VO-15 Oral Health Status of Chinese Diabetic Patients in Hong Kong.

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Objectives: To describe the oral health status of Chinese diabetic patients in Hong Kong. Methods: All patients 41-85 years-old (n = 364, 54% female), attending the out-patient diabetic clinic of Tung Wah Eastern Hospital during a 3-month period were surveyed. Age- and sex-matched control subjects (n=161) were recruited during the same period from the general out-patient clinic. All subjects were interviewed and clinically examined in the same Hospital by one of four calibrated examiners. The examination procedures and diagnostic criteria used followed those recommended by the World Health Organization. Results: Over 90% of the subjects claimed to brush their teeth at least once a day. 57% had visited a dentist within the past 2 years. The mean DMFT scores of the diabetics and controls were 16.8 and 14.5 respectively ($p < 0.05$). More missing teeth were found in the diabetic subjects than controls (13.9 *vs.* 10.5, $p < 0.001$) and edentulism was more prevalent (12.9% *vs.* 3.1%, $p < 0.001$). 46% diabetic and 62% control subjects were in need of treatment for dental caries ($p < 0.001$) while no individual in both groups had healthy gums (highest CPI score = 0). Diabetic subjects had more CPI score of 4 (50% *vs.* 36% $p < 0.02$) and lower mean number of sextants than controls with no attachment loss (ALoss = 0; 1.4 *vs.* 1.9, $p < 0.05$) and higher mean number of sextants with considerable ALoss (≥ 2; 1.0 *vs.* 0.7, $p < 0.05$). Conclusions: Dental caries and treatment need of the surveyed subjects were high but less diabetic individuals were in need of caries treatment. General periodontal health of the subjects surveyed was poor, and the diabetic patients suffered from more severe periodontal destruction and tooth loss including edentulism than controls.

VO-16 Betel Quid-associated Oral Lesions and Oral Candida species in Padaung Women of Northern Thailand

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Betel quid chewing (BQC) is still widely practiced in Asia although its effect on the oral mucosa and the mycotic flora has been little studied. Hence the aim of this study was to evaluate the oral lesions and oral candidal carriage in BQ chewing women of the Padaung tribe in Northern Thailand. A total of 100 voluntary women, both BQ chewers (n = 50) and non-chewers (n = 50) were examined (by PR) using the WHO criteria. Full mouth swabs were taken for candidal carriage, and grown on Sabourauds agar, after which the yeast growth was speciated using API20C and Chromagar Candida (Biomeruix, France). There was a significant correlation between the years of chewing BQ and the development of betel chewers mucosa (BCM ; $p<0.001$). Amongst the betel chewers the prevalence of BCM on buccal mucosa, the lateral tongue, the lips and gingivae were 79.4 %, 11.8 %, 5.9 % and 2.9 %, respectively. *Candida* spp. were found in 45 BQ-chewers (90 %) and 43 non-chewers (86 %). Also, the presence of *Candida* was not correlated with age, duration of BQC, number of BQ chewed per day, or smoking. Surprisingly, *C. parapsilosis* was the most common *Candida* species isolated (45%) next to *C. albicans* (21%). We conclude that, BCM is common amongst Padaung women in Thailand and, this habit appears to foster the oral carriage of *Candida* species, particularly *C. parapsilosis*. Further studies are warranted to evaluate these intriguing findings reported for the first time. This study was partially supported by the 'Outstanding Researcher Award' of the HKU Research Committee awarded to LPS.

VO-17 Dental Caries Status of 12 and 15 year-old Children after Twelve Years of Water Fluoridation in Ho Chi Minh City.

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Ho Chi Minh City has been fluoridated since 1990. The objective of this study was to describe the effects of the water fluoridation program after twelve years in reducing dental caries in two groups of children: the 12 year-old group, who has benefited from fluoride protection since the early days of their life and the 15 year - old group only after primary dentition eruption. A cross-sectional survey was undertaken in May 2003, following the guidelines of the WHO: "Oral health surveys-Basic methods, 1997", to measure the dental caries experience of children living in fluoridated (.7ppm) and non- fluoridated (.1ppm) districts in HCM City. 1361 school children aged 12 and 1286 aged 15 in all 22 districts of the city were examined by two well calibrated examiners.

	Fluoridated areas		Non- Fluoridated areas		
Age group	%	DMF-T ± SD	%	DMF-T ± SD	p-value
12	38.2	0.85 ± 1.37	67.0	2.16 ± 2.39	0.000
15	55.0	1.60 ± 2.05	79.5	3.19 ± 2.92	0.000

Age group	DMF-T	Fluoridated areas	Non- Fluoridated areas	OR	95% CI
12	3	12.7%	34.9%	3.70	2.78 - 4.93
	5	2.5%	13.7%	6.20	3.77-10.21
15	5	9.5%	27.0%	3.51	2.53-4.86

This study showed that water fluoridation had improved significantly the dental caries status of 12 and 15 year-old children living in fluoridated areas in HCMcity as compared to non-fluoridated ones

VO-18 Micro-Spectroscopy and Laser Scanning Microscopy of Tooth Sections.

