was progression, defined as the presence of dark shadow from dentin, cavity, restoration or extraction in the final exam. The association between the predictor variables and the outcome was evaluated through negative binomial regression models (unadjusted and adjusted) generated with generalized estimating equations, following a hierarchical approach. The status of the dental surface at the baseline (sound, INC or ANC) was considered the main predictor variable. A total of 19,438 permanent teeth and 46,238 dental surfaces were included in the study. Progression rates of 1.0%, 9.0%, and 12.6% were observed for sound surfaces, INC lesions and ANC lesions, respectively. The risk analysis showed that inactive and active carious lesions presented an approximately 5-fold increased risk of progression than sound surfaces throughout the study (IRR=5.35, 95%CI=4.20-6.80 and IRR=4.97, 95%CI=3.44-7.19, respectively). It can be concluded that the progression pattern of inactive and active non-cavitated carious lesions was similar in this population of adolescents from Porto Alegre-RS, being significantly higher than the sound surfaces.

Keywords: Dental Caries. Disease Progression. Longitudinal Study. Permanent Dentitin. Risk Assessment.

SUMÁRIO

1 INTRODUÇÃO

Tradicionalmente, a classificação das lesões cariosas baseava-se na presença ou não de cavidades com base no conceito de que a doença cárie só poderia ser tratada de modo operatório. Com a redução da experiência de cárie observada nas últimas décadas, observa-se um novo padrão de distribuição das lesões, com maior prevalência de lesões não cavitadas em relação às lesões cavitadas (PITTS; FYFEE, 1988; ISMAIL et al., 1992; BRAGA et al., 2009). Como consequência, critérios de detecção de lesões cariosas mais sensíveis foram desenvolvidos a fim de detectar os estágios iniciais da doença, permitindo um diagnóstico mais preciso da doença (NYVAD et al., 1999; ISMAIL et al., 2007).

Além da detecção precoce, esforços têm sido empreendidos para classificar a atividade das lesões e compreender como elas progridem. De uma maneira geral, as lesões cariosas podem ser classificadas como lesões inativas e ativas. As lesões cariosas inativas, por definição, são consideradas lesões "paralisadas", sendo entendidas como cicatrizes de episódios passados de atividade de cárie. Por outro lado, as lesões cariosas ativas estão sob perda mineral. O critério mais comumente utilizado para classificar a atividade das lesões cariosas baseia-se na inspeção visual e avaliação das suas características clínicas, tais como rugosidade/consistência, coloração e reflexão da luz (MALTZ et al.,2003).

Alguns estudos têm sido conduzidos a fim de validar o critério de atividade das lesões de cárie através da comparação da probabilidade de progressão de lesões não cavitadas inativas (LNCI) e lesões não cavitadas ativas (LNCA). A partir do acompanhamento de 3 anos de 273 crianças de 12 anos da Lituânia, NYVAD et al. (2003) concluíram que o método utilizado para classificação da atividade de cárie obteve validade preditiva e validade de construto. Quanto à dentição decídua, GUEDES et al. (2014) acompanharam 469 pré-escolares pelo período de 2 anos utilizando o critério padrão de avaliação de atividade de cárie em associação ao ICDAS ISMAIL et al. (2007) e obtiveram resultados semelhantes.

Apesar destas evidências, estes estudos apresentam algumas características que merecem ser comentadas. O estudo de NYVAD et al. (2003) não observou risco significativamente maior de progressão para cavitação, restauração ou extração para lesões não cavitadas ativas comparativamente às inativas. Além disso, este estudo derivou de um estudo de intervenção com uma amostra de conveniência. No que concerne ao estudo de GUEDES et al. (2014), é válido ressaltar a grande proporção de lesões cariosas ativas

comparativamente às inativas, assim como a verificação de maior risco de progressão entre LNCA do que entre LNCI apenas em superfícies oclusais. Somado a isso, o estudo realizado por FERREIRA-ZANDONÁ et al. (2012) em uma população de alta prevalência de cárie de Porto Rico demonstrou taxas de progressão de LNCA semelhantes às observadas para as LNCI.

Tendo em vista o exposto, nesta dissertação é apresentado um artigo científico intitulado "**Progression of non-cavitated caries lesions according to lesion activity: a 2.5-year longitudinal study**", cujo objetivo foi avaliar o comportamento clínico de lesões cariosas não cavitadas inativas e ativas em adolescentes de Porto Alegre-RS ao longo do tempo a fim de avaliar a validade do critério clínico visual de atividade de cárie.

2 ARTIGO – PROGRESSION OF NON-CAVITATED CARIES LESIONS ACCORDING TO LESION ACTIVITY: A 2.5-YEAR LONGITUDINAL STUDY

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Progression of non-cavitated caries lesions according to lesion activity: a 2.5-year longitudinal study

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Abstract

The aim of this longitudinal study was to evaluate the pattern of progression of inactive non-cavitated (INC) and active non-cavitated (ANC) caries lesions in a population-based sample of South Brazilian adolescents in order to check the validation of the visual caries activity assessment. A total of 801 schoolchildren were examined at baseline (12 years) and after a mean time interval of 2.5 years. Data collection included the application of questionnaire and clinical examination. The primary outcome of this study was caries progression, defined as the presence of cavity, dark shadow from dentine, filling or extraction at the follow-up examination. Negative binomial regression models (unadjusted and adjusted) were used to estimate the risk for caries progression over the study period. Models were fitted using generalized estimating equations following a hierarchical approach. The main predictor variable was the status of the surface at baseline: sound, INC lesion, or ANC lesion. A total of 19,438 permanent teeth and 46,238 tooth surfaces were included. After 2.5 years, progression rates of 1.0%, 9.0%, and 12.6% were found for sound surfaces, INC lesions, and ANC lesions, respectively. In the adjusted model, it was observed that INC and ANC lesions had an approximately 5-fold increased risk for caries progression than did sound surfaces (IRR=5.35, 95%CI=4.20-6.80 and IRR=4.97, 95%CI=3.44-7.19, respectively). In conclusion, this longitudinal study found a similar pattern of progression for inactive and active non-cavitated caries lesions among South Brazilian adolescents. Our findings emphasize the difficulty of classifying caries activity in low caries prevalence populations.

Introduction

Caries detection was traditionally based on the presence of cavities based on an outdated concept that the caries disease should be treated operatively (by restoration). The better understanding of the caries process leads to the detection of caries lesion at early stages (at non-cavitated level) and to the possibility to control the caries process (Gustafsoon et al., 1954). However, while some non-cavitated lesions progress to dentinal lesions requiring operative treatment, some do not progress (Dalderup and Backer Dirks, 1966). Many of these non-progressing lesions leave scars in the dental tissue and has been considered as arrested lesion. In addition to the detection of dental caries at its early stages, efforts have been made to classify lesion activity and to understand how lesion progression occurs in order to define the need for treatment.

The most accepted criteria for lesion activity assessment is the one based on visual inspection and evaluation of the clinical features of the lesion, such as surface roughness/consistency, color and light reflection (Holmen et al., 1987a; Holmen et al., 1987b). Previous studies have tried to assess the predictive validity of this criterion by comparing the likelihood of progression of active non-cavitated (ANC) and inactive non-cavitated (INC) caries lesions over a given period of time. Guedes et al. (2014) evaluated 469 preschool children over 2 years and showed that ANC lesions were twice more likely to become frankly cavitated, restored, or missed than did inactive ones. This study, therefore, was successful in validating the caries activity assessment system in the primary dentition. On the permanent dentition, Nyvad et al. (2003) studying 273 12-year-old children over a period of 3 years in both fluoride-exposed and control groups concluded that the clinical diagnostic criteria have construct and predictive validity for the assessment of caries lesion activity. On the other hand, similar progression rates for ANC and INC lesions were observed in a 4-year observational study (Ferreira-Zandoná et al., 2012).

