

17

Minimum Inhibitory Concentration of Antibacterial Agents Against Cariogenic Organisms. M.G. BOTELHO*. Prince Philip Dental Hospital, Hong Kong

A total of 38 oral bacteria: streptococci (15), lactobacilli (13) and actinomyces (10); were tested against eight antibacterial agents for their minimum inhibitory concentration (MIC). Antibacterial agents tested were: chlorhexidine diacetate, chlorhexidine dihydrochloride, chlorhexidine gluconate, benzalkonium chloride, cetrimide, cetylpyridinium chloride, thymol and sodium hypochlorite. These were prepared in aqueous solution. Serial dilutions of the antibacterial agents were prepared in a 96 well microtitre plates in concentrations from 64 µg/ml to 0.125 µg/ml with thioglycolate as the base media to yield a final volume of 100 µl per well. An inoculum of the test organism equivalent to 10×10^8 colony forming units per millilitre was dispensed into each test well. Each bacteria was tested on three separate occasions. The actinomyces and lactobacilli were incubated anaerobically and the streptococci aerobically for 48 hours at 35°C. Afterwards, the lowest concentration at which no visible growth occurred was recorded to be the MIC. Thymol and sodium hypochlorite did not show any antibacterial activity at the concentrations tested. The MIC range for all the microorganisms was 8.0 to 0.125 µg/ml. There was no statistically significant difference between the MIC's of the three types of chlorhexidine and the remaining 3 antibacterial agents. This does not agree with previous studies that show lactobacilli to be less sensitive to chlorhexidine gluconate than streptococci (Zickert et al 1982, Cleghorn and Bowden 1989). Thymol and sodium hypochlorite showed no antimicrobial effect at the concentrations tested. The remaining antibacterial agents displayed similar MIC-levels against the oral bacteria tested *in vitro*. CRG No. 337-252-0009

18

Caries Progression in Permanent First and Second Molars. P.G.N. RUGARABAMU¹, S. POULSON² and J.P. MASALU³. ¹Faculty of Dentistry, Dar es Salaam; ²Royal Dental College, Aarhus; ³Ministry of Health, Dar es Salaam, Tanzania

In order to determine caries progression in permanent first and second molars, dental status was assessed according to WHO criteria (1990) and followed up for 2 years (1994 - 1996) among 150 primary school children aged 10-14 years. The occlusal surface was the most affected. Lower first molars had the majority of the lesions. There were very few new caries lesions mostly on occlusal surfaces of lower first and second molars. Reversal of new lesions was noted on occlusal surfaces of upper first and second molars and lower second molars. It is proposed to take caution and delay restorative intervention in new lesions.

19

Incipient Caries in Brazilian Schoolchildren Enrolled in Different Fluoride Preventive Programmes. M.L.R.SOUZA*, A.SHEHAM, W.S.MARCELES. Faculty of Dentistry from Piracicaba - Sao Paulo; Joint Department of Dental Public Health UCL/London.

The aim of this 2 year retrospective cohort study was to assess if there were differences in active and inactive white spot lesions in the first molars of 8-years-olds consuming fluoridated toothpaste and optimally fluoridated water and using fluoride mouthrinsing, or fluoride mouthrinsing combined with fluoridated gel applications. Group 1 (n=220) was selected from schools using mouthrinses with 10 ml of NaF at 0.05% once a week. Group 2 (n=220) had fluoride gel (APF 1.23%) every three months in addition to weekly fluoride mouthrinse. The Control Group (n=220) were from schools not adopting any preventive programme. Participants were examined for white spots lesions by one examiner (ML). The criteria used were: active white spot is white, covered by a layer of plaque and appears matted and an inactive white spot is white or stained with glazed surface usually hard (Ismail et al, 1992). Groups were comparable for socio-economic status, sex, sugar consumption and toothbrushing frequency. The prevalence of active white spots was 21.5%. Control Group had 38.6%, Group 1, 16.4% and Group 2, 9.5% active white spots ($p < 0.05$). When compared two by two, the Mann-Whitney test was the same. The fluoridated mouthrinse group had more white spots than the fluoridated mouthrinse plus fluoridated gel group ($p < 0.05$). In relation to inactive white spots, overall there was 9.5%. Group 2 had a higher percentage (12.3%) than Group 1 (9.5%) or Control Group (6.8%). The Mann-Whitney showed a difference between Control Group and Group 2 ($p < 0.1$). Children consuming fluoridated water and using fluoridated toothpaste and who used fluoridated mouthrinses plus fluoride gel had less active white spots and more inactive white spots than those who did not use rinses or gel. And children consuming fluoridated water and using fluoridated toothpaste who used fluoridated mouthrinse had less active white spots than those who did not use rinses. Supported by CNPq (Process 201486-95 4).

