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Oral Session O02 – Cariology 2

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Oral Session O02/Cariology 2

O02–9

Investigation of dental health indices and caries associated microflora in children with cleft lip and palate

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Introduction: In children with oral cleft, a healthy primary dentition is important because of the increased need of orthodontic treatment during the primary dentition and transitional period. Early extractions or malformations of teeth will result in loss of bone preserved by primary teeth bordering the alveolar cleft. The purpose of the present investigation was to assess the prevalence of Streptococcus mutans and lactobacilli in 3–5 year-old children with cleft lip and palate attending Pediatric Dentistry department of Marmara University and to determine the possible factors associated with the colonization of these microorganisms.
Patients and methods: 45 children with cleft lip and palate and 34 healthy controls (21 decayed, 13 caries free) matched for sex and age attending the same department participated in the study. All subjects accompanied by their parents were called for a clinical and radiological examination and a saliva sample collection. The parents were interviewed with a structured questionnaire.
Results: The mean caries experience (dmft) was 6.42 ± 5.48. The dental anomalies most seen in children with cleft were: rotation (60%), hypodontia (37.8%) and enamel alterations (33.3%). In children with cleft lip palate the values of MS, LB and Candida were high. Salivary secretion rate was significantly low especially in children who used dental appliance.
Conclusion: These results underline the need for a more intensive approach to prevention of oral disease in children with cleft lip and palate to optimize clinical outcome. Therefore a pediatric dentist responsible for initiating the preventive program should be included in the cleft team.

O02–10

Avoidance behaviours as risk indicators for dental caries in 5-year-old children

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Introduction: The objective of the study was to explore the associations between dental anxiety and dental avoidance behaviour in parents and children and caries experience in 5-year-old children. It was hypothesized that parents' self-reports of dental anxiety and lack of access to dental care were related to child dental health and thereby could be assessed as risk indicators for dental caries in 5-year-old children.
Materials and methods: Data were collected from the dental records and by clinical and radiographic examination of 523 children. The parents completed a questionnaire regarding socioeconomics, dental anxiety, dental attendance and behaviour management problems. Bivariate and multivariate logistic regression was conducted. A written, informed consent was obtained from all parents. The investigation was approved by the Regional Committee for Medical Research Ethics and The Norwegian Social Science Data Services.
Results: Having missed dental appointments before the age of five (OR = 4.7), behaviour management problems (OR = 3.3), child dental anxiety (OR = 3.1) and parents reporting no access to dental care (OR = 2.1) were bivariately associated with caries experience. In multivariate logistic regression, having missed dental appointments (OR = 4.0) and parents reporting behaviour management problems before age of five (OR = 2.4) were statistically significant risk indicators for having caries experience at the age of five, when controlling for parents education level and national origin.
Conclusion: Behaviour management problems during previous dental visits and parents that avoid bringing their child to scheduled dental appointments represent risk indicators for dental caries in 5-year-old children.

O02–11

Oral biofilm activity, culture testing and caries experience in school children

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Introduction: To evaluate a chair side caries assessment protocol utilising an oral health questionnaire, oral biofilm activity, culture testing and routine dental examination in 5–12 year-old children at two regional schools.
Patients and methods: Permission was obtained from regional hospital and school ethics committees and informed consent was given by a parent or guardian for each volunteer child participant. Parents were interviewed by telephone and completed an interviewer assisted oral health questionnaire regarding current and previous child oral health behaviours. Oral biofilm was sampled from the labial and buccal surface of a maxillary incisor and the lingual surface of the mandibular incisor teeth using a sterile cotton swab. Biofilm activity was measured directly in relative light units (0–9999) using an adenosine triphosphate (ATP) bioluminescence meter. Bacterial counts were recorded after 48 h incubation by counting the highest density of colony forming units (Low, Medium and High). Each child's dentition was examined clinically and radiographically and their current caries experience recorded using dmfs and DMFS indices. Cross tabulations of selected categorical variables and grouped caries indices were performed using a Pearson Chi Square analysis.
Results: Caries experience was significantly associated with oral biofilm activity (RLU < 9000, 9000–9499, > 9500) in 292 children examined to date ($P = 0.3$). Bacterial counts and oral health behaviours were not significantly associated with caries indices.
Conclusions: Oral biofilm activity rather than bacterial counts is significantly prognostic of baseline caries indices in this school child population. This study was supported by a Queensland government clinical research grant.

