

clinically presented as generalized desquamative gingivitis involving the facial aspects of the attached and marginal gingiva that persisted despite substituting to a non flavored dentifrice and failure to elicit any suspected drug or food allergies. Dermatologic patch testing proved positive for Iodopropynyl Butylcarbamate (IPBC), a water based preservative or biocide used in personal care products. Microscopically, there was an intense inflammatory infiltrate in the lamina propria composed predominantly of mature plasma cells. Immunohistochemistry and in situ hybridization showed marked unrestricted cytoplasmic positivity for kappa and lambda light chains. IPBC is used in personal care products comprising lip balms, moisturizers, sunscreens, concealers and body washes due to its effectiveness at preventing fungal growth in topical products. The maximum level for safe use in leave on products is 0.1% but cosmetic products continue to use 10 times more than the safe levels. In the differential spectrum it is pertinent to discriminate erosive lichen planus, cicatricial pemphigoid, acute leukemia, HIV infection clinically; multiple myeloma and plasmacytoma histologically. Our case highlights the importance of patch testing for IPBC allergies in the oral mucosa. IPBC can lead to sensitization and contact dermatitis due to prolonged exposure; as its use in cosmetics continues to rise, and it is difficult to completely eliminate exposure to products containing IPBC especially in the context of teenaged girls and adult female patients.

RAMAN SPECTRAL STUDY OF SALIVA: A NEW TOOL FOR DETECTION OF MALIGNANT AND PREMALIGNANT ORAL

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The overall aim of this study is to develop methodologies for analysis of human saliva using Raman spectroscopy with a future applicability for oral cancer diagnosis. Artificial saliva was prepared in different concentrations, aiming to optimise the spectroscopic acquisition protocol. Furthermore, saliva samples were collected from 10 healthy volunteers by a non-stimulated collection method and from 10 healthy volunteers by a stimulated collection method and frozen for further analysis. Also, saliva samples from 20 patients with oral cancer and oral dysplasia were collected for initial characterization and analysis. Centrifugal filtration was performed to concentrate the saliva samples. The optimization of the different parameters required for Raman spectral acquisition using a HORIBA Jobin-Yvon HR-800 confocal Raman microspectrometer was carried out. Raman spectra were recorded using different wavelengths (532nm and 785nm), various objectives (x10, x50 and x60) and a diffraction grating of 600g/mm using both upright and inverted geometries and different substrates. Following pre-processing, spectra were subjected to principal component analysis (PCA) and principal component-linear discriminant analysis (PC-LDA). The 532nm source, inverted geometry, 10x objective and 96 well plate produced the best spectral quality and may be considered readily adaptable for clinical applications. Centrifugal filtration using a 3K device improved the spectra of the concentrate. PCA-LDA could discriminate between the healthy volunteer samples collected by stimulated or non-stimulated methods with reasonable accuracy (83%). Furthermore, a

specificity and a sensitivity as high as 91% and 94%, respectively, could be achieved when differentiating healthy volunteer samples from patient samples. In this study, methodologies for the analysis of saliva by Raman spectroscopy have been developed to demonstrate the applicability of Raman microspectroscopy for providing molecular level insights from human saliva samples. The study also indicates the future potential for screening of saliva samples for oral pre-cancer and cancer.

NON-HABIT RELATED ORAL SQUAMOUS CELL CARCINOMA: POSSIBLE ETIOLOGIC FACTORS AND PROBABLE PREVENTION IN INDIAN SCENARIO.

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Introduction: India has the highest number of oral cancer cases in the world. Approximately 130,000 people succumb to oral cancer in India annually. Habits such as tobacco and alcohol consumption are well established etiologic factors in causing oral cancer. However, in recent years oral cancer cases are on the rise which do not have any known causative factors and studies have associated nutritional status, Human Papilloma Virus or poor oral hygiene as the probable cause.

Objectives: This paper aims at finding the possible etiologic factors in non-habit associated oral cancer through an extensive literature search keeping in view the incidence of reported cases in the Indian sub-continent. Studies reveal that 4-6% of oral cancer cases are not associated with any oral habits. It is important to be aware of the possibility of other factors contributing to the occurrence of oral cancer and aim at its prevention.

Findings: Significant number of studies and reported cases in India have shown that incidence of oral cancer in women without the exposure of any potential risk factors is alarmingly on the rise. The age range is lower as compared to habit associated cases where middle aged men are predominant. Other etiologic factors correlated with OSCC are viral infections like EBV, HPV, immunosuppression, familial factors, genetic predisposition, chronic mechanical irritation, dietary factors and hormonal factors.