20

Effect of Cyclosporin on the Growth Rate of Gingival Fibroblasts. M. VARNFIELD*, S.J. BOTHA and A. GROBLER. Centre for Stomatological Research, Faculty of Dentistry, University of Pretoria, Pretoria, South Africa

Several drugs which may stimulate the formation of gingival hyperplasia as side effect is known and cyclosporin which is used as immuno-suppressant in treatment of transplant patients is known to be such a drug. The underlying pathogenesis of drug induced gingival hyperplasia is unresolved. It has been speculated that drugs influence the proliferation of cells formed in the connective tissue and/or influence the cell's ability to produce collagen and extra cellular matrix. In order to determine whether there is an increased cell proliferation, this study determined the growth rate of gingival fibroblasts from control and positive responder patients when cultured in absence and presence of an average serum cyclosporin concentration. Standardized cell lines from responder and non responder patients were cultured in DMEMs with 10% fetal calf serum and in the experimental group 260ng/ml³ cyclosporin was added to the medium. Growth of all cultures were determined in duplicate with 24 hour intervals for a period of 14 days. Cell numbers were determined in haemocytometers by the Trypan Blue exclusion method. Results indicated that addition of exogenous cyclosporin to *in vitro* fibroblast cultures have no significant effect on cell proliferation/growth rate of responder and non-responder cells. These results suggest that the direct effect of cyclosporin on resident fibroblasts by increasing cell proliferation is not the determining factor in progression of a lesion.

21

Gingival Recession and its Association with Calculus in Subjects Deprived of Prophylactic Dental Care. W.M. van PALENSTEIN HELDERMAN* and B. LEMBARITI. WHO Collaborating Centre, Nijmegen, The Netherlands, and Faculty of Dentistry, Dar es Salaam, Tanzania

This paper describes the prevalence and severity of gingival recession in Tanzanian adults covering the age range from 20 to 64 years. In addition it attempts to assess the relationship between the degree of gingival recession and the presence and amount of calculus. In the 20-34 years age group recession occurred in $\geq 32\%$ of the buccal, $\geq 25\%$ of the lingual, and $\geq 13\%$ of the approximal surfaces. These percentages increased to $\geq 64\%$, $\geq 52\%$ and $\geq 48\%$ respectively, in the 45-64 years age group. In the 20-34 years age group, lingual surfaces of mandibular incisors and canines followed by buccal surfaces of these teeth were the sites most severely affected with gingival recession. With increasing age, all sites became gradually more severely affected, particularly the buccal and lingual surfaces of the maxillary first molar. The lingual surfaces of mandibular incisors exhibited on an average 1.3mm, 2.4mm and 3.2mm recession in the 20-34 years, 35-44 years and 45-64 years age group, respectively. Most of the correlation coefficients between gingival recession and calculus at the individual tooth surface in three age groups were statistically significant. The highest correlation coefficients (0.50-0.67) were found in the youngest (20-34 years) age group at the lingual surfaces of the mandibular incisors, canine and first premolar and at the buccal surfaces of the mandibular incisors. Based on these findings, the working hypothesis is advanced that longstanding calculus is an important determinant in the onset of gingival recession at sites exhibiting pronounced recession at a young age in populations deprived of prophylactic dental care.

22

Cytokeratins in Leukoedema. CW VAN WYK* and A. OLIVIER. Oral and Dental Research Institute, Dental Faculty, University of Stellenbosch, TYGERBERG.