Considering these inconsistent results, the aim of this study was to evaluate the pattern of progression of inactive and active non-cavitated caries lesions in a population-based sample of South Brazilian adolescents in order to check the validation of the visual caries activity assessment.

Methods

Ethics

The study protocol was approved by the Federal University of Rio Grande do Sul Research Ethics Committee (299/08) and by the Municipal Health Department of Porto Alegre Research Ethics Committee (process number 001.049155.08.3/register number 288 and process nº 001.028618.12.2/register nº 807). All participants and their parents/legal guardians provided written informed consent.

Sample

At baseline, a cross-sectional study was conducted in southern Brazil, from September 2009 to December 2010 with schoolchildren aged 12 years old who were attending public and private schools. A multistage probability sampling strategy was used. The primary sampling unit consisted of five geographical areas organized according to the municipal water fluoridation system. Within each area, the schools were randomly selected proportional to the Number of private and public schools (42 schools: 33 public and 9 private). Schoolchildren born in 1997 or 1998 were then randomly selected proportional to school size. The following parameters were used for the sample calculation: caries prevalence of 60% (Barbachan e Silva, Maltz, 2001) with a precision level of ±3% for the 95% confidence interval and to assume a design effect of 1.3. The minimum sample size required for this study was 1,331 schoolchildren. A nonresponse error of 40% was added, and a final sample size of 1,837 was estimated. A total of 1,528 schoolchildren were examined, yielding a response rate of 83.2%.

Between August 2012 and May 2013, 801 schoolchildren were reexamined after a mean period of 2.5 years (standard deviation [SD] = 0.3), representing 52.4% of the sample initially examined. Figure 1 provides the study flowchart.

Data collection

Data collection included the application of a questionnaire and clinical examination. A structured questionnaire containing questions on socio-demographic information and oral health related habits was sent to the parents/legal guardians of the selected students.

Clinical examination was conducted at the schools, with the students in a supine position, using artificial light, air compressor, and suction. After professional tooth cleaning

and drying, the examiner recorded the presence of caries lesions according to the following criteria: 1) active non-cavitated lesion (ANC) = opaque enamel with a dull-whitish surface; 2) inactive non-cavitated lesion (INC) = shiny appearance of the surface area with a white or different degrees of brownish discoloration; 3) active cavitated lesion (AC) = localized surface destruction with active characteristics (dull-whitish enamel and soft dentin with light brown color); and 4) inactive cavitated lesion (IC) = localized surface destruction with arrested characteristics (shiny, hard surfaces with different degrees of brownish discoloration) . Dark shadows from dentine, missing or filled teeth were also recorded. Clinical examinations were performed at baseline and at follow-up according to the same protocol (Maltz et al., 2003).

Data collection was performed at baseline and at follow-up following the same protocol.

Examiners and reproducibility

At baseline, caries examination was performed by a single calibrated examiner (LSA). Training and calibration were performed before the beginning of the study. During the survey, calibration was monitored by means of repeated examinations conducted on 5% of the sample. The overall unweighted Cohen's kappa value was 0.84 (95% CI=0.82-0.87). Per category, the following unweighted Cohen's kappa values were obtained: sound surfaces 0.90 (95% CI=0.88-0.93), INC 0.75 (95%CI=0.70-0.81), ANC 0.81 (0.73-0.90).

At follow-up, clinical examination was conducted by another examiner (CDB), who was trained and calibrated by the first examiner (LSA). During the survey, calibration was also monitored by means of repeated examinations on 5% of the sample. The lowest intra-examiner unweighted Cohen's kappa value was 0.81 (CDB). The inter-examiner unweighted Cohen's kappa value was 0.78.

Data analysis

The primary outcome of this study was caries progression, defined as the presence of cavity (inactive or active), dark shadow from dentine, filling or extraction at the follow-up examination.

Our main predictor variable was the status of the surface at baseline: sound, INC lesion, or ANC lesion. Other predictor variables included in the study was sex (reference:

female vs. male), skin color (reference: white vs. non-white), mother's education (reference: >8 years vs. ≤8 years), tooth brushing frequency (reference: ≥3 times/day vs. 2 times/day or ≤1 time/day), caries experience (reference: DMF-S=0 vs. DMF-S 1-4 or DMF-S ≥5), tooth type (reference: anterior vs. posterior), arch (reference: upper vs. lower), and surface type (reference: buccal vs. palatal or occlusal).

Data analysis was performed using SPSS, version 18.0. Baseline characteristics of followed individuals and those lost to follow-up were compared using the chi-square test and the Wald test. Negative binomial regression models (unadjusted and adjusted) were used to estimate the risk for caries progression over the study period. Incidence risk ratio (IRR) and their respective 95% confidence interval (95% CI) were estimated. Since caries data at the surface level are clustered within each child and per tooth, regression models were fitted using generalized estimating equation (GEE) with exchangeable working correlation matrices. The adjusted model followed a hierarchical approach (Victora et al., 1997), considering socio-demographic characteristics as distal, behavioral as mediating, and clinical as proximate determinants. Only predictor variables presenting a P value ≤ 0.20 in the unadjusted analysis were selected for adjusted model, except for sex and skin color, which remained in the final model irrespective of their statistical significance. Therefore, IRR described in the adjusted model are adjusted for the variables of the same level and of the upper levels. Due to collinearity between the variables school and mother's education, only the former was maintained in the adjusted model. This choice was based on the strength of the association in the unadjusted model, which was greater for school.

An exploratory analysis was performed to compare progression rates for sound, INC, and ANC lesions according to patient's caries activity using the chi-square test. For this purpose, individuals were classified as caries-free (all sound surfaces); caries-inactive (sound surfaces and INC lesions); or caries-active (at least one ANC lesion).

Results

Comparing the baseline characteristics of adolescents lost to follow-up with those who remained in the study, we observed a significantly lower proportion of private school attendees among participants than among those lost to follow-up. There were no significant differences in regards to gender, socioeconomic status, and toothbrushing frequency.Individuals lost to follow-up had significantly higher caries experience (prevalence

and mean DMFS) than did followed schoolchildren.The baseline characteristics of the sample are described in Table 1. At the individual level, boys represented 51.7% of the sample (n=414) and girls 48.3% (n=387). The majority of the children was white, attended public schools, had less educated mothers, and reported a brushing frequency of twice a day. In regards to caries experience at baseline, 46.2% had a DMF-S=0 (n=370). A total of 19,438 permanent teeth were included. On average, each child contributed with 24.3 permanent teeth (SD=4.2), ranging from 10 to 28. Approximately 30% of the sample had complete permanent dentition at the follow-up examination. At the tooth level, the majority of the elements were located at the posterior region and at the lower arch. A total of 46,238 tooth surfaces were included in the study. At the surface level, most of the examined surfaces were palatal, followed by buccal, and occlusal. The great majority of the surfaces were classified as sound (95.2% n=44,017) at the baseline examination, followed by INC lesions (4%, n=1,872), and ANC lesions (0.8%, n=349).

