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Criteria 3.3.3. Average number of papers published per teacher in the Journals notified on UGC-CARE list in the UGC website/Scopus/Web of Science/PubMed during the last five years.

Year	2018 -19	2017-18	2016-17	2015-16	2014-15
Number of Papers	16	18	11	11	9

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Academic year: 2018-2019

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KAP of HIV/AIDS among clinical dental students in a dental college in Kerala.	Dr. Pooja Latti	Annoor Journal of Scientific Research	2018-19	http://annoordentalcollege.org/annooradmin/annoorjournal/Knowledge_Attitudes_and_Practice_of_HIVaids.1582089711.pdf
Knowledge, attitudes and practices regarding pharmacovigilence among students, house surgeons and teaching faculty in a dental college in Kerala.	Dr. Pooja Latti	Journal of Indian Dental Association-Kochi	2018-19	
Comparative evaluation of efficiency of single-file rotary and reciprocating systems in instrumenting severely curved mesial root canals of extracted mandibular first molars: A morphometric study using cone-beam computed tomography	Josey Mathew	Saudi endodontic Journal	2018-19	https://www.saudiendodj.com/article.asp?issn=1658-5984;year=2019;volume=9;issue=2;spage=119;epage=125;aulast=Santhosh
Immunohistochemical expression of cyclooxygenase-2 in oral squamous cell carcinoma.	Thomas N, Krishnapillai R, Bindhu PR, Thomas P	Indian Journal of Dental Research	2018-19	https://www.ijdr.in/article.asp?issn=0970-9290;year=2019;volume=30;issue=1;spage=102;epage=106;aulast=Thomas
Immunohistochemical Expression of Fascin in Oral Epithelial Dysplasia and Oral Squamous Cell Carcinoma.	Natesan SC, Ramakrishnan BP, Krishnapillai R, Thomas P	World Journal of Dentistry	2018-19	https://www.wjoud.com/doi/pdf/10.5005/jp-journals-10015-1658
The Role of Langerhans Cells in Autoimmune and Non- Autoimmune Inflammatory Conditions – A Case Control Study	SreenivasanB.S, Deepu George Mathew	IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)	2018-19	https://www.semanticscholar.org/paper/The-Role-of-Langerhans-Cells-in-Autoimmune-and-%E2%80%93-A-Lukose-Mathew/2ffb5acf2dd38488420cd4f7cdaf478395936b0c?p2df
Localized Toxicity in Patients with Fixed Orthodontic.Appliance: A Case Control Study	Mathew Deepu George	Indian Journal of Public Health Research & Development	2018-19	http://medicopublication.com/index.php/ijphrd/article/view/1340
Prevalence of nomophobia among students, interns and faculty in a dental college in Kerala.	Dr. Pooja Latti	Journal of Odontological Research	2018-19	http://jorigids.org/co_editor/upload/1603029746J%20Odontol%20Res%202018%20Volume%206%20Issue%202_1-6.pdf
Knowledge, attitudes and practices regarding medical emergencies among clinical dental students of a dental college in Kerala.	Dr. Pooja Latti	Malanadu Dental Journal	2018-19	
Comparative evaluation of antibiofilm efficacy of chitosan nanoparticle-and zinc oxide nanoparticle-incorporated calcium hydroxide-based sealer: an in vitro study	Josey Mathew	Contemporary clinical dentistry	2018-19	https://pubmed.ncbi.nlm.nih.gov/30166840/
Comparative evaluation of remineralization potential of monofluorophosphate,casein phosphopeptide-Amorphous calcium phosphate and Calcium sodium phosphosilicate on demineralized enamel lesions: An in vitro study	Kumar K	Cureus	2018-19	https://pubmed.ncbi.nlm.nih.gov/30280056/
Prevalence of geographic tongue and its association with other disorders among patients visiting a dental college in Kerala.	Dr. Pooja Latti	Malanadu Dental Journal	2018-19	https://www.researchgate.net/publication/340049844
A comparative evaluation of retrievability of Guttapercha, Resilon and CPoints for retreatment, using two different rotary retrieval systems - An ex vivo study	Vineet R V	Saudi Endod J	2018-19	https://www.saudiendodj.com/article.asp?issn=1658-5984;year=2018;volume=8;issue=2;spage=87;epage=92;aulast=Prasad
Comparative Study on the Compressive Strength of a New Ceramic Reinforced Glass Ionomer (Amalgomer CR) and Resin-coated High Strength Glass Ionomer Cement (Equia Forte) with a Nanohybrid Composite Material (Tetric N Ceram) in a Simulated Oral Environment: An In Vitro Study	Baby S, Ummar A, Mathew J, George L, Paul S	Cons Dent Endod J	2018-19	https://www.cdejournal.com/doi/CDEJ/pdf/10.5005/jp-journals-10048-0037
Comparative Evaluation Of Sialography And Ultrasonography In The Detection Of Salivary Gland Pathologies – An Invivo Study	Jiss Mary G,Giju George Baby	Int.J.Adv.Res	2018-19	https://www.researchgate.net/publication/330217496
Radiographic assessment of pulp stones: A retrospective study	RP Bindhu, KP Rekha	International J Current Research	2018-19	https://www.journalcra.com/article/radiographic-assessment-pulp-stones-retrospective-study

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Knowledge, Attitudes and Practice of HIV/aids among the Clinical Dental Students in a Dental College in Kerala - Original research article

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Abstract

Introduction: India has the third largest HIV epidemic in the world, with 2.1 million people living with HIV and with 88,000 new cases with HIV infection as per the UNAIDS data 2018. Healthcare professionals have to be sufficiently trained, so that they can play a vital role in detecting the HIV/AIDS cases and thus combatting this pandemic.

Objective: To assess the knowledge, attitudes and practice regarding HIV/AIDS among the clinical dental students of a dental college in Kerala.

Methodology: A cross sectional questionnaire based survey was conducted among 96 clinical dental students who were willing to participate in the study. A structured questionnaire that included 19 questions was distributed to the participants. The returned questionnaires were coded and analyzed using SPSS software version 21 and results were expressed as numbers and percentage of respondent for each question.

Results: The results of the study showed that all the respondents (100%) were aware about the diagnostic test for HIV and also were aware of oral manifestations of HIV. 22.9% of the students were of the opinion that a dentist is somewhat likely to be infected by providing care to HIV patients. 30% of the respondents were unaware that HIV can be transmitted by unscreened blood transfusions. And 40.6% of the respondents were of the opinion that if a dentist is suffering from HIV he must not be allowed to practice.

Conclusion: The present study revealed that dental students had adequate knowledge regarding HIV/AIDS but showed a negative attitude in treating HIV/AIDS patients and also in working with HIV/AIDS infected colleague.

Key Words: HIV/AIDS, knowledge, attitude, practice, clinical dental students.

ORIGINAL RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING PHARMACOVIGILANCE AMONG STUDENTS, HOUSE SURGEONS AND TEACHING FACULTY IN A DENTAL COLLEGE IN KERALA

ABSTRACT

Background: Adverse Drug Reactions (ADR's) are currently a problem of major concern . Studies reveal that ADR reporting in India is just less than 1% compared to world-wide figure of 5%. Adverse drug reaction reporting is the foundation of any pharmacovigilance system and the timely identification and reporting of ADRs to the regional or national drug-regulating authorities are critical. Dental students can play a pivotal role and bringing a paradigm shift in successful implementation of pharmacovigilance program provided they possess adequate knowledge and skill. The study objective was to assess the Knowledge, Attitude and Practices regarding Pharmacovigilance among students, house surgeons and teaching faculty in a Dental college in Kerala.

Methodology: The study was a cross-sectional questionnaire based survey. A prefabricated validity tested questionnaire was devised for use based on previous studies. The questionnaire consisted of questions on professional data designation, grade; and18 questions assessing the knowledge, attitude and practices on Pharmacovigilance. Results were expressed as a number and percentage of respondents for each. Chi-square test was performed to compare the response in relation to year of study and designation.

Results: The total sample size was 162. 28% knew that doctors, nurses, pharmacists and dentists can report Adverse drug reactions. About 25% knew about the existence of a pharmacovigilance program in India. 65% knew the regulatory body responsible for monitoring ADR's in India. About 96% felt that ADR reporting should be mandatory. 93.8% opined that pharmacovigilance should be taught in detail to health care professionals. About 35% reported to experiencing ADR's during their practice, yet none of the 162 respondents have reported an ADR to the pharmacovigilance centre. Only 2.5% had seen a reporting form and only 1.2% had received a prior training on reporting of the same.

Conclusion: The study showed that although the respondents had a positive attitude towards pharmacovigilance, their knowledge and practice was poor.

Key Words: Adverse drug reactions, pharmacovigilance, dental students, dentists, house surgeons.

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Original Article

Comparative evaluation of efficiency of single-file rotary and reciprocating systems in instrumenting severely curved mesial root canals of extracted mandibular first molars: A morphometric study using cone-beam computed tomography

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Abstract

Aims and Objectives: The nickel–titanium multifile system is a viable tool in shaping severely curved canals as it reduces instrumentation errors. To eliminate the drawbacks with multifile systems, single-file systems were introduced. In this *in vitro* study, two single-file systems, One Shape and WaveOne, which work in a rotating and reciprocating motion, respectively, were compared with multifile systems for their efficiency in shaping severely curved mesial canals of extracted mandibular first molars, using cone-beam computed tomography (CBCT).

Methodology: Fifty-two intact mesial roots of mandibular first molars with severely curved canals were selected using CBCT and divided into four groups of 13 samples each. Samples in Groups I, II, III, and IV, were instrumented using One Shape, WaveOne, ProTaper, and H and K-files, respectively. All the specimens were prepared up to working length to size 25 file using the manufacturer recommended technique along with standardized irrigation protocol. Pre- and postinstrumentation CBCT images were assessed at 8 mm, 5 mm, and 3 mm from apex to compare the changes in canal transportation (CT), canal centering (CC), and remaining dentin thickness.

Results: All the groups showed CT with the statistically significant difference between the groups ($P < 0.05$). Except for ProTaper group at 5 mm ($P < 0.05$) none of the file systems showed CC. Except for Group I, a significant reduction in dentin thickness was noticed in Group II, III, and IV ($P < 0.05$).

Conclusion: Among the two single-file systems compared, One Shape file in rotating motion prepared canals with fewer changes in canal anatomy than WaveOne file in the reciprocating motion.

Keywords: Cone-beam computed tomography, nickel–titanium, One Shape, protaper universal, root canal instrumentation, WaveOne

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Original Research

Immunohistochemical Expression of Cyclooxygenase-2 in Oral Squamous Cell Carcinoma

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Abstract

Background and Aim: Oral cancer is a major health problem in South East Asia. The immunohistochemical (IHC) overexpression of COX-2 in squamous cell carcinoma is well documented. This IHC study was undertaken to understand the COX-2 expression in different grades of oral squamous cell carcinoma (OSCC) and to compare the COX-2 expression in OSCC and normal mucosa. **Material and Methods:** A total of 30 cases of OSCC and 10 cases of normal mucosa and positive control colon cancer were studied for IHC expression of COX-2. Of the 30 cases studied 10 cases each of well, moderately and poorly differentiated carcinoma were studied. COX-2 staining was evaluated on the basis of presence or absence of the positive tumor cells and percentage of positive tumor cells. **Statistical Analysis:** The various statistical tests used in this study were t-test and Chi-square test which was carried out using SPSS for Windows 22.0.0 and Minitab version 17.1.0 software package. **Results:** There was significant increase in COX-2 staining intensity from well to poorly differentiated OSCC. Significant difference was observed in staining intensity between moderately and poorly differentiated SCC. The percentage of positive tumor cells were high in poorly differentiated SCC compared to well and moderately differentiated OSCC. No significant expression of COX-2 was noted in normal mucosa. **Interpretation and Conclusion:** Our results revealed that the COX-2 enzymes were expressed, suggesting that they play complementary roles during oral carcinogenesis. In near future researches on administration of chemoradiation therapy combined with COX-2 should be evaluated to improve therapy response.

Keywords: *Cyclooxygenase-2, immunohistochemistry, oral squamous cell carcinoma*

Introduction

The development of oral squamous cell carcinoma (OSCC) is a molecular and histological multistep process, the progression of which includes sequential histopathological alterations ranging from hyperplasia through dysplasia to carcinoma *in situ* and invasive carcinoma.[1] These multiple genetic alterations in OSCC are influenced by a patient's genetic predisposition as well as by environmental influences, including tobacco, alcohol, chronic inflammation, and viral infection. In 1863, Virchow hypothesized that the origin of cancer was at sites of chronic inflammation.[2]

Chronic inflammation has been known to induce neoplasia through increased production of reactive oxygen and nitrogen species, which results in elevated DNA damage. Interleukin (IL) 1, 6, and IL-8, granulocyte-macrophage colony-stimulating factor as well as vascular endothelial growth factor are secreted by head and neck squamous cell carcinoma (HNSCC) cell lines and found in HNSCC patient samples.[3] The key transcription factors downstream of inflammatory processes such as NF-κB and Stat3 have also been shown to play an important role in HNSCC.[4] The expression of Prostaglandin E2 (PGE2) and the Cyclooxygenase-2 (COX-2) which are involved in inflammatory reaction was shown to be increased in HNSCC.[5]

COX-2 an induced pro-inflammatory enzyme involved in the metabolism of arachidonic acid and in the synthesis of prostaglandins (PGs) play a role in various steps of carcinogenesis. PGs, especially of the E series, induce cell proliferation, angiogenesis, invasion, and metastasis. Overexpression of COX-2 gene alters cell adhesion, inhibits apoptosis, and alters the response to growth regulatory signals. Upregulation of COX-2 prolongs the survival of abnormal cells thereby

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ORIGINAL RESEARCH

Immunohistochemical Expression of Fascin in Oral Epithelial Dysplasia and Oral Squamous Cell Carcinoma

Shilpa C Natesan[1], Bindhu P Ramakrishnan[2], Rekha Krishnapillai[3], Priya Thomas[4]

Abstract

Aims: The present study aimed to evaluate and compare the expression of fascin in normal oral mucosa (NOM) and oral epithelial dysplasia (OED) and to estimate the expression in different grades of oral squamous cell carcinoma (OSCC).

Materials and methods: The study involves a total of 55 cases including 30 cases of OSCC, 15 cases of OED, and 10 NOM tissues. All the sections were subjected to fascin immunostaining. Epithelial dysplasia were scored by layer-wise immunohistochemical staining, while for carcinoma staining intensity and number of cells stained were assessed. The scores were analyzed using one-way ANOVA test and Tukey's *post hoc* test.

Results: Our results showed that fascin expression in NOM was very low or restricted to the basal layers of the epithelium. In case of OED and OSCC, fascin immunostaining was highly elevated. Also, it was seen increasing with increasing grades of dysplasia ($p = 0.002$) and decrease in differentiation of OSCC.

Conclusion: A steady up-regulation of fascin expression is noted in OED and squamous cell carcinoma. These findings suggest that fascin plays an important role from early stages of carcinogenesis to invasive carcinoma.

Clinical significance: Fascin can be used as a reliable biomarker for diagnostic and prognostic implications of OED and OSCC, respectively.

Keywords: Fascin, Head and neck cancer, Immunohistochemistry, Oral cancer, Oral epithelial dysplasia, Oral leukoplakia, Oral squamous cell carcinoma.

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Introduction

Oral squamous cell carcinoma (OSCC) occurring in the head and neck region is the eleventh most common type of cancer in the world.[1] However, in India there is a high incidence of oral cancer with tobacco being the most important causative factor. According to statistics by Takiar et al., the pooled projected score of head and neck cancers in India for the year 2020 is expected to be 218, 421.[2] Besides the advances in surgery, chemotherapy, radiation, and other combinational therapies, the prognosis of oral cancer has not improved in years.

