ABSTRACTS OF II BRAZILIAN MEETING OF CARIOLOGY RESEARCH
(Resumos do II Encontro Brasileiro de Pesquisa em Cariologia – II EBPC)

Place:
Bauru School of Dentistry/University of São Paulo
Date:
April 13-15, 2015
Meeting Organizer:
Prof. Dr. Ana Carolina Magalhães, (FOB/USP)
acm@fob.usp.br
Prof. Dr. Juliano Pelim Pessan, (FOA/UNESP)
jpessan@foa.unesp.br
Prof. Dr. Jonas de Almeida Rodrigues, (FO/UFRGS)
jorodrigues@ufrgs.br
Team:
Beatriz Martines de Souza, DDS (FOB/USP)
Cíntia Maria de Souza e Silva, PhD (FOB/USP)
Cristiane de Almeida Baldini Cardoso, PhD (USC/FOB/USP)
Flávia Mauad Levy, PhD (FOB/USP)
Lívia Picchi Comar, MS (FOB/USP)
Luiza de Paula Silva Cassiano, MS (FOB/USP)
Polliana Mendes Candia Scaffa, PhD (FOB/USP)
Priscila Maria Aranda Salomão, MS (FOB/USP)
Senda Charone, PhD (FOB/USP)
Alexsandro Rodrigues (Seção Técnica de Informática - PUSP/B/USP)
Camila Medina (Tecnologia Educacional - FOB/USP)
Denise Maria Regiani (Assistência Técnica-Administrativa - FOB/USP)

ABOUT THE EVENT

The development of Science has changed the paradigm in Health: the scientific base became essential for professional's decision regarding diagnosis, prevention and treatment of different diseases. The contact with research in the past years has brought benefits for professionals, companies and especially for the patients. The II Edition of the Brazilian Meeting of Cariology Research (EBPC) is the opportunity to put together researchers, students and professionals who are experts in the field of Caries Research, an area of dentistry that has grown in research and publication in Brazil. Despite the prevalence and severity of caries disease have decreased over the last years, it is still one of the most prevalent oral diseases that impairs quality of life and has high cost for the country. Besides dental caries, the dentists have become more aware about other lesions such as tooth erosion and Molar Incisor Hypomineralization. The European Organization for Caries Research (ORCA) has organized annual international meetings to discuss the research in this field involving basic sciences, diagnosis, prevention and treatment of carious and non-carious lesions. ORCA meeting is an opportunity to extend network and to disclosure results of laboratory and clinical researches. Brazilians are one of the biggest groups attending this meeting. Therefore, a meeting similar to ORCA was idealized as an initiative to put together Brazilian researchers, in order to improve knowledge and network between different research's groups of the country.

Aims

II EBPC has the aim to promote discussion and update of knowledge for Brazilian researchers expert in Cariology field through Symposiums and Oral Presentations of scientific works.

Audience

Professors, graduate students and researchers from Companies and/or Universities who are interested in Cariology research (maximum of attendants: 150).

Program

This event will take place on April 13-15, 2015, involving 13 speakers and 36 presenters according to the following topics:

Group 1: Curriculum in Cariology;
Group 2: Fluoride;
Group 3: Microbiology;
Group 4: Tooth erosion;
Group 5: Diagnosis and Risk;
Group 6: Epidemiology an clinical trials;
Group 7: Treatment.

During 2 days, the Symposiums will be given by 2 speakers for each topic during 1h, except for Group 1. The oral Presentations should be given in 3 minutes with 2 minutes of discussion with the chairpersons. At the last day, we will organize a discussion with all participants about the main topics exposed and the need for further researches. At the closing Ceremony, the best presenter will be awarded (registration for a Congress).

INFORMATION

www.fob.usp.br/ebpc

DETAILED PROGRAM

04/13/2015 (Monday): MORNING

GROUP 1 - CURRICULUM IN CARIOLOGY

Prof. Dr. Jonas Rodrigues, UFRGS

Abstract: Presentation of the results of the latest survey on the teaching of Cariology in the Brazilian Dental Schools as well as a reflection on the strategies and actual status of discussion group concerning the international guidelines supposed to be implemented in our country.

KEYWORDS: Dental caries. Schools. Teaching.

GROUP 2 - FLUORIDE

Moderator: Prof. Dr. Juliano Pelim Pessan, FOA/UNESP

Symposium: Association of self-applied and professionally applied fluoride methods for caries control: scientific evidence

Prof. Dr. Alberto Carlos Botazzo Delbem, FOA/UNESP

Abstract: The current scientific knowledge indicates that a constant supply of low-levels of fluoride, especially at the biofilm/saliva/enamel interface, is more effective for caries control in comparison with applications of higher concentrations, but at lower frequency. Considering the high availability of fluoride methods and vehicles available for community use, for self-application and professional application, it is not uncommon that individuals and populations are exposed to two or more vehicles simultaneously. Based on the mechanism of action of fluorides, it seems reasonable to expect that the concomitant use of different vehicles could increase the preventive effect of fluorides when compared to the use of a single method. However, results from recent meta-analyses indicate that the additional protective effect of the association of methods is only around 10% in comparison to the use of a fluoride dentifrice alone; in addition, some combinations of methods were not shown to produce a significant difference when compared to a method alone, what might suggest that the association of two methods does not provide any additional benefit for caries control. It should be noted, however, that little evidence is available on this topic, and that not all possible combinations of methods have been tested. Moreover, the polarized distribution of dental caries in the population indicates that some groups need more intense therapies than less susceptible groups. In this sense, even considering that the association of two or more modalities of fluoride use leads to little additional effect overall, it seems reasonable that such associations should be recommended to patients at high risk of caries. For patients at low risk, however, besides the little additional effect, the association of methods can increase the risk of possible side effects. The present recommendation takes into account both cost/benefit and risk/benefit relationships.

KEYWORDS: Dental Caries. Fluorides. Prevention.

Symposium: Relationship between carbohydrate intake and use of fluoride in the cariogenicity of dental biofilm

Prof. Dr. Cinthia Pereira Machado Tabchoury, FOP/UNICAMP

Abstract: Dental caries is a biofilm-dependent disease, in which the dietary fermentable carbohydrates are the main environmental factor involved in the development of this disease, which progresses as a result of frequent episodes of pH fall. Among dietary carbohydrates, sucrose is the most cariogenic, because is fermented by bacteria present in the biofilm and it is the only substrate for the synthesis of extracellular polysaccharides. The low pH environment in biofilm leads to changes of the resident microbiota to a more cariogenic one, and the extracellular polysaccharides promote changes in the composition and structure of the biofilm matrix. The biofilm formed in the presence of fermentable carbohydrates shows low concentrations of calcium, phosphorus, and fluoride, which are ions involved in the process of demineralization and remineralization. It is well known that the biofilm is rich in pH-dependent inorganic and organic mineral reservoirs, which can be released for the biofilm fluid during the pH drop. Thus, the release of these minerals may be relevant to reduce the forces for mineral dissolution. Significant differences in the degree of saturation in the fluid of the resting biofilm in caries-free and caries-active individuals can be explained by the composition of biofilm formed, which is diet-dependent. Thus, the homeostasis in mineral concentration of ions in the fluid can be influenced by the state of biofilm formation. In relation to the use of fluoride, it can diffuse into the saliva, teeth, remnants of biofilm, which is not removed during brushing, for example, and to the oral mucosa. The fluoride present in remnants of dental biofilm and on the surface of the teeth is essential to interfere in the process of mineral loss and gain and more on this subject will be addressed in this presentation.

KEYWORDS: Dental caries. Dental plaque. Fluorides.

GROUP 3 - MICROBIOLOGY

Moderator: Prof. Dr. Rodrigo Alex Arthur, UFRGS

Symposium: Phytotherapy and probiotics on dental biofilm control

Prof. Dr. Fernanda Lourenção Briguenti, FOAr/UNESP

Abstract: Dental caries is a biofilm-dependent disease that represents an oral health problem all over the world. Despite the availability of many prevention methods, chemical control of biofilm is still a challenge. Natural products of plant origin or probiotics have been used as a source of innovative therapeutic agents. The study of natural products enables the discovery of novel substances from plant´s secondary metabolism. The use of probiotics could modify natural oral microbiota by competing with microorganisms involved in dental caries etiology. However, difficulties need to be resolved, especially regarding efficacy and safety of these alternative forms of biofilm chemical control. World Health Organization and Brazilian Federal Government stimulate the evaluation of medicinal plants. A national guideline ("Política Nacional de Plantas Medicinais e Fitoterapia") was created aiming to ensure Brazilian population a safe access and a rational use of medicinal plants and phytotherapic. Probiotics have demonstrated efficacy in reducing aciduric and acidogenic microorganisms involved in dental caries. The effect of these products on dental caries development is encouraging. However, more studies are needed to support their over-the-counter use. The aim of this presentation will be to demonstrate the main phytotherapic and probiotics that possess potential use against oral biofilm. Methodologies associated to bioprospection and the efficacy analysis of these methods will also be discussed.

KEYWORDS: Dental caries. Phytotherapy. Probiotics.

Symposium: The effect of antimicrobial photodynamic therapy on plaque and tooth decay

Prof. Dr. Iriana Carla Junqueira Zanin dos Santos, UFC

Abstract: Dental caries, closely related to the presence of biofilm on the tooth surface, remains as a major problem in dentistry and should receive special attention in daily practice. Although we observed a decline in the prevalence of this condition, it remains as one of the most prevalent chronic diseases in the world, reaching about 60% to 90% of school children and almost 100% of the adult population. Photodynamic antimicrobial chemotherapy (PACT) can be a useful therapy in the development of new strategies for prevention and/or treatment of infectious diseases related to the presence of a biofilm, including dental caries. Previous studies have demonstrated the antimicrobial effect of PACT on oral bacteria in planktonic cultures, unorganized and organized biofilms, as well as on dentinal caries formed *in vitro*, and *in situ* when the proper combination of photosensitizer and light was used. Advances obtained by our research group in recent years has allowed the development of safe and effective parameters for the use of PACT, however the extensive time of light exposure required to obtain expected antimicrobial effect has always been one limitation of this therapy. Recently, the use of new light sources has shown promising results with irradiation times varying from 22 seconds to 2 minutes, what allows the establishment of clinical protocol for the use of PACT on oral biofilms and dental caries *in vivo*.

KEYWORDS: Dental caries. Dental Plaque. Photochemoterapy.

AFTERNOON

GROUP 4 - TOOTH EROSION

Moderator: Prof. Dr. Daniela Rios, FOB/USP

Symposium: The role of saliva and acquired pellicle on tooth erosion: proteomic analysis

Prof. Dr. Marília Afonso Rabelo Buzalaf, FOB/USP

Abstract: Tooth erosion is a multifactorial condition caused by a complex interaction of chemical, biological and behavioral factors. Among the biological factors, saliva is one of the most important parameters in the protection against erosive wear. It provides protection against erosion by different ways. Due to the constant salivary flow, saliva dilutes the acids. Also associated with the flow is the buffering capacity that leads to the neutralization of the acids. In addition, saliva is supersaturated with respect to tooth mineral, providing calcium, phosphate and fluoride to reharden softened enamel. Finally, saliva has the ability to form a protective layer on the dental hard tissues, called acquired pellicle, which is an integument formed *in vivo* as a result of selective adsorption of salivary proteins to the tooth surface, containing also lipids and glycoproteins. Some of the salivary proteins embedded within the structure of the acquired pellicle demonstrate anti-erosive properties. However, rather than individual proteins, protein-protein interactions play a fundamental role in the protective nature of the acquired pellicle. Moreover, dietary and synthetic proteins can modify the pellicle, enhancing its protective efficiency against tooth erosion. With the advent of proteomic analysis, the knowledge regarding the protein composition of the acquired pellicle has grown exponentially. This opened new avenues for the modification of the protein composition and structure of the acquired pellicle to enhance its anti-erosive properties.

KEYWORDS: Proteome. Saliva. Tooth erosion.

