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Elastase activity in static and flow gingival crevicular fluid from subjects with periodontal disease

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Gingival crevicular fluid (GCF) has been highly implicated as a promising medium to be used for early identification of periodontal destruction and for monitoring treatment response. Most commonly, the initial GCF sample (static GCF, sGCF) is collected for analysis, while the subsequent flow sample (fGCF) has been utilized as an alternative. The aim of this study was to investigate the volume and the elastase activity levels in sGCF and fGCF collected from subjects with various periodontal status. The following different categories of sites were investigated: healthy sites from healthy (H-H), gingivitis (H-G) and periodontitis subjects (H-P); gingivitis sites from gingivitis (G-G) and periodontitis subjects (G-P); and periodontitis sites from periodontitis subjects (P-P). The samples were collected by placing a paper strip inside the gingival sulcus / pocket for 30s. The fGCF samples were taken either 1 min (fGCF1) or 5 min (fGCF5) following the sGCF collection. The volume of each sample was determined by Periotron® 6000. The total elastase activities in supernatants were analyzed with a low molecular weight substrate specific for granulocyte elastase (S-2484). Both mean GCF volume and total elastase activity levels from periodontitis subjects were significantly higher than those from healthy or gingivitis subjects ($p < 0.05$). No significant difference was found between sGCF and fGCF volume, except for lower fGCF1 volume from H-H sites($p < 0.001$). The elastase activity levels in fGCF samples were significantly less than those in sGCF samples, except the fGCF5 samples from G-G , H-P, G-P, and P-P sites ($p > 0.05$). The present results indicate that the GCF volume and elastase activity levels are related to periodontal status. The dynamic changes of GCF granulocyte elastase activity may reflect the specific host response in subjects with periodontal diseases.

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Clinical and Microbiological Effects of Metronidazole Dental Gel in Treated Adult Periodontitis Subjects

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The aim of this study was to evaluate the clinical efficacy of metronidazole 25% dental gel as compared with subgingival scaling in treated adult periodontitis. Ten adult periodontitis patients, who had been treated with nonsurgical periodontal therapy, and who presented with at least 1 site per quadrant with a residual probing depth ≥5 mm were selected to participate in this randomized clinical study with a split-mouth design. Probing pocket depth (PPD), probing attachment level (PAL), bleeding on probing (BOP) and visual plaque index (VPI) were measured before, and at 4, 12 and 24 weeks after, treatment. Subgingival plaque samples were taken from one selected site in each quadrant before, and at 1, 3, 12 and 24 weeks after, treatment. Samples were silver-stained and analyzed under light microscope. Four treatment modalities, *viz.* oral hygiene alone, metronidazole gel alone, subgingival scaling alone and gel plus subgingival scaling, were randomly assigned to quadrant 1, 2, 3 or 4. Results at the end of 24 weeks showed that subgingival scaling and gel plus subgingival scaling produced statistically significantly greater reductions in mean PPD and PAL compared to gel and oral hygiene. Moreover, gel, subgingival scaling and gel plus subgingival scaling were more effective in reducing spirochaetes and curved rods compared to gel and oral hygiene in week 4, but the differential counts became similar for all groups in week 24. Results of the differential counts showed a marked decrease in relative percentage of spirochaetes and motile rods from 28.45% to 3.8% in the first week, but gradually increased to 14.22% by week 24. From the 24 week results, metronjazole gel alone does not seem to be effective in treating residual pockets in treated adult periodontitis subjects.

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Dynamic activity of gingival crevicular fluid elastase in subjects with adult periodontitis.