After 2.5 years, progression rates of 1.0%, 9.0%, and 12.6% were found for sound surfaces, INC lesions, and ANC lesions, respectively, yielding an overall progression rate of 1.4%. Table 2 describes the transitions of sound surfaces, INC and ANC caries lesions from baseline to follow-up. Regarding the surfaces classified as sound at the baseline examination, 93.6% remained sound at follow-up, with the majority of transitions to INC lesions (4.9%). The vast majority of INC lesions remained unaltered or regressed to sound surfaces (77.4% and 12.9%, respectively), whereas 4.2% cavitated but remained inactive. Approximately 87% of the ANC lesions reverted to sound surfaces, inactivated, or remained in the same category.

Table 3 shows the association between predictor variables and caries progression. In the unadjusted analysis, all variables were significantly associated with caries progression, except for sex. In the adjusted model, it was observed that INC and ANC lesions had an approximately 5-fold increased risk for caries progression than did sound surfaces (IRR=5.35, 95%CI=4.20-6.80 and IRR=4.97, 95%CI=3.44-7.19, respectively). With the exception of the demographic variables sex and skin color, all other variables were also significantly associated with caries progression in adjusted model. Children from public schools, reporting a lower brushing frequency, and those with higher caries experience were more prone to suffer caries progression. Furthermore, posterior and lower teeth showed an increased risk for caries progression compared with anterior and upper teeth. In regards to tooth surface,

occlusal surface appeared as a risk factor whereas palatal surfaces as a protective factor against caries progression.

Progression rates for sound, INC, and ANC lesions according to patient's caries activity are described in Table 4. Overal progression rates were 0.6%, 1.1%, and 2.2% fror caries-free, caries-inactive, and caries-active individuals, respectively (p<0.05). In regards to the status of the tooth surfaces at baseline, sound surfaces and INC lesions showed significantly higher progression rates among caries-active patients (1.5% and 11.4%, respectively) than among caries-inactive patients (0.7% and 7.3%, respectively).

Discussion

This study was undertaken to assess the pattern of progression of inactive and active non-cavitated caries lesions among South Brazilian adolescents in order to check the validation of the visual caries activity assessment. To the best of our knowledge, this is the first population-based longitudinal study assessing the validity of this criterion in permanent teeth.

Inactive lesions, by definition, are not under mineral loss and therefore do not show tendency to progress, being considered just as scars of past episodes of caries activity. Some in situ studies (Iijima and Takagi, 2000; Koulourides and Cameron, 1980; Maltz et al 2006) found evidence that tooth surfaces that underwent cariogenic attacks and were later arrested showed greater resistance to new acid challenges than sound surfaces. This additional resistance attributed to inactive caries lesions could be explained by the remineralization of the enamel, which occurs through a substitution of more soluble minerals by minerals with greater resistance to acids. On the other hand, clinical studies have shown that inactive lesions have a greater likelihood of progression than sound surfaces (Nyvad et al., 2003; Ferreira-Zandoná et al., 2012; Zenkner et al., 2016). Even in the presence of fluoride, inactive caries lesions presented an approximately 8-fold increased risk for progression to cavitation, filling or extraction than sound enamel among Lithuanian schoolchildren (Nyvad et al., 2003). Similarly, higher progression rates were found for inactive lesions than sound surfaces in a high-caries risk population from Puerto Rico (Ferreira-Zandoná et al., 2012). Recently, these evidences have been corroborated by Zenkner et al. (2016), who showed that inactive lesions tend to progress twice as often as sound surfaces in a convenience sample of schoolchildren from South Brazil. The results of the present study are in agreement with these previous

findings since inactive lesions had higher risk for progression than did sound surfaces. In this population-based study, surfaces classified as INC lesions at baseline showed a 5-fold increased risk to have a cavity, dark shadow, filling or extraction at the follow-up examination than did surfaces classified as sound.

In regards to caries lesion activity, our findings suggest that INC lesions and ANC lesions have similar progression rates, which is in agreement with the findings by Nyvad et al. (2003). In that study, although the authors discussed that "ANC lesions had a higher risk of progressing to a cavity or filling than did INC lesions" and concluded that "the clinical diagnostic criteria have construct and predictive validity for the assessment of caries lesion activity", these statements were not supported by the data. In the risk assessment analysis, the authors found no significant difference between the risk of progression of INC and ANC lesions in both groups (RR=1.04, 95%ICI=0.8-1.3 for fluoride group; RR=1.24, 95%CI=0.9-1.26 for control group). In addition, when different tooth surfaces were analyzed separately, ANC lesions showed a significantly lower progression risk than INC lesions in smooth surfaces (RR=0.61, 95%CI=0.4-0.9), thus contradicting the hypothesis that active lesions should have greater progression than inactive ones. Corroborating the findings by Nyvad et al. (2003), the present study found that both INC and ANC lesions had similar progression risks, around 5 times the progression risk observed for sound surfaces. In conjunction, these evidences suggest that classifying caries activity at a single moment using the visual criterion in permanent teeth is of questionable reliability. In primary dentition, Guedes et al. (2014) showed a higher risk of progression to cavity, restoration, or filling in ANC lesions compared to INC lesions. However, the extrapolation of these findings to the permanent dentition is difficult due to the great disparity in the distribution of active and inactive lesions, with approximately 15% of INC lesions and 85% of ANC lesions in the study by Guedes et al. (2014). In our study, from a total of 2,221 non-cavitated lesions detected at baseline, around 84% were INC lesions and 16% were ANC lesions.

The exploratory analysis of progression rates according to patient's caries activity showed that the condition of caries activity of the patient influences the pattern of progression of sound surfaces, INC, and ANC lesions. Sound surfaces showed similar progression rates among caries-free (0.6%) and caries-inactive (0.7%) patients, which was significantly lower and approximately the half of the progression rate found among caries-active patients (1.5%). Similarly, INC lesions also had a significantly lower progression rate among caries-inactive

individuals (7.3%) than among caries-active ones (11.4%). This findings show the importante of assessing and classifiying patients' caries activity in order to purpose the best treatment option, as previously discussed in the literate (Twetman and Fontana, 2009). In caries-acive patients, both INC and ANC lesions showed similar progression rates (11.4% and 12.6%, respectively, p>0.05), thus suggesting that the presence of an unbalance between de- and remineralization in the mouth are able to promote the progression of both types of lesion.

Dental caries might be defined in a continuum ranging from slight biochemical changes to obvious lesions. In the "pre-fluoride era", the prevalence of dental caries was higher and caries lesions used to progress faster than we observe nowadays. Currently, with the widespread use of fluoridated products at the population level, caries progression is slower and can take a long time from the initial signs of the disease up to a frank cavitation. In addition, dental caries is a chronic and dynamic disease, with many regressing cases from baseline to follow-up being considered as biologically plausible, referred to as "reversals" (Ismail et al., 2011). An example of a biologically plausible reversal is the transition of non-cavitated lesions to sound surfaces, as we observed in our study. From a total of 1,872 surfaces classified as INC lesions at baseline, 12.9% (n=242) reverted to sound at the follow-up examination. In regards to ANC lesions, 147 out of 349 (42.1%) of ANC lesions regressed to sound at follow-up. The greater proportion of reversals among ANC lesions may be explained by the fact that a white lesion is more likely to be polished up to disappear than a brown/pigmented lesion. This dynamic behavior of dental caries, with recurrent episodes of de-remineralization, added to the long time between the first signs to a cavity leads to a wide range of possibilities between an obvious active lesion and an obvious inactive lesion, with several intermediate aspects that make the caries activity assessment a complex and sometimes contradictory process.