Symposium: Tooth erosion diagnosis: a challenge for clinicians

Prof. Dr. Marcelo Bönecker, FO/USP

Abstract: Erosive tooth wear is a public health problem. Even though it is important to detect the erosive tooth wear lesion early, its diagnosis is a challenge for clinicians because the first signs of enamel wear are difficult to be visually detected and erosive lesions are always associated with other tooth wear processes. It is important to highlight that erosive tooth wear diagnosis must be made not only by clinical examination of the teeth and its surroundings, but also through biological knowledge of oral health environment and information about patient history. A well conducted anamnesis is essential in order to help in distinguishing erosive tooth wear from other defects and processes of wear and also to search for the main cause to immediately implement preventive measures. Various indices are used to register the erosive tooth wear lesions and the clinician must choose one to use on daily practice to help also with the assessment of progression of the erosive tooth wear lesion.

KEYWORDS: Diagnosis. Etiology. Tooth erosion.

ORAL PRESENTATIONS

Chairs: Prof. Dr. Juliano Pelim Pessan, FOA/UNESP; Prof. Dr. Rodrigo Alex Arthur, UFRGS; Prof. Dra. Daniela Rios, FOB/USP

FLUORIDE

Preventive effect of fluoride and casein phosphopeptide dentifrices on dental caries

Alexandria AK[1]*, Valença AMG[2], Maia LC[1]

[1]Department of Pediatric Dentistry and Orthodontics, Dental School, Federal University of Rio de Janeiro (UFRJ), Rio de Janeiro, RJ, Brazil.
[2]Department of Clinical and Social Dentistry, Dental School, Federal University of Paraíba (UFPB), João Pessoa, PB, Brazil.

OBJECTIVE: This study aimed to evaluate *in vitro* the preventive caries effect of fluoride or casein phosphopeptide–amorphous calcium phosphate (CPP-ACP) dentifrices. MATERIAL AND METHODS: Fifty bovine enamel blocks, previously selected by surface microhardness, were submitted to a cariogenic challenge through mixed bacterial biofilm growing (*S. sanguis* ATCC 10556, *S. mutans* ATCC 25175, *S. parasanguinis* ATCC 15912, *S. sobrinus* ATCC 27609). The blocks were randomly assigned to (n=10): G1 (CPP-ACP dentifrice containing sodium fluoride – 900 ppm of fluoride), G2 (dentifrice containing monofluorophosphate - MFP, 1450 ppm of fluoride), G3 (dentifrice containing arginine and MFP, 1450 ppm of fluoride), G4 (negative control: culture medium with biofilm) and G5 (positive control: medium without biofilm culture). The inoculum of $1.5x10^6$ CFU/ml of microorganisms was placed on treated enamel blocks and incubated for 24 h 37°C in microaerophilic environment. The measured response variable was the percentage of surface microhardness loss (% SML), in addition, qualitative evaluation from photomicrographs were obtained by scanning electron microscopy (SEM). The data were analyzed for normality and compared using ANOVA test and Tukey test ($p<0.05$). RESULTS: G4 was statistically different from all groups and presented the highest %SML ($p<0.05$). G1, G2 and G3 did not differ among them ($p>0.05$). G5 had the lowest %SML and differ from all other groups ($p<0.05$). The SEM photomicrographs revealed surface with small areas of demineralization in the experimental groups, and G4 revealed areas of high surface structural loss. CONCLUSION: All products tested were able to reduce the enamel surface microhardness loss in the presence of cariogenic challenge with mixed biofilms *in vitro*.

FINNANCIAL SUPPORT: FAPERJ (E-26/201.316/2014), CNPq (302800/2012-3) and CAPES.

KEYWORDS: Dentifrices. Fluoride. Prevention & control.

Effect of nano-hydroxiapatite/fluoride pastes on enamel caries lesion *in situ*

Souza BM[1]*, Comar LP[1], Vertuan M[1], Fernandes Neto C[1], Buzalaf MAR[1], Magalhães AC[1]

[1]Department of Biological Sciences, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVES: This study evaluated the potential of an experimental paste containing nano-hydroxyapatite and fluoride on the reduction of enamel demineralization and on the increase of enamel remineralization *in situ*. MATERIAL AND METHODS: Thirteen subjects took part in this crossover and double-blind study performed in 4 phases (14 days each). Two sound (S) and 2 pre-demineralized (WS) specimens were worn intraorally at each phase corresponded to the following treatments: Nanop plus (10% hydroxyapatite+900 ppm F), MI Paste Plus (CPP-ACP+900 ppm F), F (900 ppm F) and placebo (without active ingredients). Two hundred and forty enamel specimens were selected by using surface microhardness; half (n=120) were subjected to demineralization (WS, pH 5, for 6 days) and the other half remained sound (S). S specimens were protected from disturbance by using plastic mesh to allow biofilm accumulation; while on WS no biofilm accumulation was allowed to facilitate remineralization. S specimens were further exposed to severe cariogenic challenge (20% sucrose, 8x5 min/day). The treatments were done 2x4 min/day, extraorally. The de-remineralization was quantified by transversal microradiography. The data were analyzed by Repeated-Measures ANOVA followed by Tukey's test ($p<0.05$). RESULTS: In respect to demineralization, none of the treatments was able to reduce ΔZ (%min x μm) and the lesion depth, (μm) compared to placebo: Nanop Plus (1000.9±249.5; 45.0±15.3); MI Paste (883.6±431.7; 60.7±26.4); F (985.5±313.4; 53.4±21.1); Placebo (1369.6±988.3; 57.2±30.6), respectively. In respect to remineralization, Nanop Plus and F were able to increase the gain of integrated mineral (ΔΔZ) compared to placebo: Nanop Plus (549.9±405.4); MI Paste (370.8±230.6); F (555.5±264.1); Placebo (200.4±186.8). CONCLUSION: No treatment was able to reduce enamel demineralization, while the pastes Nanop Plus and F were able to improve the remineralization.

FINANCIAL SUPPORT: FAPESP (2013/03942-7).

KEYWORDS: Dental caries. Dental enamel. Tooth demineralization.

Comparison between acidulated fluoride gel and infiltrant in the treatment of artificial enamel caries lesions

Velo MMAC[1]*, Araújo DFG[1], Freitas MCCA[1], Comar LP[2], Souza BM[2], Magalhães AC[2], Rios D[3], Wang L[1]

[1]Department of Operative Dentistry, Endodontics and Dental Materials, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.
[2]Department of Biological Sciences, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.
[3]Department of Pediatric Dentistry, Orthodontics and Community Health, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: The topical fluoride application is the standard strategy in the treatment of the initial caries lesions (ICL). An approach based in the formation of a mechanical barrier using resin infiltrant emerged with the perspective of paralyzing the ICL. This study compared the effect of the treatment of ICL with fluoride gel (acidulated phosphate fluoride gel – 1.23% APF) and the treatment performed with resin infiltrant (ICON) through the analysis of the enamel cross-sectional hardness (CSH). MATERIAL AND METHODS: Bovine enamel specimens (6x4 mm), after surface microhardness (SH) assessment, were randomized in two groups (n=12): F (1.23% APF - 4 min, during 4 weeks) and I (treatment of surface and application of the ICON, in a single application). The DE-RE cycling was performed for 7 days and the specimens were submitted to one of the treatments described. After this, a new DE-RE cycling was performed. A longitudinal cut was made for the CSH analysis, which were performed in duplicate for each phase (Sound-S, DE-RE cycling-D, Treatment-F or I and new challenge-NC), in the depths 10, 30, 50, 70, 90, 110 and 220 μm. Comparative analysis among the depths and phases in a same treatment were performed by two-way ANOVA and Bonferroni; t-student test was done to detect differences between the two treatments for the same condition ($p<0.05$). RESULTS: The sound and after DE-RE cycling conditions were similar between the two groups, showing the homogeneity for the initial conditions and acid challenge used. After the treatment and after the new DE-RE cycling, the enamel specimens treated with fluoride demonstrated higher acid resistance comparatively to ICON until enamel depth of 70 μm. CONCLUSION: None of the strategies tested was able to recover completely the CSH after the DE-RE cycling. However, fluoride was more effective in increasing resistance to a new acid challenge compared to ICON.

KEYWORDS: Dental caries. Acidulated phosphate fluoride. Infiltrant resin.

Laser with/without photodynamic cream on the prevention of enamel demineralization: Optical Coherence Tomography analysis

Barbosa PS[1]*, Freitas AZ[2], De Sant`Anna GR[1]

[1]Department of Pediatric Dentistry, Cruzeiro do Sul University, São Paulo, SP, Brazil.
[2]Department of Economic Development, Science and Technology, Institute of Energy and Nuclear Research (IPEN), São Paulo, SP, Brazil.

OBJECTIVE: Lasers can be used as tools for the prevention of tooth enamel demineralization. The aim of this study was to assess the effect on the enamel demineralization of low-intensity infrared laser (λ=810 nm, 100 mW/cm^2, 90s, 4.47J/cm^2, 9J) with or without photodynamic cream containing or not fluoride, using Optical Coherence Tomography (OCT). MATERIAL AND METHODS: Samples (n=105) of deciduous enamel specimens were previously analyzed using OCT and randomly assigned into seven groups (n=15): (L) laser application; (C-) no treatment; (F) acid fluoride gel; (IV) cream; (IVF) neutral fluoride cream; (IVL) cream and laser; and (IVFL) neutral fluoride cream+laser. The specimens were submitted to the treatments before demineralizing pH cycling and then were reanalyzed. Analysis of variance and multiple comparative Tukey's test were performed with a significance level of 5%. RESULTS: Greater delta attenuation was seen between baseline and post challenge for L (0.034±0.011) compared to IVF (0.016±0.007), F (0.018±0.010), IVFL (0.019±0.008) and IVL (0.014±0.010) ($p<0.01$). The cream laser group (IVL) also showed significant lower delta compared to C- (0.025±0.008), which was not significantly different from group L ($p>0.05$). CONCLUSION: The OCT technique demonstrated that cream associated with laser led to the lowest quantitative enamel mineral loss after cariogenic challenge.

FINNANCIAL SUPPORT: CAPES - PROSUSP (3307801700P7).

KEYWORDS: Dental enamel. Lasers. Photochemotherapy.

MICROBIOLOGY

Molecular analysis of biofilm bacteria associated to different stages of early childhood caries

Neves BG[1]*, Stipp RN[2], Bezerra DS[3], Guedes SFF[3], Rodrigues LKA[3]

[1]Faculty of Dentistry, Federal University of Ceará, Sobral, CE, Brazil.
[2]Department of Oral Diagnosis, Piracicaba Dental School, University of Campinas, Piracicaba, SP, Brazil.
[3]Department of Operative Dentistry, Faculty of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Fortaleza, CE, Brazil.

OBJECTIVE: The aim of this study was to quantify and to evaluate the presence of *Actinomyces naeslundii*, *Bifidobacterium* spp., *Lactobacillus acidophilus*, *Lactobacillus casei* group, *Streptococcus gordonii*, *Mitis* group and *Streptococcus mutans* using quantitative polymerase chain reaction (qPCR) in dental biofilm from children with different stages of early childhood carious lesions. MATERIAL AND METHODS: Preschool children (n=75) aged 2 to 5 years were clinically examined according to ICDAS criteria and were divided into three groups: caries-free (CF; n=20), presence of enamel caries lesions (ECL; n=17) and presence of dentine caries lesions (DCL; n=38). Pooled dental biofilm sample of each child was collected and analyzed to detect the presence and quantity of the cited bacteria by qPCR. The data were analyzed by Kruskal-Wallis and chi-squared test, followed by multiple logistic regressions. RESULTS: *L. acidophilus* and *L. casei* groups were absent in almost all biofilm samples. No differences in relative proportions were observed for any stage of caries for *A. naeslundii*, *Mitis* group and *S. gordonii*. However, *S. mutans* and *Bifidobacterium* spp. were present in higher concentrations in the biofilm samples of children with DCL when compared to samples from CF and ECL groups ($p<0.01$). Furthermore, multivariate analysis showed that *S. mutans* and *Bifidobacterium* spp. were strongly associated with biofilm in children with cavitated dentin lesions with an "odds-ratio" of 21.5 and 5.9, respectively. CONCLUSION: Differences were observed in the proportion of acidogenic and aciduric bacteria with dental caries progression. The data indicated that *S. mutans* and *Bifidobacterium* spp. may be strongly associated with the progression of early childhood caries.