Oral cancer is often preceded by potentially malignant disorders, which include oral leukoplakia, oral submucous fibrosis, erythroplakia, and lichen planus.[3] Among them, oral leukoplakia is the most common with a malignant transformation risk of 1.5 to 34%.[4] The key to successful treatment outcome and survival rate of OSCC therefore depends on early diagnosis of these potentially malignant disorders. The gold standard method of diagnosis for oral epithelial dysplasia (OED) still remains to be the microscopic evaluation of hematoxylin-and-eosin stained sections. Histopathologically, all oral leukoplakias may not show epithelial dysplasia and many dysplastic lesions have shown to regress with time.[5] Histopathological diagnosis of OED can lead to subjective errors in assessing dysplasia. Also, the fact that oral cancer being developed from lesions that lacked dysplastic changes have led many researchers to consider for reliable biomarkers in diagnosing OED.[6]

Fascin (FSCN1), a highly conserved 55 kDa actin binding and bundling protein, is found to be up-regulated in many human carcinomas. It is primarily expressed in cells requiring motility like dendritic cells, neuronal cells, vascular endothelial cells, fibroblasts, and macrophages.[7,8] This globular actin cross-linking protein plays an important role in the organization of cortical cell protrusions like filopodia, lamellipodial ribs, spikes, microvilli, and dendrites.[8,9]

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For any carcinoma to spread, cancer cells need to acquire the ability to migrate. The progression of cancer cells are achieved by the active remodeling of actin cytoskeleton. Fascin organizes F-actin into parallel bundles and helps in the formation of these cellular protrusions. These protrusions have roles in cell–matrix adhesions, cell interactions, and migration. Also, they are rich in matrix metalloproteinases (MMPs), which when released, results in the degradation of extracellular matrices thus helping in the progression and invasion of carcinoma.[10,11]

Metastasis of oral cancer is achieved by the migration of dysplastic epithelial cells after breaching the basement membrane. Though the exact molecular mechanism for cell migration is not elucidated, several theories explore the morphological polarization of cells, formation of membrane extensions like filopodia and lamellipodia and cell-substratum attachments.[12] Whenever an external migratory stimulus becomes active, cells become anterio-posteriorly polarized and extend protrusions in the direction of the signal. Cell–matrix adhesions attach these protrusions to the

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The Role of Langerhans Cells in Autoimmune and Non-Autoimmune Inflammatory Conditions – A Case Control Study

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Abstract: ***Objective:*** *The aim of this study is to compare the CD1a positive Langerhans Cells between lichen planus, non- autoimmune inflammatory reactions, and normal oral mucosa in order to understand and differentiate the pathogenic mechanisms between autoimmune and non-autoimmune inflammatory conditions.* ***Methodology:*** *The study group I comprised of histologically confirmed Lichen planus (n=20) and group II comprised of histologically confirmed chronic inflammatory hyperplasia of gingiva (n=20). The control group consisted of clinically appearing normal mucosa (n=10). Sections of 3 µm were cut from paraffin-embedded blocks. The immunohistochemical procedure was done using antiCD1a antibody. The total number of CD1a positive cells in the study and control groups were evaluated by counting three high power fields per lesional tissue. Results: There was a significant increase in CD1a count in lichen planus when compared to that of chronic inflammatory hyperplasia of gingiva and normal mucosa (p<0.001). The comparison between the chronic inflammatory condition of gingiva and normal mucosa was not statistically significant.* ***Conclusion:*** *Our findings suggest that the pathogenic mechanisms involved in autoimmune and non-autoimmune conditions are different. Dysregulation of Langerhans cells may be responsible for the initiation and progression of oral lichen planus.*

Keywords*: Lichen planus, gingivitis, Langerhans cell, Antigen Presenting cell, CD1a*

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I. Introduction

Lichen Planus (LP) is a chronic inflammatory disease affecting the skin and areas in the oral cavity [1]. While taking into account the prevalence of Oral Lichen Planus (OLP) in the general population and in the Indian population, it was found to be 1-2% in the former and 2.6% in the later [2].The disease is commonly seen in Asian population, predominantly in females with the age of onset between 3rd and 6th decades of life [3].The clinical presentation of OLP ranges from mild painless white keratotic lesions to painful erosions and ulcerations [4]. OLP is a chronic mucocutaneous disease of unknown etiopathogenesis. Cell-mediated immunity which appears to play a major role in the pathogenesis of OLP is probably initiated through unmasking a keratinocyte self-peptide by the endogenous or exogenous factors in persons with a genetic predisposition to the development of the disease [5]. The factors predisposing to its development are genetics, dental materials, drugs, infectious agents, immunodeficiencies, psychological factors, trauma, diabetes, hypertension etc. The pathogenic mechanism leading to OLP is considered to be autoimmunity and being so, is refractory to treatment. Dendritic cells are those immune cells which are responsible for the initiation of autoimmunity. Langerhans cells(LCs) are a type of dendritic cells which are present in the oral mucosa. Their main function is to present antigens to T cells, in order to evoke a T cell response [6]. LCs act through certain molecules which they possess. One such a molecule is CD1a (Cluster of Differentiation 1a) which is capable of presenting various forms of self and microbial lipid antigens to T lymphocytes. The location of Langerhans cells in the epidermis allows the innate immune system to respond rapidly to foreign antigens in the epithelium and result in improved clearance of the antigen [6]. A dysregulated LC function is considered to be the initiating event in the pathogenesis of LP. Hence understanding its pathologic mechanism is important. The treatment of an autoimmune disease like OLP is only temporary, contributing towards the reduction of the discomforts occurring during the course of the disease [7]. Corticosteroids are the mainstay in the palliative management of OLP, which can be used topically, intralesionally or systemically [8]. The aim of the currently available OLP therapy is to alleviate symptoms. Understanding the role of LCs in the pathogenesis of lichen planus can help us

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Localized Toxicity in Patients with Fixed Orthodontic Appliance: A Case Control Study

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Abstract

Fixed orthodontic appliances made of metal alloys are routinely used in dental practise to correct malocclusion. Oral environment favours the biodegradation of metal alloys. The discharged metal ions accumulate cumulatively on the adjacent tissues and results in toxic effects on cellular metabolism and DNA stability. The study was designed to evaluate localized genetic and cytokinetic toxicity due to fixed orthodontic appliance by measuring micronuclei frequency and other nuclear abnormalities in the buccal mucosal cells. Subjects with orthodontic appliance were selected as exposure cohort (n=20) and subjects without orthodontic appliance were selected as comparative cohort (n=20). Buccal smears were collected and DNA specific feulgen stain was used. Micronuclei, nuclear bud and binucleate cells frequency were recorded and compared between the study groups. We found a significant increase in the frequency of cells with micronuclei ($p<0.001$) and binucleate cells($p=0.002$) in the exposure cohort compared to controls. The increase in the indicators of genotoxicity and cytokinetic toxicity in the exposed cohort compared to controls could be attributed to the exposure to the metal ions released from long term orthodontic appliance treatment. Increase in binucleate cells in subjects with fixed orthodontic appliance was demonstrated for the first time in our study. The cellular changes due to toxicity could be the predisposing factor for the occurrence of immune mediated oral mucosal lesions in orthodontic patients.

Keywords: *Micronuclei, nuclear bud, binucleate cells, metal ions, fixed orthodontic appliances.*

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Introduction

Fixed orthodontic appliances are routinely used in dental practise to correct malocclusion. Fixed orthodontic appliance consists of bands, brackets and wires made of metal alloys containing nickel, chromium, cobalt, iron and titanium. The treatment requires the patient to wear this appliance for a period of two to three years. The physical and chemical characteristics of oral environment are favourable for the biodegradation of metal alloys[1,2]. Hafiz et al have stated that even

ORIGINAL RESEARCH ARTICLE

PREVALENCE OF NOMOPHOBIA AMONG STUDENTS, INTERNS AND FACULTY IN A DENTAL COLLEGE IN KERALA

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ABSTRACT

Background: Nomophobia is defined as the fear of being out of mobile phone contact and is considered a modern age phobia. With the advent and prolific use of smart phones by people, the addiction levels have also concomitantly increased. This study was conducted with the objective of assessing the prevalence of Nomophobia among dental students, house surgeons and teaching faculty of a dental college in Kerala.

Methodology: The study was a cross-sectional questionnaire based survey. The target population was the clinical dental students, house surgeons and teaching faculty of a dental college Kerala. The Nomophobia Questionnaire developed at The Iowa State University, herein after referred to as NMP-Q validated by Caglar Yaldirim and Ana- Paula Correia was used in the study. Results were expressed as a number and percentage of respondents for each question. Chi-square test was performed to compare the response in relation to year of study and designation.

Results: Among the 153 respondents, 84 were students, 45 interns and the rest 24 were faculty members. About 96% (n=147) were smart phone users. About 95% of the respondents had an access to internet on their mobile phone. The present study showed that – 2% had no nomophobia, 39.2% had mild nomophobia, 56.2% had moderate nomophobia and 12.4% had severe nomophobia. There was a statistically significant difference in nomophobia levels among teaching faculty, house surgeons and students (p=0.042), where teaching faculty and house surgeons had significantly greater levels of nomophobia compared to the students.

Conclusion: Present study revealed that nomophobia was highly prevalent among the respondents. The most common reasons for smart phone use were calling of family members and friends.

J Odontol Res 2018;6(2)5-10.

KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING MEDICAL EMERGENCIES AMONG CLINICAL DENTAL STUDENTS OF A DENTAL COLLEGE IN KERALA

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ABSTRACT

Background: Medical emergency is a condition that requires immediate attention and subsequent treatment. Despite efforts to minimize any untoward incidence, emergency situations may arise on the dental chair. Effective management of medical emergency in a dental office is the responsibility of a dentist. Lack of training and inability to cope with these can lead to tragic consequences.

Objective: The objective of this study was to assess the knowledge, attitude and practice among clinical dental students of a dental college in Kerala, in handling medical emergencies.

Materials and Methods: A cross sectional study was conducted on clinical dental students of a dental college in Kerala. A structured questionnaire consisting of 20 questions was distributed to 83 participants who consented to participate in the study. The returned questionnaires were coded and analyzed using SPSS Version 22 software.

Results: About 88% of respondents were aware about the medical emergencies that are likely to occur on the dental chair. Majority (96.4%) of them were of opinion that precautionary measures should be taken in case of a positive family history. 80.7% said that they were aware about the basic steps in Cardio Pulmonary Resuscitation. And only 78.3% of the respondents said that they are capable of providing emergency care to the patients.

Conclusion: The present study revealed that the dental students had adequate knowledge regarding medical emergencies in dental practice but they showed lack of confidence when it came to managing such cases in dental chair.

Key words: Medical emergencies, clinical dental students, knowledge, attitude and practices.

Running title: KAP regarding medical emergencies among clinical dental students.

Format: Abstract

Contemp Clin Dent. 2018 Jul-Sep;9(3):434-439. doi: 10.4103/ccd.ccd_225_18.

Comparative Evaluation of Antibiofilm Efficacy of Chitosan Nanoparticle- and Zinc Oxide Nanoparticle-Incorporated Calcium Hydroxide-Based Sealer: An *In vitro* Study.

Nair N[1], James B[1], Devadathan A[1], Johny MK[1], Mathew J[1], Jacob J[1].

Author information

Abstract

AIM: This study evaluated the antibiofilm efficacy of calcium hydroxide-based sealer incorporated with chitosan nanoparticles (CS-NPs) and zinc oxide nanoparticles (ZnO-NPs) against two strains of *Enterococcus faecalis* (ATCC 29212, OG1RF).

MATERIALS AND METHODS: The materials tested were Apexit Plus sealer in the commercial unmodified form and two modified forms with CS-NP and ZNO-NP, respectively. Crystal violet assay and confocal laser scanning microscopy (CLSM) study were used to assess the bacterial viability of biofilms grown in wells of microtiter plate and glass slides, respectively. Two *E. faecalis* strains (ATCC 29212, OG1RF) were used for the study.

RESULTS: The crystal violet assay done on *E. faecalis* strain ATCC 29212 showed a significant decrease in the optical density (OD) value with ZNO-NP-incorporated calcium hydroxide sealer when compared with CS-NP. In the case of *E. faecalis* strain OG1RF, only ZNO-NP-incorporated calcium hydroxide-based sealer showed reduction in the OD value. In CLSM study done on *E. faecalis* strain ATCC 29212, only ZNO-NP-incorporated calcium hydroxide-based sealer showed reduction in the thickness of biofilm. No groups of OG1RF strain showed reduction in the thickness of biofilm.

CONCLUSION: The incorporation of nanoparticles (ZnO and CS) into calcium hydroxide-based sealers significantly enhances the antibiofilm efficiency against *E. faecalis* strain ATCC 29212 but has questionable effectiveness against *E. faecalis* strain OG1RF. The present study demonstrates that ZNO-NP shows better antibiofilm efficacy than CS-NP against both strains of *E. faecalis*.

KEYWORDS: Calcium hydroxide-based sealer; Enterococcus faecalis; chitosan nanoparticles; confocal laser scanning microscope; crystal violet assay; zinc oxide nanoparticles

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Free PMC Article

A Scanning Electron Microscope Evaluation of Smear Layer Removal and Antimicrobial Action of Mixture of Tetracycline, Acid and Detergent, Sodium Hypochlorite, Ethylenediaminetetraacetic Acid, and Chlorhexidine Gluconate: An *In vitro* Study

K. M. Charlie, M. A. Kuttappa, [...], and Nishin K. John

Abstract

Objectives:

The main objective is to evaluate the efficiency in removal of smear layer of mixture of tetracycline, acid and detergent (MTAD), sodium hypochlorite (NaOCl), ethylenediaminetetraacetic acid (EDTA) and chlorhexidine gluconate by scanning electron microscope (SEM) evaluation and also to evaluate the antimicrobial action of the same irrigants against standard culture strains of *Enterococcus faecalis*.

Materials and Methods:

This study included 60 extracted permanent teeth with single root canal. The sample was categorized into five groups with 12 teeth in each group. Root canals were enlarged till size 40 with K-files. One group was kept as control and irrigated only with saline. Other four groups used 5% NaOCl as irrigant during instrumentation and MTAD, 5% NaOCl, 17% EDTA, and 2% chlorhexidine gluconate as final rinse. Teeth were split and examined under SEM. To test the antibacterial action, the zone of inhibition method using agar plates was used. Obtained data were statistically analyzed by SPSS version 17 (SPSS Inc., Chicago, IL, USA).

Results:

MTAD and 17% EDTA removed smear layer from all regions of the root canals. About 5% NaOCl and 2% chlorhexidine gluconate were ineffective in removing the smear layer. The mean zone of inhibition formed by the irrigants was in the following order; MTAD (40.5 mm), 2% chlorhexidine gluconate (29.375 mm), 17% EDTA (24.125 mm), 5% NaOCl (22.125 mm), and saline (zero).

Conclusion:

MTAD showed high smear layer removal efficacy, but no significant difference was found to that of 17% EDTA. As the dimensions of the zones of inhibition showed, MTAD has got highest antibacterial action against *E. faecalis*, followed by 2% chlorhexidine gluconate, 17% EDTA, and 5% NaOCl. However, the exact correlation of *in vitro* study results to clinical conditions is impossible due to the variables involved.

Keywords: *Acid and detergent*, *enterococcus faecalis*, *mixture of tetracycline*, *scanning electron microscope*, *smear layer*, *zone of inhibition*

Introduction

The complex root canal system precludes the absolute elimination of the bacteria. Facultative bacteria such as enterococci, nonmutans streptococci, and lactobacilli are more probable to endure chemomechanical instrumentation and irrigation medication.[1,2]

According to Mader *et al*., smear layer is made up of a superficial layer on the root canal walls about 1–2 μm in thickness and a deep layer of about 40 μm packed into the dentinal tubules.[3] Few consider it may be valuable as it lessens the dentin permeability, thereby preventing the bacterial penetration into the dentinal tubules. Several methods used for smear layer removal are mechanical, chemical, and lasers of which chemical method using different irrigating solutions is the most popular one. Of the several root canal irrigants, saline, sodium hypochlorite (NaOCl), and ethylenediaminetetraacetic acid (EDTA) are the frequently used ones.[3,4,5]

Recently irrigating solutions such as chlorhexidine gluconate and a mixture of tetracycline, acid and detergent (MTAD), and their combinations are in use. We carried our study to evaluate the efficiency in removal of smear layer of MTAD, NaOCl, EDTA, and chlorhexidine gluconate by scanning electron microscope (SEM) evaluation and also to evaluate the antimicrobial action of the same irrigants against standard culture strains of *Enterococcus faecalis*.[5]

Materials and Methods

Sixty extracted permanent mandibular premolars with single root canal, and fully developed apices were included. The study period was between March 2016 and December 2016 at Coorg Institute of Dental Sciences, Virajpet, Karnataka, India, after obtaining institutional ethical committee approval (Reference No. 152/CIDSV/IRB-E/2016). The sample size and procedure were based on Attur *et al*. study (2016) with some modifications. The irrigants used were MTAD, 5% NaOCl, 17% EDTA, and 2% chlorhexidine gluconate. The smear layer removal efficacy was evaluated using SEM analysis, and antimicrobial action was tested by zone of inhibition method on agar plates inoculated with *E. faecalis*.

