P-9 Factors Associated with Early Dental Crowding in Japanese Children

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Dental crowding is a primary concern of parents as well as dental professionals. The purpose of this study is to identify and evaluate the relative contributions of specific factors associated with incisor crowding in the early developing dentition. Records from 23 subjects in the files of Tokyo Medical and Dental University, Department of Pediatric Dentistry, were analyzed at nine years of age. Two groups of subjects were identified (normal and crowded groups) based on the degree of lower incisor crowding. Lateral headfilms were traced, digitized and measured, and dental casts were measured using a digital caliper. A total of 86 measurements (72 cephalometric and 14 cast variables) were selected for statistical analysis. Student's t test and discriminant analysis were performed. The results revealed that the statistically significant factors ($p<0.05$) associated with early incisor crowding, in order of importance as determined by discriminant analysis, were 1) Cranial base dimension; 2) Mesiodistal width of the permanent central incisors; and 3)Craniofacial morphology represented by gonial angle.

P-10 The Use of the Sugar Clock to Change Dietary Behavior.

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The purpose of this study was to evaluate and to compare between two dental health education programs for limiting the frequency of fermentable carbohydrate intakes. We studied in 11-12 year-old children who lived in urban community. In experimental group ,we used the sugar clock as a media to teach them how to eat fermentable carbohydrate with a minimum harm to their teeth. In control group, we taught them not to eat fermentable carbohydrate by using standard media. Both of groups recorded everything they ate in the sugar clock as a daily record for 5 days (including holidays).They recorded before teaching, After teaching immediately and 1,3 and 6 months later. The data was statistically analysed using paired t-test($p<0.05$). The result showed a significant decrease of frequency of fermentable carbohydrate intakes in both groups. They decrease from 3.8 times/5 days to 2.4 times/5 days for the 6 months later in control group and decrease from 5.2 times/5 days to 2.6 times/5 days in experimental group. It was concluded that the use of the sugar clock as a daily record can decrease the number of times of daily intakes of fermentable carbohydrate. This study was supported by Tantarakwijai Foundation, Faculty of Dentistry, Chulalongkorn University.

P-11 Stain removing efficacy of some commonly consumed beverages.

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Previous *invitro* studies examined stain inhibition and removal by cosmetic dentifrices (Swaminathan et al, J. Dent Res 74, Abs 1323, 1995), detergents (Swaminathan et al, J. Dent Res 75, Abs 563, 1996). The aim of this *invitro* study was to evaluate the chemical stain removing efficacy of some commonly consumed beverages namely acidic soft drinks and white wine as these beverages have been implicated in the erosion of dentition which is possibly related to their pH. The products used in this study were lemonade, white wine, coke, tab clear, orange juice and specimens treated with only distilled water acted as control. Prestaining of the specimens was achieved using the perspex - chlorhexidine-tea staining model and the procedure was repeated until optical density (OD) which was determined on a uv/vis spectrophotometer reached between 2 - 2.5 on the perspex blocks. The baseline OD of these previously stained blocks was determined and perspex blocks in triplicate were allocated for each product so that the mean OD was similar for each of the treatment. The blocks were then soaked in beverage/water for certain intervals and the OD was determined at the lambda maximum for tea of 395 nm. pH of the products used in the study was then determined. Results as determined by OD indicated that stain was removed at almost similar rate by these beverages. However specimens treated with only water also produced some reduction in stain. Generally exposure of the specimens to beverages removed stain by approximately 40% when compared to water control. Thus OD of prestained specimens reduced from approximately 2.3 to 1.0 with beverages and from 2.3 to 1.88 for the water control after a total treatment of about 13 hours using different soaking periods. Cosmetic dentifrices like Eucryl reduced stain from 2.3 to 0.23 after treatment period of 13 hours and detergents like SLS from 2.3 to 0.00 after only 6 hours of treatment. Although it was assumed that acidic beverages which erode hard tooth tissues could also remove surface stains from the specimens, the results of this study did not substantiate this assumption. It was thus concluded that stain removal by acidic beverages may not be of any clinical relevance.