FINANCIAL SUPPORT: CNPq (Proc. 475346/2011-4 Edital MCT/CNPq 14/2011 Universal).

KEYWORDS: Dental caries. Dental plaque. Real-Time Polymerase Chain Reaction.

Cariogenicity of biofilms originated from different inoculum in a microcosm biofilm model

Signori C[1]*, Maske TT[1], Cenci MS[1], Oliveira EF[1], Van de Sande FH[1,2]

[1]Graduate Program in Dentistry, Federal University of Pelotas, Pelotas, RS, Brazil.
[2]School of Dentistry, IMED Faculdade Meridional, Passo Fundo, RS, Brazil.

OBJECTIVE: This study aimed to evaluate the cariogenic potential of biofilms originated from different types of inoculum (saliva and dental plaque) of caries active and caries-free individuals, in a microcosm biofilm model. MATERIAL AND METHODS: Ten volunteers were selected from each caries experience condition (caries-free and active caries) for the collection of dental plaque and saliva. Microcosm biofilms were initiated from inoculum on enamel specimens individually disposed in 24-well microplates. Biofilms were grown with defined medium enriched with mucin, under daily cariogenic challenge (defined medium supplemented with 1% sucrose 6 h/day). After 10 days, biofilms were collected for assessment of the outcome variables: mineral loss (percentage of surface hardness change) and microbiological composition of the biofilm (CFU counts). Statistical analysis was performed using T-tests, Multivariate General Linear Model analysis and Pearson correlation coefficients ($p<0.05$). RESULTS: The comparative baseline analysis of CFU counts between individuals with different caries status showed statistically significant differences for mutans *Streptococci* and acid-tolerant microorganisms' counts in dental plaque samples and for acid-tolerant counts in saliva. Higher levels of mutans *Streptococci* were found in dental plaque collected from active caries lesions. After the growth of biofilm under cariogenic challenges, the differences in mean values were not statistically significant for total microorganisms, *lactobacilli*, *mutans Streptococci*, acid-tolerant microorganisms' counts, and also for surface hardness change (%SHC), considering the inoculum type and caries status. Significant correlation was found for %SHC and CFU counts of acid-tolerant bacteria and lactobacilli in microcosm biofilm. CONCLUSION: Under the limitations of the present biofilm model, the cariogenic potential of microcosm biofilm is similar, regardless of baseline differences in the inoculum.

FINNANCIAL SUPPORT: CNPq.

KEYWORDS: Biofilms. Demineralization. Saliva.

Efficacy of curcumin–mediated photodynamic inactivation for oral biofilm elimination

Santezi C[1]*, Albuquerque G[1], de Annunzio SR[1], Bagnato VS[2], Dovigo LN[1]

[1]Department of Social Dentistry, Araraquara Dental School, Univ. Estadual Paulista, Araraquara, SP, Brazil.
[2]Physics Institute of São Carlos, University of São Paulo, São Carlos, SP, Brazil.

OBJECTIVE: Biofilm is the main etiological agent of dental caries. However, safe and effective antimicrobial preventive measures are still a challenge in dentistry. This study aimed to evaluate the photodynamic activity (PDI) of Curcumin (CUR) on biofilm of *Streptococcus mutans* (UA 159 ATCC 700610; Sm) and *Lactobacillus casei* (ATCC 4646; Lc). MATERIAL AND METHODS: Standardized suspensions (10^7CFU/mL) of each microorganism (MO) were transferred to 96 well plates and incubated (37ºC, 75 rpm, 90 min). Then, it was pipetted broth culture medium in each well and the plates were incubated (37°C, 75 rpm, 48 h) to promote biofilm growth. The groups that received light (CUR + Light + / CUR-Light +) were treated with 200 µL of CUR (80 µM) or the vehicle used for CUR preparation, incubated in the dark (37°C, 5 min) and illuminated (460 nm, 14 min, 18 J/cm^2). Groups that did not receive light (CUR+Light-/ CUR-Light-) were only incubated in the dark (37°C, 19 min). The metabolic rate was analyzed using the XTT assay and, the cell viability, calculating CFU/mL. After descriptive analysis, the comparison of means was performed using confidence intervals (95% CI). RESULTS: For Sm, the CFU/mL averages for the groups CUR-Light- and CUR+Light+ were 6.83 (CI95%:7.22-6.43) and 3.03 (CI95%:3.73-2.34), respectively; for Lc, the CFU/mL averages to the same groups were 6.71 (CI95%:7.01-6.41) and 1.54 (CI95%:2.32-0.75), respectively. Likewise, for XTT assay, there was no crossing between the CI95% limits for the same groups, indicating statistically significant reduction in the viability and metabolism of MOs. There was intersection between the CI95% limits of CUR-Light-, CUR+Light- and CUR-Light+, suggesting no

effect of CUR or Light alone. CONCLUSION: CUR-mediated PDI reduces MO and it can be useful in the prevention of caries.

FINANCIAL SUPPORT: FAPESP (2013/15770-6).

KEYWORDS: Dental caries. Microbiology. Photochemotherapy.

Antimicrobial activity of tyrosol on *Streptococcus mutans, Candida albicans* and *Candida glabrata* mixed biofilms

Monteiro DR[1]*, Arias LS[1], Barbosa DB[2], Delbem ACB[1]

[1]Department of Pediatric Dentistry and Public Health, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.
[2]Department of Dental Materials and Prosthodontics, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.

OBJECTIVE: This study assessed the effects of different concentrations of tyrosol on the formation of *Streptococcus mutans* ATCC 25175, *Candida albicans* ATCC 10231 and *Candida glabrata* ATCC 90030 mixed biofilms. MATERIAL AND METHODS: Biofilms were allowed to form on the surface of hydroxyapatite specimens in 24-well plates. The inoculum of the mixed culture (1 mL) was added to each well, and plates were then incubated for 2 hours to allow cell adherence to the specimens. Following, artificial saliva containing tyrosol at concentrations of 50, 100 and 200 mM was added to the adherent cells and the plates were further incubated for 48 hours at 37°C, to allow biofilm formation. The effectiveness of tyrosol in inhibiting biofilm formation was determined by total biomass quantification, evaluation of metabolic activity and quantification of colony forming units (CFUs). Data were submitted to ANOVA, followed by Holm-Sidak post hoc test ($p< 0.05$). RESULTS: Tyrosol had no inhibitory effect on total biomass. However, tyrosol at all concentrations tested was effective in reducing metabolic cell activity in the biofilms, with significant reductions ranging from 25% to 87% ($p< 0.001$). Furthermore, the highest reduction in CFU number for all strains was verified for groups exposed to 200 mM tyrosol, which was significant different from the other concentrations. The highest reduction in CFU (4.99-log10; $p<0.001$) was seen for *C. albicans*. CONCLUSION: Tyrosol shows a dose-dependent effect in reducing the formation of cariogenic biofilms, except for total biomass.

FINANCIAL SUPPORT: FAPESP (Proc. 2013/03273-8 and 2013/10285-2).

KEYWORDS: Biofilms. Quorum sensing. *Streptococcus mutans.*

Antibiofilm effect of tyrosol on *Streptococcus mutans*

Arias LS[1]*, Monteiro DR[1], Barbosa DB[2], Delbem ACB[1]

[1]Department of Pediatric Dentistry and Public Health, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.
[2]Department of Dental Materials and Prosthodontics, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.

OBJECTIVE: This *in vitro* study analyzed the influence of tyrosol (a quorum sensing molecule) in the inhibition of *Streptococcus mutans* biofilm formation on hydroxyapatite specimens. MATERIAL AND METHODS: *S. mutans* ATCC 25175 inoculum (1 mL, 10^8 cells/mL) was added to each well of 24-well plates containing hydroxyapatite specimens. After 2 hours (cell adhesion period), the inoculum was removed and artificial saliva containing tyrosol at concentrations of 50 mM, 100 mM and 200 mM was pipetted into wells. Plates were then incubated (37ºC, 48 h) for biofilm formation. Artificial saliva without tyrosol and with chlorhexidine digluconate (CHG - 250 µg/mL) were used as negative (NC) and positive controls, respectively. The effect of tyrosol was evaluated by quantification of total biofilm biomass, metabolic activity (XTT) and colony forming units (CFUs). Data were submitted to one-way ANOVA, followed by Holm-Sidak *post-hoc* test ($p<0.05$). RESULTS: No differences were observed among the groups regarding total biofilm biomass. All concentrations of tyrosol and CHG significantly promoted reductions in the cellular metabolic activity when compared to NC group. The highest decrease in metabolic activity occurred for the group exposed to tyrosol at 100 mM (86.53%, $p<0.001$). The CFU counts confirmed that all groups treated with tyrosol or CHG promoted significant reductions (ranging from 1.19 to 4.54-log[10]) in the number of cultivable cells when compared to NC. CONCLUSION: Tyrosol inhibited *S. mutans* biofilm formation. However, further studies should be conducted so that this compound can be safely used as an alternative treatment for the prevention of tooth decay.

FINNANCIAL SUPPORT: FAPESP (Proc. 2013/10285-2 and 2014/05507-9).

KEYWORDS: Biofilms. Quorum sensing. *Streptococcus mutans*.

Photodynamic Antimicrobial Chemotherapy on *Streptococcus mutans* mature and in forming Biofilms

Lima RA[1]*, Lins DS[2], Rodrigues LKA[1], Duarte S[3], Zanin ICJ[4]

[1]Department of Dental Clinics, School of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Fortaleza, CE, Brazil.
[2]Department of Prosthodontics and Dental Materials, Araraquara School of Dentistry, Univ. Estadual Paulista, Araraquara, SP, Brazil.
[3]Department of Basic Science and Craniofacial Biology, College of Dentistry, New York University, New York, USA.
[4]Department of Microbiology, School of Dentistry, Federal University of Ceará, Sobral, CE, Brazil.

OBJECTIVE: This study aimed to evaluate the effect of photodynamic antimicrobial chemotherapy (PACT), by the association of toluidine blue-ortho (TBO-100 µg/ml) and a non-coherent red light (630 nm) on the microbial viability, polysaccharides and topography of *Streptococcus mutans* biofilm, in addition to determine the amount of intracellular reactive oxygen species (ROS), and potential cytotoxic effects on oral tissues. MATERIAL AND METHODS: *S. mutans* UA159 biofilms were formed on saliva-coated hydroxyapatite discs. Energy densities of 211.37 and 422.74 J/cm^2 were used (1 and 2 min irradiation-time, respectively). To analyze the effects of therapy in mature biofilm, PACT was applied in a single dose on 5 days-old biofilms; and for analyzing its effect on biofilm formation, it was applied twice/daily over 5 days. Chlorhexidine digluconate (0.12% CHX) was used as positive control. Variable pressure scanning electron microscopy (VPSEM) was used to check biofilm topography. An oxidative-stress-sensitive probe determined production of ROS in mature biofilm. The cytotoxic effects were evaluated by determining LDH (lactate dehydrogenase) using EpiOral™ tissue model. RESULTS: PACT-2-minutes single dose achieved 5-log reduction of microbial viability and 6.5-log reduction, when used twice/daily, being superior to all other groups (ANOVA, $p<0.05$). Twice/daily PACT 2-minutes treatment dramatically reduced the production of soluble and insoluble polysaccharides in *S. mutans* biofilm (ANOVA, $p<0.05$). VPSEM images showed a small number of cell clusters and lost of the connective

polysaccharides structures in the biofilms treated with PACT twice/daily. PACT-2-minutes presented the highest levels of ROS production ($p<0.0001$) followed by PACT-1-minute (ANOVA, $p<0.05$). The cytotoxicity percentage of PACT-2-minutes irradiation was 1.29%, and CHX, 3.33%. CONCLUSION: PACT performed with red light and TBO may be a promising and safe therapy against *S. mutans* biofilm. Further studies are needed to assess the PACT effects on *in situ* and *in vivo* biofilms.