O02–12

Plaque mutans streptococci levels on glass ionomer restorations with and without chlorhexidine

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Introduction: The aim of the study was to investigate the effects of chlorhexidine in glass-ionomer cement on levels of mutans streptococci and total bacterial counts in saliva and interproximal dental plaque on the restorations.

Patients and methods: Twenty-three 6–10 year-old children with two approximal lesions on primary molars in different quadrants were included in the study. Prior parents had given informed consent. One of the teeth was restored by conventional glass-ionomer cement (Fuji IX, GC) and the other with experimental glass-ionomer cement containing 1% chlorhexidine diacetate. Saliva samples were collected before restoring the cavities and at every evaluation visit. Plaque samples were collected from the restorations 1, 3 and 6 months after treatment. The statistical comparison of pre and post bacterial counts in saliva and plaque accumulated on the approximal surfaces of restorations was done using Mann–Whitney's U and Wilcoxon tests.

Results: The results revealed significant differences between the first and the third months' total bacterial counts in saliva in comparison to baseline. The mutans streptococci levels in plaque showed a significant decrease by time for both restorative materials (6 months, $P < 0.05$). First month's results revealed a statistically significant lower level of mutans streptococci in plaque on chlorhexidine containing glass-ionomer cement then the control.

Conclusion: Restoring the caries lesions with glass-ionomer cements reduced the total bacterial counts in saliva. The present *in vivo* study revealed lower mutans streptococci counts in plaque that accumulated on the experimental glass-ionomer cement with chlorhexidine.

O02–13

Black stain: microbiological quantification and salivary buffer capacity

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Introduction: Black stain is a special type of dental plaque observed generally in children and associated with a low frequency of caries. This study compares the colony forming units (CFU) of Mutans Streptococci and Lactobacillus spp. and the salivary buffer capacity of 23 children with black stain and a healthy group of 44 children.

Patients and methods: A total of 1790 Chilean children from 4 to 13 years old were examined. 23 of them presented black stain corresponding to the 1.28%. Bacteria were grown in Mitis Salivarius Bacitracin (Mutans Streptococci) and Rogosa (Lactobacilli) and incubated at 37ordm; with a 5% CO_2 atmosphere. The salivary buffer capacity was evaluated titrating with HCl 0.1%.

Results: The children who had black stain presented a lower DMFT and dmft index than the children without it. The total CFU per ml of Mutans Streptococci was higher in the group with black stain and there where no significant differences between both groups when the CFU per ml of Lactobacillus spp was determined. Finally, the saliva of the children with black stain had a higher buffer capacity than the control group.

Conclusion: The children who have black stain present a lower caries frequency, because their augmented salivary buffer capacity. Although bacterial composition seems to be the same, we observed five different colony morphologies in both media which varied significantly between healthy and black stain children. Nevertheless, further studies must be made to elucidate this observation.

O02–14

Effect of sucrose concentration on cariogenicity of Streptococcus mutans in s-ECC

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Introduction: Severe early childhood caries (S-ECC) seriously does harm to the children's health. Excessive carbohydrates uptake and Streptococcus mutans (S. mutans) are believed the most important pathogenic factors. The Objective of this study is to determine the correlation between sucrose concentration and cariogenicity of S. mutans in ECC.

Materials and methods: 67 nursery children aged 3–5 years were included in this study, who was classified into severe Early Childhood Caries group (s-ECC, $n = 39$) and Caries Free group (CF, $n = 28$) according to NIH standard. Plaque samples were collected from subjects respectively and cultured on TYCSB plates. The stains identified by colonial morphologies and special level biochemically were cultured in PYG broth containing 1%, 5%, 10% and 20% sucrose respectively until log phase. After centrifugated, pH and extracelluar polysaccharides (EPS) were dectected. Total RNA of S. mutans was extracted and GTFs expression was analysed by RT-PCR.

