<table>
<thead>
<tr>
<th><strong>Title</strong></th>
<th>Quantitative evaluation of composite bone graft healing in rabbits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Author(s)</strong></td>
<td>Rabie, ABM; Abbas, S; Cooke, MS</td>
</tr>
<tr>
<td><strong>Citation</strong></td>
<td>73rd General Session and Exhibition of the International Association for Dental Research, Singapore, 28 June-July 1 1995, v. 74 n. Sp Iss, p. 441</td>
</tr>
<tr>
<td><strong>Issued Date</strong></td>
<td>1995</td>
</tr>
<tr>
<td><strong>URL</strong></td>
<td><a href="http://hdl.handle.net/10722/54363">http://hdl.handle.net/10722/54363</a></td>
</tr>
<tr>
<td><strong>Rights</strong></td>
<td>This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License.</td>
</tr>
</tbody>
</table>
231 Caries Inhibitory Effect of Fluoride Co-crystallized Sucrose—Establishing Field Trials MULYAN DALJANI* (Univ. of North Sumatera, Medan, Indonesia) & J. M. MUNTHEY (Univ. of Adelaide, South Australia)

As the caries rate of children in Indonesia increases, a field trial has been established to assess the ability of a 0.5% fluoride sucrose to inhibit caries development in a group of children whose diet can be strictly controlled. This method based on modifications of those used by Looma et al. (1979) and Brown and Pearson (1986) is being tested in two more traditional fluoride sources in developing countries. Preparatory work involved a detailed analysis of the children’s diet, including other sources of fluoride, and fluoride in drinking water (Fm). Experimentation to demonstrate fluoride was freely available initially. Repeated urinary analysis of fluoride excretion is being used to monitor total fluoride intake.

It is expected to take three to five years before significant caries inhibition between placebo and experimental groups might be detected. The trial commenced in mid-1992, prior to which extensive caries recording, including bite-wing radiography, was carried out. Short-term effects are being tested using stannous fluoride varnish. Caries lesions present, which are bonded to selected subjects’ teeth for three-week periods. Increase in mineral density was evident in those lesions in the test subjects, compared with controls, one year into the trial. This result causes optimism for the longer term ability of fluoride co-crystallized sucrose to provide clinical evidence of caries inhibition and thus is a further validation that this method of caries control should be considered as a useful method in public health prevention of caries in developing countries.

232 Chemical and Enzymic Disinfection of Carious Dentin. H. NORDUO*, R. BELTZ & A.H. TIAN (LiU School of Dentistry, Loma Linda, CA, USA).

The tunnel preparation method for the operative treatment of Class II carious lesions complicates the removal of carious dentin, remnants of which may be left in the cavity. Carious dentin consists predominantly of organic material. This investigation aimed at studying the ability of sodium hypochlorite (NaOCl) and peracetic acid (PAA) to remove organic components was measured by the Berthelot reaction. Cavities walls cleansed for caries with excavators were also exposed to NaOCl, PAA, Protosan, or combinations of these agents, and studied under inverted microscopy. The N-containing material of carious dentin and Protosan and of the N-containing material of powdered carious dentin and Protosan about 40%. NaOCl and Protosan in tandem was more efficient than Protosan alone. Cavity walls excavated manually still contained remnants of organic matter. Protosan could not at all to the cleansing of such walls; however, there still remained material scattered over the surface that with a caries disinfecting dye containing Acid Red. NaOCl and PAA in tandem were more effective than Protosan at removing remnants of carious dentin in cavities. It is concluded that NaOCl may constitute a supplement to the conventional cavity cleansing.

233 In Vitro Study of New Caries Disclosing Dyes. O. ANZAI, K. EED*, S. D. DONALD, R. FOYE

Dpts. of Child Dental Care & Oral Sciences, Glasgow Dental Hospital and School

The aim of this study was to assess the specificity of three new dyes, to stain carious dentine. Fifteen freshly extracted carious primary and permanent teeth had the caries removed using a slow speed handpiece and a tungsten carbide bur (ISO 14). Caries was removed until the cavity was clinical, as measured, to be caries free. One of the dyes was then applied to the cavity floor of primary and permanent teeth and removed from only half of the cavity, the other half acting as control. This procedure was repeated until a dye specific for Haematoxylin was used on the exposed floor (3-6 times). Ground sections (125μm thick) and demineralised sections (5-7μm thick) were prepared from the treated teeth. The prepared ground sections contained both experimental and control areas. The dyes studied were 2% aqueous basic fuchsin and 2% aqueous basic fuchsin and the dyes studied were 2% aqueous basic fuchsin and 2% aqueous basic fuchsin and luxol fast blue were used. The Glcin method was used to determine the distribution of micro-organisms in all areas of experimental and control cavities. The examination of the sections using light microscope observations confirmed that the dye had been removed uneventfully due to general applicability and lack of specificity of the dye studied. Of the dyes tested, the only one to exhibit differential staining between the experimental and control sites was not caries specific.