KEYWORDS: Dental plaque. Photochemotherapy. *Streptococcus mutans*.

A biofilm model for mineral and antimicrobial dose-response studies in a multifunctional oral cavity simulator

Maske TT[1]*, Brauner KV[1], Nakanishi L[1], Arthur RA[2], van de Sande FH[1,3], Cenci MS[1]

[1]Graduate Program in Dentistry, Federal University of Pelotas, Pelotas, RS, Brazil.
[2]Department of Preventive and Community Dentistry, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil.
[3]School of Dentistry, IMED Faculdade Meridional, Passo Fundo, RS, Brazil.

OBJECTIVE: This study aimed to establish and standardize a complex biofilm model to caries-related studies. MATERIAL AND METHODOS: Independent experiments were performed as pilot studies (PS), and their results were used to establish the protocol for the biofilm model. Saliva was used as inoculum and biofilms were formed on bovine enamel discs (n=10). In PS, samples (enamel/biofilm) were collected at 4, 7, 14 and 21-days, and different conditions were tested regarding the artificial saliva flow rate and cariogenic challenges. For the final model, 5% sucrose (0.25 ml/min, 6 min, 3x/day) with artificial saliva flow rate at 0.06 ml/min were chosen. Then dose-response (Chlorhexidine – CHX) and reproducibility evaluations were performed. CHX solutions (0.012%, 0.03%, 0.06%, 0.12%) and sterile saline solution (control) were applied 2x/day, up to 7 days (n=10). To evaluate the reproducibility of the model, data from independent experiments under the same protocol conditions were compared (n=10). The response variables assessed were: percentage of superficial hardness change; integrated hardness loss; and colony-forming units for total microorganisms, total aciduric, *Lactobacilli* and mutans *Streptococci* counts. Statistical analysis was performed by ANOVA and Tukey's test, and T-Test ($p<0.05$). RESULTS: In PS, for the response variables assessed, differences between 7 and 14-days were not statistically significant. Therefore, the experimental period to evaluate the model was defined as 7-days. A dose-response pattern was found and differences were statistically significant for mineral loss, mutans *Streptococci* and total microorganisms counts for the control group compared to 0.12% and 0.06% CHX solutions. Data from independent repetitions were similar and no significant for the response variables assessed. differences were found ($p\geq0.350$). CONCLUSION: The proposed biofilm model may be useful for caries-related studies since caries-like lesions were developed and dose-response pattern was shown.

FINNANCIAL SUPPORT: CNPq (Proc. 486810/2012-7).
KEYWORDS: Demineralization. Dental caries. Dental plaque.

TOOTH EROSION

How to simulate tooth erosion and erosive enamel wear lesions *in vitro*?

Oliveira GC[1]*, Dionísio EJ[1], Jordão MC[1], Gonçalves PSP[1], Buzalaf MAR[2], Honório HM[1], Rios D[1]

[1]Department of Pediatric Dentistry, Orthodontics and Public Health, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.
[2]Department of Biological Sciences, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: The aim of this *in vitro* study was to establish and validate a protocol for the formation of tooth erosion and erosive tooth wear lesions using hidrocloric acid (intrinsic acid) and different measurement methods. MATERIAL AND METHODS: Twelve bovine enamel blocks were selected by surface microhardness and immersed in 17.5 ml of hydrochloric acid (0.01 M, pH 2.3) for 360 seconds (under stirring, 24°C). Before the *in vitro* phase and after 15 s, 30 s, 60 s, 120 s, 240 s and 360 s of acid challenge, enamel alterations were determined by surface Knoop hardness, roughness measurement (Ra), profilometry, and depth of hardness impression (based on the indentation length). Data were analyzed for each response variable by Repeated Measures ANOVA and Tukey's test ($p<0.05$). RESULTS: Surface hardness significantly decreased, with increasing erosive challenge, up to 120 s. There was no difference on surface hardness among 120 s, 240 s and 360 s. The depth of hardness impression showed alteration only after 30 s of erosive challenge. Indentation length could not be measured on the enamel samples eroded for more than 60s. Profilometry showed enamel loss for all evaluated periods of erosion, however there was no difference among 15 s, 30 s and 60 s. Roughness increased significantly only after 240 s. CONCLUSION: According to the present study, the immersion of bovine enamel blocks in hydrochloric acid under stirring for 30 s (24°C) is able to develop tooth erosion lesion *in vitro*. Erosive tooth wear lesion with maximum surface softening was achieved after 120 s of bovine enamel blocks immersion in acid. All the methods used in the study gave complementary data for the understanding of the erosion process.

KEYWORDS: Tooth wear. Tooth erosion. Hardness tests.

***In vitro* evaluation of dentifrice containing fluoride and sodium hexametaphosphate on enamel erosion**

Amaral JG[1]*, Pessan JP[1], Vilha TA[1], Moretto MJ[1], Martinhon CCR[1], Delbem ACB[1]

[1]Department of Pediatric Dentistry and Public Health, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.

OBJECTIVE: This study evaluated the effect of fluoride dentifrices associated with sodium hexametaphosphate (HMP) on dental erosion. MATERIAL AND METHODS: Bovine enamel blocks (n=72) were selected after polishing and surface hardness analysis (initial SH), and randomly divided into 6 groups (n=12) according to the dentifrice used: placebo, 1,100 µg F/g, 5,000 µg F/g, 500 µg F/g with 1% of HMP, 1,100 µg F/g with 2.2% of HMP and 5,000 µg F/g with 10% of HMP. During 7 days, blocks were submitted to erosive challenges (citric acid solution, 0.04 M, pH 3.2) during 5 minutes 4 x a day, and treated immediately after with the respective dentifrice slurry (1:3) for 15 seconds. There was a 2 hour interval between each erosive challenge/treatment. Blocks were

analyzed by profilometry and surface hardness and the results were submitted to one-way ANOVA, followed by Bonferroni (surface hardness) and Student-Newman-Keuls (profilometry) tests ($p<0.05$). RESULTS: Blocks treated with 500 µg F/g with 1% and 5,000 µg F/g dentifrices had the lowest wear values when compared to the other groups ($p<0.05$), with no significant differences between them. Regarding surface hardness, the use of dentifrices containing 1,100 µg F/g and 5,000 µg F/g led to higher values, followed by 5,000 µg F/g with 10%HMP, 1,100 µg F/g with 2.2%HMP, 500 µg F/g with 1%HMP and placebo ($p<0.05$). CONCLUSION: The use of the dentifrice containing 500 µg F/g supplemented with 1% HMP led to a higher protective effect against erosive challenges, achieving similar enamel wear values to the 5,000 µg F/g dentifrice.

KEYWORDS: Fluoride. Polyphosphates. Tooth erosion.

Effect of different *in situ* periods of saliva exposure on enamel erosion inhibition

Jordão MC[1]*, Mendonça FL[1], Oliveira GC[1], Gonçalves PSP[1], Magalhães AC[2], Honório HM[1], Rios D[1]

[1]Department of Pediatric Dentistry, Orthodontics and Community Health, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.
[2]Department of Biological Sciences, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: Saliva presents an important role in the maintenance of dental tissues. This study evaluated the influence of different *in situ* periods of saliva exposure in the inhibition of dental erosion. MATERIAL AND METHODS: One hundred and eighty bovine enamel blocks were selected by surface microhardness and randomly divided into 5 groups: control (no salivary exposure), 30 min, 1, 2 and 12 h of salivary exposure. There were 4 *in situ* crossover phases with 1 day interval. In each phase of salivary exposure, 20 volunteers wore intraoral appliances containing 2 enamel blocks during the period corresponding to group under study. For the 12 h group, volunteers wore the intraoral appliance at night, during sleep. Immediately after the *in situ* phase of each group, the appliance and the specimens from the control group were immersed in hydrochloric acid (0.01 M, pH 2.3) during 30 s (initial erosion lesion). Surface hardness of all blocks were analyzed before the *in situ* phase (IH) and after erosion (FH), to calculate the percentage of surface hardness loss (%SHL = [(IH-FH)/(IH)]x100). The data were subjected to ANOVA and Tukey's test ($p<0.05$). RESULTS: There were no statistically significant differences among 30 min, 1 h and control groups. The groups of 2 h and 12 h of salivary exposure showed statistically similar effect and promoted a significantly lower %SHL compared to the control. CONCLUSION: The enamel *in situ* salivary exposure is able to decrease erosive demineralization. However this effect is achieved with a minimum period of two hours. The increase in enamel salivary exposure between two and twelve hours does not improve its preventive effect.

FINNANCIAL SUPPORT: FAPESP (2013/15765-2).
KEYWORDS: Hardness tests. Saliva. Tooth erosion.

***In vitro* effect of varnishes supplemented with sodium trimetaphosphate on bovine dentin erosion/abrasion**

Danelon M[1]*, Pessan JP[1], Ramos J[1], Moretto MJ[1], Delbem ACB[1]

[1]Department of Pediatric Dentistry and Public Health, Araçatuba Dental School, Univ. Estadual Paulista, Araçatuba, SP, Brazil.

OBJECTIVE: The present study evaluated the effectiveness of fluoride varnishes supplemented or not with sodium trimetaphosphate (TMP) on dentin erosion and abrasion. MATERIAL AND METHODS: Bovine dentin discs (n=60; diameter of 4 mm) were sequentially polished and selected using surface microhardness (SMH). They were divided into 5 groups (n=12) according to the type of varnish used: placebo (no F/TMP), 5% NaF (5% NaF), 2.5% NaF (2.5% NaF), 2.5% NaF associated with 5% TMP (2.5% NaF+5% TMP), and 5% NaF associated with 5% TMP (5% NaF+5% TMP). The erosive challenge was promoted by immersion in citric acid (0.05 M, pH 3.2) for 5 minutes (4 times daily) in addition to abrasive treatment by mechanical brushing for 15 seconds, for a period of 5 days. After the experimental phase, dentin loss (µm) was determined by profilometry. The type of experimental varnish was considered as the variation factor and the dentin surface loss (µm) as the dependent variable. Data was subjected to 1-way analysis of variance, followed by Student-Newman-Keuls test ($p<0.05$). RESULTS: There was no statistical difference among the groups regarding SMH ($p>0.05$). Varnishes with 2.5% NaF+5% TMP and 5% NaF+5% TMP presented the lowest dentin loss compared to the other groups ($p<0.05$). Moreover, the groups 2.5% NaF and 5% NaF presented similar dentin loss ($p>0.05$). CONCLUSION: The results suggest that it is possible to reduce the dentin erosion/abrasion by supplementing fluoride varnish with sodium trimetaphosphate.

KEYWORDS: Fluorine. Tooth abrasion. Tooth erosion.

Influence of erosive/abrasive challenge in deciduous teeth undergoing restorative procedures with different adhesive protocols

Santos NM[1], Assunção CM[1,3], Erhardt MCG[2], Goulart M[2], Essvein TE[2], Lussi A[3], Rodrigues JA[1]

[1]Department of Surgery and Orthopedics, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil.
[2]Department of Conservative Dentistry, Federal University of Rio Grande do Sul, Porto Alegre, RS, Brazil.
[3]Department of Preventive, Restorative and Paedriatric Dentistry, University of Bern, Bern, Switzerland.