Results: The pH, EPS synthesis and GTFs expression in s-ECC group were much higher than CF group ($P < 0.01$). Cariogenicity of S. mutans enhanced with sucrose concentration increasing and there was statistical difference ($P < 0.01$). The ability of acidgenicity, EPS synthesis and GTFs expression is much lower in 1% sucrose group compared with other group ($P < 0.01$). The concentration above 5% showed higher cariogenicity, however, there was no statistical difference between 10% and 20% group.

Conclusion: The cariogenicity of S.mutans is associated with the sucrose concentration. The effect of sucrose on cariogenicity seems to be steady-going when the concentration of sucrose is ≥ 5%.

O02–15

Role of IL-1β, IL-1ra and IL-10 on the colonization of Streptococcus mutans

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Introduction: Streptococcus mutans has been suggested to have an association with dental caries. Although, the role of cytokines in the pathogenesis of dental caries is not clear, components of S.mutans have been shown to stimulate the production of proinflammatory cytokines. The objective of this study was to assess the serum and saliva concentrations of IL-1β, IL-1ra and IL-10 and their relationship with dental caries and salivary S.mutans levels.

Materials and methods: Unstimulated whole saliva and blood samples were obtained from children aged 6–12 years with high caries (dmft/DMFT > 5, $n = 37$), with moderate caries (dmft/

DMFT = 1–4, n = 37) and without caries (dmft/DMFT = 0, n = 34). Ethical approval was obtained and written informed consent was acquired from each parent. The dental caries indices (WHO), plaque scores and salivary S.mutans levels were recorded. The S.mutans levels were classified as low ($\leq 10^3$), moderate ($10^3 < x \leq 10^5$) and high ($> 10^5$). The salivary and serum levels of IL-1β, IL-1ra and IL-10 were measured with ELISA. The statistical analysis were performed by chi-square, Oneway Anova, Posthoc and t-tests.

Results: The relationship between dental caries and salivary S.mutans levels was not statistically significant. No significant correlation was detected between dental caries and saliva and serum levels of studied cytokines. A positive correlation was detected between salivary S.mutans levels and saliva IL-1β level, while a negative correlation was detected between IL-1ra level. No significant correlation was detected between saliva and serum levels of studied cytokines.

Conclusion: These results suggested that S. mutans play a significant role in stimulating the production of saliva levels of IL-1β and inhibition of IL-1ra.

O02–16

Cariogram profiles for 2–6 year-old Greek children

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Introduction: Cariogram is a computer based caries risk assessment method. The aim of this study was to investigate caries risk factors in 2–6 year-old Greek children and illustrate their chance to avoid caries and caries risk profile using Cariogram.

Patients and methods: After permission from the Athens dental school ethical committee, 814 children, were selected from Attica kindergartens. Data from a questionnaire completed by the parents, clinical examination (dmft), salivary mutans streptococci levels and buffer capacity were all entered into the Cariogram program. Caries risk factors were correlated to caries risk by regression analysis.

Results: Cavitated or restored carious lesions were found in 26.5% of the children. The saliva tests showed that 23.9% of the children had detectable mutans streptococci and 23.3% had low buffer capacity. Good oral hygiene was recorded in 40% of the children while 81.7% had a cariogenic diet and 17.8% did not take fluoride. The most significant caries risk variable as found by regressions analysis ($R^2 = 0.88$), were insufficient fluoride intake (β 0.160, P 0.000) and presence of white spot lesions (β 0.159, P 0.000). Cariogram profiles displayed that 28.7% of the children had a low chance to avoid caries, 15.4% medium, while 55.8% had a high chance.

Conclusions: Insufficient fluoride intake and presence of white spot lesions were found as the most significant caries variables. One third of the children had high caries risk while half of them low. This project was supported by the FDI-UNILEVER Live, Laugh and Learn program.