Cureus. 2018 Jul 27;10(7):e3059. doi: 10.7759/cureus.3059.

Comparative Evaluation of the Remineralization Potential of Monofluorophosphate, Casein Phosphopeptide-Amorphous Calcium Phosphate and Calcium Sodium Phosphosilicate on Demineralized Enamel Lesions: An In Vitro Study

Kavita Kumar [1], Sheela Sreedharan [2]

Affiliations

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Free PMC article

Abstract

Aim: The aim of the study is to compare the remineralization potential of monofluorophosphate, casein phosphopeptide-amorphous calcium phosphate (CPP-ACP), and calcium sodium phosphosilicate on demineralized enamel lesions.

Materials and methods: Enamel sections from 30 sound human premolar crowns were prepared and sectioned into quadrants. Early enamel lesions were created in each sample by immersion in a demineralizing solution for 72 hours. Of the four sections, the first quadrant (A) was not given any surface treatment, the second quadrant (B) was treated with monofluorophosphate dentifrice, the third (C) was treated with casein phosphopeptide-amorphous calcium phosphate (CPP-ACP), and the fourth (D) was treated with calcium sodium phosphosilicate while being subjected to a five-day pH cycling protocol. The sections were further cross-sectioned to expose the lesion depth and were then viewed under the confocal laser scanning microscope after staining with 0.1 mM rhodamine B dye for 24 hours. The two parameters evaluated were the cross-sectional demineralized lesion area and total fluorescence.

Results: Amongst the dentifrices tested, the lowest values for lesion area and total fluorescence were recorded by calcium sodium phosphosilicate (3874.1 μ^2 and 107282.6, respectively), followed by casein phosphopeptide-amorphous calcium phosphate (5776.6 μ^2 and 129470.8) and then by monofluorophosphate dentifrice (7371.2 μ^2 and 233765.9) in increasing order. The highest values for lesion area and total fluorescence were recorded by the no treatment group (16449.2 μ^2 and 759743.1). One-way analysis of variance (ANOVA) showed significant variations ($p<0.01$) between the groups and Scheffe multiple comparisons confirmed the significance ($p<0.01$) of intergroup variations.

Conclusion: The results of this study suggest that, among the three agents tested, calcium sodium phosphosilicate is the most effective remineralizing agent followed by casein-phosphopeptide-amorphous calcium phosphate. Monofluorophosphate is the least effective remineralizing agent when tested under the conditions mentioned in this study.

Keywords: calcium sodium phosphosilicate; confocal laser scanning microscopy; cpp-acp; monofluorophosphate; remineralization.

Original Article

A comparative evaluation of retrievability of Guttapercha, Resilon and CPoints for retreatment, using two different rotary retrieval systems - An *ex vivo* study

Aswathy Prasad, Rajesh Sasidharan Nair, Jeyabalaji Mano Christaine Angelo, Vijay Mathai, R. V. Vineet, Sarah R. Christopher

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Abstract

Introduction: Nonsurgical retreatment of failure cases requires regaining access to the entire root canal system through complete removal of the core filling material and sealer.

Aims: The aim of this study was to compare the retrievability of gutta-percha (GP), Resilon, and CPoints, using Protaper and Mtwo rotary retreatment systems.

Materials and Methods: Sixty freshly extracted mandibular premolars were decoronated and biomechanically prepared and obturated using GP, Resilon, and CPoints along with their corresponding sealers, in twenty teeth each. The teeth were divided into 6 groups of 10 teeth each. The filling was removed after 2 weeks with Protaper and Mtwo rotary retreatment files and the teeth were analyzed using cone beam computed tomography, to assess the remaining percentage volume of obturation material from each group.

The data were statistically analyzed by ANOVA (*post hoc* test) followed Dunnett's *t*-test to evaluate statistical significant between the groups and paired *t*-test to find statistical significant before and after treatment.

Results: The analysis of the results showed that the mean volume percentage of the residual material is low for Resilon group with Protaper retreatment file (16.35 ± 2.69%) and high in the groups obturated by CPoint and removed by Mtwo retreatment file system (29.67 ± 2.34%).

Conclusions: Canals obturated with CPoints and endosequence bioceramic sealer are the least retreatable among the study groups.

Keywords: Cpoints, gutta-percha, Mtwo retreatment files, Protaper retreatment files, Resilon, root canal retreatment

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INTRODUCTION

The success of an endodontic therapy depends on the achievement of the endodontic triad of debridement, disinfection, and three-dimensional obturation.[1] The clinical success rate of endodontic treatment ranges between 50% and 90%.[2,3] The preferred treatment of failing endodontic cases is nonsurgical

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10.5005/jp-journals-10048-0037

ORIGINAL ARTICLE

Comparative Study on the Compressive Strength of a New Ceramic Reinforced Glass Ionomer (Amalgomer CR) and Resin-coated High Strength Glass Ionomer Cement (Equia Forte) with a Nanohybrid Composite Material (Tetric N Ceram) in a Simulated Oral Environment: An *In Vitro* Study

[1]Sonu Baby, [2]Afin Ummar, [3]Josey Mathew, [4]Liza George, [5]Sinju Paul

ABSTRACT

Aim: To evaluate and compare the compressive strength of a new ceramic-reinforced glass ionomer (Amalgomer CR) and resin coated high strength glass ionomer .cement (GIC) (Equia forte) with a nanohybrid composite (tetric N ceram).

Methodology: Twenty four maxillary premolar teeth were selected. Selected teeth after cleaning were mounted in acrylic resin blocks exposing the crown. Class II cavities were prepared. Samples were divided into three groups of 8 teeth;

- *Group 1:* Class II cavity restored with Tetric N Ceram composite (control group)
- *Group 2:* Class II cavity restored with amalgomer CR
- *Group 3:* Class II cavity restored with equia Forte

Restored samples stored in artificial saliva for 2 weeks and subjected to compressive strength test using the universal testing machine at a cross head speed of 0.5 mm/min. The failure load was recorded. SPSS software was employed for statistical analysis. Mean compressive strength and mean compressive load was calculated. One way analysis of variance (ANOVA) followed by post hoc tests served for comparison of compressive strength among the study groups. The significance level was set at 0.001.

Conclusion: Tetric N ceram has a high compressive strength compared to amalgomer CR and equia forte. It can be concluded that tetric N ceram may be a better posterior restorative in comparison with Amalgomer CR and Equia Forte.

Keywords: Amalgomer CR, Compressive strength, Equia Forte, Posterior class II restorations, Tetric N Ceram.

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Conflict of interest: None

INTRODUCTION

Dental restorative materials which substitute the lost tooth structure should be stable in different oral environment conditions. Degradation of the materials in saliva leads to deterioration and disintegration of the material in the course of time limiting the longevity of the restorative material. Higher failure rates of restorations in class II cavities can be attributed to the role of mechanical stresses due to occlusal loading leading to cuspal flexure.[1]

Recently, a new ceramic reinforced glass ionomer (amalgomer CR) and resin coated high strength GIC (equia forte) has been introduced to the dental market. These tooth-colored products are claimed to be superior in withstanding masticatory load than conventional composite.

Even now, there are concerns regarding strength of glass ionomer cements. More recently, amalgomer CR, a ceramic reinforced GIC has gained popularity on the grounds of better mechanical properties. However, there is no evidence regarding long term mechanical properties like compressive strength of this material. Together with this, there is no information regarding nature of reinforcement of Amalgomer CR.

Moisture is integral to the setting of Glass Ionomer cement (GIC), especially for conventional acid–base reaction GIC (C-GIC). Water is the essential reaction medium and it hydrates the siliceous hydrogel facilitating formation of polyacid salts.[2] Therefore, mechanical properties of GIC depend on water balance, i.e. the uptake and release of water during storage and manipulation. C-GIC is sensitive to both hydration and desiccation during initial setting. Desiccation retards the setting reaction decreasing strength; shrinkage and crazing also may happen. Hydration or water uptake during setting may compensate for setting shrinkage, but causes wash out of calcium and aluminum ions retarding setting and decreasing surface integrity.[3]

Article

COMPARATIVE EVALUATION OF SIALOGRAPHY AND ULTRASONOGRAPHY IN THE DETECTION OF SALIVARY GLAND PATHOLOGIES ? AN INVIVO STUDY.

November 2018 · International Journal of Advanced Research 6(12):501-506
DOI: 10.21474/IJAR01/8165

Authors:

Jiss MaryG · Admaja KNair · Giju BabyGeorge · Sindhuja Soman

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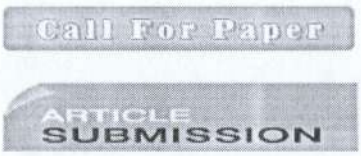

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SUBJECT AREA

Radiographic assessment of pulp stones: a retrospective study

Author: Dr. Jose George, Dr. Rose Mary David, Dr. Priya Thomas, Dr. Bindhu, P.R. and Dr. Rekha Krishna Pillai

Subject Area: Health Sciences

Abstract:

Background: Pulp stones are discrete calcifications and can be identified in periapical and bitewing radiographs. Stones may exist freely within the pulp tissue or attached to or embedded in dentine. They are more frequently present in the coronal than in the radicular portion of the pulp with a predominating tendency to appear in the maxillary teeth especially the maxillary first molar. Pulp stones have been noted in patients with systemic diseases like cardiovascular, diabetes mellitus and hypertension or in genetic diseases like dentine dysplasia, dentinogenesisimperfecta and Van der Woude syndrome. Etiopathogenesis of pulp stone is still not clear inspite of many microscopic and histochemical studies. Objective: This retrospective study was planned to correlate the association of pulp stones with age, gender, location, dental or systemic disorders. Methods:.The material for this study was obtained by retrospective review of the case files of Annoor Dental College, Muvattupuzha from March 2016 to April 2018, a span of 2 years. A total of 2500 radiographs (OPG) were retrieved from the outpatient department and were assessed for pulp stones within age group of 12–72 years. Statistical Analysis was carried out using chi square test; Minitab (version 17.1.0.0). Results: Overall prevalence of pulp stones in both the gender was 28.9% (723/2500). Out of 723 cases, 411 females& 312 males had pulp stones. Pulp stones were significantly higher in maxilla than mandible (Max. = 67.3%, Mand. = 32.6%).More number of pulp stones were observed in females(56.8%) than males(43.1%).The prevalence of pulp stones in age group from 32–42 years showed higher pulp stones as compared to other groups (29.3%).The prevalence of pulp stones in dental conditions include (Caries -25.5%, Periodontitis- 28.8%, Restored 16.5%, Orthodontically treated teeth -18.9%).The prevalence of pulp stones in hyperlipaedimicpatients was 24.7& renal stones were 21.7%. Conclusion: Even though the aetiological factors involved in their formation are still not fully understood, it would appear that pulp stones are primarily a physiological manifestation and may increase in number and/or size due to local or systemic pathology. The radiographic assessment of pulp stones helps in early diagnosis of many systemic conditions which eventually helps for a better treatment plan.

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Knowledge, attitude and practices of apron hygiene among dental students, faculty and auxiliaries in a dental	Dr. Pooja Latti	Journal of Odontological Research 2017;5(2):5-	2017-18	http://jorigids.org/co_editor/upload/1603028177l.pdf
Assessment of total antioxidant capacity and antimicrobial activity of Glycyrrhiza glabra in saliva of HIV-	Eby Aluckal Ismail A	Journal of pharmacy & bioallied sciences. 2017	2017-18	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5731021/
Mast Cell Density in Oral Lesions using Metachromatic Stains: A Comparative Study	Natesan SC, George J, Pillai RK, Ramakrishnan BP, Thomas P	Journal of Clinical & Diagnostic Research	2017-18	https://www.researchgate.net/publication/320409189
Histological Evaluation of Epithelial Thickness, Microvasculature and Number of Mast Cells in the Gingiva of Smokers and Non-smokers with Chronic Periodontitis	Paul J, D'lima JP, Thomas S, Karim S, Thomas P, Ramakrishnan BP, Paul B, Salma R.	Journal of Clinical & Diagnostic Research	2017-18	https://www.jcdr.net/articles/PDF/10886/29112_F(AP)_PF1(BT_PB_SH_AP)_PFA(MJ_GG).pdf
Assessment of total antioxidant capacity and antimicrobial activity of Glycyrrhiza glabra in saliva of HIV-infected patients	Eby Aluckal, Asif Ism	Journal of Pharmacy & bioallied sciences	2017-18	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5731021/
Stress in the periodontal ligament during orthodontic retraction of anterior tooth: a finite element analysis	Asif Ismail	IDA Kodungalore	2017-18	www.idakunnamkulam.com
Effect of incorporating seed oils on the antifungal property, surface roughness, wettability, weight change, and glucose sorption of a soft liner	Jyothi K S	Journal of Prosthetic Dentistry	2017-18	https://www.researchgate.net/publication/305818989
Comparison of alcoholic and non-alcholic oral rinse during fixed appliance therapy.	Asif Ismail	Journal of IDA kunnamkulam	2017-18	www.idakunnamkulam.com
Histological Evaluation of Epithelial Thickness, Microvasculature and Number of Mast Cells in the Gingiva of Smokers and Non-smokers with Chronic Periodontitis	Thomas P, Ramakrishnan BP, Paul B, Salma R.	Journal of Clinical & Diagnostic Research	2017-18	https://www.jcdr.net/articles/PDF/10886/29112_F(AP)_PF1(BT_PB_SH_AP)_PFA(MJ_GG).pdf
Estimation of dentin sialo-phosphoprotein in gingival crevicular fluid during orthodontic intrusion using Rickets simultaneous intrusion and retraction utility arch	Rahul S. Thalanany	International journal of current research	2017-18	http://www.journalcra.com/article/estimation-dentin-sialophosphoprotein-gingival-crevicularfluid-during-orthodontic-intrusion
Assessment of epithelial dysplasia and malignant treanformation in oral lichenoid lesions – a systematic review	Jiss Mar, Giju Baby George	Journal of applied dental and medical science	2017-18	http://www.joadms.org/home/article_abstract/262
To evaluate the reliability of different facial anatomic landmarks closest to the midline of the face using esthetic frame concept in two age groups	Manu Johns	International journal of scientific research	2017-18	https://www.worldwidejournals.com/international-journal-of-scientific-research-(IJSR)/article/to-evaluate-the-reliability-of-different-facial-anatomic-landmarks-closest-to-the-midline-of-the-face-using-esthetic-frame-concept-in-two-age
Evaluation of efficacy of chitosan-silver nanocomposite on Candida albicans when compared to three different antifungal agents in combination with standard irrigation	RV Vineet	Saudi Endod J	2017-18	https://www.saudiendodj.com/article.asp?issn=1658-5984;year=2017;volume=7;issue=2;spage=87;epage=91;aulast=Babu
Assessment of total antioxidant capacity and antimicrobial activity of Glycyrrhiza glabra in saliva of HIV-infected patients	Anoopa Paulose, Sanju Lakshmanan	Journal of Pharmacy & bioallied sciences	2017-18	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5731021/
Effect of two denture cleansers on tensile bond strength of a permanent resilient denture liner bonded to a conventional heat polymerized denture base resin	Angel Mary	International j of current research	2017-18	http://journalcra.com/article/effect-two-denture-cleansers-tensile-bond-strength-permanent-resilient-denture-liner-bonded

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Short Study

Prevalence of geographic tongue and its association with other disorders among patients visiting a dental college in Kerala.

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Abstract

Introduction: Geographic tongue(GT), benign recurrent condition on the tongue with controversial etiology, is characterized by loss of papillae, especially filiform papillae, associated with white keratotic serpigenous border and may be associated with burning sensation.

Objectives: To determine the prevalence of geographic tongue among patients visiting a dental college in Kerala.

Materials and Methods: Patients who attended outpatient department of the college, were clinically examined for geographic tongue over a period of 2 months.