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The aims of this study were to investigate *in vivo* dynamic activity of gingival crevicular fluid (GCF) elastase in subjects with advanced adult periodontitis (AP), and to determine the initial effect of scaling and root debridement on elastase activity. Granulocyte elastase was assessed in GCF collected from sites with various clinical signs in 9 advanced AP patients (mean age 43.1±5.7 yr) at baseline and 1 month after a course of scaling and root debridement. Dynamic elastase activities in supernatants were analyzed with a low molecular weight substrate specific for granulocyte elastase (S-2484). 5 distinct time-dependent dynamic patterns of elastase activity were identified and the maximal rate of elastase activity (MR-EA) in each pattern was calculated. Significant differences in clinical parameters were found among the 5 patterns ($p < 0.05$). MR-EA and maximal elastase level at 5 hr were both significantly correlated with Probing Depth (PD), Bleeding on Probing (BOP), and GCF volume ($p<0.01$). According to the 1-month treatment response (pre- / post-therapy) the non-responding sites (PD≥5mm, BOP+ / PD≥5mm, BOP+) had significantly higher MR-EA than responding sites (PD≥5mm, BOP+ / PD≤ 3mm, BOP-), both at baseline ($p < 0.01$) and after treatment ($p < 0.001$). In conclusion, the dynamic patterns of granulocyte elastase activity in GCF are related to both periodontal status and the 1-month treatment response. The proposed measure of MR-EA may prove to be a sensitive parameter in monitoring periodontal status and predicting response to initial periodontal therapy.

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Calculus and gingival bleeding in incoming dental students 1980 - 94.

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In 1980 the first students commenced dental studies in Hong Kong. At that time there were only 640 registered dentists in Hong Kong and a school dental care service for primary school children had just commenced a phased introduction. Since that time the school dental care service has been fully established, the Government has established, in 1988, an Oral Health Education Unit and the number of registered dentists has risen, by 1994, to over 1,400. All incoming dental students, as part of an introduction to oral health during their first week of studies, receive a periodontal examination performed by Faculty staff. The aim of this study was to monitor the calculus and gingival bleeding of incoming dental students over the period 1980 - 94 to test whether the increased availability of oral health promotion and care services had any effect on calculus and gingival bleeding in this selected population. The periodontal examinations included probing the gingival sulcus of each tooth at six sites. The presence of calculus or bleeding at any site resulted in the tooth being scored positive. For the years 1980-82 a mean of 37.6% of teeth were found to have calculus and a mean of 37.7% of teeth to exhibit gingival bleeding. By the years 1992-94 the proportions of teeth affected had reduced to a mean of 30.8% for calculus and 31.2% for bleeding. It was concluded that the increased availability of oral health promotion and care services were reflected in reduced calculus and gingival bleeding in incoming dental students but that further oral health promotion activities for Hong Kong youth appear to be indicated.

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The Effect of Sodium Flouride (NaF) on *Porphyromonas gingivalis*-stimulated murine splenocyte proliferation. W. SOSROSENO* (Faculty of Dentistry, Gadjah Mada Univ., Yogyakarta, Indonesia)

Flouride, known as an anti-dental caries agent, has potential adverse effects on the host tissues. The aim of this study was to determine the effect of NaF on the murine cellular immune response stimulated with *Porphyromonas gingivalis*-derived outer membrane proteins *in vitro*. Balb/c mice were immunized with PBS (as a negative control) and *P. gingivalis*-derived antigens (as a positive control). Spleen cells were cultured and stimulated with antigens. Different NaF concentrations (10^{-1} M, 10^{-3} M, 10^{-4}, 10^{-5} M, and 10^{-6} M) were added to the cell cultures. CD4 cell depletion carried out by injecting anti-murine CD4 cell monoclonal antibodies was employed to determine the mechanism of NaF-induced cell proliferation. In addition to two experimental groups as described above, mice were injected with the respective antibodies prior to immunization with antigens. A colorimetric method was used to determine the cell proliferation following a 3 day period of culture. The results showed that at low NaF concentration, increased cell proliferation as seen in the positive control was observed ($p<0.01$). In contrast, suppressed cell proliferation could be detected in high NaF concentration ($p<0.01$). Both Up- and down-regulation of the cell proliferation were independent upon the role of CD4 cells. It can be concluded that NaF could act as either an immunostimulant or an immunosuppressive agent in a dose-dependent fashion and that this agent would function as a polyclonal activator on the induction of *in vitro* cellular immune response in the murine model. This work was supported by The GMU Research Fund.