Dpts. of Child Dental Care & Oral Sciences, Glasgow Dental Hospital and School

The aim of this study was to assess the efficiency of the Nd:YAG laser to remove caries from primary teeth. Twenty freshly extracted primary carious teeth, regardless of the size of the cavity, were treated using the Nd:YAG laser. Half the cavity was laser lased leaving the other half untreated. The power levels used were: 60mW with 540Ips, 30mW with 800Ips. The laser energy delivered was 0.36 J/lm of energy above the surface of the carious tissue. Half of the samples were treated with a caries dentine surface without any obvious changes in the underlying structure of the treated area. The area removed assessment using micrographs shows a greater opacity of the treated half compared to the untreated half. The treated half had a distinct layer of ground and demineralized structures of the treated teeth showed that the laser pulses delivered at 80mW peak power were the most efficient and least damaging for caries removal. Haematoxylin and Eosin staining of sections throughout the whole cavity showed damage primarily in the underlying structure of both treated and untreated halves, without any sign of damage from the laser. Micrographs of the prepared sections of treated teeth indicated that the degree of mineralisation of the cavity floor after laser application was similar to that of sound dentine. The remaining dentine was shown to be both clinically and histologically caries free.


Dpt. of Restorative Dentistry, UPPS, Portico Agile, RE, Brazil.

The aim of the study was to describe the 2-year results of a individualized treatment program designed to control occlusal caries in the first permanent molars. The sample consisted of 147 6-8 years old students divided in a control group (n=71) and a test group (n=76). The children of the control group were submitted to a preventive program based on patient education. All children received a biannual basic preventive program and a recall system according to individual status of caries and periodontal disease activity. The sample was statistically selected to simulate a pilot clinical trial. The analysis of the baseline, one and two years data, showed a significant reduction in the number of surfaces caries in the group. In the beginning of the study there were 80 surfaces with active lesion (69 white spots and 17 cavities) and after two years remained only 3 surfaces with the disease. In the control group there were initially 61 active lesions as demineralized surfaces and 17 cavities. The number of active lesions with disease and 23 surfaces had been filled. The children in the test group had 17 active cavities lesions at the beginning of the study. From this group only 5 surfaces were filled. This study showed the economic potential of non invasive treatment of occlusal caries. The number of cavities increased over surfaces with cavities. This study was supported by the CNPq, Grant 521007-93-3.

236 Intravenous Administration of Neurogenic Peptides Enhances Bone Formation. C. SHIH and R.T. YEH

(Department of Biology and Anatomy, National Defense Medical Center, Taipei, Republic of China).

Neurogenic peptides—calcitonin gene-related peptide (CGRP), substance P (SP) and vanosactive intestinal peptide (VIP) immunoreactive nerve fibers are co-localized in enteral platelets, perineurium, bone and bone marrow. Recent studies showed that CGP plays a role in dentin mineralization and bas bonate stimulating effects both in vitro and in vivo. In addition, SP VIP could enhance bone formation in a similar manner and the purpose of this study was to investigate the potential of VIP and VIP after intravenous administration. To this end, intravenous injection of 250μg/kg was made at 1, 40 or 400 μg/kg group in rabbits in the presence of DMB. The average of bone mass of 3-week-old Sprague-Dawley male rats was performed two hours before surgery. By using Ticoc-Paque density gradient separation method, light density (LD) bone samples of the double cell walls were harvested and needed onto a previously prepared feeder layer of fibroblasts in Petri dishes. Ten days after adding LD white cells, in the solvents (with and without injection of 500μg/kg VIP) were reduced to 40% or as injected group and VIP(all the doses except 400 μg/kg-injected group there were 2 bones samples with 40% injected group with 40 and 400 μg/kg-injected group with 40 and 400 μg/kg-vip group (p<0.01 and p<0.001); with 400 μg of VIP there were 4 colonies (p<0.005). In addition, the size of bone colonies in the SPI or VIP (40 or 400 μg/kg) injected group was significantly (p<0.01) increased as compared to the controls. The results of this study indicate that SP and VIP could enhance bone formation by stimulating the formation of new cell matrix, predominantly osteoblasts and confirming additional extracellular matrix activity. This study was supported by National Science Council Grant NSC 83-0411-B-016-010.

238 Quantitative Evaluation of Composite Bone Graft Healing in Rabbits. A.B.M. RABIE, S. ABDUL & M.S. COHEN

(Department of Children’s Dentistry and Orthodontics, The University of Hong Kong).

Previous studies have qualitatively evaluated the improved induction and integration of composite bone grafts (bone with added demineralised bone matrix powder, DBM) using histological methods. Aim: To quantitatively evaluate the healing capacity of composite intramembraneous (IM) and of composite bone-grafted (BC) bone in rabbits. Methods: Seven day immunocompromised rabbits were prepared using the Methods. Surgical defects were created in the skulls of 12 rabbits. Intravenous saline alone (5 rabbits), endochondral bone grafts alone (3 rabbits), and composite grafts of bone with demineralised bone matrix powder (IM + DBM) or BC + DBM. Results: The results were compared by image analysis of stained histological sections. Conclusions: 1) Image analysis is a reliable method for the quantitative measurement of bone induction. 2) Composite bone grafts (with added DBM) showed more bone regeneration than composite bone grafts of bone alone (BC) and rabbit bone grafts. 3) Composite bone grafts must further clinical evaluation.

This study was supported by grant no. 372/251/6352 from the University of Hong Kong.