Results: Among 4292 patients who visited dental college during the specified period, 17 patients were clinically confirmed with a diagnosis of GT of which 6 were males and 11 were females. Majority of patients (6) were between 5th to 6th decade. Among 17 GT positive patients only 3 were symptomatic (burning sensation), and 4 were associated with fissured tongue. 9 patients were found to have associated systemic diseases namely hypertension, diabetes, arthritis, thyroid disease, asthma and allergy.

Introduction:

Rayer;1831, first described Geographic Tongue (GT) as a common inflammatory benign disorder presenting as depapillated areas on dorsal and lateral surface of the tongue with a prevalence rate of 0.5% to 12.7%.[1,2,3] Alternate terminologies for the lesion are wandering rash, benign migratory glossitis, marginal exfoliative glossitis, transitory benign plaque and exfoliatio areata linguae.[2] The depapillated areas on the surface presents as erythematous areas bordered by white, yellow or grey bands representing regeneration of filiform papillae.[1,2] This depapillation may change its shape, size or location within hours or days, due to which the term "lingual erythema migrans" has been proposed, and has been reported to occur in males and females with equal frequency.[4,5] Although precise etiology remain obscure, association with stress, hot and spicy food, allergy, psoriasis, diabetes, vitamin deficiency, immune disorders, bacterial and fungal infections, anemia and alcohol has been postulated.[4,5] Treatment may be required in case of burning sensation, pain, aesthetic concerns, decreased taste and cencerophobia.[5]

The present study was carried out to assess the prevalence of geographic tongue among patients visiting a dental college in Kerala.

Materials and Methods:

A total of 4292 patients who attended the Department of Oral Medicine and Radiology over a period of 2 months, willing to participate in the study

were examined for clinical evidence of geographic tongue. Diagnosis of GT was done based on clinical examination. Data regarding age and gender of patients, association with any other tongue diseases, symptomatic/ asymptomatic and association with any systemic diseases were recorded and analyzed.

Results:

Among 4292 patients examined, clinical confirmation of GT was done in 17 patients. The age group of these patients ranged from 6 years to 70 years. This data provided a prevalence rate of 0.39%. Among these 17 geographic tongue positive patients, 11(64.7%) were males and 6(35.3%) were females. This provided an overall male prevalence of 0.23% and female prevalence of 0.16%. Most of the patients were between the age 51 – 60 years, which included 3 females and 3 males. Fissured Tongue(FT) was the only tongue lesion found to be associated with GT. 4 patients with GT were associated with FT(23%) of whom, 2 were males and 2 were females. 3 patients were symptomatic(17.6%) of which burning sensation was the only symptom reported. GT were also found to be associated with other systemic disorders namely diabetes, allergy, hypertension, thyroid disease, arthritis and asthma. The number of patients reported with these disorders are diabetes 3(2 females and 1 male), allergy 1(female), hypertension 1(male), thyroid disease 2(1male and 1 female), arthritis 1(female) and asthma 1(male).

Discussion:

Geographic Tongue, a benign disorder, is characterized by depapillated erythematous areas on the dorsal and lateral aspect of tongue bordered by folded white, yellow or grey band.[1,3] Even though numerous factors for the occurrence of GT has been proposed, which includes stress, hot and spicy food, allergy, psoriasis, diabetes, vitamin deficiency, immune disorders, bacterial and fungal infections, Reiters syndrome, Downs syndrome, pregnancy, family history, other psychological factors, oral contraceptive pills, lithium carbonate, anemia and alcohol, the exact etiology still remains unconfirmed.[3,4,5] Different studies determine a prevalence rate between 0.5% - 12.7% for different populations,[1] having a higher occurrence in women with a ratio of 2:1.[2] Generally asymptomatic, but may also present with symptoms such as burning sensation, soreness or sensitivity, usually during intake of spicy, salty, acidic or alcoholic food items.[1,3] Treatment may not be indicated in most cases of asymptomatic GT.[2] Anesthetizing agents, anti-histamines, non-steroidal anti-inflammatory drugs(NSAID's), anti-fungals and corticosteroids may be indicated for relief in symptomatic cases.[2]

As reported earlier, the prevalence rate of GT varies from 0.5% - 12.7% in various studies.[1] Honamand M et al;2013, reported a prevalence rate of 7.8% in their study among 2000 Iranian dental patients.[3] In another study by Ghanaei FM et al;2013, in adult Iranian patients, the prevalence rate of GT was reported to be 2.6%.[6] In 2013, Patil S et al, reported a prevalence rate in Indian population of 16.4% among 4926 patients.[7] Various other studies also reported different prevalence rate for GT namely; Brailo V et al;2013 reported 6.6% prevalence among 1118 patients, [8] 2.2% prevalence among 6448 adult Swedish patients by Robledo – Sierra J et al;2013,[9] a prevalence rate of 20.59% among 395 Brazilian military police officers was reported by Araujo VS et al;2015[10] and 1% prevalence in western Silician population, reported by Tortorici S;2016, among 2539 patients.[11] Amadori et al;2017 reported 9.6% prevalence rate of GT for 6374 adolescents patients(13 – 18 years) in Italy.[12] According to these studies, the prevalence rates ranged between 1% - 20.59% in different populations. In the present study, 4292 patients were examined for GT, and 17 patients were confirmed of having GT. This provides with 0.39% prevalence rate of GT,(Fig:1) which provides a much lesser prevalence when compared to the above studies.

Honamand M et al;2013, reported a male prevalence of 3.7% and females,4.1%.[3] Increased female prevalence of GT was reported according to a study by Patil S et al;2013.[7] Jainkittivong A and Langlais R P also reported female : male ratio of 1.5.1 for GT[13]. In a

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ORIGINAL ARTICLE

Phase-contrast Microscopy: An Adjuvant Tool to assess Cementum Annulation in Forensic Dentistry

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ABSTRACT

Introduction: Teeth are one of the most durable structures in human body. As they do not degrade easily due to their high mineral content, dental hard tissue has been a valuable aid in forensic identification.

Aim: The aim of this research was to estimate the age with incremental lines in human dental cementum using phase-contrast microscope and to correlate the estimated age with the actual age of the person.

Materials and methods: The study sample consisted of 30 teeth that were extracted from patients ranging from 30 to 66 years of age. Longitudinal ground sections of each tooth were prepared and examined under phase-contrast microscope. These areas were photographed, and the images were magnified in a computer. Counting of the cemental annulations were done using Image J software.

Results: The Karl-Pearson correlation coefficient showed a strong positive correlation between the estimated age and calculated age ($r = 0.928$, $p < 0.0005$).

Conclusion: Our results showed that the cemental annulations viewed under phase-contrast microscope can be used as a valuable aid for forensic identification.

Keywords: Age estimation, Incremental lines of cementum, Phase-contrast microscope, Tooth cementum annulations.

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INTRODUCTION

Tooth as an indicator of age dates back to first half of 19th century. Yet the best method for estimating the age at death from human dental tissue is unknown. Age determination can be of great value in forensic odontology for individual identification in natural calamities, crimes, or bomb blasts. All hard tissues of the tooth can be used for age estimation out of which cementum has shown to provide more accurate and reliable results than others. Zander and Hurzeler[1] stated that cementum is potentially a better age-estimating tissue due to its unique location in the alveolar process.

Cementum is a calcified tissue that surrounds the root dentin of teeth and is formed as a continuous process throughout life. In cementum, there are alternating dark and light bands. These dark lines have been referred to as incremental lines of cementum/"Lines of Salter" and the cementum between the two dark lines have been referred to as bands. These are highly mineralized areas representing the periods of rest during the process of cementogenesis. According to Lieberman, a pair of light and dark lines represents 1 year.[2] Variations in lines may be induced by biomechanical forces, nutrition, hormonal cycle, or ecological conditions, such as temperature, Ultraviolet (UV) light, humidity, altitude, or pollution.[3]

Cemental annulations can be a better tool for dental age estimation for forensic purpose due to the following reasons: (1) Hard tissues of human dentition are able to resist decay and degradation long after other tissues are lost; (2) location of cementum within the alveolar process; (3) the incremental lines are more clearly visible in cementum than that of enamel or dentin; (4) cementum is more resistant to resorption than bone; (5) any tooth or series of teeth can be used as long as the cementum is intact.

MATERIALS AND METHODS

Collection of Specimens

The study was carried out in the Department of Oral Pathology and Microbiology, Annoor Dental College and Hospital, Muvattupuzha, Kerala. The study sample consisted of 30 extracted teeth of known age, which included representatives of all four groups: Incisors, canines, premolars, and molars. A signed consent was obtained from each individual from whom the tooth was extracted. Teeth extracted due to dental caries, orthodontic, and prosthetic reasons were included in the study while teeth with periapical pathology, root caries, developmental anomaly, hypercementosis, or root resorption were excluded. An ethical committee clearance was obtained from our institutional review board to undergo the study.

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Short Study

Prevalence of geographic tongue and its association with other disorders among patients visiting a dental college in Kerala.

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Abstract

Introduction: Geographic tongue(GT), benign recurrent condition on the tongue with controversial etiology, is characterized by loss of papillae, especially filiform papillae, associated with white keratotic serpigenous border and may be associated with burning sensation.

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The present study was carried out to assess the prevalence of geographic tongue among patients visiting a dental college in Kerala.

Materials and Methods:

A total of 4292 patients who attended the Department of Oral Medicine and Radiology over a period of 2 months, willing to participate in the study

ORIGINAL RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE AND PRACTICES ABOUT APRON HYGIENE AMONG CLINICAL DENTAL STUDENTS IN A DENTAL COLLEGE IN KERALA - A CROSS SECTIONAL SURVEY

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ABSTRACT

Background: Healthcare-associated infections (HAIs), also known as nosocomial infections, constitute a significant hazard for patients and their families visiting a healthcare facility. In a dental setup, white coatsare known to be potentially contaminated with pathogenic bacteria and there has been always a concern about the risk of transmitting pathogenic bacteria in clinical settings.Thus apron hygiene is a very important aspect of protective clothing. This study was undertaken with the objective of assessing the knowledge, attitude and practices regarding apron hygiene among clinical dental students and house surgeons in a dental college in Kerala.

Methodology: The study was a cross-sectional questionnaire based survey. The target population were the dental students and house surgeons. The questionnaire contained 20 questions to assess the knowledge, attitude and practice about apron hygiene. Results were expressed as a number and percentage of respondents for each question and were analyzed using Chi-square test.

Results: All the 106 respondents believed there was a necessity to wear aprons in clinic. About 89% opined that apron in worn for personal protection. About 45% are using the present apron since less than a year. About 83% of the respondents have 2 aprons or more. 78% prefer separate aprons for clinic and laboratories. 88% wore apron outside the clinic and laboratory premises among whom 95% wear it in canteen and over 50% wear it outside the college premises.

Conclusion: Although the knowledge and attitude regarding apron hygiene is good, the practice seems poor. A more serious approach towards inclusion and practice of apron hygiene in dental curriculum needs to be done.

Key Words: Apron hygiene, dental students, universal precaution, cross infection.

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Assessment of Total Antioxidant Capacity and Antimicrobial Activity of *Glycyrrhiza glabra* in Saliva of HIV-Infected Patients

Eby Aluckal, Asif Ismail, [...], and Abraham Kunnilathu

Abstract

Objectives:

The objectives of this study were to evaluate the antimicrobial activity and total antioxidant capacity (TAC) of licorice in Saliva of HIV/AIDS patients.

Materials and Methods:

Saliva specimens were collected from 20 people living with HIV infection, with CD4 count <500 cells/mm^3 from people infected with HIV/AIDS in Mangalore city, India. A combination of amoxicillin-clavulanic acid and nystatin was taken as the positive control and normal saline as negative control. Results were compared using one-way analysis of variance followed by Tukey's *post hoc* analysis in SPSS 19.

Results:

The TAC was evaluated spectrophotometrically at 695nm using the phosphomolybdenum method. *Glycyrrhiza glabra* showed a statistically significant reduction ($P < 0.05$) in total *Candida* count. The TAC of *G. glabra* was found to be 4.467 mM/L.

Conclusions:

G. glabra extracts showed good anticandidal activity and also high antioxidant property which reduces the oxidative stress of HIV-infected people.

Keywords: *Antibacterial activity*, *Glycyrrhiza glabra*, *HIV/AIDS*, *total antioxidant capacity*

Introduction

HIV/AIDS has emerged as a major public health problem since its recognition as an emerging disease a couple of decades ago.[1] According to the estimates of the National AIDS Control Organization, India had 2.2 million HIV-positive persons in 2008, with an estimated HIV prevalence of 0.29% among adults, and Karnataka is one among the high prevalence states of South India.[2] HIV infection induces a wide array of immunologic alterations resulting in the progressive development of opportunistic infections and malignancy, which results in AIDS.[3] Due to widespread emergence of resistance among microbial pathogens against antibiotics, there is an immense requirement to discover novel antibiotics. Traditional medical practitioners use different medicinal plants for curing various diseases in their daily practice, but a rational approach of this with the modern system of medicine is still not available. HIV-infected people and AIDS patients often seek complementary therapies including herbal medicines due to reasons such as unsatisfactory effects, high cost, nonavailability, or adverse effects of conventional medicines.[4]

Glycyrrhiza glabra L., family *Fabaceae*, known as licorice, is a plant growth belonging to the pea and bean family, which has extensive use in foods and both traditional and herbal medicine.[5] It is a herb which is cultivated mainly for its underground stems that are used to flavor confectionery. It is also known as "sweet roots," which contains a compound that is roughly 50 times sweeter than sugar.[6,7] Recent research has indicated that it can slow down the progression of HIV to AIDS, by triggering the chemical compound interferon.[4]

Infection with viruses such as HIV causes persistent chronic inflammation. It's protein produces a progressive intracellular increase of the reactive oxygen species, which influences the rate of apoptosis, decreases CD4 lymphocyte cells, and consequently increases HIV replication secondary to over production of free radicals. This actually interferes with normal physiological chemistry of the endoplasmic reticulum and cell mitochondria.[8] Such interference is responsible for the generation of oxygen reactive species and depletion of total antioxidant capacity (TAC) in AIDS patient.

The antioxidant and antimicrobial constituents of licorice were studied by some researchers,[5,6,9,10,11] but there is a dearth of knowledge regarding their effectiveness while comparing with the routine gold standard antibiotics. Based on ethnobotanical knowledge, an attempt was made here to assess the TAC and antimicrobial activity of *G. glabra* in saliva of people living with HIV/AIDS.

Materials and Methods

The present study was a cross-sectional study conducted at Snehasadan, which is a care and support center for people infected with HIV/AIDS situated in Mangalore, India. Ten HIV-infected patients were enrolled in the study, who readily participated. Ethical approval was taken from the

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Original Article

Dentistry Section

Mast Cell Density in Oral Lesions using Metachromatic Stains: A Comparative Study

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ABSTRACT

Introduction: Mast Cells (MCs) are bone marrow derived granular cells, distributed throughout the body near blood vessels, nerves and subepithelial areas. MC granules stain by basic dyes but are most readily demonstrated by metachromatic dyes such as toluidine blue and azure A.

Aim: This study focuses on evaluating and comparing the count of MCs by identification and staining of these cells by azure A with toluidine blue as a control, in normal oral mucosa and in various other oral pathologies.

Materials and Methods: Five cases each of Normal Oral Mucosa (NOM), Inflammatory Fibrous Hyperplasia (IFH), Oral Pyogenic Granuloma (OPG), Oral Lichen Planus (OLP) and Oral Squamous Cell Carcinoma (OSCC) were stained with 1% toluidine blue and azure A.

Results: Mean MC count was higher in all four lesions when compared to normal oral mucosa with both stains. OLP exhibited the maximum amount of mean MC count when compared to other pathologies under study. With all four lesions, toluidine blue exhibited higher number of MC density (count/high power field) compared to azure A.

Conclusion: Higher count of MCs was noticed in all four lesions indicating a possible role of MCs in their pathogenesis either directly or indirectly. Also, the number of degranulated MCs was more in OLP followed by OSCC, IFH and OPG.