Conclusions: OSCC is more prevalent amongst the lower socio-economic strata of the society in India where oral deleterious habits are common. The rising trend of oral cancer affecting people, especially women, without exposure to potentially harmful irritants should motivate researchers in identifying the possible etiologic factors. HPV virus association, genetic counselling, hormonal and dietary factors are to be considered to correlate cause and effect of such non-habit associated OSCC and adequate measures taken towards its prevention.

INVESTIGATION OF FOREIGN MATERIALS IN GINGIVAL BIOPSIES: A CLINICOPATHOLOGIC, ENERGY-DISPERSIVE X-RAY

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Foreign body gingivitis (FBG) has been previously described as a localized inflammatory reaction associated with the presence of foreign material in gingival tissues. However, among the gingival biopsies submitted to the Pacific Oral Pathology Laboratory (POPL) for diagnosis, we have identified foreign material in lesions that are markedly keratinized and described clinically as white plaques rather than inflamed lesions.

Objectives: To evaluate the clinical and histopathological features of 86 gingival biopsies containing foreign material retrieved from the POPL archives and to identify the composition of these particles by energy-dispersive x-ray spectroscopy (EDX). Further, primary human gingival fibroblasts (HGF) were stimulated with silica (SiO₂) microparticles to investigate the production of COL-1, MMP2 and inflammatory cytokines.

Findings: Foreign material was most commonly found in women (61%), in the 6th or 7th decade of life, and the clinical lesions were most frequently described as white plaques involving posterior mandibular gingiva. Interestingly, histopathological examination identified verrucous hyperplasia in 60.5% of the cases and epithelial dysplasia in 28.5% of the cases. EDX microanalysis revealed that Si (94%) followed by Ca (85%) and Al (66%) were the most frequently detected elements in the foreign particles. Silica microparticles induced higher COL-1 expression and increased MMP-2 activity in HGF, and higher levels of pro-inflammatory cytokines such as IL-6, IL-8 and TGF- in a micro-particle-concentration-dependent manner.

Conclusions: Our study demonstrates that there is a strong association between the presence of foreign material in gingiva and clinically and microscopically demonstrable hyperkeratotic verrucous plaques. Moreover, we found that the most common element in the foreign material is Si which is usually found in the Earth's crust as silica. Our in vitro findings demonstrate the importance of silica-mediated effects on gingival fibroblasts, suggesting that the presence of silica in gingival biopsies could modulate the host inflammatory response and should be further investigated.

ODONTOGENIC KERATOCYST - THE ROLE OF PTCH1 AND HEDGEHOG SIGNALING IN ITS PATHOGENESIS. PROF. TIEJUN LI, MR. JIANYUN ZHANG. PEKING UNIVERSITY SCHOOL OF STOMATOLOGY

Objectives: Mutations in PTCH1 gene, a receptor in the Hedgehog (Hh) signaling, are responsible for Gorlin syndrome (GS) and are related in tumors associated with this syndrome. The aims of this series of studies were to determine the role of PTCH1 mutation and misregulation of the Hh signaling in the pathogenesis of GS-related and sporadic odontogenic keratocysts (OKCs).

Findings: Based on screening of 73 sporadic and 30 GS-related OKCs, we identified PTCH1 mutations in 35.6% (somatic, 26/73) of sporadic cases and 83.3% (germ-line, 25/30) of GS-related OKCs. However, a much higher mutation rate (79%, 30/38) in sporadic OKCs was detected by analyzing epithelial samples separated from the fibrous capsules. The previously underestimated mutation rate in sporadic cases might be due to the masking effect of the attached stromal tissues. Mutations in other genes of the Hh signaling such as PTCH2, SUFU, and SMO were rare and their pathologic roles in OKC were uncertain. Using whole-exome sequencing (WES), we further characterized the mutational landscape of 5 OKC samples lacking PTCH1 mutation and revealed 22 novel mutations, among which two significantly altered genes (CDON and MAPK1) were predicted to affect Hh signaling activity in two cases. However no recurrent mutations were identified in the WES samples and validation cohort of 10 OKCs. Functional analysis revealed that PTCH1 mutations activated Hh signaling and resulted in aberrant cell proliferation via both classical and non-canonical Hh pathways.

Conclusions: Our data confirmed the high PTCH1 mutation rate in both GS-related and sporadic OKCs. In PTCH1-negative cases, other genetic alterations were rare, but could also be related to Hh signaling. These results suggested that an inhibitor of the Hh pathway may be effective for the treatment of OKCs.