Much has been discussed about the difficulty and reliability of the detection of non-cavitated lesions in epidemiological surveys. As previously commented by Carvalho et al. (2014), with participants lied down on tables under suitable conditions for professional cleaning of the teeth and equipment for lighting and drying, it is possible to overcome the obstacles imposed by the field conditions and thus obtain a reliable diagnosis of non-cavitated lesions. In the present study, we could obtained high kappa coefficients by categories, including for INC lesions, contradicting the difficulties reported by Carvalho et al. (2014) for the reproducibility of the diagnosis of INC lesions. We could also emphasize the fact that only

two examiners were involved in data collection, one calibrated by the other, as well as our population-based sample. On the other hand, among the shortcomings of this study, we need to recognize the high proportion of schoolchildren lost to follow-up, with significant differences between individuals who were lost to follow-up and those who remained in the study regarding some baseline characteristics, as well asthe lack of dietary data.

In conclusion, this longitudinal study found a similar pattern of progression for inactive and active non-cavitated caries lesions among South Brazilian adolescents. Our findings emphasize the difficulty of classifying caries activity in low caries prevalence populations. The definition of patient's profile regarding caries activity may be a useful tool to define the best treatment decision for non-cavitated caries lesions.

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Tables

Table 1. Baseline characteristics of the sample.

	N (%)
Variables – individual level	
Sex	
Female	387 (48.3)
Male	414 (51.7)
Skin color	
White	555 (69.3)
Non-white	246 (30.7)
School	
Private	117 (14.6)
Public	684 (85.4)
Mother's education*	
> 8 years	383 (48.0)
≤ 8 years	415 (52.0)
Tooth brushing	
≥3 times/day	275 (34.3)
2 times/day	349 (43.6)
≤ 1 time/day	177 (22.1)
Caries experience	
DMF-S = 0	370 (46.2)
DMF-S 1-4	313 (39.1)
DMF-S ≥5	118 (14.7)
TOTAL	801 (100)
Variables – tooth level	
Tooth type	
Anterior	9,028 (46.4)
Posterior	10,410 (53.6)
Arch	
Upper	9,445 (48.6)
Lower	9,993 (51.4)
TOTAL	19,438 (100)
Variables – surface level	
Surface type	
Buccal	17,485 (37.8)
Palatal	19,067 (41.2)
Occlusal	9,686 (20.9)
Caries status	
Sound	44,017 (95.2)
Inactive non-cavitated lesion	1,872 (4.0)
Active non-cavitated lesion	349 (0.8)
TOTAL	46,238 (100)

*Missing data.

Table 2. Transitions of sound surfaces, inactive and active non-cavitated caries lesions from baseline to follow-up. N (%).

Baseline	Follow-up								
	Sound	INC	ANC	IC	AC	Shadows	Filled	Missing	TOTAL
Sound	41,225 (93.6)	2,174 (4.9)	180 (0.4)	108 (0.2)	140 (0.3)	39 (0.1)	112 (0.3)	39 (0.1)	44,017 (100)
INC	242 (12.9)	1,449 (77.4)	12 (0.6)	78 (4.2)	34 (1.8)	9 (0.5)	45 (2.4)	3 (0.2)	1,872 (100)
ANC	147 (42.1)	106 (30.4)	52 (14.9)	6 (1.7)	20 (5.7)	2 (0.6)	15 (4.3)	1 (0.3)	349 (100)
TOTAL	41,614 (90.0)	3,729 (8.1)	244 (0.5)	192 (0.4)	194 (0.4)	50 (0.1)	172 (0.4)	43 (0.1)	46,238 (100)

INC=inactive non-cavitated lesion; ANC=active non-cavitated lesion; IC=inactive cavitated lesion; AC=active cavitated lesion.

Table 3. Association between predictor variables and caries progression (Unadjusted and adjusted negative binomial regression models following a hierarchical approach).

	Unadjusted		Adjusted	
	IRR (95% CI)	P	IRR (95% CI)	p
1st block: Socio-demographics				
Sex				
Female	1.00		1.00	
Male	0.94 (0.75-1.19)	0.64	0.95 (0.75-1.19)	0.64
Skin color				
White	1.00		1.00	
Non-white	1.30 (1.02-1.66)	0.03	1.24 (0.98-1.59)	0.08
School				
Private	1.00		1.00	
Public	1.64 (1.12-2.41)	0.01	1.57 (1.07-2.31)	0.02
Mother's education				
> 8 years	1.00		-	
≤ 8 years	1.36 (1.07-1.72)	0.01	-	
2nd block: Behavioral				
Tooth brushing				
≥3 times/day	1.00		1.00	
2 times/day	1.36 (1.03-1.78)	0.03	1.37 (1.04-1.80)	0.02
≤ 1 time/day	1.78 (1.32-2.42)	<0.001	1.73 (1.27-2.35)	<0.001
3rd block: Clinical				
Caries experience				
DMF-S=0	1.00		1.00	
DMF-S 1-4	2.09 (1.58-2.77)	<0.001	2.14 (1.60-2.87)	<0.001
DMF-S ≥5	3.81 (2.80-5.17)	<0.001	3.31 (2.39-4.57)	<0.001
Tooth type				
Anterior	1.00		1.00	
Posterior	7.48 (5.03-11.13)	<0.001	4.87 (3.20-7.41)	<0.001
Arch				
Upper	1.00		1.00	
Lower	1.58 (1.32-1.90)	<0.001	1.73 (1.44-2.09)	<0.001
Surface type				
Buccal	1.00		1.00	
Palatal	0.57 (0.46-0.72)	<0.001	0.60 (0.48-0.75)	<0.001
Occlusal	2.84 (2.35-3.44)	<0.001	1.26 (1.00-1.58)	0.04
Caries status				
Sound	1.00		1.00	
Inactive non-cavitated lesion	9.09 (7.43-11.11)	<0.001	5.35 (4.20-6.80)	<0.001
Active non-cavitated lesion	10.43 (7.15-15.21)	<0.001	4.97 (3.44-7.19)	<0.001

Table 4. Progression rates for sound, INC and ANC lesions according to patient's caries activity.

	Caries free (n=174)	Caries inactive (n=327)	Caries active (n=300)	Overall (n=801)
Sound	0.6[a] (56/9,929)	0.7[Aa] (131/17,690)	1.5[Ab] (251/16,398)	1.0 (438/44,017)
INC lesion	-	7.3[Ba] (79/1,080)	11.4[Bb] (90/792)	9 (169/1,872)
ANC lesion	-	-	12.6[B] (44/349)	12.6 (44/349)
TOTAL	0.6[a] (56/9,929)	1.1[b] (210/18,770)	2.2[c] (385/17,539)	1.4 (651/46,238)

INC=Inactive non-cavitated; ANC=Active non-cavitated.
Different lowercase letters indicate statistical significant difference in rows; different uppercase letters indicate statistical significant difference in columns (chi-square test, $p<0.05$).