Keywords: Azure A, Oral cancer, Oral lichen planus, Oral pyogenic granuloma, Toluidine blue

INTRODUCTION

MCs are specialized cells of haematopoietic origin distributed ubiquitously in the connective tissue. They are common residents of human body both in physiologic and pathologic conditions [1]. The paramount features of these cells include the presence of granularity in their cytoplasm. Upon degranulation, they release chemical mediators like histamine, heparin, certain chemokines and enzymes which can mediate inflammatory reactions [2]. The role of MCs in various pathologies have been elucidated over time which has enlightened us with new knowledge and understanding of these specialized cells [3]. In oral cavity, MCs are seen in all soft tissues including dental pulp [4]. Most of the pathologies occurring the oral cavity may preclude chronic inflammation and therefore are a habitat for MCs [4].

Identification of these cells is best done with metachromatic stains. Metachromasia is the property by which the tissue dye complex exhibits a shift in absorption of light towards shorter wavelength with an inverse shift in colour transmission or emission towards the longer wavelengths. As a result the colour of the tissue bound dye complex differs significantly from the colour of the original dye complex [5]. The compounds responsible for metachromasia are called chromatophores and in case of MCs, it was identified as heparin [6]. Routinely used metachromatic stain in a laboratory setting is toluidine blue (tolonium chloride). Other metachromatic stains include methyl violet, azure A, azure B, safranin etc., [6]. Metachromatic dyes stain MC granules a deep purple colour, with the background and nucleus staining blue colour [5].

The aim of this comparative pilot study was to evaluate and compare the number of intact and degranulated MCs in IFH, OPG, OLP and OSCC with NOM using azure A and toluidine blue. This study also focuses to determine the efficiency of azure A as a metachromatic stain in identifying MCs in comparison to toluidine blue as a control.

MATERIALS AND METHODS

This comparative pilot study was conducted in the Department of Oral Pathology and Microbiology, Annoor Dental College and Hospital, Kerala, India during the period of November 2013 to January 2014. Previously histopathologically proven, five cases each of OPG, OLP, IFH and OSCC were retrieved from the departmental archive. All these tissue sections were formalin fixed and paraffin embedded. Normal oral mucosal tissues biopsied from extraction sites were used as controls. Two sections, each of 3 µ thickness were cut; one stained with 1% toluidine blue, the other stained with azure A for demonstrating MCs. Modified Kramer and Windrum technique was used for the preparation of azure A solution [5]. Fifteen fields (40X) from each of these slides were selected randomly and photographed using microscope camera Canon Canoscan LiDE. These images were later transmitted to a computer monitor and the cells were counted using Image J 1.43 software to avoid human error. The MC count, both intact and degranulated cells were computed separately and expressed as the number of MCs per high power field.

Criteria for Identification and Counting of Mast Cells

The cytoplasmic granules in MCs are difficult to observe in Haematoxylin and Eosin (H and E) stained sections and can only be definitely recognized with metachromatic stains. With these stains, the intact cells appear as spindle to ovoid shaped cells with purplish red granules in the cytoplasm and a unilobar spherical sky blue coloured nuclei placed at the center or eccentrically. Those MCs, which showed no disruption of their surface membranes, were estimated as intact cells and those which showed partial or complete discontinuity of their cell membranes with one or more extruded purple staining granule(s) were counted as degranulated MCs [Table/Fig-1,2] [7]. As it is a comparative pilot study, statistical analysis was not done and only the mean total and standard deviation was calculated and compared.

Original Article

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Dentistry Section

Histological Evaluation of Epithelial Thickness, Microvasculature and Number of Mast Cells in the Gingiva of Smokers and Non-smokers with Chronic Periodontitis

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ABSTRACT

Introduction: Smoking influences the clinical parameters and disease progression in many ways. Increase in the gingival epithelial thickness and alteration in the microvasculature can be associated with decreased clinical sings of inflammation and bleeding on probing.

Aim: To histologically compare the epithelial thickness, vascular density, lumen area and the number of mast cells in the gingiva of smokers and non-smokers with chronic periodontitis.

Materials and Methods: Gingival biopsies were obtained from 30 chronic periodontitis patients (15 smokers and 15 non-smokers) undergoing due to poor periodontal prognosis. Two sections were obtained and were stained with Haematoxylin & Eosin (H&E) and toluidine blue. The epithelial thickness, vascular density, lumen area of blood vessels and number of mast cells were assessed using histomorphometric image analysis.

Results: Results of this study showed that the mean epithelial thickness among smokers was significantly increased when compared to non-smokers. The vascular density (p-value 0.790), area of lumen (p-value 0.790) of blood vessels were more in smokers than in non-smokers but did not show any significant difference. The number of mast cells were increased in smokers with significant difference when compared with non-smokers.

Conclusion: Based on the present histomorphometric study, it can be concluded that smokers have increased epithelial thickness which could be attributed to the reduced clinical signs of inflammation, but vascular density and lumen area were comparable to non-smokers. The mast cell density was higher in smokers which could be attributed to the increased disease severity.

Keywords: Gingival epithelium, Gingival microvasculature, ImageJ analysis, Periodontal disease

INTRODUCTION

Cigarette and tobacco usage has been considered as a peril for numerous disease outbreaks in many developed and developing countries [1]. Smoking has been established as a major risk factor of periodontal disease and has an astute effect on the prevalence, extent and severity of periodontitis [2]. It is an established fact that clinical parameters including probing pocket depth and clinical attachment loss are increased in smokers as compared to non-smokers [3].

Periodontal disease is highly progressive in smokers and their response to periodontal therapy is significantly reduced than non-smokers. However, there is reduction in bleeding on probing and inflammatory response due to plaque accumulation among smokers [3]. These signs of inflammation could be masked due to histological changes such as increased epithelial thickness and altered microvasculature of the gingival connective tissue [4,5]. Reduced vascular density and lumen area of the gingival vessels in smokers have been stated in literature [6]. Nicotine plays a major role in promoting the rate of proliferation of gingival epithelium, thereby increasing the epithelial thickness [7].

Among the different immune cells present in the periodontal tissues, mast cells have been detected both in healthy as well as in inflamed tissues. Mast cells are involved in abundant activities ranging from control of vasculature, host defense, tissue injury and repair and allergic inflammation. Mediators that are derived from these cells are stored in secretory granules and are released by degranulation or can be newly generated when mast cells are appropriately activated. The substantial contribution of mast cell mediators to tissue damage and progression of inflammatory responses make the regulation of mast cell activity vital in the management of many inflammatory diseases [8].

Huang S et al., suggested that mast cell degranulation may contribute to the progression of periodontal disease and there is strong correlation between the density of mast cells, degranulation and severity of periodontitis [8].

With the advent of digital photomicrography, computer interphasing and powerful image analysis software, the measurement procedures have been greatly simplified. This digital technology has created a major impact in the microscopic analysis of images. Image analysis is the extraction of numerical information from digital images and has its advantages over visual assessment.

The definitive reasons for the effect of smoking on epithelium and microvasculature has not been conclusive and limited attention has been given to the role of mast cells in smoking associated periodontal disease. Hence, this study was designed to assess and compare the epithelial thickness, vascular density, lumen area, and the number of mast cells in smoking and non-smoking associated chronic periodontitis using image analysis software.

MATERIALS AND METHODS

Study Design

The present cross-sectional study was conducted after attainment of the Institutional Ethical Committee approval (Ethical committee reference no. 014/10), on 30 patients diagnosed with chronic periodontitis between the age group of 33 to 78 years drawn from the Departments of Periodontics and Oral and Maxillofacial Surgery, Annoor Dental College and Hospital, Muvattupuzha, Kerala, India, from March to August, 2016.

Assessment of Total Antioxidant Capacity and Antimicrobial Activity of *Glycyrrhiza glabra* in Saliva of HIV-Infected Patients

Eby Aluckal, Asif Ismail, [...], and Abraham Kunnilathu

Abstract

Objectives:

The objectives of this study were to evaluate the antimicrobial activity and total antioxidant capacity (TAC) of licorice in Saliva of HIV/AIDS patients.

Materials and Methods:

Saliva specimens were collected from 20 people living with HIV infection, with CD4 count <500 cells/mm^3 from people infected with HIV/AIDS in Mangalore city, India. A combination of amoxicillin-clavulanic acid and nystatin was taken as the positive control and normal saline as negative control. Results were compared using one-way analysis of variance followed by Tukey's *post hoc* analysis in SPSS 19.

Results:

The TAC was evaluated spectrophotometrically at 695nm using the phosphomolybdenum method. *Glycyrrhiza glabra* showed a statistically significant reduction ($P < 0.05$) in total *Candida* count. The TAC of *G. glabra* was found to be 4.467 mM/L.

Conclusions:

G. glabra extracts showed good anticandidal activity and also high antioxidant property which reduces the oxidative stress of HIV-infected people.

Keywords: *Antibacterial activity, Glycyrrhiza glabra, HIV/AIDS, total antioxidant capacity*

Introduction

HIV/AIDS has emerged as a major public health problem since its recognition as an emerging disease a couple of decades ago.[1] According to the estimates of the National AIDS Control Organization, India had 2.2 million HIV-positive persons in 2008, with an estimated HIV prevalence of 0.29% among adults, and Karnataka is one among the high prevalence states of South India.[2] HIV infection induces a wide array of immunologic alterations resulting in the progressive development of opportunistic infections and malignancy, which results in AIDS.[3] Due to widespread emergence of resistance among microbial pathogens against antibiotics, there is an immense requirement to discover novel antibiotics. Traditional medical practitioners use different medicinal plants for curing various diseases in their daily practice, but a rational approach of this with the modern system of medicine is still not available. HIV-infected people and AIDS patients often seek complementary therapies including herbal medicines due to reasons such as unsatisfactory effects, high cost, nonavailability, or adverse effects of conventional medicines.[4]

Glycyrrhiza glabra L., family *Fabaceae*, known as licorice, is a plant growth belonging to the pea and bean family, which has extensive use in foods and both traditional and herbal medicine.[5] It is a herb which is cultivated mainly for its underground stems that are used to flavor confectionery. It is also known as "sweet roots," which contains a compound that is roughly 50 times sweeter than sugar.[6,7] Recent research has indicated that it can slow down the progression of HIV to AIDS, by triggering the chemical compound interferon.[4]

Infection with viruses such as HIV causes persistent chronic inflammation. It's protein produces a progressive intracellular increase of the reactive oxygen species, which influences the rate of apoptosis, decreases CD4 lymphocyte cells, and consequently increases HIV replication secondary to over production of free radicals. This actually interferes with normal physiological chemistry of the endoplasmic reticulum and cell mitochondria.[8] Such interference is responsible for the generation of oxygen reactive species and depletion of total antioxidant capacity (TAC) in AIDS patient.

The antioxidant and antimicrobial constituents of licorice were studied by some researchers,[5,6,9,10,11] but there is a dearth of knowledge regarding their effectiveness while comparing with the routine gold standard antibiotics. Based on ethnobotanical knowledge, an attempt was made here to assess the TAC and antimicrobial activity of *G. glabra* in saliva of people living with HIV/AIDS.

Materials and Methods

The present study was a cross-sectional study conducted at Snehasadan, which is a care and support center for people infected with HIV/AIDS situated in Mangalore, India. Ten HIV-infected patients were enrolled in the study, who readily participated. Ethical approval was taken from the

ORIGINAL RESEARCH

Stress in the Periodontal Ligament during Orthodontic Retraction of Anterior tooth: A Finite Element Analysis

Arif Ismail[1], Asif Ismail[2], Rohan Mascarenhas[3]

Assistant Professor, Department of Orthodontics and Dentofacial Orthopaedics, Royal Dental College, Palakkad[1]

Assistant Professor, Department of Pedodontics and Preventive Dentistry, Anoor Dental College, Muvatupuzha[2]

Senior Professor, Department of Orthodontics and Dentofacial Orthopaedics, Yenepoya Dental College,Mangalore[3]

ABSTRACT

It is now nearly two thousand years since the phenomenon of orthodontic tooth movement in response to an applied load was first reported. Although teeth are moved routinely in orthodontic practice, it is still the case that there is much more to learn about the exact on going changes in the biomechanical loading of tissues and the precise mechanism of tissue response following force application to the crown of a tooth.

Keywords: Orthodontic, Dentoalveolar, Archwire, FEM

INTRODUCTION

The most advanced and reliable study that revolutionized the dental and biomechanical research is the Finite Element Analysis/ Finite Element method (FEA/FEM). Many authors have used FEM as a tool to study various types stress patterns associated with different types of tooth movements.FEA has various advantages compared with studies on real models. The experiments are repeatable, there are no ethical considerations and the study designs may be modified and changed as per the requirement. There are certain limitations of FEA too. It is a computerized in vitro study in which clinical condition may not be completely replicated. So, further FEA research should be supplemented with clinical evaluation. The study was done to analyse the stress related changes in periodontal ligament during en masse retraction of maxillary anterior six teeth using finite element method.

MATERIALS AND METHOD

A CT-Scan of the upper dentition and maxilla was taken of a patient in the axial direction at a distance of 1mm. The scanned images were converted into soft copy and were viewed with dental software and images were copied to modeling software.

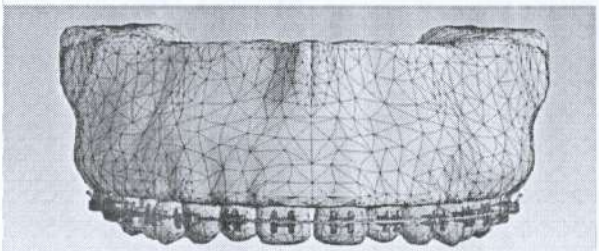

Fig 1 FEM Model of Maxilla with brackets and archwire

Different volumes were created for all the teeth, bone, wire and PDL to study the movement of individual teeth in the alveolar bone sockets. The bracket considered for this study was of MBT, 0.022 x 0.025 inch slot with molar tubes. A complete scan 3D image replicating the exact shape and size of the brackets with tip and torque values incorporated.

Format: Abstract

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Effect of incorporating seed oils on the antifungal property, surface roughness, wettability, weight change, and glucose sorption of a soft liner.

Muttagi S[1], Subramanya JK[2].

Author information

Abstract

STATEMENT OF PROBLEM: The colonization of Candida albicans on soft liners causes the deterioration of material surface properties and denture stomatitis.

PURPOSE: The purpose of this in vitro study was to investigate the effect of incorporating seed oil on the antifungal properties, surface roughness, wettability, weight changes, and glucose adsorption/absorption of a soft liner.

MATERIAL AND METHODS: Centratherum anthelminticum, Ocimum sanctum Linn, and Linum usitatissimum seed oils were incorporated into a soft liner, and the diameter of the inhibition zone (DIZ) was calculated relative to the growth of C albicans at 24, 48, and 72 hours and 7 days. The effect of incorporating oil on wettability was evaluated with the contact angle analyzer, and effect on surface roughness was evaluated with scanning electron microscopy. Weight changes and absorption/adsorption of glucose to the soft liner were estimated. Data were analyzed by using paired Student t tests and 2-way ANOVA (α=.01).

RESULTS: Soft liner with 800 μL each of C anthelminticum and O sanctum oils showed complete inhibition at 72 hours; the DIZ on day 7 were 31.66 ±1.20 mm and 29.66 ±1.46 mm, respectively. The change in weight between time intervals differed significantly between conditions (P<.01). The addition of oils decreased the surface roughness and improved wettability significantly for O sanctum and C anthelminticum specimens (P<.01). At 72 hours, 5.5 mg of glucose was detected in the positive control, whereas no glucose was detected in the oil specimens.

CONCLUSIONS: The addition of the seed oils of C anthelminticum and O sanctum to the soft liner significantly reduced the growth of C albicans, improved wettability, reduced surface roughness, and minimized the absorption and adsorption of glucose.

PMID: 27492984 DOI: 10.1016/j.prosdent.2016.05.010

ORIGINAL RESEARCH

Comparison of Alcoholic and Non-Alcoholic oral rinse during fixed appliance therapy

Arif Ismail[1], Asif Ismail[2], Mohammed Iqbal D.K[3], Subramanya Shetty[4]

Assistant Professor, Department of Orthodontics and Dentofacial Orthopaedics, Royal Dental College, Palakkad[1]
Assistant Professor, Department of Pedodontics and Preventive Dentistry, Annoor Dental College, Muvatupuzha [2].
Former Reader, Department of Orthodontics and Dentofacial Orthopaedics, Yenepoya Dental College, Mangalore[3]
Reader, Department of Orthodontics and Dentofacial Orthopaedics, Yenepoya Dental College, Mangalore[4].