Leukoedema is a very common well-known clinical and histological entity of the buccal and labial mucosa, microscopically recognised by epithelial hyperplasia and extensive intracellular oedema. The aim here was to study, in leukoedema, the distribution of the cytokeratins normally found in unkeratinized buccal mucosa. The material comprised 6 specimens of normal mucosa, 3 fixed in formalin and 3 in Bouin's fluid, and 5 specimens of leukoedema fixed in Bouin's fluid. Having found that Bouin's fixative is superior for the demonstration of cytokeratins, only the specimens fixed in Bouin's were investigated. Sections were stained, in pairs (control and leukoedema), with the avidin-biotin complex (ABC) method and the following single and combinations of cytokeratins were studied: basic, acidic, 4, 5/6, 7/8, 1/10, 10/11, 13, 14, 13/16, 17, 18, 19. Barring minor differences in the distribution of the keratins in the basal, intermediate and superficial cell layers, their distribution in the rest of the epithelium was broadly similar for basic, acidic, 4, 5/6, 7/8, 13 and 13/16 keratins. Present in leukoedema, but not in normal mucosa were 10/11, and 19, the opposite being the case with 1/10 and 14. Keratins 17 and 18 were not encountered. It is concluded that the differences found (10/11, 19) in leukoedema and the absence of 1/10 and 14) are the result of the cellular hyperplasia, the intracellular oedema and the resulting interference with normal squamous maturation of cells in leukoedema.

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23

Permeability of Human Vaginal and Buccal Mucosa to a High M_w Dextran. P. VAN DER BIJL*, A.D. VAN EYK and I.O.C. THOMPSON. Faculty of Dentistry, University of Stellenbosch, Tygerberg 7505, South Africa

In a previous study we demonstrated that human vaginal mucosa was as permeable as buccal mucosa to water (Van der Bijl et al JDR 75, Abstr. 80, 1997). The latter is, however, a very small molecule with a molecular weight of 18 Dalton. To further explore similarities between these two types of mucosa with respect to permeability, it was decided to investigate the passage of a large hydrophilic molecule across these epithelia. Specimens of fresh, clinically healthy human vaginal (N=6) and buccal mucosa from non-smokers (N=6) were taken from excised tissue obtained during vaginal hysterectomies and various oral surgical procedures. Seven biopsies from each specimen were mounted in flow-through diffusion cells (exposed area 0.039 cm^2) and their permeability to a 4.4 kDa FITC-labelled dextran determined using a continuous flow-through perfusion system. Dextran was detected using a fluorospectrophotometric method at excitation and emission wavelengths of 498 and 520 nm, respectively. Specimens were examined histologically before and after permeability experiments and similarities between vaginal and buccal tissues verified. Mean steady state flux values ($16 - 20 \text{ h}$) of $1.02 \pm 0.03 \text{ SEM}$ and $1.83 \pm 0.06 \times 10^{-7} \text{ mmol/min/cm}^2$ were obtained for vaginal and buccal mucosa, respectively. No statistically significant differences ($p < 0.05$) (Kruskal-Wallis test) between these flux values were found. These results demonstrate that human vaginal mucosa is for practical purposes as permeable as buccal mucosa to large hydrophilic molecules and they support the hypothesis that the former may be a useful model for studying the passage of compounds across the latter tissue. (Supported by the Univ. of Stell., the SA Medical Research Council, Lever-Pond's (Pty) Ltd and the DASA).

24

An Indication of Cytotoxicity of Etchants, Primers and Bonding Liquids. P.J. GERMISHUYS¹, M.F.G. DANNHEIMER², S.J. BOTHA³ and A. GROBLER³. ¹Dept. Periodontics and Oral Medicine, ²Dept. Restorative Dentistry, ³Centre Stomatological Research, University of Pretoria, S.A.

Etchant, primers and bonding liquids are used routinely in restorative procedures. Although these compounds are only implicated for contact with hard tissues their occasional contact - accidental or with purpose - with soft tissue of the oral cavity cannot be precluded. As some of these compounds are known for their strong chemical reactivity the possibility of cell and tissue toxicity exist, but is not known. In this study the cytotoxicity of eleven compounds on human gingival fibroblasts were determined by a simple contact procedure. Three compounds (3M Scotchbond Multi Purpose Primer 2; Scotchbond Multi Purpose Etchant; ESPE KETAC Conditioner) had no cytotoxic effect on fibroblasts. Six of the compounds (3M Scotchbond Ceramic Primer; 3M Scotchbond Multi Purpose Adhesive 3; Panavia 21 Ed Primer Liquid A; Panavia 21 Ed Primer Liquid B; Dyract-PSA Primer/Adhesive; Etching Liquid) had variable degrees of cytotoxicity which were noted as ranging from very little effect to quite severe toxic effects. In most of these cases the toxic effects on fibroblasts were observed within two hours after contact with the compound. Two compounds (3M Scotchbond Etchant 1 Phosphoric Acid; Panavia Etching Agent V) had severe and immediate toxic effects on contact with fibroblasts. This indication of cytotoxicity confirms the need for more extensive research on the cytotoxicity of compounds used in restorative and other dental procedures.