OBJECTIVE: To evaluate the influence of erosive challenge in the tooth-restoration interface of deciduous teeth submitted to different bonding protocols (etch-and-rinse and self-etching adhesives, containing or not fluoride). MATERIAL AND METHODS: Forty extracted/exfoliated deciduous molars were used and randomly divided according to the adhesive system: G1 (Adper Single Bond 2®), G2 (Universal Single Bond®), G3 (Optibond FL®) and G4 (Bond Force®). After conducting standardized cavity preparation (2x2 mm), adhesive systems were applied and the samples were restored with composite resin. Half of the samples were submitted to erosive and abrasive cycles, and the other half (control group) remained immersed in artificial saliva. For the erosive challenge, samples were immersed in 50 ml Coca-Cola® (pH 3.6) for 1 minute at 25°C, under constant shaking, 3x/day, for 5 days. The samples were brushed once a day using fluoridated toothpaste and artificial saliva. For

microleakage analysis, samples were immersed in 1% methylene blue, cross-sectioned, and the extent of dye penetration along the restoration-tooth interface was measured under stereomicroscope at 40x magnification. Cross-sectional microhardness (CSMH) was performed with 50 g/5 s, at 25 µm, 50 µm and 100 µm from the eroded surface and at 25 µm, 75 µm and 125 µm from the adhesive interface. Statistical analysis was completed using Kruskal Wallis test for microleakage and 2-way ANOVA for microhardness data ($p<0.05$). RESULTS: Considering the microleakage, in 7.5% of the samples no dye infiltration was observed, in 30% dye was observed only at enamel and in 62.5% the dye infiltrated through amelodentinal junction. No significant differences were observed neither for CSMH at different depths ($p\geq 0.05$) nor for microleakage ($p=0.413$) among all experimental groups. CONCLUSION: No significant changes were observed in both test and control groups for microleakage and CSMH in deciduous teeth submitted to different adhesive protocols.

KEYWORDS: Permanent dental restoration. Primary teeth. Tooth erosion.

Influence of the type of intraoral appliance on enamel erosive demineralization

Gonçalves PSP[1]*, Jordão MC[1], Mendonça FL[1], Oliveira GC[1], Magalhães AC[2], Honório HM[1], Rios D[1]

[1]Department of Pediatric Dentistry, Orthodontics and Community Health, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.
[2]Department of Biological Sciences, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: This *in situ* study compared the influence of palatal and mandibular intraoral appliances on enamel erosive demineralization. MATERIAL AND METHODS: Eight bovine enamel blocks were selected by surface microhardness and randomly assigned into 2 groups: palatal appliance and mandibular appliance. The *in situ* study was conducted with 2 crossover phases with an interval of one day. In each phase, twenty volunteers wore the intraoral appliance containing 2 blocks, for 2 hours. Immediately after the appliance removal, the blocks were subjected to short-term acidic exposure by immersion in 0.01 M hydrochloric acid (pH 2.3) for 30 s *in vitro*, resulting in initial erosion (surface softening). Surface hardness of enamel blocks was analyzed before the *in situ* phase (IH) and after erosion (FH), for the calculation of the percentage of surface hardness loss (%SHL=[(IH-FH)/(IH)]x100). The data were tested using Repeated Measures ANOVA and Tukey's test ($p<0.05$). RESULTS: The results showed no statistically significant difference in the degree of enamel erosive demineralization by the use of palatal (9.66±5.4% KHN) or mandibular (10.52±5.6% KHN) intraoral appliance. CONCLUSION: When considering *in situ* studies design, the type of intraoral appliance (palatal x mandibular) does not interfere on the degree of enamel erosive demineralization.

FINNANCIAL SUPPORT: FAPESP (2013/15765-2).
KEYWORDS: Hardness tests. Saliva. Tooth erosion.

Evaluation of erosive potential of energy marketed associated or not with alcohol

Lima RL[1], Camargo LG[1], Leite MF[1], Sant´Anna GR[1]

[1]School of Dentistry, University Cruzeiro do Sul, São Paulo, SP, Brazil.

OBJECTIVE: The intake of energy drinks is widespread in Brazil, especially among young people, and their consequences for the oral environment are little known. This *in vitro* study aimed to analyze the initial pH and acid concentration of marketed energy drinks and some forms of preparation with alcohol. MATERIAL AND METHODS: pH values and acid concentration of marketed energy drinks (n=16) and some forms of preparation with alcohol were analyzed (n=64): pure - E, with whiskey - EU, with rum - ER and with vodka - EV. Statistical analysis was performed using ANOVA with 95% confidence interval and Tukey multiple comparisons. RESULTS: All energy drinks showed acidic pH in relation to the critical pH of dental mineralized hard tissues. When added to alcoholic beverages, the value was maintained in all combinations. There was a significant difference ($p<0.001$) in initial pH between E (3.31±0.65) and EU (3.65±0.65); E and ER (3.65±0.65) and E and EV (3.65±0.63). For the percentage of acid, significant differences ($p<0.001$) were found between E (7.12±3.80) and EU (3.94±2.71), E and ER (3.65±2.35) and E and EV (3.73±2.26). CONCLUSION: Pure energy drinks have demineralizing potential due to low pH, which remains acid when associated with alcoholic drinks, despite the acid concentration in the formulation decreased when alcohol is added.

KEYWORDS: Alcoholic beverages. Energy drinks. Tooth erosion.

04/14/15 (Tuesday):
MORNING

GROUP 5 - DIAGNOSIS AND RISK

Moderator: Prof. Dr. Michele Baffi Diniz, UNICSUL

Symposium: Suitable teaching strategies on differential diagnosis of enamel white spot lesions

Prof. Dr. Lidiany Karla Azevedo Rodrigues, UFC

Abstract: Disturbances can occur in the initial stages of enamel development and may result in reducing amount or thickness of enamel, or in changing of its color. Such alterations can be confused with dental caries and erosion. We will discuss the main changes of dental enamel appearance, diagnostic methods and treatment options. To carry out an accurate diagnosis of caries lesions, especially of initial lesions (white spot) is necessary to conduct prophylaxis prior to dental examination, the tooth should be further dried and well illuminated for visual assessment. Clinical aspects such as color, roughness, loss of structure in which the lesion occurs should be analyzed so that an accurate diagnosis can be established. Details about using the "Index Development Defects of Enamel (DDE)" and "International Caries Detection and Assessment System" (ICDAS) as well as other indexes related to other enamel lesions will be presented and discussed. The differential diagnosis of defects in the enamel is complex and, therefore, it requires knowledge of the clinical aspects and etiological factors of each lesion, as well as the ability to classify them properly when needed.

KEYWORDS: Dental caries. Diagnosis. Enamel.

Symposium: Caries risk assessment: scientific evidence

Prof. Dr. Soraya Coelho Leal, UNB

Abstract: This lecture will describe tools for caries risk assessment (CRA), focusing on their validity and accuracy. CRA aims to assist professionals regarding their treatment making decision process and to establish patient's individualized recall periods. In this review, qualitative and algorithm-based programs especially developed for CRA will be presented. The use of a single caries progression predictor, the combination of caries predictors and of multiple models will be also discussed. Among different CRA tools identified, CARIOGRAM, CAMBRA (caries management by risk assessment), CAT (caries-risk assessment tool) and NUS-CRA (National University of Singapore Caries Risk Assessment) were superior, but with limited reliability, taking into account the populations in which CRA's were tested and the summation of their sensitivity and specificity (minimum of 160%). The performance of CRA programs varied according to the population studied. Considering single caries predictors' factors, past caries experience was the most accurate one.

KEYWORDS: Dental caries. Diagnosis. Risk.

GROUP 6 - EPIDEMIOLOGY AND CLINICAL TRIALS

Moderator: Prof. Dr. Fausto Medeiros Mendes, FO/USP

Symposium: Epidemiological surveys of dental caries

Prof. Dr. Saul Martins Paiva, UFMG

Abstract: Epidemiology is the study of factors affecting the health and illness of populations and serves as the foundation and rationale of interventions made in the interest of public health. It is considered the most important methodology of public health research and is highly regarded in evidence-based medicine for the identification of risk factors of disease and the determination of optimal treatment approaches in clinical practice. Epidemiologic studies involve the definition of study design, data collection, statistical analysis, data interpretation and the documentation of results for submission to peer-reviewed journals. It is possible to apply this knowledge to prevent, control and even eradicate health problems. It is also an essential tool to support health promotion activities geared to produce changes at the community level, in public policy and in the social structure that benefit health and the quality of life. In recent years, there has been a decrease in the prevalence of dental caries indicators both in developed as in developing countries. In Brazil, this trend has been clearly identified. The mean DMFT value for 12 year olds in 1986 was 6.65, and dropped to 2.78 in 2003. These data show a decrease of 58.2%. Some factors that have contributed to this change in the epidemiological framework are: the use of fluoride in public water supply and the use of fluoridated toothpastes, the expansion of dental services under the Brazilian Public Health System, preventive and operative dental services, changes in the sugar consumption, improvement of socioeconomic factors and the dissemination of oral health knowledge.

KEYWORDS: Dental caries. Epidemiology. Dental fluorosis.

Symposium: Design of randomized clinical trials in Cariology

Prof. Dr. Heitor Marques Honório, FOB/USP

Abstract: Randomized clinical trials represent a reliable source of scientific evidence about a particular topic of study. This type of study is also a major source of raw material for the production of systematic reviews. However, systematic reviews include only papers that fall into strict inclusion criteria, thus eliminating those with less rigorous design and conduction. In the past, many clinical studies were performed without concern for methodological rigor. As a result, it can be seen in the literature a huge amount of articles that do not serve as a reliable source for the generation of new scientific evidence. Therefore, with the evolution of Evidence-based Dentistry, there is a growing demand for excellence in conducting randomized clinical trials. This presentation will discuss the most relevant topics on the subject that will help the researcher in the design and conduction of randomized clinical trials in Cariology.

KEYWORDS: Dental caries. Evidence-based Dentistry. Review.

AFTERNOON
GROUP 7 - TREATMENT

Moderator: Prof. Dr. Linda Wang, FOB/USP

Symposium: Minimal Intervention treatment and new technologies for controlling initial caries lesions

Prof. Dr. Daniela Prócida Raggio, FO/USP

Abstract: Dental caries is still the most prevalent oral disease, and can lead to problems in self-esteem and quality of life, even in childhood. In this sense, we have done efforts to control initial caries lesion in order to avoid more invasive and costly treatments. The aim of this lecture is to show new possibilities in controlling these lesions, in more conservative and humanized way. We are going to discuss the differences in treatment modalities for enamel and dentin lesions, if there is need for new and expensive technologies in order to achieve the best results, and also, the comfort reported by patients after different approaches. The best way to control enamel lesion is the topical use of fluoride, which can be available in toothpastes, professional application, and even in dental restorative materials in contact with adjacent white spots. The current approach for lesion that reaches dentin is the drill and fill. There is one new possibility for this type of lesion, at the outer dentin third, which is the dental sealing (with resin sealant), with no caries removal, reducing the chair time and stress for patients, with similar results as restorative treatment. Finally, when restoration is the chosen treatment, we are going to discuss if there is evidence for a better material or technique regarding patient centered outcomes and restoration/tooth longevity.

KEY-WORDS: Dental caries. Fluorides. Materials.

Symposium: Restorative decision of caries lesions

Prof. Dr. Marisa Maltz, UFRGS

Abstract: Caries treatment can be conducted with conservative approaches based on controlling the disease and its clinical aspects (caries lesions) instead of immediate restorative treatments. Control of the disease may be established by changes in oral hygiene habits and diet, as well as use of fluoride, remineralizing agents and antimicrobials. After controlling the patient's caries activity, active non-cavitated lesions (white, opaque and rough) may be arrested (smooth and shine). These changes in the enamel surface are a result of both remineralization processes and surfaces polishing. Furthermore, inactive lesions can be even more resistant to a new cariogenic challenge than the sound surface. In the presence of cavities, there is an increase in bacterial invasion into the caries lesion. Cavities in the dentin allow penetration of bacteria in the dentinal tubules. Caries lesions can be controlled even in the presence of bacteria within the tissue. For this, there is a need of mechanical removal of plaque at the site. However, when it is not possible to remove the biofilm of a cavity, the caries process is likely to progress. Thus, the restorative treatment is indicated to arrest the caries lesion. In addition to enabling the appropriate patient's plaque control, the restorative treatment is also indicated for the caries lesions next to the tooth-pulp complex, remaining tooth structure and aesthetics changes.

KEYWORDS: Dental caries. Dentin. Materials.