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Histopathological Appearance of Caries-like Lesion of Enamel in vitro. A.T SARWONO*. (Dept. of Oral Biology, Faculty of Dentistry, Univ. of Indonesia, Indonesia).

The initial stage of caries, has hitherto been considered as the white spot lesion. To understand the established subsurface lesion in vivo, we exposed human premolars to Streptococcus mutans FA-1 (ATCC 19645) in vitro with and without NaF. Sixty four caries-free teeth divided into two groups. One groups treated with NaF as control and test groups without NaF. Both groups were incubated in medium inoculated with Streptococcus mutans FA-1 (ATCC 19645) for periods of four to eight weeks. Lesions progress were assessed using zoom-stereo microscopy and polarized light microscopy. Subsurface porosity increased in each system, especially teeth treated without NaF. Formation of the zone of the classical 'white-spot' carious lesion were similar with or without NaF as tested by Chi-square ($p<0.05$). Examination of ground sections from both specimens showed similar typical caries-like lesions. This suggest that initial opening up of the surface is a prior step to the subsequent progression of subsurface demineralization and that the presence of NaF resulted in only partial inhibition of lesion formation.

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Diet and dental caries in Melbourne adolescents: Baseline measures. JA CONN[1], MV MORGAN[1]*, RW EVANS[1], MJ WATSON[1], FJ CUMMING[2]. ([1]The University of Melbourne, [2]Deakin University)

The relationships that exist between dietary intake and dental caries are of continuing interest - particularly in an era of widespread fluoride availability. This ongoing longitudinal study is being undertaken in a sample of year seven students (12-13 years of age) in lower socio-economic areas of Melbourne, Australia to investigate the impact that diet has on oral health. The objectives of this study are three fold: (1) to establish the prevalence of dental caries experience in a population based sample of adolescents and measure the incidence over a 30 month period; (2) to estimate the food and nutrient composition in this group using a 4 x 4-day diet record over this same period; (3) to identify key features of the diet contributing to the development of caries. This paper presents baseline levels of dental caries and a number of physiological measures in the adolescent group. A comparison is made between these baseline measures and recent Australian data. Using a random selection process, 642 students (mean age 12.6 years) from 33 Schools, were initially enrolled in the study. The dental caries experience at baseline was 0.98 DMFT (1.72 DMFS) with females having a non-statistically significantly higher experience than males. In 1995, the DMFT for Victorian 12 year olds was also 0.98 (Health and Community Services, 1995). The Body Mass Index (BMI) for the study population was 20.2 compared with 19.2 in Australia (Australian Health and Fitness Survey, 1985). The dental health status and BMI measures are not substantially different to that reported in either Victoria or Australia indicating that the study population may be considered representative of the general population. This study is supported by NH&MRC (PHRDC) Grant No 4 21176.

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A community assessment of the potential impact of a fissure sealant policy. ISA NM, JAAFAR N*, ABDUL-KADIR R.
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Fissure sealents, although proven to be a very effective clinical preventive measure, are not necessarily a cheaper alternative as compared to conventional fillings on a community basis. Certain conditions in epidemiological trends of dental caries must be fulfilled before it can be justified as a cost-effective public health measure. The aim of this study is to assess the potential benefit of using fissure sealant to reduce the DMFT index in the first permanent molar. A random sample of 602, 12 year old schoolchildren were examined clinically and their past treatment records scrutinized. The overall caries experience was very low (DMFT 1.34 ± SD 1.42). Almost 70% of the first permanent molars were caries free. Of the teeth which were carious, the most caries prone were the lower molars (43%) as compared to the uppers (20%). The most common site affected were the pit & fissures (77%). Fifty percent of the caries occurred about 3.5 years after eruption. However almost all (99.4%) had been filled with amalgam thereby contributing to the DMFT index. Therefore, it is concluded that given this scenario, the selective use of fissure sealents in this population is justified in order to bring down further the level of DMFT. The optimum time of placement of fissure sealant should be within 3.5 years of tooth eruption. Guidelines affecting the decision to adopt fissure sealants on a community basis will be discussed.