ABSTRACT:
Gingival inflammation is often associated with the use of fixed orthodontic appliances which leads to elevated gingival inflammation level during orthodontic treatment. Aims and objectives of this study was to compare and evaluate the efficacy of two mouthwashes in reducing the bacterial activity. Non- alcoholic mouthwash (Colgate Plax Complete Care) and Alcoholic (Original Listerine) were tested in our study. Oral hygiene were evaluated using Loe and Silness gingival index, Silness and Loe plaque index and Muhlemann and Son sulcular bleeding index. Quantification of Streptococcus mutans from the saliva sample was taken from the orthodontic patients undergoing fixed orthodontic appliance. The study outcome indicated that Non-alcoholic mouthwash showed maximum efficacy in bringing about a reduction in bacterial activity.

Key words: Mouthwash, Bacteria, Index

INTRODUCTION

Patients who undergo fixed mechanotherapy have oral ecological changes such as Increased retentive sites for food particles, low pH environment, colonization of bacteria and increased plaque accumulation on brackets and resins This has been shown to occur even in subjects practicing good oral hygiene The junction between enamel and resin can be a potential site for enamel demineralization because of the increased formation of plaque[1].

Gingival inflammation is often associated with the use of orthodontic appliances, which leads to elevated infection level during active orthodontic treatment. Mouthwashes are an antiseptic solution intended to reduce the microbial load in the oral cavity. There has been concern that the use of alcohol-containing mouthwash such as Listerine may increase the risk of developing oral cancer. As of now there is no evidence to support a connection between oral cancer and alcohol-containing mouthrinse[2].

In this study an Alcoholic mouthwash and a Non-Alcoholic mouthwash were tested for their antibacterial efficiency during orthodontic treatment.Original Listerine was the Alcoholic mouth wash and Colgate Plax Complete Care was the Non-Alcoholic mouth wash which were tested.Chlorhexidine, which is a proven antiplaque and antibacterial mouthwash was not selected for this study due to its disadvantages such as side effects Staining, Taste Disturbances, Desquamation, Soreness and Increased Calculus Formation[1,3,8]. Oral hygiene were evaluated using the Loe & Silness gingival index, Silness and Loe plaque index, Muhlemann & Son sulcular bleeding index and quantification of Streptococcus mutans from the saliva sample taken from the orthodontic patients undergoing fixed orthodontic appliance.

Original Article

DOI: 10.7860/JCDR/2017/29112.10886

Dentistry Section

Histological Evaluation of Epithelial Thickness, Microvasculature and Number of Mast Cells in the Gingiva of Smokers and Non-smokers with Chronic Periodontitis

JOSE PAUL[1], JOHNSON PRAKASH D'LIMA[2], SENNY THOMAS[3], SHERMIN KARIM[4], PRIYA THOMAS[5], BINDHU PUSHPARAJAN RAMAKRISHNAN[6], BINITTA PAUL[7], RIFAT SALMA[8]

ABSTRACT

Introduction: Smoking influences the clinical parameters and disease progression in many ways. Increase in the gingival epithelial thickness and alteration in the microvasculature can be associated with decreased clinical sings of inflammation and bleeding on probing.

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Materials and Methods: Gingival biopsies were obtained from 30 chronic periodontitis patients (15 smokers and 15 non-smokers) undergoing due to poor periodontal prognosis. Two sections were obtained and were stained with Haematoxylin & Eosin (H&E) and toluidine blue. The epithelial thickness, vascular density, lumen area of blood vessels and number of mast cells were assessed using histomorphometric image analysis.

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MATERIALS AND METHODS

Study Design

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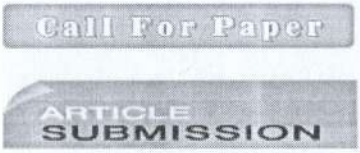

Estimation of dentin sialophosphoprotein in gingival crevicularfluid during orthodontic intrusion using ricketts' simultaneous intrusion and retraction utility arch

Author: Dr. Rahul S. Thalanany, Dr. H. L. Uma and Dr. Nausheer Ahmed
Subject Area: Health Sciences

Abstract:

Background: Apical root resorption is an unwanted effect associated with orthodontic tooth movement especially intrusion. Immuno analysis of Gingival Crevicular Fluid (GCF) has identified Dentin Sialo phospho protein (DSPP) to be present during root resorption. This study is aimed to identify and quantify DSPP, released into GCF during orthodontic intrusion using Ricketts' simultaneous intrusion and retraction utility arch and to investigate the potential of DSPP in GCF as a biomarker for root resorption. Methods: GCF was taken from central and lateral incisors of 10 subjects(experimental group) undergoing fixed orthodontic treatment before intrusion and after 2 months of intrusion and 10 subjects with no history of orthodontic treatment (control group) using micro capillary tubes. These samples were analyzed and quantified for DSPP using ELISA. To determine differences between the means of the various experimental and control groups, data obtained were statistically analyzed using parametric t-test. Results: DSPP in GCF was detected in both control and experimental subjects. There was a significant increase in DSPP levels in GCF, 2 months after intrusion. Significant differences were not found in DSPP levels between central and lateral incisors. Conclusion: The results of the study confirm the presence of significant levels of DSPP in GCF during orthodontic intrusion. DSPP in GCF can be considered as a biomarker to monitor root resorption during orthodontic intrusion. Light continuous forces are recommended during intrusion mechanics. Early detection of DSPP in GCF in highly susceptible individuals for root resorption is beneficial so as to alter the treatment mechanics as needed.

PDF file:
22344.pdf

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Original Research

ASSESSMENT OF EPITHELIAL DYSPLASIA AND MALIGNANT TRANSFORMATION IN ORAL LICHENOID LESIONS – A SYSTEMATIC REVIEW

Admaja Nair[1], Jiss Mary G[2], Sheeba Padiyath[3], Giju Baby George[4]

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ARTICLE INFO

Keywords:
epithelial dysplasia; lichenoid dysplasia; oral lichen planus; oral lichenoid lesion

ABSTRACT

Aim and objectives: The article aims a systematic review on malignant transformation of oral lichen planus ,lichenoid lesions as well as those lichenoid lesions with dysplastic features in the clinical and histopathological diagnosis. **Study design :** A review of the international literature was performed to summarize clinicopathological features of oral lichenoid lesions with dysplasia in initial diagnosis progressing to malignancy .**Results:** A total of 27 studies were evaluated to assess the malignancy progression in OLP, OLL and OLD. The average rate of malignant transformation in OLP ranges from 0.07 to 6.57%.The survey of the literature shows that no particular risk groups can be identified. However, OLD exhibit significant risk of malignancy followed by OLL and OLP. **Conclusion:** malignant transformation in oral lichenoid lesions is still a controversy. Only retrospective studies are available till date. Long term multicentre, longitudinal studies must be carried out to assess the progression of dysplasia as well as development of malignancy in those lesions.

ORIGINAL RESEARCH PAPER

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INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

TO EVALUATE THE RELIABILITY OF DIFFERENT FACIAL ANATOMIC LANDMARKS CLOSEST TO THE MIDLINE OF THE FACE USING ESTHETIC FRAME CONCEPT IN TWO AGE GROUPS.

Dental Science

Dr. Manu Johns M.D.S; Assistant Professor Annoor Dental college Muvattupuzha.

***Dr Pradeep P S.** MDS ; Associate Professor DM wayanad institute of Medical Science, Wayanad, *Corresponding Author

Dr. Brijesh Shetty M.D.S; Associate Professor. Kurunji Venkatramana Gowda Dental college and Hospital. Sullia

Dr Dexton Antony Johns MDS Consultant, DM wayanad institute of Medical Science, Wayanad

ABSTRACT

Background & Objectives:
The midline is the fundamental reference for all esthetic deviations. Therefore, knowledge of the midline will invariably result in a better understanding of facial and dental esthetics. However, the literature is not clear regarding verifiable guidelines for the determination of midlines of the face or mouth. The aim of this study was to determine the hierarchy of facial anatomic landmarks closest to the midline of the face as well as midline of the mouth.

Objectives:
The objectives of the study were to define:
(1) The hierarchy of facial anatomic landmarks closest to the midline of the face;
(2) The hierarchy of facial anatomic landmarks closest to the midline of the oral commissures (mouth); and
(3) The relationship between the midline of the oral commissures and the midline of the face.

Material and methods:
- This study was conducted among subjects of Dakshin Kannada population.
- Frontal full-face digital photographs of the subjects (in smile) were made under standardized conditions using a digital camera and
- A tripod stand was used to place and orient the camera in the standardized position (camera was positioned 5 feet away from the patient; and the lens of the camera was adjusted at the patients' eye level).
- Imaging software (Adobe Photoshop CS5; Adobe Systems, Inc, San Jose, Calif.) was used to mark the anatomic landmarks and to digitally analyze the photographs.

Deviations from the midlines of the face and mouth were measured for the 3 clinical landmarks; the existing dental midline was considered as the fourth landmark. The entire process of midline analysis was done by a single observer.

Results:
The results indicated that each of the 4 landmarks deviated uniquely and significantly ($P<.001$) from the midlines of the face as well as the mouth.

Conclusion:
Within the limitations of the study, the hierarchy of anatomic landmarks closest to the midline of the face in smile were as follows: The midline of the oral commissures, dental midline, tip of philtrum, nasion and tip of the nose. The hierarchy of anatomic landmarks closest to the midline of the oral commissures was: tip of philtrum, dental midline, nasion and tip of the nose. These relationships were the same for both age groups studied.

KEYWORDS

Facial midline, Facial symmetry, Inter-commissural midline, Esthetic Frame.

Introduction:
The classical elements of facial beauty are Symmetry, normalcy, sexual dimorphism and youthfulness. Symmetry means "correspondence in size, shape and relative position of parts on opposite sides of a dividing line or median plane or about a center or axis"[1]. The midline, that is the fundamental of all esthetic deviations, is the dividing line, which is used to attain symmetry.

Thus for better understanding of facial and dental esthetics knowledge of the midline will be essential. In the History various facial anatomic landmarks like the bisector of the pupils, nasion, tip of the nose, tip of the philtrum, and chin, located on the middle third of the face have been used to determine the facial and dental midlines[2,3]. The use of intraoral landmarks, like the incisive papilla, for determination of the maxillary dental midline was also supported by some. Whether the dental midline should be made coincident with the midline of the face or the midline of the oral commissures was also point of argument in the literature.

Some were of the opinion that it is adequate by making the dental midline coincident with the midline of the oral commissures because patients will likely relate their dental midline to proximal structures and not to the anatomic structures as they are farther from the mouth[4,5].

The literature though is not clear regarding verifiable guidelines for the determination of midlines of the face or mouth. Most clinicians choose one specific anatomic landmark and an imaginary line passing through it based upon convention and dogma. Whereas, dental floss is used by others by holding it in front of the face from glabella to menton.

The clinician thus has to determine the midline based on unverified landmarks as he is left with no predictable guidelines.

It is more important in dental esthetics that the maxillary dental midline and the facial midline coincide, than the mandibular and facial midline, which is mainly because of the dominant visibility of the maxillary anterior teeth in smile and function. This coincidence is not mandatory but it is desirable. Over and above the removable and fixed prosthodontics, implant prosthodontics, orthodontics, and facial plastic surgery the maxillary dental and facial midlines has an key role in esthetics and occlusion in many disciplines.[6]

There was lack of objectivity in the evaluation criteria for facial midlines in all the previous studies. The lack of a repeatable and verifiable definition for facial and dental midlines and lack of scientific information on relationships of specific anatomic landmarks with the facial midline are the gaps in the knowledge in this field. A lack of information about the relationship of the 2 standard midlines: midline of the face and the midline of the mouth is an addition to it, providing the rationale for this study.

And its main objectives were to define: (1) the hierarchy of facial

Saudi Endodontic Journal

ORIGINAL ARTICLE
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Evaluation of efficacy of chitosan-silver nanocomposite on *Candida albicans* when compared to three different antifungal agents in combination with standard irrigation protocol: An *ex vivo* study

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India

Abstract

Aims: This study aims to evaluate the efficacy of chitosan-silver nanocomposite on *Candida albicans* when compared to three different antifungal agents in combination with standard irrigation protocol. **Materials and Methods:** Fifty experimental teeth were biomechanically prepared and inoculated with suspension of *C. albicans*. At the end of 96 h, teeth were divided into five experimental groups. The groups were treated with respective irrigating solutions for 1 min and compared to the antifungal. An inoculation loop was used to remove aliquots from the fluid and was plated on 4% Sabouraud Dextrose Agar and incubated for 48 h. After incubation, the growth of *C. albicans* was assessed with light microscopy at ×400. **Statistical Analysis Used:** The data were statistically analyzed using one-way ANOVA. *Post hoc* followed by Dunnet *t*-test. **Results:** Colony forming unit (CFU) was determined for all five groups. One percent clotrimazole and chitosan-silver nanocomposite showed complete inhibition in all the samples. Control group (5.25% sodium hypochlorite, 17% ethylenediaminetetraacetic acid, and 0.9% saline), 0.2% fluconazole and 0.2% amphotericin B showed complete inhibition in 8 samples and reduced CFU in two samples. 0.2% fluconazole showed better inhibition of *C. albicans* compared to control group and 0.2% amphotericin B. **Conclusions:** Chitosan-silver nanocomposite as an endodontic irrigant can inhibit the growth of *C. albicans* in combination with standard irrigation protocol.

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Babu B, Nair RS, Angelo JM, Mathai V, Vineet R V. Evaluation of efficacy of chitosan-silver nanocomposite on *Candida albicans* when compared to three different antifungal agents in combination with standard irrigation protocol: An *ex vivo* study.Saudi Endod J 2017;7:87-91

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Full Text

Introduction

Endodontic infections are polymicrobial in nature with predominance toward anaerobic species. Among the microorganisms, fungi may play an important role in the failed endodontic treatment.[1] The most important oral fungi belong to genus Candida with Candida albicans being the most predominant.[2] The incidence of C. albicans in the oral cavity is 30% to 45% in healthy adults and 95% of patients infected with human immunodeficiency virus. C. albicans is a dimorphic fungus that exists in many morphologic forms such as germ tubes, blastospores, pseudohyphae, true hyphae, and chlamydospores. Each form of growth

Assessment of Total Antioxidant Capacity and Antimicrobial Activity of *Glycyrrhiza glabra* in Saliva of HIV-Infected Patients

Eby Aluckal, Asif Ismail, [...], and Abraham Kunnilathu

Abstract

Objectives:

The objectives of this study were to evaluate the antimicrobial activity and total antioxidant capacity (TAC) of licorice in Saliva of HIV/AIDS patients.

Materials and Methods:

Saliva specimens were collected from 20 people living with HIV infection, with CD4 count <500 cells/mm^3 from people infected with HIV/AIDS in Mangalore city, India. A combination of amoxicillin-clavulanic acid and nystatin was taken as the positive control and normal saline as negative control. Results were compared using one-way analysis of variance followed by Tukey's *post hoc* analysis in SPSS 19.

Results:

The TAC was evaluated spectrophotometrically at 695nm using the phosphomolybdenum method. *Glycyrrhiza glabra* showed a statistically significant reduction ($P < 0.05$) in total *Candida* count. The TAC of *G. glabra* was found to be 4.467 mM/L.

Conclusions:

G. glabra extracts showed good anticandidal activity and also high antioxidant property which reduces the oxidative stress of HIV-infected people.