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The non-linear nature of multi-photon fluorescence excitation has the proven capability for micro-spectroscopic investigation and microscopic imaging with less scattering and spherical aberration, compared with the single-photon (1-p) excitation. However, this technique has not been fully utilized in studying tooth structures. Objectives: To explore and compare the uses of this technique for micro-spectroscopic and laser scanning microscopic characterization of enamel/dentin. Methods: To excite two-photon (2-p) fluorescence and second harmonic (SH) generation in tooth sections, we use a mode-locked Ti:sapphire laser (Mira 900, Coherent) pumped by a frequency-doubled laser (Verdi, Coherent) with ultrafast laser pulses tunable from 700 nm to 920 nm and pulse-width approximately 100 femtoseconds. Three different wavelengths (335, 375, and 400 nm) from a fiber-coupled xenon arc lamp were used for 1-p excitation. Results: There are two main peaks at 430 nm and 490 nm in the 1-p fluorescence spectra. Under the same illuminating power, dentin exhibited strongest fluorescence, followed by the dentino-enamel junction, collagen, enamel, and HAP crystals. The HAP crystals did not exhibit observable fluorescence for excitation wavelengths other than 335 nm. In the two-photon fluorescence spectra, two peaks (at 507 nm and 600 nm) were identified, indicating the presence of two different chromophores or pathways. A minor peak was found at 430 nm. The SH response appeared strong and the intensity was a function of incident wavelength in dentin, although not found in either enamel or hydroxyapatite crystals. Based on the comparison of the 1-p, 2-p, and SH images, it is indicated that the 2-p auto-fluorescence images may reflect the distribution/content of hydroxyapatite and SH may be closely related to collagen and its orientation. Conclusion: The multi-photon excitation in confocal microscopy may provide a non-invasive and effective method capable for investigating the functional and pathological features of the tooth. (*Financial support from: NSC-90-2112-M-110 and R-222-000-004-112)

VO-19 Characterization of the Surface Morphology of Human Dentin Upon Heat of Nd:YAG laser. An SEM Investigation.

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The purpose of this study was to evaluate the surface morphological aspects of human dentin after heat-treated with Nd:YAG laser by SEM-EDS. Dentin samples were taken from sound permanent human third molar teeth. Dentin disc specimens were then treated with a Nd:YAG (Pulsemaster™ 600 Dental Laser System, American Dental Technologies) at 1060 nm wavelength. The laser was scanned across the specimen with a 200 μm diameter fiber optic delivery probe in contact mode. The irradiance energy output used were 40, 80, 120 and 160 mJ/pulse with a repetition rate of 10 Hz (pps) respectively. Surface treatment was evaluated with SEM (JSM-5310LV Scanning microscope, JEOL) and Energy Dispersive X-Ray Spectroscopy (EDS) to qualitatively and quantitatively compare the effects of the unirradiated and laser-irradiated dentin. Pictures were taken at a magnification of between 100 and 5000x. The SEM observation on dentin surface after Nd:YAG laser irradiation shows crater formation at higher energy output, as well as surface melting, recrystallized and glazed surfaces. The mineral component of normal dentin were mainly Ca and P with a slight changes of Ca/ P content and the presence of Mg, Na and Si at site of laser treatment with higher energy output. It can be concluded that Nd:YAG laser treatment to dentin caused morphological and mineral composition changes on dentin surfaces.

VO-20 Diagnostic accuracy of enhanced digital images for caries detection.

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Our aim was to compare the accuracy in detecting occlusal caries lesions between an original *vs.* enhancements of the same image, for sharpness, zoom and pseudo colour. Four hundred images of 100 extracted, third-molars were examined *in vitro* by four observers, who noted the presence or absence of caries using a five-point confidence scale: 1=caries definitely absent, 2= caries probably absent, 3=uncertain if caries absent or present, 4=caries probably present,and 5=caries definitely present. The observers had no prior knowledge of the distribution of the occlusal caries. The definitive diagnosis of caries was based on histological assessment after sectioning the teeth. The diagnostic accuracy for each imaging mode was expressed by the area of the receiver operating characteristic (ROC) curve. Differences between the areas under the ROC curves were assessed through an analysis of variance. The original image had a mean ROC curve of 0.71 (95% CI: 0.65 to 0.77). The ROC curves for sharpness, zoom and pseudo colour were 0.74 (95% CI: 0.68 to 0.79), 0.73 (95% CI: 0.67 to 0.79), and 0.79 (95% CI: 0.73 to 0.84), respectively. Analysis using Bonferroni method for post-hoc comparison of multiple groups found pseudo-color was significantly different from an original image ($p=0.002$). Agreement among observers analysed by Cohen's kappa was substantial. Occlusal caries detection was significantly more accurate using the pseudo colour image method compared to the original digital image. This study was supported by the Faculty of Dentistry, Khon Kaen University.