ORAL PRESENTATIONS

Chair: Prof. Dr. Michele Baffi Diniz, UNICSUL; Prof. Dr. Fausto Medeiros Mendes, FO/USP; Prof. Dr. Linda Wang, FOB/USP

DIAGNOSIS & RISK

Ultrastructutral scoring system of caries lesion porosity for differentiating caries lesion status

Louzada IC[1]*, Tedesco TK[1], Rezende KMP[1], Braga MM[1]

[1]Department of Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.

OBJECTIVE: The aim of this study was to validate a porosity scale based on ultrastructural evaluation using scanning electron microscopy (SEM) to differentiate activity status of caries lesions in primary teeth. MATERIAL AND METHODS: 37 primary teeth were clinically evaluated for the presence and activity of caries lesions (active lesion, inactive lesion or sound surface). After extraction/exfoliation, areas of lesion and/or sound areas were selected in each surface. All areas were evaluated by environmental SEM, with magnification of 1000, 2500, 5000 and 10000x, adding up 318 images. Two previously calibrated examiners classified the images according to an adapted porosity scale developed to assess enamel etching patterns (Galil, Wright, 1979): 1- dissolution of the prism cores (honeycombs); 2- dissolution of the periphery of the prisms (cobblestone); 3- alternation between types 1 and 2; 4- fissured surfaces (maps or networks); 5- flat surfaces, but with minimum evidence of dissolution; 6 (created score)- surface without ultrastructural evidence of demineralization/dissolution. The scores 2 and 3 were reordered for the statistical analysis. Thus, the lower score, higher was the degree of porosity. Poisson regression analysis was used to assess the association between the clinical pattern of the lesions and the adapted porosity scale. Rate ratios (95% CI) were calculated as a measure of association. RESULTS: Higher scores were assigned to inactive lesions (RR=1.45; 95% CI: 1.08-1.96) and sound surfaces (RR=1.39; 95% CI: 1.06-1.83) than for that for active lesions (RR=1.04; 95% CI: 0.90-1.21). Inactive lesions did not differ when compared to sound surfaces. Magnification did not influence activity status differentiation (p=0.94). CONCLUSION: The porosity scale adapted from etching patterns is valid to differentiate ultrastructural active lesions of inactive lesions and sound surfaces.

FINANCIAL SUPPORT: CNPq, Rectory of Research (New Teachers Edital) and FFO (Fundecto).

KEYWORDS: Dental caries. Porosity. Primary tooth.

Differences among dental students regarding their perception about a practical activity in caries lesions detection

Pedroza-Uribe IM[1]*, Conessa J[1], Floriano I[1], Reyes A[1], Mattos-Silveira J[1], Gimenez T[1], Braga MM[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.

OBJECTIVE: This pilot study compared 2nd-year and 4th-year dental students regarding their perceptions about teaching of caries lesions detection after being exposed to a laboratorial activity using the ICDAS. MATERIAL AND METHODS: 2nd-year- (n=51) and 4th-year-students (n=48) from FO-USP answered a questionnaire about their perceptions concerning a laboratorial activity in caries detection aided by a scoring system (ICDAS). The questionnaire was filled at the beginning and at

the end of the laboratorial activity and it was comprised by questions focused on students' perception about the activity and judgment concerning their abilities to perform caries detection. Poisson regression analyses were used and prevalence ratios (PR) calculated in order to verify the influence of student's year and other independent variables on students' answers. RESULTS: At the baseline, 2nd-year and 4th-year students years were similar regarding their attitudes towards practical activity and judgment about the importance/facility in caries detection using ICDAS (p>0.05). At the end of the laboratorial practice, 4th-year students assigned lower level of clinical importance of using a system in caries detection than 2nd-year students (RP=0.96 95%IC=0.92-0.99). Very satisfied students were 10% more prone to choose higher scores regarding the importance of caries detection using a system compared to the unsatisfied students (PR=1.10; 95%IC:1.01-1.21). Independently of the student year, those students who declare greater facility to detect caries lesions also stated to be better prepared after finishing the activity (PR=1.17; 95%IC:1.07-1.28) and reported higher level of importance of using scores to detect caries lesion (PR=1.03; 95%CI: 1.01-1.07). CONCLUSION: Dental students at the beginning of their academic formation seem to valorize the caries detection, but the students' perception about the laboratorial activity in this field is influenced by other students' attitudes and not properly by the students' year.

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KEYWORDS: Dental Caries. Diagnosis. Teaching.

Socioeconomic determinants and risk factors for caries in children's municipal shelter/RJ

Tannure PN[1]*, Oliveira DN[1], Valente AR[1], Fidalgo TKS[2], Antonio AG[2]

[1]Discipline of Pediatric Dentistry, School of Dentistry, Veiga de Almeida University, Rio de Janeiro, RJ, Brazil.
[2]Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil.

OBJECTIVE: This study aimed to identify the socioeconomic determinants and risk factors for the development of caries in children from a child shelter in Rio de Janeiro. MATERIAL AND METHODS: The study included data collected from parents/caregivers and children aged 3 to 12 years enrolled in the Abrigo Municipal Teresa de Jesus. The parent answered to a questionnaire with socio-demographic data, oral hygiene habits and diet. After performing a professional cleaning, the children underwent clinical examinations in dental chairs using artificial light, a dental probe nº 5 with blunt and mouth mirror. The exams were conducted by graduate students, supervised by a professor. The data were tabulated, stored and analyzed using SPSS 20.0 (SPSS Inc, IL, USA). The chi-square and Fisher's exact tests were used (p<0.05). RESULTS: Thirty-eight parents attended the interview. Of this population, the predominant caregivers were mothers with a high school degree/higher incomplete and belonging to C2 level (IBGE). Children (n=67) with the mean age of 6.98±2.15 years were examined from a total sample of 450 from June 2013 to March 2014. Most of these children were boys (55.2%) in the mixed dentition (70.1%), without caries (56.7%) and fluorosis (77.6%). According to caries index, the highest average was found in the primary dentition with a DMFT of 1.33 (±2.25) while the DMFT was 0.43±0.99 for permanent dentition. The caregiver education level and family's socioeconomic status were not associated with caries (p>0.05). The presence of biofilm, hypoplasia and gingival bleeding showed no positive associations with caries (p>0.05). CONCLUSION: The socioeconomics determinants and the risk factors studied were not considered predisposing features to the development of caries in this population.

FINNANCIAL SUPPORT: FAPERJ (Proc. 110.674/2013).

KEYWORDS: Dental caries. Institutionalized child. Oral health.

Performance of a novel LED-based device for occlusal caries detection in primary molars

Campos PH[1]*, Cordeiro RCL[2], Ferreira-Zandona AG[3], Diniz MB[1]

[1]Department of Pediatric Dentistry, Cruzeiro do Sul University, São Paulo, SP, Brazil.
[2]Department of Pediatric Dentistry, Araraquara School of Dentistry, Univ. Estadual Paulista, Araraquara, SP, Brazil.
[3]Department of Operative Dentistry, School of Dentistry, University of North Carolina at Chapel Hill, Chapel Hill, NC, USA.

OBJECTIVE: The aim of this *in vitro* study was to compare the performance of a novel LED-based device (Midwest Caries I.D.; MID), ICDAS (International Caries Detection and Assessment System) visual criteria and a pen-type laser fluorescence device (DIAGNOdent 2190; LFpen) in the detection of occlusal caries in primary molars. MATERIAL AND METHODS: Eighty-eight primary molars with sound occlusal surfaces or with different stages of carious lesions were assessed twice with a one-week interval by one examiner using MID, ICDAS and LFpen. Teeth were then sectioned and lesion depth was verified using stereomicroscopy as the gold standard. The sensitivity, specificity and accuracy were calculated at D1 (enamel and dentin lesions) and D3 (dentin lesions) thresholds. Spearman´s rank correlations with histology were obtained. Weighted Kappa and intraclass-correlation (ICC) coefficients were calculated to assess intra-examiner reproducibility. RESULTS: At D1 threshold the specificities were 0.30 (MID), 0.70 (ICDAS) and 0.48 (LFpen); the sensitivities were 0.71 (MID), 0.86 (ICDAS) and 0.81 (LFpen); the accuracies were 0.61 (MID), 0.82 (ICDAS), and 0.73 (LFpen). At D3 threshold the specificities were 0.93 (MID), 0.92 (ICDAS) and 0.83 (LFpen); the sensitivities were 0.43 (MID), 0.71 (ICDAS) and 0.93 (LFpen); the accuracies were 0.89 (MID), 0.90 (ICDAS), and 0.84 (LFpen). Spearman´s rank correlations with histology were 0.15 (MID), 0.57 (ICDAS) and 0.44 (LFpen). Intra-examiner reproducibility values were 0.30 (MID), 0.92 (ICDAS) and 0.77 (LFpen). CONCLUSION: The Midwest Caries I.D. did not present good performance in detecting occlusal caries in primary molars compared to the ICDAS and LFpen device.

FINNANCIAL SUPPORT: CAPES (Process nº 4053/08-7).

KEYWORDS: Dental caries. Diagnosis. Primary tooth.

Is the form based on Cariogram® software a capable tool to predict new carious lesions?

Cabral RN[1]*, Faber J[2], Leal SC[1]

[1]Department of Pediatric Dentistry, University of Brasília, Brasília, DF, Brazil.
[2]Department of Orthodontics, University of Brasília, Brasilia, DF, Brazil.

OBJECTIVE: To determine whether a form based on Cariogram® software is able to predict new carious lesions in a 1 year period. MATERIAL AND METHODS: 150 schoolchildren, aged 5 to 7 years old from Brasília/DF, were included in this survey. Caries prevalence was obtained according to International Caries Detection and Assessment System (ICDAS) II. All children were

classified in relation to caries risk using the form based on Cariogram® software, which was filled through questionnaires sent to parents. After 1 year, 89 children were reevaluated for caries progression considering the caries risk group to which they were initially allocated. Multiple regressions models were applied to correlate the variables (caries risk and the development of new carious lesions) considering the upper/lower molars from both dentitions. Intra-examiner agreement was determined by kappa test. RESULTS: The sample population comprised 89 children (45 girls and 44 boys) with a mean age and standard deviation of 6.79±0.48. The mean DMFT score and standard deviation were 3.68±3.05. Children with DMFT>2 represented 56.1% of the sample. In relation to caries risk at baseline, 8% were classified as high risk, 86% moderate and 6% as low risk. Progression of carious lesions was detected in 16% of the sample, and the majority of the children were classified as moderate risk. Caries risk assessed at baseline could not predict the development of new carious lesions in a 1 year period ($p>0.05$). The kappa test value was 0.924. CONCLUSION: For this population, the form based on Cariogram® software was not capable to predict new carious lesions over 1 year.

FINNANCIAL SUPPORT: CNPq.

KEYWORDS: Dental caries. Oral health. Risk.

Digital photography as a diagnostic method for incipient carious lesion in pigmented fissures

Bueno TL[1]*, Agulhari MAS[1], Modena K[1], Consolmagno EC[1], Wang L[1], Atta MT[1]

[1]Department of Operative Dentistry, Endodontics and Dental Materials, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: The objective of this *in vivo* and *in vitro* study was to verify the use of photographic images as a diagnostic method to the decision of intervention in pigmented groove and fissures in molars. MATERIAL AND METHODS: Sixty-two permanent molars with pigmented fissures were analyzed clinically and through digital photographic images by 3 calibrated independent examiners. To validate the method, an *in vitro* study was conducted with 60 extracted human molars with pigmented fissures that were examined by the same examiners of the *in vivo* study. Data were recorded as Yes or No for the need of intervention, both for the visual examination and for the photographs images of the same teeth. The extracted teeth were sectioned in an ISOMET® 1000 Digital cutting machine with double-sided diamond disc, perpendicular to the occlusal surface, photographed and analyzed by the 3 evaluators. The data were analyzed by Kappa and Qui-square tests ($p<0.05$). RESULTS: The Kappa interexaminers values were 0.65-0.55-0.53, for *in vivo* visual; 0.79-0.89-0.89, for *in vivo* photographic; 0.78-0.85-0.65, for *in vitro* visual; and 1-0.86-0.86, for *in vitro* photographic. The percentage of agreement for visual and photographic examination with the sectioned teeth were 70% and 60% with a low Kappa 0.31 and 0.05, respectively. For the *in vitro* study the Qui-square tests showed a slight association between visual inspection of the occlusal surface and the sectioned teeth section ($p=0.036$). CONCLUSION: Digital photos cannot be used as a diagnostic method, but can serve as documentation and control. Visual examination is required and more reliable.

