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<th><strong>Title</strong></th>
<th>Quantitative evaluation of composite bone graft healing in rabbits</th>
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Carlesi Inhibitory Effect of Fluoride Co-crystallized Sucrose - Establishing Field Trials MAHYAN DALALJAN* (Univ. of North Sumatra, Medan, Indonesia) and J. M. WINTWORTH (Univ. of Adelaide, South Australia)

As the caries rate of children in Indonesia increases, a field trial has been established to assess the efficacy of a 3% F-fluoride co-crystallized 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 Luoma et al. (1978) and Brown and Pearson (1979), is being tested in the more traditional fluoride sources in developing countries. Preparatory work involved a detailed analysis of the children's diet, including other sources of fluoride, and in vitro experimentation to demonstrate that fluoride was freely available. Repeated urinary analysis of fluoride excretion is being used to monitor total fluoride intake.

It is to be expected that three to five years before significant caries inhibition between (polyp 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 standard enamel slabs with artificial caries lesions present, which are bonded to selected subject's 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 benefit of fluoride co-crystallized sucrose to provide clinical evidence of caries inhibition and thus is a major indication that this method of caries control should be considered as a useful method in public health prevention of caries in developing countries.

An In Vitro Study of New Caries Disclosing Dyes
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Depts. 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 tooth halves had the caries removed using a slow-speed handpiece and a high-speed burr (ISO 1A). Caries was removed until the cavity was clearly, by clinical means, to be free from caries. One of the dyes was then applied to the cavity floor of primary and permanent tooth halves from only half of the cavity, the other half acting as control. The procedure was repeated until all tooth halves were scored. Dye scores were compared with controls, and the percentage difference expressed in percentage terms. Ground sections (125 μm thick) and demineralized sections (5-7 μm thick) were prepared from the treated teeth. The prepared ground sections contained both experimental and control areas. The histologic sections were stained with haematoxylin and eosin and visualized by Gomori's method. This method of determining the distribution of microorganisms in both areas of experimental and control halves of the cavity. Examination of the sections using light microscopy observations confirmed that the cavity had been removed successfully due to good visibility, and lack of specificity of the dyes employed. Of the three dyes tested, 0.04% of 0.06% and 0.2%, the only dye to exhibit differential staining between the experimental and control sites was not caries specific.

325 Non Invasive Treatment of Occlusal Caries. Results After 2 Years
M. KUNZLER, B. DE HUH, D. O.BERNARD, A. VOLESKOVIC (Facility of Odontology, UPF, Porto Alegre, RS, 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-year-old children 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 test-children received a biannual basic preventive program and, on recall system, according to individual status of caries and periodontal disease activity. The children included had a polished clinical history with no evidence of cavitative lesions. The analysis of the baseline, one and two years data, showed a significant reduction in the number of occlusal carious lesions in the group. In the beginning of the study there were 80 surfaces with active lesion (69 white spots and 17 cavitations) and after two years remained only 3 surfaces with the disease. In the control group there were initially 86 active lesions as demineralized and 14 cavitations. 2 years later 12 surfaces with disease and 23 surfaces were filled. The children in the test group had 17 active caries lesions at the beginning of the study. From this group only 5 surfaces were filled. The result showed that the treatment program designed to control occlusal caries was effective over surfaces with cavities. This study was supported by the CNPq, Grant 521007-93-3.

326 Intravenous Administration of Neuroreguline Peptides Enhances Bone Formation. C. LINDH and H. VIBES (Department of Biology and Anatomy, National Defense Medical Center, Taipanc, Republic of China).

Neuroreguline peptides:calcitonin gene-related peptide (CGRP), substance P (SP) and vasoactive intestinal peptide (VIP) immunoreactive nerve fibers are co-existent in ephialid plate, peristome, bone and bone marrow. Recent studies showed that CGRP plays a role in bone mineralization and has neurogenic stimulating effects both in vitro and in vivo. In addition, SP and VIP could enhance bone formation in vivo. The purpose of this study was to investigate the potential of SP and VIP after intravenous administration. To this end, intravenous injection of 30 U/kg of Recombinant Human bone morphogenetic protein-2 was given to 6-week-old Sprague-Dawley male rats were performed two hours before surgery. By using Triscuque density gradient separation method, light density (LD) bone and dense density (DD) bone were separated and then the diffusion layer of fibroblasts in Petri dishes. Ten days after adding DD white cells, in the controls (without intravenous injection) and in SP or VIP injected group (1 μg/kg), the cell count and fibroblasts of DD bone were measured using light microscopy. ky(x)(0.01) increased as compared to the controls. This data indicated that SP and VIP could enhance bone formation by stimulating the diffusion layer of fibroblasts in Petri dishes. This study was supported by National Science Council Grant No. 83-0411-Sh-105-105.


In the treatment of orthodontic patients with a narrow maxillary arch, rapid palatal expansion of a mid-palatal suture is generally employed. Herein, we examined the effects of low-power laser irradiation on bone regeneration quantitatively during the expansion of a mid-palatal suture in rats. The animals were subjected to expansion of mid-palatal suture in which different dosages (18-420) of a Ga-As diode laser (830nm, 100mW) were irradiated. The animals were administered calcine on days 3, 6 and 9 for triple bone labeling. Bone specimens were stained with the Villanueva bone staining method and embedded in plastic. Then grid sections were made. The evaluation was performed quantitatively by bone histomorphometry. Newly formed mineralized bone area was significantly increased in a radiation dose-dependent manner (p<0.01, ANOVA) in the 7 day irradiation group, although it was not increased in the control irradiation group. In the 3 day irradiation group, it was also significantly increased by irradiation on day 0-2 (p<0.01) but not by that on day 4-6.

These findings suggested that a series of low-power laser irradiation accelerated bone regeneration in the suture during rapid palatal expansion, and that laser irradiation in the early stage of the active suture was more effective for bone formation.


Previous studies have qualitatively evaluated the improved induction and integration of composite bone grafts (bone with demineralised bone matrix powder, DBM) using histologic methods. Aim: To quantitatively evaluate the healing capacity of composite intramembranous (BM) or of composite and endochondral (EC) bone grafts in rabbits in the presence of DBM. Methods: Surgical defects were created in the skulls of 12 rabbits. Intramembranous grafts alone (3 rabbits); endochondral grafts alone (3 rabbits); and composite grafts of bone with demineralised bone matrix powder (BM + DBM) or EC + DBM, 5 g each. In the BM and EC groups the defects. Healing was evaluated, 2 weeks later, by image analysis of stained histological sections. Results: The defects with the composite bone grafts showed rapid osseous healing throughout the whole width and depth of the graft. EM histologic examination showed 11% by area of bone regeneration in 9% for the BM grafts and 32% for the EC bone grafts. EM histologic examination showed 11% by area of bone regeneration in 9% for the BM grafts and 32% for the EC bone grafts. The method error using the image analysis was about 4%. 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 new bone volume and surface area than the bone grafts of bone alone. 3) EC bone grafts. 4) Composite bone grafts must further clinical evaluation.

This study was supported by grant no. 372/251/1452 from the University of Hong Kong.