Figure
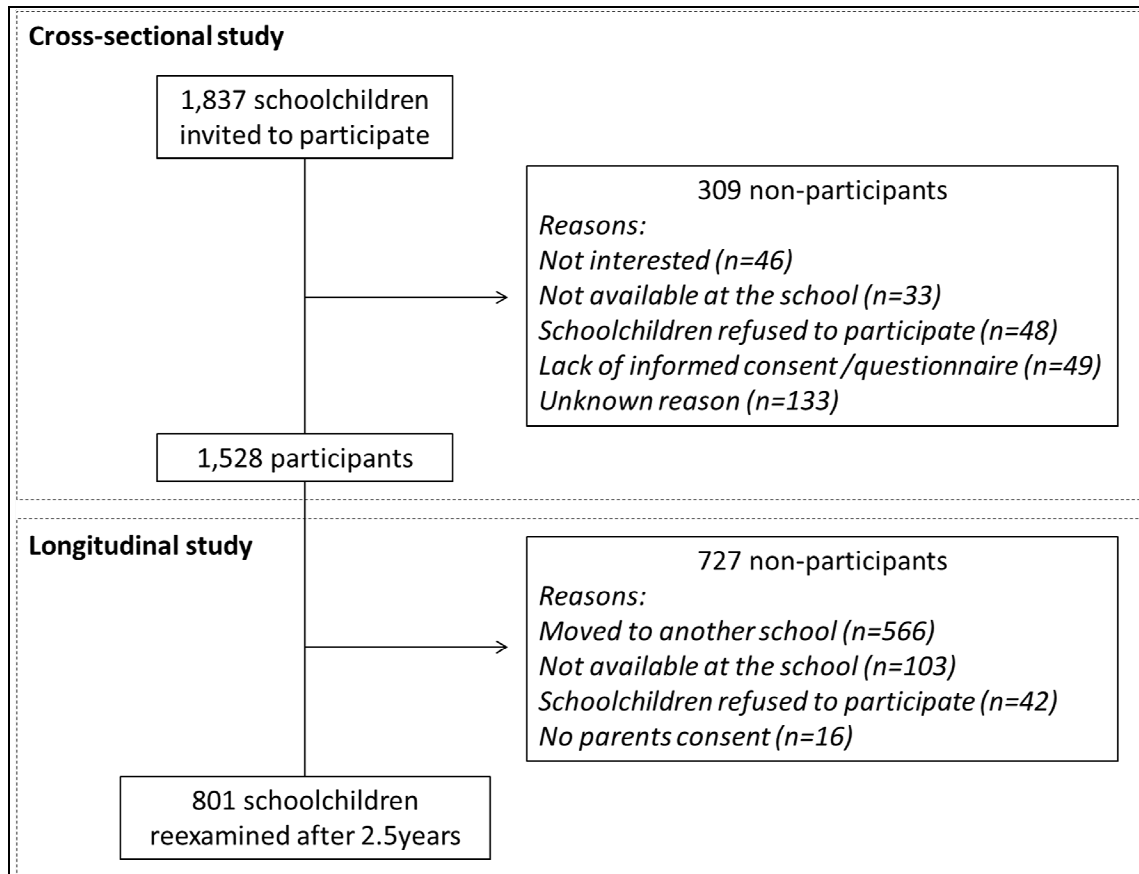
Figure 1. Study flowchart.

3 CONCLUSÃO

Com base nos resultados desta dissertação, foi possível concluir que o padrão de progressão de lesões de cárie não cavitadas inativas e ativas foi similar em adolescentes do sul do Brasil. Esse fato demonstra a dificuldade na classificação de atividade de cárie em populações de baixa prevalência de cárie.

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ANEXO A – CARTA DE APROVAÇÃO DO COMITÊ DE ÉTICA EM PESQUISA DA UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL (ESTUDO TRANSVERSAL)

=UFRGS
Universidade Federal do Rio Grande do

Faculdade de Odontologia

COMITÊ DE ÉTICA EM PESQUISA

RESOLUÇÃO

O Comitê de Ética em Pesquisa e a Comissão de Pesquisas da Faculdade de Odontologia da Universidade Federal do Rio Grande do Sul analisaram o Projeto:

Número: 299/08

Título: ESTUDO DA PREVALÊNCIA DE CÁRIE DENTÁRIA, GENGIVITE E FLUOROSE DENTÁRIA EM ESCOLARES BRASILEIROS: EM 1998 E 2008.

Investigador(es) principal(ais): Professores Berenice Barbachan e Silva, Marisa Maltz, Cristiano Susin e CD. Luana Severo Alves.

O Projeto foi aprovado na reunião do dia 14/08/2008, Ata nº 08/08 do Comitê de Ética em Pesquisa e da Comissão de Pesquisas, da UFRGS, por estar adequado ética e metodologicamente de acordo com a Resolução 196/96 do Conselho Nacional de Saúde.

Porto Alegre, 15 de agosto de 2008.

Profª. Heloísa Emília Dias da Silveira
Coordenadora do Comitê de Ética em Pesquisas

Profª. Deise Ponzoni
Coordenadora da Comissão de Pesquisas

ANEXO B - CARTA DE APROVAÇÃO DO COMITÊ DE ÉTICA EM PESQUISA DA PREFEITURA MUNICIPAL DE PORTO ALEGRE (ESTUDO TRANSVERSAL)

Prefeitura Municipal de Porto Alegre
Secretaria Municipal de Saúde
Comitê de Ética em Pesquisa

PARECER CONSUBSTANCIADO

Pesquisador (a) Responsável: Mariza Maltz
Equipe executora:
Registro do CEP: 288 Processo Nº. 001.049155.08.3
Instituição onde será desenvolvido: Escolas municipais
Utilização: TCLE
Situação: **APROVADO**

      O Comitê de Ética em Pesquisa da Secretaria Municipal de Saúde de Porto Alegre analisou o processo Nº.001.049155.08.3, referente ao projeto de pesquisa: "**Estudo da prevalência de cárie dentária, gengivite e fluorose dentária em escolares de Porto Alegre, RS: em 1998 e 2009**", tendo como pesquisador responsável Mariza Maltz cujo objetivo é "Geral: Estudar a prevalência de cárie dentária, gengivite e fluorose dentária em escolares de 12 anos do município de Porto Alegre, RS, 2008 e comparar os dados obtidos com dados coletados em 1998. Objetivos específicos: Verificar as condições atuais de saúde bucal de escolares de 12 anos regularmente matriculados em escolas públicas e particulares do município de Porto Alegre, RS;• Avaliar a presença de modificações na prevalência de cárie dentária,gengivite e fluorose dentária na população estudada nos últimos dez anos;• Avaliar a existência de associação entre variáveis demográficas, socioeconômicas e comportamentais e as doenças em estudo".

      Assim, o projeto preenche os requisitos fundamentais das resoluções. O Comitê de Ética em Pesquisa segue os preceitos das resoluções CNS 196/96, 251/97 e 292/99, sobre as Diretrizes e Normas Regulamentadoras de Pesquisa Envolvendo Seres Humanos, do Conselho Nacional de Saúde / Conselho Nacional de Ética em Pesquisa / Agência nacional de Vigilância Sanitária. Em conformidade com os requisitos éticos, classificamos o presente protocolo como **APROVADO**.

O Comitê de Ética em Pesquisa, solicita que :

1. Enviar primeiro relatório parcial em seis meses a contar desta data;

2. Informar imediatamente relatório sobre qualquer evento adverso ocorrido;

3. Comunicar qualquer alteração no projeto e no TCLE;

4. Entregar junto com o relatório, todos os TCLE assinados pelos sujeitos de pesquisas e a apresentação do trabalho.

5. Após o término desta pesquisa, o pesquisador responsável deverá apresentar os resultados junto à equipe da unidade a qual fez a coleta de dados e/ou entrevista, inclusive para o Conselho Local da Unidade de Saúde.