KEYWORDS: Dental caries. Oral diagnosis. Dental photography.

CLINICAL TRIALS AND EPIDEMIOLOGY

Use of casein amorphous calcium phosphate (CPP-ACP) on white spots lesions: randomized clinical trial

Mendes ACB[1]*, Restrepo MR[1], Bussaneli DG[1], Zuanon ACC[1]

[1]Department of Child's Clinic, Araraquara School of Dentistry, Univ. Estadual Paulista, Araraquara, SP, Brazil.

OBJECTIVE: The aim of this study was to evaluate the efficacy of CPP-ACP in remineralization of white spot lesions in prior teeth of children aged 5-13 years old enrolled in public schools of the city of Botucatu-SP. MATERIAL AND METHODS: The study counted on 36 individuals divided into 4 experimental groups: 1- control (placebo); 2- fluoride gel; 3- CPP-ACP; 4- CPP- ACP + fluoride gel. Two applications were performed of such products by a calibrated examiner with a week of interval between these. The monitoring of the lesions was accomplished with the DIAGNOdent Pen Device, before the first application, before the second application, after 1 and 3 months of the first application. In study of the lesion intensity, the Friedman test was applied and for the comparison between experimental groups, Kruskal-Wallis test was applied. The analyses were complemented with the Dunn test and the level of significance was 5%. RESULTS: At the end of the 90-day trial, the use of CPP-ACP and fluoride showed similar improvement in remineralization. The best result in white spots lesion remineralization was observed when CPP-ACP and fluoride were associated. CONCLUSION: The use of the CPP-ACP is a good alternative for the remineralization of white spots lesions and the effect can be improved when this product is used associated with fluoride.

KEYWORDS: Dental enamel. Fluoride. Tooth remineralization.

Virulence gene expression of *Streptococcus mutans* in dentin lesions from early childhood caries

Bezerra DS[1]*, Stipp RN[2], Neves BG[1], Guedes SFF[1], Rodrigues LKA[1]

[1]Department of Dentistry Clinic, Faculty of Pharmacy, Dentistry and Nursing, Federal University of Ceará, Fortaleza, CE, Brazil.
[2]Department of Oral Diagnosis, Piracicaba Dental School,University of Campinas, Piracicaba, SP, Brazil.

OBJECTIVE: This study aimed to verify the prevalence and quantity of viable *Streptococcus mutans* (SM) as well as to analyze their expression of virulence genes in active and arrested dentin lesions of children with early childhood caries (ECC). MATERIAL AND METHODS: Dentin samples from 29 active and 16 arrested lesions were harvested from pre-school children (age 2-5 years). Total RNA was extracted and the RT-qPCR reactions were performed for SM identification, quantification and analysis of virulence gene expression (atpD, fabM, nox, pdhA and aguD). The data were analyzed by Student's t test or Mann-Whitney test. RESULTS: Although present in low quantity in relation to total bacteria, no statistically significant differences were found in the prevalence and quantity of SM in active and arrested caries lesions ($p>0.05$). SM expressed all studied virulence genes in both groups, but pdhA and aguD were more expressed in arrested lesions ($p\leq0.05$). CONCLUSION: Although present in low quantity, SM is part of the viable microbial community in dentin lesions and their pdhA and aguD genes had an increased expression in arrested caries, probably due to the unfavorable environmental conditions for microbial growth, inherent

to this type of lesion.

FINNANCIAL SUPPORT: CNPq (475346/2011-4 -MCT/CNPq 14/2011 - Universal).

KEYWORDS: Dental caries. Dentin. Gene expression.

Influence of selection method on profile of patients included in Pediatric Dentistry researches

Floriano I[1]*, Mattos-Silveira J[1], Reyes A[1], Guedes RS[1], Piovesan C[2], Mendes FM[1], Braga MM[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.
[2]Dental School, Franciscano University Center, Santa Maria, RS, Brazil.

OBJECTIVE: This study aimed to compare the profile of patients included in Pediatric Dentistry researches, with samples from different selection methods: children seeking treatment and children who are randomly selected from the general population. MATERIAL AND METHODS: For this study, the databases of other primary studies were used. One study evaluated children selected from a national vaccination day, for dental examination without prior call (Piovesan et al., 2013) (n=639). Another study included children who sought for dental treatment (ClinicalTrials.gov NCT01477385 / NCT0150135) (n=225). All patients were examined in a dental chair, regarding presence of caries lesions, and the parents answered a questionnaire with socio-demographic data. The patients profile was compared using t tests and Poisson analysis (vaccination group vs. group that sought for treatment). The selected children in the vaccination day were younger than those who sought treatment (mean [standard deviation]) (2.8 [1.1] and 6.4 [1.4] years old, respectively), and; therefore, the analysis were adjusted for age. RESULTS: Although samples did not differ regarding race and family structure, there were differences regarding income (PR [95% CI]) (2.09 [1.61 to 2.70]), neighborhood social capital (e.g., contact with relatives: 2.39 [1.81 to 3.17]) and parents with more than eight years of study (mother: 0.58 [0.42 to 0.79]; father: 0.69 [0.52 to 0.94]). In addition, the sample that sought treatment had lower caries experience (0.49 [0.29 to 0.84]) and reported a better perception of oral health (7.59 [4.68 - 12.34]). CONCLUSION: Samples with different selection procedures can show different caries experience. In addition, different characteristics regarding socio-demographic factors such as perception and attitude towards oral health can also be found.

FINANCIAL SUPPORT: FAPESP (Proc. 2013/27206-8 and 2012/50716-0).

KEYWORDS: Dental caries. Diagnosis. Primary tooth.

Are minimally invasive approaches to the approximal caries lesions similarly cost-effective in reducing biofilm?

Mattos-Silveira J[1]*, Floriano I[1], Ferreira FR[1], Viganó ME[1], Mendes FM[1], Braga MM[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.

OBJECTIVE: To compare the cost-efficacy of the some options of treatment for initial caries lesions on the approximal surfaces of primary teeth regarding visible biofilm reduction. MATERIAL AND METHODS: In this clinical trial, double-blind and placebo-controlled (NCT01477385), 141 children with initial caries lesion on the approximal surface of primary molars were allocated in three treatment groups: 30% silver diamine fluoride - SDF (n=47), resin infiltration - RI (n=47) and control - instruction for flossing (n=47). Individuals received the instruction for flossing, the active treatment and the placebo treatment(s), but just the active treatment costs and instruction for flossing were computed in this study. The visible biofilm on the treated approximal surfaces was assessed at the baseline and after 1, 6 and 12 months. The costs of treatment were compared by analysis of variance. Cost-efficacy analyses were performed and the incremental cost-efficacy ratio (CER) was calculated considering the method efficacy as the percentage of biofilm reduction in the evaluated sites. RESULTS: Treatment with RI showed the highest cost *per* individual (mean=$40.02, SD=10.40 USD, p<0.001). SDF and control groups presented similar costs. After one month, the groups presented similar efficacy (p>0.05), but the CER for the RI group compared to the control group was $1,128.82 *per* additional site where biofilm reduction was recorded. At 12 months, RI showed the worst efficacy in reducing approximal biofilm (17% vs. SDF=30% e control=21%, p=0.005). On the other hand, the CER for the SDF using the same reference was $8.52, and after 12 months, $5.83 *per* surface in which biofilm reduction was found. CONCLUSION: Treatment with RI is less effective and more expensive in reducing biofilm on treated surfaces. Treatment with SDF is cost-efficacious to complement the flossing with such purpose.

FINANCIAL SUPPORT: FAPESP (Proc. 2012/50716-0 and 2014/00271-7), CNPq, CAPES.

KEYWORDS: Cost-benefit analysis. Child. Dental plaque.

Attitudes of responsible regarding treatments for initial caries lesions on approximal surfaces of primary teeth

Viganó MEF[1]*, Mattos-Silveira J[1], Lopes JMC[1], Braga MM[1]

[1]Department of Pediatric Dentistry, School of Dentistry of São Paulo, University of São Paulo, São Paulo, SP, Brazil.

OBJECTIVE: To evaluate the parents' satisfaction and attitudes regarding treatments performed in initial caries lesions on approximal surfaces of the primary molars during a randomized clinical trial. MATERIAL AND METHODS: A study with parallel groups (30% silver diamine fluoride, resin infiltration and control group – instruction for flossing) was performed to verify the efficacy of the treatments. 141 children were followed for 2 years. At the end of the study, parents' satisfaction was collected. Parents had to classify the treatment as excellent, good, acceptable or bad. Parents who did not return to final evaluation or evaluated the treatment negatively were considered as having negative attitude and those who answered positively about treatment as having positive attitude. Patients with exfoliated teeth (n=27) were not considered in this sample. Poisson regression analyses were performed to verify the association of explanatory variables with the parents' attitude and the prevalence ratios were calculated. RESULTS: No responsible pointed negative impression about treatments. About 85% of respondents rated the treatment as excellent and 15% as good (positive attitude). The group that child had been allocated did not influence the parent's attitudes (RP=0.98; 95%IC:0.81-1.17). Caries progression did not influence the parents' attitudes (p>0.05) The positive parents' attitude was associated with children who reported higher level of discomfort in the treatment session (RP=1.46; 95%IC:1.22-1.75) and yellow race children (RP=1.58; 95%IC:1.35-1.88). Parents of black children showed more often negative posture than the white children (RP=0.48; 95%IC:0.24- 0.97). CONCLUSION: The parents' satisfaction regarding the received treatment for

approximal lesions is high and independent on the type of treatment. Other factors such as race and previous experience with dental treatment may influence parents' attitude throughout the study.

FINANCIAL SUPPORT: CNPq, FAPESP (2012/50716-0).

KEYWORDS: Dental caries. Patient satisfaction. Therapeutics.

Oral Health Conditions of the population from Monte Negro/RO: project FOB-USP in Rondonia

Damiance PRM[1]*, Franco EC[1], Santo CE[1], Carleto NG[1], Favoretto NC[1], Oliveira AN[1], Xavier A[1], Damasceno RJ[1], Panes VCB[1], Godoy M[1], Figueiredo AM[1], Guedes MF[1], Caldana ML[1], Bastos JRM[1]

[1]Department of Pediatric Dentistry, Orthodontics and Community Health, Bauru School of Dentistry, University of São Paulo, Bauru, SP, Brazil.

OBJECTIVE: To report the prevalence of dental caries, use and need of dental prosthesis in Monte Negro, in 2002 and 2008, for all age groups recommended by the World Health Organization. MATERIAL AND METHODS: A sample was composed of 5, 12, 15 to 19, 35 to 44 and 65 to 74 years old individuals. Residents underwent oral examination at the municipal school. The instruments used for the exam were dental mirror, CPI probe or "ball point" and wooden spatula. Indexes used for the evaluation were DMFT and dmft. Discrete and continuous variables were presented as mean and standard deviation, whereas categorical as proportions. RESULTS: 443 individuals were examined, in 2002, and 635, in 2008. Prevalence of dental caries in 5 years-old children was considered high: 78.5%, in 2002, and 65.5%, in 2008. At 12 years old, there were a decline of prevalence of dental caries and an increase of its severity (around 17%) from 2002 to 2008. Between 15-19 years old, in both surveys, caries prevalence was approximately 90%. 100% of adult had dental caries experience. High caries prevalence (98.2%) and severity was seen in elderly. Use and necessity of dental prosthesis among adolescents were considered null. Among the adults, use and necessity of total prosthesis decreased overtime. In elderly group, increase in use and decrease of the need were seen from 2002 to 2008. CONCLUSION: This population presented high prevalence of dental caries in all age groups with decline from 2002 to 2008. Use of total dental prosthesis increased only between elderlies and necessity went down between adults. The severity of the disease remained high for 12 years-old children and elderlies.