Keywords: *Antibacterial activity, Glycyrrhiza glabra, HIV/AIDS, total antioxidant capacity*

Introduction

HIV/AIDS has emerged as a major public health problem since its recognition as an emerging disease a couple of decades ago.[1] According to the estimates of the National AIDS Control Organization, India had 2.2 million HIV-positive persons in 2008, with an estimated HIV prevalence of 0.29% among adults, and Karnataka is one among the high prevalence states of South India.[2] HIV infection induces a wide array of immunologic alterations resulting in the progressive development of opportunistic infections and malignancy, which results in AIDS.[3] Due to widespread emergence of resistance among microbial pathogens against antibiotics, there is an immense requirement to discover novel antibiotics. Traditional medical practitioners use different medicinal plants for curing various diseases in their daily practice, but a rational approach of this with the modern system of medicine is still not available. HIV-infected people and AIDS patients often seek complementary therapies including herbal medicines due to reasons such as unsatisfactory effects, high cost, nonavailability, or adverse effects of conventional medicines.[4]

Glycyrrhiza glabra L., family *Fabaceae*, known as licorice, is a plant growth belonging to the pea and bean family, which has extensive use in foods and both traditional and herbal medicine.[5] It is a herb which is cultivated mainly for its underground stems that are used to flavor confectionery. It is also known as "sweet roots," which contains a compound that is roughly 50 times sweeter than sugar.[6,7] Recent research has indicated that it can slow down the progression of HIV to AIDS, by triggering the chemical compound interferon.[4]

Infection with viruses such as HIV causes persistent chronic inflammation. It's protein produces a progressive intracellular increase of the reactive oxygen species, which influences the rate of apoptosis, decreases CD4 lymphocyte cells, and consequently increases HIV replication secondary to over production of free radicals. This actually interferes with normal physiological chemistry of the endoplasmic reticulum and cell mitochondria.[8] Such interference is responsible for the generation of oxygen reactive species and depletion of total antioxidant capacity (TAC) in AIDS patient.

The antioxidant and antimicrobial constituents of licorice were studied by some researchers,[5,6,9,10,11] but there is a dearth of knowledge regarding their effectiveness while comparing with the routine gold standard antibiotics. Based on ethnobotanical knowledge, an attempt was made here to assess the TAC and antimicrobial activity of *G. glabra* in saliva of people living with HIV/AIDS.

Materials and Methods

The present study was a cross-sectional study conducted at Snehasadan, which is a care and support center for people infected with HIV/AIDS situated in Mangalore, India. Ten HIV-infected patients were enrolled in the study, who readily participated. Ethical approval was taken from the

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Effect of two denture cleansers on tensile bond strength of a permanent resilient denture liner bonded to a conventional heat polymerized denture base resin

Author: Rene Kuriakose, Godbole, S. R. and Angel Mary Joseph
Subject Area: Health Sciences

Abstract:

Aim: To study the effect of enzymatic and sodium perborate denture cleansers on tensile bond strength between permanent resilient liner and heat polymerized denture base immersed in different durations of immersion solutions. Materials and Methods: Sixty three samples with the resilient denture liner sandwiched between two polymerized PMMA blocks were divided into three groups A, B and C with 21 samples in each subgroup. All samples were stored in artificial saliva in an incubator at 370C for 15 days. They were then immersed in distilled water (Group A-Control group), enzymatic (Group B-Test group) and sodium perborate denture cleanser (Group C-Test group) for 8 hours once a day and repeated for fifteen days. Tensile bond strength values were evaluated using universal testing machine on 1st, 7th and 15th day. The type of bond failure was assessed using a stereomicroscope. The data was statistically analyzed using one way ANOVA (F-Test), Dunnett D test and Student's paired t test. Results: Group A, B and C showed maximum tensile strength on 14th, 7th and 1st day respectively. Group A and B showed adhesive type of bond failure. Group C showed both adhesive and cohesive types of bond failure. The enzymatic denture cleanser showed more tensile bond strength compared to sodium perborate denture cleanser. Conclusion: This study demonstrated that there were significant differences among the samples for different types and durations of immersion solutions which are due to leaching out of plasticizers from resilient liner and composition of the different immersion solutions.

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24293.pdf

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Determination of the patterns in the prescribing medications for periodontal disease among dentists – A pilot study	Jiss Antony, Jose Paul, Johnson Praksh D'Lima, Biju Philip, Rincy Roshan, Binitta Paul	Journal of Cochin Periodontists Society	2016-17	https://www.copsonweb.org/JCOPS/JCOPS-Vol-01-Issue-01.pdf
Evaluation and Comparison of Three Chemical Agents with a New Herbal Agent for Disinfection of Gutta-percha Cones: An in vitro Study	Prashant, George L	Cons Dent Endod J	2016-17	https://www.researchgate.net/publication/334369498
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ORIGINAL ARTICLE
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Evaluation of oral lesions in HIV seropositive individuals and its correlation with CD4 $^+$ T-lymphocytic count

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Abstract

Background and Objectives: Human immunodeficiency virus (HIV) infection is characterized by a gradual reduction in the counts of cluster of differentiation (CD)4 $^+$ T-lymphocytes that in turn leads to opportunistic infections and specific neoplastic processes. The introduction of antiretroviral therapy (ART)/highly active ART (HAART) has led to a decrease in the morbidity and mortality associated with HIV infection. The aim of this study is to evaluate the prevalence of HIV-related oral lesions and to correlate these lesions with laboratory parameter such as CD4 $^+$ T-lymphocyte count before and after the administration of ART. **Materials and Methods:** In the present study, a total of 120 patients were evaluated, out of which 79 patients who presented with oral lesions were further assessed for oral lesions and respective CD4 $^+$ T-lymphocyte counts. The oral examination was carried out using presumptive criteria by European Community (EC) Clearinghouse and CD4 $^+$ T- lymphocyte counts was assessed by flow cytometry. Same group of patients were followed up for next 6 months to determine the changes in the CD4 $^+$ T-lymphocyte counts and oral lesions. **Results:** HIV-related oral lesions were found to be more prevalent in the age group of 31-40 years, with a relatively high frequency of occurrence in male patients. The CD4 $^+$ T-lymphocyte count was significantly increased after the administration of ART when compared to that before the administration of ART in all the patients. However, the lesions did not subside completely even after the increase in of CD4 $^+$ T-lymphocyte counts. **Interpretation and Conclusion:** The difference in the prevalence of oral manifestations may be the result of variations in data of the study population such as race, socioeconomic status, sex, drug therapy, genetics, oral habits, and degree of immune suppression and variation in diagnostic criteria.

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Full Text

INTRODUCTION

J Cancer Prev. 2016 Mar;21(1):55-9. doi: 10.15430/JCP.2016.21.1.55. Epub 2016 Mar 30.

Epidemiology of Oral Lichen Planus in a Cohort of South Indian Population: A Retrospective Study

Soma Susan Varghese [1], Giju Baby George [2], Sreenivasan Bargavan Sarojini [1], Sankar Vinod [3], Philips Mathew [4], Deepu George Mathew [5], Joseph Sebastian [6], Arun George [6]

Affiliations

PMID: 27051650 PMCID: PMC4819667 DOI: 10.15430/JCP.2016.21.1.55
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Abstract

Background: Oral lichen planus (OLP) is an immune-mediated potentially malignant disorder of the oral cavity. Dysplastic OLP has an altered cytogenic profile and can progress into oral squamous cell carcinoma. The epidemiology of OLP is well-described in several relatively large series from various geographic locations, whereas such series from southern India is rare. The aim of the present study was to determine the epidemiology of OLP in a cohort of South Indian population.

Methods: All the case data records of 29,606 patients who visited Mar Baselios Dental College and Hospital, Kerala, India from 2014 to 2015 were retrospectively reviewed. For data review, 122 patients of OLP were selected Estimated were type, number, and location of lesions, clinical manifestation, age of the patient, gender, onset and duration of lesion, stressful life style, habits, skin involvement and associated systemic illness, and presence/absence of dysplasia.

Results: When the distribution of OLP among the gender was considered, we found more prevalence in females than males. Fifty-seven percent of patients were associated with stressful lifestyle. Reticular lichen planus was the most common clinical subtype found. Bilateral buccal mucosal was the common site, when the distribution of sites of OLP were compared ($P < 0.05$). Hypersensitivity reaction was frequently associated with systemic illness with OLP ($P < 0.05$). Anaplasia was found among 5% of lichen planus lesions.

Conclusions: OLP patients had high incidence of hypersensitivity reactions and 5% of OLP lesions showed anaplasia. Long term follow-up is necessary to monitor the recurrence, prognosis, and malignant transformation of OLP.

Keywords: Immunologic diseases; Lichen planus; Precancer.

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Assessment of implant stability during various stages of healing placed immediately following extraction in an overdenture situation

Ashwin Thomas Koshy, T. Aby Mathew, [...], and Angel Mary Joseph

Abstract

To assess the implant stability during different stages of healing in an immediate loaded implant soon after extraction. A 73-year-old female came with a chief complaint of bad smell and irritation in her lower front gum region. On examination, she was found to be completely edentulous in the maxillary arch and partially edentulous in the mandibular arch with only the canines present bilaterally. The posterior mandibular ridge was severely resorbed and hence could not be treated with a conventional mandibular complete denture. Considering the age of the patient and the preference of only a single surgical visit, we decided to plan for a conventional maxillary denture against an implant supported mandibular overdenture with two implants placed immediately after extraction of canines. The stability of these implants was assessed during the early phases of healing with the help of a resonance frequency analysis method (RFA) using Osstell ISQ™. During the healing phase, implant stability quotient (ISQ) values decrease by 4–5 values after installation with the lowest values at the 1st week postplacement. Following this, the ISQ values increased steadily for all implants up to 16 weeks. No significant differences were noted over time. At placement, the mean ISQ values at 33 and 43 regions were 74 and 75.2, respectively. The mean lowest ISQ values recorded at the 1st week were 58.8 and 65.4, respectively. At 16 weeks, the mean ISQ values were 70.5 and 67.9, respectively. The survival of such immediately placed implants, which are later used as overdenture supported implants, are highly predictable when the surgical and prosthetic part is done meticulously. However, there needs future studies oriented to understand better the healing pattern of immediately placed implants in extraction sockets, which would guide the clinician with the optimal loading time.

Keywords: Immediately placed implants, implant supported overdenture, resonance frequency analysis (RFA)

INTRODUCTION

According to the WHO, edentulous patients are considered as "physically impaired." The classic treatment for such patients would be to fabricate conventional complete dentures. Patients who are treated with such dentures often complain of the instability of their lower dentures. These dentures are fully tissue borne and transmit all of the functional forces onto the residual ridge thereby resulting in rapid loss of the remaining alveolar ridge.[1] To counteract this problem, denture adhesives came into the market these adhesives offered a temporary solution for the poor retention of these dentures with underlying etiology remaining unsolved.

An implant supported overdenture is a simple and an excellent treatment alternative to the problem of a loose, unstable denture thereby restoring masticatory function, speech, and the confidence level of the patient. Although the initial expense for an overdenture is high when compared to conventional denture, on a long run, an implant overdenture using ball attachments have proved to be more retentive and cost-effective.[2] These dentures receive their support from the mucosa as well as from the implants. Implants placed immediately after extraction carries the advantages of reduced treatment time and reduced number of surgical experiences. The success of such implants depends on the underlying physiologic changes that occur at the bone-implant interface.[3] A sound understanding of these biological changes that takes place at the bone-implant contact interface during the early phases of healing would guide the clinician from premature loading, which may result in implant failure.

Different methods have been used to measure implant stability and bone quality, namely percussion testing, histological analysis, radiographs, insertion torque, cutting resistance, periometer, and resonance frequency analyzer. One of the main limitations of some of these methods were its invasive nature during the assessment of implant stability. If an implant is subjected to micromovement during the healing phase, normal healing would be disrupted resulting in the formation of a fibrous capsule around this interface and subsequent implant failure.[4,5] The RFA method is a noninvasive technique and uses the principle of "tuning fork." It is a bending test of the bone implant system, in which a microscopic bending force is applied by exciting a transducer (Smart Peg), that is fixed rigidly onto the implant fixture.[6] The RFA has shown to correlate with clinical assessments and the osseous changes reflective of the metabolic activity following implant placement.[3]

This article involves the stability assessment of immediately placed implants in the extraction sockets during the early phases of healing with the help of the resonance frequency analysis (RFA) Osstell ISQ™ followed by a detailed description of a simple way to fabricate an implant-supported overdenture using ball attachments.

CASE REPORT

A female patient aged 73 years visited the Department of Prosthodontics and Implantology, Pushpagiri College of Dental Science, Kerala, India with a chief complaint of bad smell and irritation in her lower front gum region [Figure 1]. She gave a history of hypertension and hypothyroidism and was under medication for the same. The patient was wearing a maxillary conventional denture for the past 15 years. In the mandibular anterior region, she had a fixed bridge receiving its support from the right and left canine teeth. Posteriorly, she had a removable acrylic temporary denture with clasps extending onto the canines bilaterally [Figure 2]. Anterior and posterior teeth presented in cross bite relation. The panoramic view revealed a severe bone resorption on the mandibular molar area and a combination syndrome-like appearance on

ORIGINAL RESEARCH

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Reliability of Beta Angle for Analyzing Changes with Activator High Pull Headgear Using Linear and Angular Measurements by Cephalometric Analysis

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Source of Support: None, **Conflict of Interest:** None

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Comparative Evaluation of Three Herbal Solutions on the Disinfection of Guttapercha Cones: An In vitro Study

Pratap Kumar Mukka, Samba Shiva Rao Pola, [...], and Praveen Chilakabathini

Abstract

Introduction

Guttapercha (GP) cones are usually supplied in aseptic, sealed packages from the manufacturers, but once exposed to the dental office environment or even by handling; they can be contaminated by a number of microorganisms. Supplementary decontamination of GP cones is critical. As they cannot be sterilized by moist or dry heat, cold sterilization, using disinfectants should be used.

Aim

The aim of the study was to evaluate rapid, reliable, convenient and effective method of disinfection of GP cones using readily available herbal solutions such as Aloevera Juice, Amla Juice and Pancha Tulsi.

Materials and Methods

Ninety GP cones were selected for the study. Based on the contaminants used, 80 GP cones were divided into two groups: Group A and Group B with 40 cones in each group and the remaining 10 cones which were uncontaminated served as negative control. The cones from Group A were contaminated with *Staphylococcus aureus* (*S. aureus*) and Group B were contaminated with *Enterococcus faecalis* (*E. faecalis*). The contaminated cones from both groups were subdivided into four groups with 10 cones in each group. Group I cones were disinfected with Aloevera Juice, Group II with Amla Juice and Group III with Pancha Tulsi. The fourth group consisted of GP cones without any disinfection which served as positive control. All the cones were then incubated in thioglycollate media for seven days. The thioglycollate media was subcultured and colony forming units were counted. The data were analyzed by one way ANOVA (analysis of variance) and Post-hoc Tukey test using SPSS 17.0 software.

Results

Mean colony forming units were compared in all the groups and there was a statistically significant difference present among the groups ($p<0.01$). Pancha Tulsi was found to be most effective disinfectant followed by Amla Juice.

Conclusion

All the herbal solutions were found to be effective in the disinfection of GP points. However, Pancha Tulsi possesses superior antibacterial activity when compared with Aloevera Juice and Amla juice.

Keywords: Aloevera Juice, Amla Juice, Digital colony counter, Pancha Tulsi

Introduction

The success of endodontic therapy is dependent on the maintenance of aseptic chain right from access opening to permanent coronal restoration of the tooth. The practitioner must be concerned not only with endogenous oral microbial flora, but also with exogenous bacterial contamination as well [1]. For optimum infection control, every instrument and material placed in the root canals should be sterile [2]. This holds true for obturating materials also. GP cones are the most commonly used core material for the obturation of root canal system [3]. Although GP cones are manufactured under aseptic conditions and present potential antimicrobial properties especially owing to zinc oxide component [4], they can be contaminated by aerosols, improper storage and physical handling of the cones [2].

According to various studies, *Staphylococcus* genus is found to be the most common micro-organism contaminating GP cones in their boxes and after handling with the gloves [5,6]. De Lima Guimaraes et al., observed about 15.7% *Staphylococcus* genus, this justifies the need of GP disinfection [7]. Various studies have reported that *E. faecalis* is found to be the most resistant intracanal pathogen in failed root canal cases that serves as a gold standard bacterium in the endodontic research [8]. *E. faecalis* was selected for the study to represent the other possible micro-organisms that may contaminate GP cones owing to its superior virulence property.

It would be worthwhile if obturation material used to fill the root canal system were free from pathogenic microorganisms, because endodontic therapy is mainly a procedure of decontamination in order to prevent the dissemination of microorganisms throughout the root canal system and periapical tissues [9]. Hence, rapid chair side disinfection of GP cones is of utmost importance to maintain aseptic chain during root canal treatment [10]. As GP cones are heat labile, moist and dry heat sterilization cannot be used as it causes alteration of GP structure.