Porto Alegre, 22/10/08
Elen Maria Borba
Coordenadora do CEP

ANEXO C - CARTA DE APROVAÇÃO DO COMITÊ DE ÉTICA EM PESQUISA DA PREFEITURA MUNICIPAL DE PORTO ALEGRE (ESTUDO LONGITUDINAL)

Prefeitura Municipal de Porto Alegre
Secretaria Municipal de Saúde
Comitê de Ética em Pesquisa

PARECER CONSUBSTANCIADO

Pesquisador (a) Responsável: Marisa Maltz
Registro no CEP: 807 **Processo Nº.** 001.028618.12.2
Instituição onde será desenvolvido: 42 escolas do município de Porto Alegre (09 particulares e 33 públicas
Utilização: TCLE
Situação: APROVADO

O Comitê de Ética em Pesquisa da Secretaria Municipal de Saúde de Porto Alegre analisou o processo Nº.001.028618.12.2, referente ao projeto de pesquisa: **"Condições de saúde bucal e de adolescentes de Porto Alegre e fatores associados: estudo de coorte".**

De acordo com os procedimentos internos estabelecidos nesta instituição, bem como as exigências das Resoluções do Conselho Nacional de Saúde n.ºs 196/96, 251/97 e 292/99, este Comitê de Ética em Pesquisa considera **APROVADO** o referido projeto, em sua Reunião Ordinária realizada em 14 de agosto de 2012.

O Comitê de Ética em Pesquisa solicita o atendimento aos itens abaixo:

1. Enviar primeiro relatório parcial em seis meses a contar desta data;

2. Informar imediatamente qualquer evento adverso ocorrido;

3. Comunicar qualquer alteração no projeto e no TCLE;

4. Entregar com o relatório final todos os TCLEs assinados pelos sujeitos de pesquisas, juntamente com o formulário disponível no site e CD com trabalho concluído;

5. Após o término desta pesquisa, o pesquisador responsável deverá apresentar os resultados junto à equipe da unidade a qual fez a coleta de dados e/ou entrevista, inclusive para o Conselho Local da Unidade de Saúde.

Porto Alegre, 14/08/2012.

Maria Mercedes Bendati
Coordenadora do CEP

Comitê de Ética em Pesquisa da Secretaria Municipal de Saúde de Porto Alegre – CEP SMS/PMPA
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ANEXO D – NORMAS PARA PUBLICAÇÃO NO PERIÓDICO JOURNAL OF DENTAL RESEARCH

The *Journal of Dental Research (JDR)* adheres to the CSE (8th Edition) editorial style. All submitted manuscripts should be formatted in this style

The *Journal of Dental Research* (*JDR*) is a peer-reviewed scientific journal dedicated to the dissemination of new knowledge and information on all science relevant to dentistry and to the oral cavity and associated structures in health and disease. The *Journal of Dental Research*'s primary readership consists of oral, dental and craniofacial researchers, clinical scientists, hard- tissue scientists, dentists, dental educators, and oral and dental policy-makers. The *Journal* is published monthly, allowing for frequent dissemination of its leading content. The *Journal of Dental Research* also offers OnlineFirst, by which forthcoming articles are published online before they are scheduled to appear in print.

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Submissions to the *Journal of Dental Research* are only accepted for consideration via the SAGETrack online manuscript submission site at http://mc.manuscriptcentral.com/jdr. Authors who do not have an active account within the system are required to create a new account by clicking, "Create Account," on the log-in page. The system will prompt the authors through a step by step process to create their account. Once created authors can submit their manuscripts by entering their "Author Center" and clicking the button by "Click Here to Submit a New Manuscript."

If any difficulty is encountered at anytime during the account creation or submission process, authors are encouraged to contact the *Journal of Dental Research* Publications Coordinator, Kourtney Skinner, at kskinner@iadr.org

MANUSCRIPT REQUIREMENTS BY TYPE

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The *Journal of Dental Research* accepts the following types of manuscripts for consideration:

Original Research Reports: These manuscripts are based on clinical, biological, and biomaterials and bioengineering subject matter. Manuscripts submitted as research reports have a limit of 3,200 words (including introduction, materials, methods results, discussion and; excluding abstracts, acknowledgments, figure legends and references); a total of 5 figures or tables; 40 references; and must contain a 300 word abstract.

Letters to the Editor*: Letters must include evidence to support a position about the scientific or editorial content of the *JDR*. Manuscripts submitted as a letter to editor have a limit of 250 words. No figures or tables are permitted. Letters on published articles must be submitted within 3 months of the article's print publication date.

Guest Editorials*: A clear and substantiated position on issues of interest to the readership community can be considered for this manuscript type. Guest Editorials are limited to 1,000 words. No figures or tables are permitted.

Discovery!: Essays that explore seminal events and creative advances in the development of dental research are considered for the "Discovery!" section of the journal. Manuscripts submitted for "Discovery!" have a limit of 2,500 words and a total of 2 figures or tables. Manuscripts are to be submitted by invitation only.

Critical Reviews in Oral Biology & Medicine: These manuscripts should summarize information that is well known and emphasize recent developments over the last three years with a prominent focus on critical issues and concepts that add a sense of excitement to the topic being discussed. Manuscripts are to be submitted by invitation only. Authors interested in submitting to this section must contact the

Editor of *Critical Reviews in Oral Biology & Medicine,* Dr. Dana Graves, at dgraves@iadr.org for submission approval and instructions. Manuscripts submitted as Critical Reviews have a limit of 4,000 words; a total of 6 figures or tables; 60 references; and must contain a 300 word abstract.

Additional Instructions for Critical Reviews*:*

-It is important to include several illustrations or diagrams to enhance clarity. Manuscripts that lack figures or diagrams typically receive a low priority score.

-Summarize important concepts in tables or flow charts or show critical data in the form of figures. NOTE: authors will need to obtain permission to reproduce a previously published figure or table.

-Due to the broad readership, abbreviations commonly recognized in one field may not be readily apparent to those in a different field. Keep abbreviation use to a minimum.

-The cover page, abstract, text, summary, figure legends, and tables should be combined into a single Word document. Figures should be submitted as a separate document.

-To view examples of recent Critical Reviews in the Journal, please click the following links: http://jdr.iadrjournals.org/cgi/content/full/86/9/800   or http://jdr.iadrjournals.org/cgi/content/full/85/7/584

*Brief responses to Letters to the Editor or Guest Editorials will be solicited for concurrent publication.

Clinical Reviews (formerly Concise Reviews): These manuscripts are generally systematic reviews of topics of high clinical relevance to oral, dental and craniofacial research. Meta-analyses should be considered only when sufficient numbers of studies are

available. Manuscripts that include investigations of limited study quality of under- studied areas are typically not acceptable as topics for a clinical review. Although some systematic reviews may be well done, those that receive highest scientific priority will only be considered given the very limited space allowed for these reviews in the journal. Manuscripts submitted as Clinical Reviews have a strict limit of 4,000 words (including introduction, materials, methods results, discussion and; excluding abstracts , acknowledgments, figure legends and references); a total of 6 figures or tables; up to a maximum of 60 references; and must contain a 300 word abstract. Manuscripts above the 4,000 word/6 figure or table limit may use supplemental appendices for other supporting information that would be available online only.

Additional Instructions for Clinical Reviews:

-It is important to include illustrations or diagrams to enhance clarity. Manuscripts that lack figures or diagrams typically receive a low priority score.

-Summarize important concepts in tables or flow charts or show critical data in the form of figures. NOTE: authors will need to obtain permission to reproduce a previously published figure or table.

-Due to the broad readership, abbreviations commonly recognized in one field may not be readily apparent to those in a different field. Keep abbreviation use to a minimum.

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All submissions must include a title page and be accompanied by a cover letter and list of suggested reviewers. Cover letters should certify the research is original, not under publication consideration elsewhere, and free of conflict of interest. Title pages should include: abstract word count, total word count (Abstract to Acknowledgments), total number of tables/figures, number of references, and a minimum of 6 keywords. Keywords cannot be words that have been included in the manuscript title. Key words should be selected from Medical Subject Headings (MeSH) to be used for indexing of articles. See: http://www.nlm.nih.gov/mesh/MBrowser.html for information on the selection of key words.