P-12 BACTERICIDAL AND FUNGICIDAL EFFECTIVENESS OF VARIOUS SURFACE CLEANING SOLUTIONS. S. SRISINTORN, R. TEANPAISAN

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The objective of this experimental study was to determine the comparative bactericidal and fungicidal effectiveness of a number of surface cleaning solutions. Ten solutions were applied to surface cultures of Escherichia coli, Staphylococcus aureus, Bacillus subtilis and Candida albicans at each of 2 levels (8 or 15 ml.), treatment time was 1 minute and the numbers of organisms remaining after treatment assessed by counts of the numbers of colonies developing in cultures obtained from swabs of the treated surfaces. Cultures from swabs of surfaces receiving no treatment served as controls.

Six (Biocide, Virkon 1%, hypochlorite 1000 ppm, Pose-Cresol 0.5%, Pose-Dex solution and Pose-Dex spray) of the ten solutions appeared to have been totally effective, in that no organisms could be cultured after treatment. Four treatments (tapwater, 1% phenol, 70% ethanol and 0.5% Virulex) failed to exhibit total effectiveness against at least some of the organisms.

This experiment suggested that (Biocide, Virkon 1% hypochlorite 1000 ppm, Pose-Cresol 0.5% Pose-Dex solution and Pose-Dex spray) needed only 1 minute treatment time to reduce number of organisms to the level that it was unable to culture from swabs of the treated surfaces.

P-13 Penetration of the Pulp Chamber by Carbamide Peroxide Bleaching Agent.

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Vital tooth bleaching has become a popular procedure for correction of tooth discoloration. Most home bleaching products contain 10% carbamide peroxide. The purpose of this in vitro study was to measure the quantity of hydrogen peroxide that reaches the pulp chamber by 3 carbamide peroxide products: Opalescence, Sparkle and Rembrandt. Seventy roots of extracted premolars were amputated approximately 3 mm apical to the cemento-enamel junction and the pulp tissues were removed. They were devided into three experimental groups (3x20) and a control group of ten teeth.An acetate buffer solution was placed in the pulp chamber then the crown was exposed to the bleaching agent at 37°C for 25 min.The buffer solution was removed and reacted with leuco crystal violet and horse radish peroxidase. The absorbance of the solution was measured by a spectrophotometer and determined the quantity of hydrogen peroxide by comparing to a calibration curve. The amounts in micrograms of hydrogen peroxide in the group of Opalescence, Sparkle and Rembrandt were 3.605 ±1.405, 1.282±0.762 and 0.339±0.251 respectively. The data were analysed by ANOVA and showed significant difference among the groups ($p < 0.05$). It was concluded that the penetration of commercial bleaching products was very different even they were labelled as having the same 10% carbamide peroxide. This study was supported by a grant from Mahidol University.

P-14 Expression of Secreted Aspartyl Proteinases (Saps) of *Candida* in Human Whole Saliva

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It is known that the Saps produced by *Candida* species amplify their virulence. Although the Sap activity of *C. albicans* in human saliva has been studied in quantitative terms (Samaranayake et al. *Oral Microbiol Immunol* 9: 236-40, 1994), no qualitative data are available. Hence the expression of Saps of 3 oral isolates each of *C. albicans*, *C. parapsilosis* and *C. tropicalis* was investigated in batch cultures of human, whole saliva supplemented with glucose. The saliva samples were collected from a healthy donor, spun and the supernate supplemented with glucose (200 mM). The yeasts grown for 18 h on Sabourauds agar were washed and inoculated to yield salivary suspensions of 1.0×10^6/ml. Appropriate controls, and the test suspension were incubated for 72 h at 37°C. Aliquots were removed periodically to estimate the pH, cell numbers (haemocytometer counting), protein profile (BCA protein assay; *Anal Biochem* 1985; 150:76-85), secreted aspartyl proteinase activity and their antigenic characteristics (polyacrylamide gel electrophoresis, ELISA and Western blotting). Antibodies used for ELISA and Western blots were raised in rabbits, and were generous gifts. All three *Candida* species demonstrated marked growth, Sap expression and salivary proteolysis with significant inter-species variations. In general, *C. albicans* displayed a greater growth, acidogenic potential, and Sap expression in saliva than the other species. *C. parapsilosis* and *C. tropicalis* isolates resembled each other in the studied parameters. Neither candidal growth nor proteolysis was observed in glucose-free control saliva samples. As the oral cavity provides low pH niches periodically supplemented with dietary carbohydrates the secreted aspartly proteinases of *Candida* species may play a role in the pathogenesis of oral candidosis.