KEYWORDS: Dental caries. Oral health. Prevalence.

TREATMENT

Impact of dental treatment on quality of life of children with early childhood caries

Vollú AL[1]*, Costa MEPR[1], Maia LC[1], Antonio AG[1]

[1]Department of Pediatric Dentistry and Orthodontics, School of Dentistry, Federal University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil.

OBJECTIVE: This study evaluated the impact of Early Childhood Caries (ECC) treatments on the oral health-related to quality of life (OHRQoL) of preschool children. MATERIAL AND METHODS: Sixteen children (3.56±1.31 years) affected by ECC were selected. Anamnesis, clinical and radiographic exams were performed. Data about sociodemographic aspects, OHRQoL and dmf-t index were collected. The Brazilian version of Early Childhood Oral Health Impact Scale (B-ECOHIS) was applied in two time intervals: before and after 30 days of treatment. B-ECOHIS scores and effect size (ES) were used to evaluate the OHRQoL of preschool children. The Student t-test was used for comparison between the B-ECOHIS averages, considering the following aspects: gender, age, socioeconomic status, severity of caries and type of treatment. RESULTS: The mean dmf-t was 6.25±4.20 and no differences between boys (6.00±4.32) and girls (6.83±4.35) ($p=0.942$) were found. Pain and eating problems among children and parents feeling upset and guilty were the most frequently reported impacts at baseline. There was a greater impact on girls (17.67±8.68) than on boys (13.30±10.53) ($p<0.001$); and on children younger than 4 years (16.71±9.96) ($p<0.05$). The highest B-ECOHIS scores were observed in treatments involving dental extractions and space maintainer. There was no difference between the total B-ECOHIS scores of subjects from middle (16.24±10.30) and lower socioeconomic classes (15.97±10.26). The total scores B-ECOHIS and its domains decreased after 30-day follow-up. Dental rehabilitation of preschool children showed a large effect size for these subjects, both for children (ES=1.19) and for their families (ES=1.00). CONCLUSION: Dental treatment resulted in significant improvement of the preschool children's OHRQoL.

FINNANCIAL SUPPORT: FAPERJ (Proc. 110.090/2014).

KEYWORDS: Dental care for children. Dental caries. Quality of life.

Bi-layer technique increases success of ART-restorations: randomized trial

Hesse D[1]*, Guglielmi CAB[1], Bönecker M[1], van Amerongen WE[2], Bonifácio CC[2], Raggio DP[1]

[1]Department of Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.
[2]Department of Cariology, Pedodontology and Endodontology, Academic Centre for Dentistry Amsterdam (ACTA), Amsterdam, The Netherlands.

OBJECTIVE: The aim of the present study was to compare two different insertion techniques for glass ionomer cement (GIC) used in Atraumatic Restorative Treatment (ART) for approximal lesions in primary molars. Furthermore, two different surface protections (petroleum jelly and a nanofilled particles coating for GIC) were used. MATERIAL AND METHODS: Two hundred and eight 6-7 years old schoolchildren with at least one approximal caries lesion in a primary molar were selected. They were randomly assigned in four groups, according to GIC insertion technique and superficial protection used: G1- one-layer technique, conventional GIC insertion (powder/liquid ratio 1:1) and surface protection with petroleum jelly; G2- bi-layer technique, consisting of a flowable consistency of GIC layer (powder/liquid ratio 1:2) and a second layer of a conventional consistency, protected with petroleum jelly; G3- one-layer technique, protected with nanofilled particles coating; G4- bi-layer technique, protected with nanofilled particles coating. Restorations were evaluated after 1, 6, 12, 18, 24 and 36 months. Kaplan–Meier survival analysis was performed on the censored data to compare the different groups and the difference among survival curves was determined by log-rank test. Variables were tested for association with restoration longevity using Cox regression analysis (α=5%). RESULTS: The dropout rate after 36 months was 9.1%, and the overall cumulative restorations survival was 52.8%. The main failure characteristics were total or partial loss of restoration (70%) followed by pulp inflammation (14.2%). Log-rank test indicated significant difference between the groups and insertion techniques, with better survival for the bi-layer technique (p=0.005). No difference was found regarding the surface protection used (p=0.082). Cox regression test showed no influence of any variable tested on the survival rate of the restorations. CONCLUSION: The survival rate of approximal ART-restorations was positively influenced by the bi-layer technique, but was not affected by any surface protection used.

KEYWORDS: Dental atraumatic restorative treatment. Glass ionomer cements. Primary tooth.

Polymer burs and dental caries removal: a systematic review of the literature

Barreiros D[1]*, Oliveira DSB[1], Silva RAB[1], Silva LAB[1], Nelson-Filho P[1], Küchler EC[1]

[1]Department of Children's Clinic, School of Dentistry of Ribeirão Preto, University of São Paulo, Ribeirão Preto, SP, Brazil.

OBJECTIVE: The aim of this study was to evaluate microbiological aspects of carious dentin removal and the mean difference effect sizes of microorganism reduction before and after carious excavation with polymer burs through a systematic and critical review. MATERIAL AND METHODS: Two reviewers performed the database search of studies published between January 1950 and May 2014. The exclusion criteria were studies *in vitro*, *ex-vivo*, case reports, case series animal studies and reviews, studies without comparison of the polymer bur with other technique or those that evaluated only permanent teeth. Risk of bias was assessed based on the Newcastle-Ottawa Scale for observational studies. Comparisons of microorganism reduction before and after carious excavation were performed for each study. Individual study effect sizes were calculated using Cohen's formula. RESULTS: It was found 108 non-duplicated studies. However, after reviewing the articles, only 2 were included. The quantitative evaluation demonstrated that polymer bur reduces microorganism' levels. The larger effect size observed was seen for *Streptococcus mutans* (r=0.84; d=3.12) using the polymer bur technique, followed by *Lactobacillus* (r=0.83; d=3.03) compared to carbide bur technique. CONCLUSION: The polymer burs are effective in selective caries removal, promoting a significant reduction of microorganisms' level, especially of *Streptococcus mutans*.

KEYWORDS: Bacteria. Dental caries. Review.

Adolescents' discomfort reported after treatment for approximal initial caries lesions: preliminary results

Ferreira FR[1]*, Vigano MEF[1], Mattos-Silveira J[1], Moriyama CM[1], Mendes FM[1], Braga MM[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.

OBJECTIVE: To verify adolescents' discomfort reported after treatment for approximal initial caries lesions of permanent posterior teeth. MATERIAL AND METHODS: A randomized, placebo-controlled clinical trial to assess progression of caries lesions after application of minimally invasive treatments was designed. Data from a subsample of this study (n=24, 12-to-17-year-old adolescents) were analyzed for the purpose described above. Three treatments were used for approximal initial caries lesions: resin infiltrant, silver diamine fluoride (SDF) and just flossing instruction (control group). Each patient received the active treatment from allocated group and two simulations of other treatments at each visit (placebo). After each step of treatment, active or not, the Wong-Baker Faces Scale was applied to check the patient's discomfort regarding the received treatments. The effect of the active treatments on reported adolescents' discomfort was tested using Multilevel Poisson Regression and Rate Ratio (RR) values were calculated with 95% confidence intervals (CI). Other independent variables were tested for adjusting the models (p<0.05). RESULTS: In univariate analysis, the control group was associated with lower levels of discomfort compared with the resin

infiltrant (RR=0.35; 95% CI=0.16-0.79). SDF resulted in discomfort levels similar to the control group (RR=1.53; 95% CI=0.65-3.57). Adjusting the multiple model by the discomfort reported after simulated treatments and gender, both the control group (RR=0.42; 95% CI=0.20-0.87) and SDF (RR=0.53; 95% CI=0.29-0.96) had lower levels of discomfort than resin infiltrant.CONCLUSION: Dental flossing and SDF cause less discomfort to adolescents in the treatment of approximal caries lesions. The discomfort reported after different active treatments seems to be influenced by discomfort reported after the use of placebos.

FINNANCIAL SUPPORT: FAPESP (Proc. 2014/00271-7 and 2012/50716-0).

KEYWORDS: Adolescent. Dental caries. Therapeutics.

Approximal ART restorations using three different filling materials: Randomized Clinical Trial

Costa ICO[1], Hesse D[1], Bonifácio CC[2], Raggio DP[1]

[1]Department of Orthodontics and Pediatric Dentistry, School of Dentistry, University of São Paulo, São Paulo, SP, Brazil.
[2]Department of Cariology, Pedodontology and Endodontology, Academic Centre for Dentistry Amsterdam (ACTA), Amsterdam, The Netherlands.

OBJECTIVE: The aim of this study was to evaluate the survival rate of approximal ART restorations using three different filling materials. MATERIAL AND METHODS: A total of 290 primary molars with approximal caries lesions were selected in 4-7 years old children from Barueri city, Brazil. The patients were randomly allocated in three groups: G1 – high-viscosity GIC restoration (Fuji IX – GC); G2 – compomer restoration (Dyract Extra – Dentsply) and G3 – glass carbomer cement (GCC - Glass Carbomer – GCP Dental) restoration. All treatments were performed following the ART premises and all restorations were evaluated after 2 and 6 months. Restoration survival was evaluated using Kaplan-Meier survival analysis and Log-rank test, while Cox regression analysis was used for testing association with clinical factors (α = 0.05). RESULTS: There was difference in survival rate between the materials tested. The worst performance was found for GCC (RR=1.33, CI=1.05–1.69, p=0.017). The overall survival rate of restorations was 58.3% and the survival rate of groups were G1=62%; G2=58% and G3=48%. Cox regression test revealed influence of operator, the presence of cavitated lesion in the tooth surface adjacent to the restored surface and DMFT on the restorations survival. CONCLUSION: The application of a new developed glass carbomer filling material does not improve the survival rate of approximal ART restorations in primary molars.

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KEYWORDS: Primary tooth. Longevity. Dental Atraumatic Restorative Treatment.

Invasive treatment needs associated with molar-incisor hypomineralization (MIH)

Grossi JA[1]*, Cabral RN[1], Leal SC[1]

[1]Department of Dentistry, School of Health Sciences, University of Brasília, Brasília, DF, Brazil.

OBJECTIVE: The aim of this study was to evaluate the invasive treatment need in teeth affected by molar-incisor hypomineralization (MIH). MATERIAL AND METHODS: 185 children, from Paranoá-DF diagnosed with MIH by a previous epidemiological study, were evaluated using the Nyvad criterion for caries diagnosis and the European Academy of Paediatric Dentistry – EAPD for MIH diagnosis by a single trained and calibrated examiner. All teeth with enamel post-eruptive breakdown with dentine exposed were evaluated regarding invasive treatment needs. RESULTS: 2200 teeth (740 molars and 1480 incisors) from 93 boys and 92 girls (mean age of 9.07±1.45) were evaluated regarding the presence of MIH. From this total, MIH features were detected in the 27.5% of the sample (447 molars and 158 incisors) and 109 molars and 1 incisor had invasive treatment needs. Regarding treatment needs, extraction was indicated for 5.46% (n=6) of the sample, while endodontic treatment and restorative care were indicated in 7.27% (n=8) and 87.27% (n= 96) affected teeth, respectively. Dental caries was diagnosed in all teeth that required invasive treatment. Considering the teeth with the need of restorative care, the involvement of one, two or more than two surfaces were detected in 51.04%, 21.87% and 25% teeth, respectively. CONCLUSION: Dental caries was present in all MIH teeth with post-eruptive breakdown involving dentin. The restorative treatment for teeth affected by MIH with dentin exposure should be implemented as soon as possible to avoid mutilating procedures such as dental extractions.

KEYWORDS: Dental caries. Preventive dentistry. Tooth demineralization.

04/15/15 (Wednesday): MORNING

Discussion about the lectures, concepts and idea for further studies mediated by the moderators and speakers.

Closing ceremony (Award)