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ACKNOWLEDGMENTS

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Files containing figures and tables should be clearly labeled to indicate their placement in the text or appendix. Tables should be viewable in a portrait view. Tables that are created in a landscape view are more suitable for an appendix.

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mc.manuscriptcentral.com/societyimages/jdr/CONSORT+2010+checklist%5b1%5d.doc

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www.nc3rs.org.uk/downloaddoc.asp?id=1206&page=1357&skin=0   The   STROBE checklists can be found here:
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they had assistance with study design, data collection, data analysis, or manuscript preparation.

If such assistance was available, the authors should disclose the identity of the individuals who provided this assistance and the entity that supported it in the published article. Financial and material support should also be acknowledged.

Groups of persons who have contributed materially to the paper but whose contributions do not justify authorship may be listed under such headings as "clinical investigators" or "participating investigators," and their function or contribution should be described—for example, "served as scientific advisors," "critically reviewed the study proposal," "collected data," or "provided and cared for study patients." Because readers may infer their endorsement of the data and conclusions, these persons must give written permission to be acknowledged.

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APÊNDICE A – TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO (ESTUDO TRANSVERSAL)

Universidade Federal do Rio Grande do Sul
Faculdade de Odontologia

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Estudo da prevalência de cárie dentária, gengivite e fluorose dentária em escolares de Porto Alegre, RS: em 1998 e 2009

1. Objetivo do estudo: Estudar a ocorrência de gengivite (inflamação na gengiva), cárie, fluorose (manchas nos dentes ocasionadas pela ingestão de flúor em excesso durante o seu período de formação), erosão (desgastes nos dentes) e traumatismos dentários (fratura) em estudantes de 12 anos de idade residentes em Porto Alegre-RS;
2. Seleção dos indivíduos: As escolas e os estudantes foram sorteados aleatoriamente;
3. Duração: A participação na pesquisa consiste no preenchimento de um questionário pelos pais ou responsáveis e um pelo estudante e exame odontológico da criança, a ser realizado em um único dia, com duração prevista de aproximadamente dez minutos.
4. Procedimentos: Os indivíduos terão seus dentes limpos com escova, fio e pasta dental, fornecidos pela equipe da pesquisa e examinados pela cirurgiã-dentista Luana Severo Alves (CRO-RS 16588) (estudante de doutorado da UFRGS).
5. Importância do estudo: Este levantamento epidemiológico será muito importante para avaliação do estado atual de saúde bucal das crianças de nossa cidade.
6. Danos: Não existem danos previstos. Todo o instrumental (espelho, pinça e sonda) utilizado estará devidamente esterilizado. Somente participarão dos exames os estudantes que assim concordarem e assinarem este termo, juntamente com a assinatura dos pais ou responsáveis.
7. Benefícios: Os pais ou responsáveis conhecerão as condições de saúde bucal de seu filho e receberão, posteriormente, um relatório do exame realizado, assim como a indicação de lugares que ofereçam atendimento odontológico gratuito. O estudante receberá uma escova dental.
8. Confidencialidade: As informações contidas nos questionários e a identidade dos estudantes ficarão sob o poder restrito dos pesquisadores e não serão divulgadas nos trabalhos resultantes desta pesquisa.

A participação na pesquisa é totalmente voluntária e o indivíduo tem a liberdade de se recusar a participar ou retirar seu consentimento em qualquer momento do estudo sem nenhum tipo de penalidade.

No caso de dúvidas ou acontecimentos associados à pesquisa, o participante poderá entrar em contato com a pesquisadora Luana Severo Alves, através do telefone 3308 5193 ou com a orientadora deste projeto, profª. Drª. Marisa Maltz (3308 5247), e terá a garantia de resposta a qualquer pergunta ou informação extra.

Confirmo que entendi a natureza da pesquisa e autorizo a participação do estudante

_____

Assinatura dos pais ou responsável:_____

Confirmo que entendi a natureza da pesquisa e me disponho a participar voluntariamente.
Assinatura do estudante:_____

Pesquisadora Luana Severo Alves:_____

Porto Alegre, _____ de _____ de 20___

Comitê de Ética em Pesquisa da Faculdade de Odontologia da UFRGS: 3308 5187
Comitê de Ética em Pesquisa da Secretaria Municipal de Saúde de Porto Alegre-RS: 3212 4623

APÊNDICE B – TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO (ESTUDO LONGITUDINAL)

Universidade Federal do Rio Grande do Sul
Faculdade de Odontologia

TERMO DE CONSENTIMENTO LIVRE E ESCLARECIDO

Condições de saúde bucal de adolescentes de Porto Alegre e fatores associados: estudo de coorte

1. Objetivo do estudo: Estudar a incidência e a progressão da cárie, gengivite, fluorose e erosão (desgaste nos dentes) em estudantes residentes em Porto Alegre- RS.
2. Seleção dos indivíduos: Os estudantes foram examinados anteriormente, em 2009/2010, sendo escolhidos por sorteio aleatório.
3. Duração: A participação na pesquisa consiste em exame odontológico do estudante, a ser realizado em um único dia, na própria escola, com duração prevista de aproximadamente dez minutos.
4. Procedimentos: Os indivíduos terão seus dentes limpos com escova, fio e pasta dental, fornecidos pela equipe da pesquisa e examinados pelas cirurgiãs-dentistas Carolina Doege (CRO-RS 17.892) e Luana Severo Alves (CRO-RS 16.588) (estudantes de Pós-Graduação da UFRGS).
5. Importância do estudo: Este levantamento epidemiológico será muito importante para avaliação da incidência e da progressão de problemas bucais dos estudantes de nossa cidade.
6. Danos: Não existem danos previstos. Todo o instrumental (espelho, pinça e sonda) utilizado estará devidamente esterilizado. Somente participarão dos exames os estudantes que assim concordarem e assinarem este termo, juntamente com a assinatura dos pais ou responsáveis.
7. Benefícios: Os adolescentes e os pais conhecerão as condições de saúde bucal do estudante e receberão, posteriormente, um relatório do exame realizado, assim como a indicação de lugares que ofereçam atendimento odontológico gratuito. O estudante receberá uma escova dental.
8. Confidencialidade: As informações contidas nos questionários e a identidade dos estudantes ficarão sob o poder restrito dos pesquisadores e não serão divulgadas nos trabalhos resultantes desta pesquisa.

A participação na pesquisa é totalmente voluntária e o indivíduo tem a liberdade de se recusar a participar ou retirar seu consentimento em qualquer momento do estudo sem nenhum tipo de penalidade.

No caso de dúvidas ou acontecimentos associados à pesquisa, o participante poderá entrar em contato com a pesquisadora Carolina Doege, através do telefone 3308 5193 ou com a orientadora deste projeto, profª. Drª. Marisa Maltz (3308 5247), e terá a garantia de resposta a qualquer pergunta ou informação extra.