(Funded by the Committee for Research and Conference Grants of the University of Hong Kong)

P-15 Effect of Soft Laser on Bacterial Killing of Neutrophils B. THAWEBOON*,S.THAWEBOON and W. BUAJEEB. (Department of Microbiology, Faculty of Dentistry, Mahidol University, Bangkok)

Previous studies have shown an increase in phagocytic activity of human neutrophils following low reactive-level laser therapy (LLLT), however the data about the effect of this laser on bacterial killing was unclear. To investigate whether LLLT would enhance bacterial killing of neutrophils, we measured the effect of Ga-Al-As diode laser on neutrophils bactericidal activity in vitro. The test was done in 20 replicate assays using blood from 5 healthy adult volunteers. Neutrophils were isolated from venous blood and adjusted to the concentration of 4.2×10^6 cells/ml. Bactericidal assay following the therapeutic dose of this laser (830 nm, 15mW, 60 sec) was performed by incubating 1 ml volume with opsonized *Staphylococcus aureus (ATCC 25923)* and neutrophils at 1:1 ratio then determining the number of viable bacteria with time after laser irradiation. The results showed that the mean percent killing at 30, 60, 90 and 120 min of laser irradiated groups were 10.36+6.27, 60.24+10.25, 82.48+8.32, 89.56+9.81 and of control groups were 8.25+6.38, 56.00+10.45, 78.00+9.56, 86.00+10.22 respectively. The differences at any time points between these two groups were not significant ($p > 0.05$) as tested by t-test. These data indicate that the Ga-Al-As diode laser has no effect on bacterial killing of neutrophils.

This study was supported by the National Research Council Grant 1994.

P-16 Development of an Electronic Platform for TMD Research and On-line Clinical Diagnosis.

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Temporomandibular disorders (TMD) are a group of clinical disorders involving the temporomandibular joints and associated structures. As the precise etiology of TMD is still unclear, it remains the center of much debate and controversy. This controversy has been fuelled in part by the lack of uniformity in research protocols and designs. To address this problem, Dworkin et al (*J Craniomand Disorders: Facial Oral Pain, 1992; 6:301-355*) proposed a set of research diagnostic criteria (RDC). This TMD-RDC allows standardisation and replication of research into the most common forms of muscle and joint-related TMD. This paper reports on the development of an electronic platform based on the TMD-RDC. The History Questionnaire and the Clinical Examination have been implemented as electronic forms which allows direct data input by the patients and clinicians, thus bypassing the manual data entry stage. Development issues included: 1) Customisation of TMD-RDC for Asian population; 2) Optimisation of the human-computer interface design (screen presentation of information, navigation control, progress tracking) and 3) Internal logic. The Patient Summary of Findings is immediately generated by the prototype program from the electronic History Questionnaire and the Clinical Examination Forms. The TMD-RDC diagnostic rules to derive the Axis I and Axis II Diagnoses were hard-coded in a custom C++ program. These diagnoses are immediately available to the examining clinician, enabling on-line clinical diagnoses. Data can also be exported to SAS or SPSS for statistical analysis. The electronic platform has been designed for deployment on both desktop and portable notebook personal computers. The latter hardware platform allows deployment and administration of the TMD-RDC in the field or in clinical situations where personal computers would not otherwise be available. A pilot study on 34 patient records was used to validate the system and full correlation between the conventional manual method and the electronic program was obtained. It is concluded that the NUS TMD-RDC electronic platform holds great potential as a tool for both clinical and epidemiological TMD research due to its simplicity of administration, flexible deployment and on-line clinical diagnosis.