Confirmo que entendi a natureza da pesquisa e autorizo a participação do estudante chamado:_____

Assinatura dos pais ou responsável:_____

Confirmo que entendi a natureza da pesquisa e me disponho a participar voluntariamente.
Assinatura do estudante:_____

Pesquisadora Carolina Doege: _____

Porto Alegre, _____ de _____ de 20___

Comitê de Ética em Pesquisa da Secretaria Municipal de Saúde de Porto Alegre-RS: 3212 4623

APÊNDICE C – QUESTIONÁRIO SOCIOECONÔMICO

UFRGS
UNIVERSIDADE FEDERAL
DO RIO GRANDE DO SUL

Universidade Federal do Rio Grande do Sul – Faculdade de Odontologia
Questionário para pais ou responsáveis

Nome do aluno:_____ Data de Nascimento:___/___/___
Endereço:_____ Bairro:_____
Telefones:_____ Escola:_____ Sexo do aluno: (1) Fem (2) Masc

O preenchimento completo deste questionário é muito importante para a conclusão deste trabalho!

1. Você considera seu filho:
(1) Branco   (3) Mulato
(2) Negro   (4) Outro (oriental, índio)

2. Seu filho mora em Porto Alegre desde quando?
(1) Desde que nasceu
(2) Desde os _____ anos. Antes morou em_____

3. Seu filho mora com:
(1) Pai e mãe   (3) Só com a mãe
(2) Só com o pai   (4) Outros

4. Quantos irmãos de sangue seu filho têm?_____

5. Quantas pessoas moram na sua casa?_____

6. Quantos cômodos têm a casa?_____

7. Sua casa é:
(1) Própria   (4) Cedida
(2) Financiada   (5) Outro:_____
(3) Alugada

Qual destes ítens você possui em sua casa? Qual a quantidade de cada um deles?

8. Televisão em cores ( )	13. Aspirador ( )
9. Rádio ( )	14. Máquina de lavar roupa ( )
10. Banheiro ( )	15. Videocassete/DVD ( )
11. Automóvel ( )	16. Geladeira ( )
12. Empregada/mensalista ( )	17. Freezer ( )

OBS.: Geladeira duplex/biplex: corresponde à geladeira e freezer

18. Grau de instrução do pai:
(1) Não estudou   (5) 2º grau completo
(2) 1º grau incompleto   (6) 3º grau incompleto
(3) 1º grau completo   (7) 3º grau completo
(4) 2º grau incompleto

19. Grau de instrução da mãe:
(1) Não estudou   (5) 2º grau completo
(2) 1º grau incompleto   (6) 3º grau incompleto
(3) 1º grau completo   (7) 3º grau completo
(4) 2º grau incompleto

20. Qual a água utilizada para beber/preparar alimentos?
(1) Encanada   (4) Caminhão pipa
(2) Poço artesiano   (5) Outro: _____
(3) Bica

21. Seu filho usa escova dental?
(1) Sim   (2) Não

22. Se sim, quantas vezes seu filho usa escova dental?
(1) Nem todos os dias   (3) 2 vezes por dia
(2) 1 vez por dia   (4) 3 vezes ou mais por dia

23. Cada membro da família possui escova própria ou vocês compartilham uma mesma escova?
(1) Cada um possui sua própria escova
(2) Mais de uma pessoa usa a mesma escova

24. Seu filho usa fio dental?
(1) Sim   (2) Não

25. Se sim, quantas vezes seu filho usa fio dental?
(1) De vez em quando   (3) 1 vez a cada 2 dias
(2) 1 vez/semana   (4) 1 vez/dia ou mais

26. Seu filho usa creme dental?
(1) Sim   (2) Não

27. Se sim, há quanto tempo seu filho usa creme dental?
(1) Desde o nascimento dos dentes
(2) A partir de 1 ano de idade
(3) A partir de _____ anos de idade

28. Seu filho já foi ao dentista? Onde foi o atendimento?
(1) Não, nunca foi
(2) Sim, na escola
(3) Sim, no posto de saúde. Qual?_____
(4) Sim, por convênio
(5) Sim, consultório particular

29. Qual a causa da última visita de seu filho ao dentista?
(1) Ele nunca foi ao dentista
(2) Dor de dente
(3) Quebra/fratura/perda de dente em acidente
(4) Controle periódico (revisão)
(5) Outro:_____

30. Quando seu filho foi ao dentista pela última vez?
(1) Ele nunca foi ao dentista
(2) Há _____ ano (s)
(3) Há menos de um ano

31. Seu filho já recebeu aplicação de flúor pelo dentista?
(1) Sim   (2) Não

32. Se sim, que idade seu filho tinha?
(1) Menos de 3 anos   (3) Mais de 6 anos
(2) Entre 3 e 6 anos   (4) Ainda recebe

33. Seu filho usa medicamento para doenças respiratórias, como asma?
(1) Sim. Qual?_____   (2) Não

34. Seu filho apresenta algum problema de estômago (azia, refluxo, engasgos, vômitos freqüentes)?
(1) Sim. Qual?_____   (2) Não

35. Seu filho costuma apertar os dentes ou fazer barulhos com os dentes enquanto dorme?
(1) Sim   (2) Não

36. Você possui alguma queixa com relação aos dentes do seu filho?
(1) Sim:_____   (2) Não

37. Qual sua renda familiar (soma da renda de todos os membros da família)? R$_____

APÊNDICE D – FICHA CLÍNICA

Nome: _____ Data: ___/___/____

ETA: (1) (2) (3) (4) (5) (7)   Tipo de escola: (1) Particular (2) Pública   Escola nº:_____

MEDIDAS ANTROPOMÉTRICAS

PESO 1:	PESO 2:	ALTURA:	CINTURA:

SANGRAMENTO GENGIVAL

17			16			15			14			13			12			11		
D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M

21			22			23			24			25			26			27		
M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D

P / L

27	26	25	24	23	22	21	11	12	13	14	15	16	17

37			36			35			34			33			32			31		
D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M

41			42			43			44			45			46			47		
M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D

P / L

47	46	45	44	43	42	41	31	32	33	34	35	36	37

ESTÉTICA

Dentição	Dentes decíduos presentes	13: (1) em oclusão	23: (1) em oclusão	Espaço para 13:_____mm
(1) mista	(53) (54) (55) (63) (64) (65)	(2) erupcionando	(2) erupcionando	Espaço para 23:_____mm
(2) permanente	(73) (74) (75) (83) (84) (85)	(3) não irrompeu	(3) não irrompeu	Largura do IC:_____mm

Dentes ausentes:		Desalinhamento max:	mm	Overjet maxilar:	mm	Relação molar: (0) (1) (2)	
Apinhamento: (0) (1) (2)		Desalinhamento mand:	mm	Overjet mand:	mm	Cobertura labial: (0) (1) (2) (3)	
Espaçamento: (0) (1) (2)		Diastema inter-incisal:	mm	Mordida aberta:	mm		

TRAUMATISMO

	13	12	11	21	22	23	33	32	31	41	42	43
Classificação												
Tratamento existente												
Necessidade de tratamento												

CÁRIE

17			16			15			14			13			12			11		
D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M

21			22			23			24			25			26			27		
M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D

P / L   O

27	26	25	24	23	22	21	11	12	13	14	15	16	17	17	16	15	14	24	25	26	27

37			36			35			34			33			32			31		
D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M	D	V	M

41			42			43			44			45			46			47		
M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D	M	V	D

P / L   O

47	46	45	44	43	42	41	31	32	33	34	35	36	37	37	36	35	34	44	45	46	47

EROSÃO

16			12			11			21			22			26		
V	P	O	V	P	I	V	P	I	V	P	I	V	P	I	V	P	O

36			32			31			41			42			46		
V	P	O	V	P	I	V	P	I	V	P	I	V	P	I	V	P	O

FLUOROSE

17	16	15	14	13	12	11	21	22	23	24	25	26	27

37	36	35	34	33	32	31	41	42	43	44	45	46	47