Assessment of awareness of the association between periodontitis and systemic conditions/ diseases amongst general population

Paul, ** Johnson Prakash D'Lima, ***Biju Philip, **** Aswathy Sheela Sudhakar

Abstract

Introduction: Over the last few years, numerous researches have been conducted to prove the periodontal-systemic health link. There is a lack of general awareness among the public regarding this link as well as the need to undergo periodontal treatment in order to establish good oral and general health. **Aim:** The aim of the study was to determine the level of awareness of the association between periodontitis and systemic conditions/ diseases among outpatients attending Annoor Dental College and Government Taluk Hospital Muvattupuzha. **Materials and Methods:** A self-structured questionnaire comprising ten questions regarding association between periodontitis and systemic conditions/diseases, was distributed among 180 outpatients. The respondents were instructed to mark one of the choices given as answers for the questions, the choices being yes, no and don't know. **Results:** Out of the 180 respondents, 72%, 22%, 15.5% and 30.5 % were aware about the association between periodontitis and diabetes mellitus, cardiovascular diseases, pre term low birth weight babies and stress respectively. 28.8% and 33.3% were aware that treatment of periodontitis can result in better systemic control and can reduce the risk of schemic heart disease and stroke respectively. **Conclusions:** The data points out that adequate awareness regarding the association between periodontitis and systemic conditions/diseases is lacking among the public. Hence integrated individual and community based education programmes are necessary to make the public aware about the association of periodontal disease and systemic diseases.

Keywords: Periodontal disease, Systemic disease, Systemic conditions, Diabetes mellitus, Cardiovascular disease, pre term low birth weight babies, Stress

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Introduction

Periodontitis is predominantly a Gram negative infection resulting in severe inflammation, in which microorganisms and their products such as lipopolysaccharides (LPS) by vascular dissemination would spread throughout the body[1]. This results in the spread of infection to different parts of the body resulting in systemic changes as well.

Over the last few years, there has been a keen interest in the relationship between periodontal and systemic health, labelled as periodontal–systemic interlink: a two-way road[2]. The term Periodontal Medicine was first suggested by Offenbacher denoting a rapidly emerging branch of Periodontology focusing on the evidence relating periodontal diseases with systemic diseases[3]. This relationship has been mentioned in the Assyrian clay tablet, 17th century, and it was Miller who later proposed the "human mouth as a focus of infection" in 1891, and in 1900 William Hunter designated it with the term "Oral sepsis.

But this focal infection theory fell into disrepute in 1940s due to widespread practice of so called "preventive" or "therapeutic edentulation," including extraction of otherwise healthy teeth. Resurrection of the theory was seen in the form of Periodontal Medicine when Kimmo Matilla et al. in 1989 examined a possible relationship of oral infection in contributing to an individual's risk for systemic disease.[3] After which, numerous researches have been conducted to prove this dynamic periodontal-systemic health link.

There is a lack of general awareness among the public regarding this link as well as the need to undergo periodontal treatment in order to establish good oral and general health.

Hence the aim of this study was to assess the awareness of the link between periodontitis and systemic conditions/ diseases among the outpatients attending Annoor Dental College and Government Taluk Hospital, Muvattupuzha.

Materials and methods

A self-structured questionnaire was distributed among 180 patients (135 from Annoor Dental College, Muvattupuzha and 45 outpatients from Government Taluk hospital, Muvattupuzha). Prior permission was obtained from the authorised personnel for conducting the study and a verbal consent from the respondents. The questionnaires were distributed among the subjects after explaining the purpose and terms of the study.

The questionnaire comprised of ten questions regarding the link between periodontitis and systemic conditions/ diseases such as diabetes mellitus,

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BASIC RESEARCH

Determination of the patterns in prescribing medications for periodontal disease among dentists: A pilot study

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ABSTRACT

Background: Dentists prescribe medications for the management of a number of oral conditions. Apart from the side effects, a great concern with injudicious use of antibiotics is the development of resistance.

Aim of the study: The aim of the study was to determine the pattern of prescribing medication for periodontal disease among dentists.

Materials and methods: It was a questionnaire based pilot study conducted among general dental practitioners, dental specialists, junior residents and faculty members in and around Muvattupuzha, Kerala. A questionnaire consisting of 12 questions were distributed.

Statistical analysis: In order to understand if the questions in this questionnaire reliably measure the same variable, a Cronbach's alpha (reliability test) is conducted. In the analysis significance level is taken to be 0.05.

Results:The questionnaire was distributed among 136 dentists, out of which 74.2% (101/136) had the opinion that there is overuse of antibiotics prescribed. 75% (102/136) of participants opined the use of medication with incision and drainage in treatment of periodontal abscess in patients with good general health. Only 41.9% (57/136) preferred to start with loading dose of medication in cases of periodontal abscess. Amoxycillin and metronidazole were the preferred choice of antibiotic for managing periodontal infection. 94.1% (128/136) of participants were reluctant to do culture and sensitivity tests before prescribing an antibiotic. 66.9% (91/136) of participants preferred to use trade name while prescribing antibiotics and 97%

INTRODUCTION

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MATERIALS AND METHO

This study was a questionn
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The dental practitioners who

Comparative Evaluation of Three Herbal Solutions on the Disinfection of Guttapercha Cones: An In vitro Study

Pratap Kumar Mukka, Samba Shiva Rao Pola, [...], and Praveen Chilakabathini

Abstract

Introduction

Guttapercha (GP) cones are usually supplied in aseptic, sealed packages from the manufacturers, but once exposed to the dental office environment or even by handling; they can be contaminated by a number of microorganisms. Supplementary decontamination of GP cones is critical. As they cannot be sterilized by moist or dry heat, cold sterilization, using disinfectants should be used.

Aim

The aim of the study was to evaluate rapid, reliable, convenient and effective method of disinfection of GP cones using readily available herbal solutions such as Aloevera Juice, Amla Juice and Pancha Tulsi.

Materials and Methods

Ninety GP cones were selected for the study. Based on the contaminants used, 80 GP cones were divided into two groups: Group A and Group B with 40 cones in each group and the remaining 10 cones which were uncontaminated served as negative control. The cones from Group A were contaminated with *Staphylococcus aureus* (*S. aureus*) and Group B were contaminated with *Enterococcus faecalis* (*E. faecalis*). The contaminated cones from both groups were subdivided into four groups with 10 cones in each group. Group I cones were disinfected with Aloevera Juice, Group II with Amla Juice and Group III with Pancha Tulsi. The fourth group consisted of GP cones without any disinfection which served as positive control. All the cones were then incubated in thioglycollate media for seven days. The thioglycollate media was subcultured and colony forming units were counted. The data were analyzed by one way ANOVA (analysis of variance) and Post-hoc Tukey test using SPSS 17.0 software.

Results

Mean colony forming units were compared in all the groups and there was a statistically significant difference present among the groups ($p<0.01$). Pancha Tulsi was found to be most effective disinfectant followed by Amla Juice.

Conclusion

All the herbal solutions were found to be effective in the disinfection of GP points. However, Pancha Tulsi possesses superior antibacterial activity when compared with Aloevera Juice and Amla juice.

Keywords: Aloevera Juice, Amla Juice, Digital colony counter, Pancha Tulsi

Introduction

The success of endodontic therapy is dependent on the maintenance of aseptic chain right from access opening to permanent coronal restoration of the tooth. The practitioner must be concerned not only with endogenous oral microbial flora, but also with exogenous bacterial contamination as well [1]. For optimum infection control, every instrument and material placed in the root canals should be sterile [2]. This holds true for obturating materials also. GP cones are the most commonly used core material for the obturation of root canal system [3]. Although GP cones are manufactured under aseptic conditions and present potential antimicrobial properties especially owing to zinc oxide component [4], they can be contaminated by aerosols, improper storage and physical handling of the cones [2].

According to various studies, *Staphylococcus* genus is found to be the most common micro-organism contaminating GP cones in their boxes and after handling with the gloves [5,6]. De Lima Guimaraes et al., observed about 15.7% *Staphylococcus* genus, this justifies the need of GP disinfection [7]. Various studies have reported that *E. faecalis* is found to be the most resistant intracanal pathogen in failed root canal cases that serves as a gold standard bacterium in the endodontic research [8]. *E. faecalis* was selected for the study to represent the other possible micro-organisms that may contaminate GP cones owing to its superior virulence property.

It would be worthwhile if obturation material used to fill the root canal system were free from pathogenic microorganisms, because endodontic therapy is mainly a procedure of decontamination in order to prevent the dissemination of microorganisms throughout the root canal system and periapical tissues [9]. Hence, rapid chair side disinfection of GP cones is of utmost importance to maintain aseptic chain during root canal treatment [10]. As GP cones are heat labile, moist and dry heat sterilization cannot be used as it causes alteration of GP structure.

BASIC RESEARCH

Determination of the patterns in prescribing medications for periodontal disease among dentists: A pilot study

Jiss Antony, Jose Paul, Johnson Prakash D'lima, Biju Philip, Rincy Roshan, Binitta Paul

Department of Periodontics,
Annoor Dental College,
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ABSTRACT

Background: Dentists prescribe medications for the management of a number of oral conditions. Apart from the side effects, a great concern with injudicious use of antibiotics is the development of resistance.

Aim of the study: The aim of the study was to determine the pattern of prescribing medication for periodontal disease among dentists.

Materials and methods: It was a questionnaire based pilot study conducted among general dental practitioners, dental specialists, junior residents and faculty members in and around Muvattupuzha, Kerala. A questionnaire consisting of 12 questions were distributed.

Statistical analysis: In order to understand if the questions in this questionnaire reliably measure the same variable, a Cronbach's alpha (reliability test) is conducted. In the analysis significance level is taken to be 0.05.

Results:The questionnaire was distributed among 136 dentists, out of which 74.2% (101/136) had the opinion that there is overuse of antibiotics prescribed. 75% (102/136) of participants opined the use of medication with incision and drainage in treatment of periodontal abscess in patients with good general health. Only 41.9% (57/136) preferred to start with loading dose of medication in cases of periodontal abscess. Amoxycillin and metronidazole were the preferred choice of antibiotic for managing periodontal infection. 94.1% (128/136) of participants were reluctant to do culture and sensitivity tests before prescribing an antibiotic. 66.9% (91/136) of participants preferred to use trade name while prescribing antibiotics and 97%

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Perspect Clin Res. Apr-Jun 2016;7(2):88-93. doi: 10.4103/2229-3485.179434.

Effectiveness of 3% hypertonic saline nebulization in acute bronchiolitis among Indian children: A quasi-experimental study

Harsh V Gupta [1], Vivek V Gupta [2], Gurmeet Kaur [1], Amitoz S Baidwan [3], Pardeep P George [4], Jay C Shah [5], Kushal Shinde [2], Ruku Malik [2], Neha Chitkara [6], Krushnan V Bajaj [7]

Affiliations

PMID: 27141475 PMCID: PMC4840797 DOI: 10.4103/2229-3485.179434
Free PMC article

Abstract

Objective: To compare the effects of 3% hypertonic saline (HS) and 0.9% normal saline with nebulized 0.9% normal saline with salbutamol in patients of acute viral bronchiolitis.

Materials and methods: Participants were divided into three groups, that is, 3% HS group, 0.9% normal saline group and 0.9% saline with salbutamol group. Four doses at interval of 6 h were given daily until discharge. Average CS score and length of hospital stay were compared. One-way analysis of variance paired t-test and Chi-square test were utilized for statistical analysis.

Results: The mean ages of the patients in three groups were 6.03 ± 3.71, 5.69 ± 3.34 and 5.48 ± 3.35 respectively. The 3(rd) day CS scores for all the groups were 1.0 ± 1.1, 1.9 ± 1.1 and 3.3 ± 0.5 respectively (P = 0.000). The average length of hospital stay was 3.4 ± 1.7, 3.7 ± 1.9 and 4.9 ± 1.4 days respectively (P = 0.001).

Conclusion: The present study concludes that 3% HS nebulization (without additional bronchodilators) is an effective and safe treatment for nonasthmatic, moderately ill patients of acute bronchiolitis. The economic benefit of this comparably priced modality of treatment can be enormous in terms of hospital costs with parents returning to work sooner.

Keywords: 0.9% normal saline; 0.9% saline with salbutamol; 3% hypertonic saline; acute bronchiolitis.

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Miscellaneous

Assessment of awareness of the association between periodontitis and systemic conditions/ diseases amongst general population

se Paul, ** Johnson Prakash D'Lima, ***Biju Philip, **** Aswathy Sheela Sudhakar

Abstract

Introduction: Over the last few years, numerous researches have been conducted to prove the periodontal-systemic health link. There is a lack of general awareness among the public regarding this link as well as the need to undergo periodontal treatment in order to establish good oral and general health. **Aim:** The aim of the study was to determine the level of awareness of the association between periodontitis and systemic conditions/ diseases among outpatients attending Annoor Dental College and Government Taluk hospital Muvattupuzha. **Materials and Methods:** A self-structured questionnaire comprising of ten questions regarding association between periodontitis and systemic conditions/diseases, was distributed among 180 outpatients. The respondents were instructed to mark one of the choices given as answers to the questions, the choices being yes, no and don't know. **Results:** Out of the 180 respondents, 72%, 22%, 15.2% and 30.5 % were aware about the association between periodontitis and diabetes mellitus, cardiovascular diseases, pre term low birth weight infants and stress respectively. 28.8% and 33.3% were aware that treatment of periodontitis can result in better systemic control and can reduce the risk of ischemic heart disease and stroke respectively. **Conclusions:** The data points out that adequate awareness regarding the association between periodontitis and systemic conditions/diseases is lacking among the public. Hence integrated individual and community based education programmes are necessary to make the public aware about the association of periodontal disease and systemic diseases.

Keywords: Periodontal disease, Systemic disease, Systemic conditions, Diabetes mellitus, Cardiovascular disease, pre term low birth weight infants, Stress

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Introduction

Periodontitis is predominantly a Gram negative infection resulting in severe inflammation, in which microorganisms and their products such as lipopolysaccharides (LPS) by vascular dissemination would spread throughout the body[1]. This results in the spread of infection to different parts of the body resulting in systemic changes as well.

Over the last few years, there has been a keen interest in the relationship between periodontal and systemic health, labelled as periodontal–systemic interlink: a two-way road[2]. The term Periodontal Medicine was first suggested by Offenbacher denoting a rapidly emerging branch of Periodontology focusing on the evidence relating periodontal diseases with systemic diseases[3]. This relationship has been mentioned in the Assyrian clay tablet, 17th century, and it was Miller who later proposed the "human mouth as a focus of infection" in 1891, and in 1900 William Hunter designated it with the term "Oral sepsis.

But this focal infection theory fell into disrepute in 1940s due to widespread practice of so called "preventive" or "therapeutic edentulation," including extraction of otherwise healthy teeth. Resurrection of the theory was seen in the form of Periodontal Medicine when Kimmo Matilla et al. in 1989 examined a possible relationship of oral infection in contributing to an individual's risk for systemic disease.[3] After which, numerous researches have been conducted to prove this dynamic periodontal-systemic health link.

There is a lack of general awareness among the public regarding this link as well as the need to undergo periodontal treatment in order to establish good oral and general health.

Hence the aim of this study was to assess the awareness of the link between periodontitis and systemic conditions/ diseases among the outpatients attending Annoor Dental College and Government Taluk Hospital, Muvattupuzha.

Materials and methods

A self-structured questionnaire was distributed among 180 patients (135 from Annoor Dental College, Muvattupuzha and 45 outpatients from Government Taluk hospital, Muvattupuzha). Prior permission was obtained from the authorised personnel for conducting the study and a verbal consent from the respondents. The questionnaires were distributed among the subjects after explaining the purpose and terms of the study.

The questionnaire comprised of ten questions regarding the link between periodontitis and systemic conditions/ diseases such as diabetes mellitus,

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Effect of rubber dam on arterial oxygen saturation in children.	Dr. Pooja Latti	Journal of International Oral Health	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4479774/pdf/JIOH-7-54.pdf
Comparison of diagnostic ability of storage phosphor plate in detecting proximal caries with direct measurement by stereomicroscope: A pilot study	Vineet Alex	Clinics and practice	2015-16	https://pubmed.ncbi.nlm.nih.gov/26664712/
Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching	K M Charlie	contemp Clini	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4632217/
A comparative study of bio degradation of various orthodontics arch wires; an in vitro study.	Gopikrishnan	Journal of International Oral Health	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4336653/pdf/JIOH-7-12.pdf
Evaluation & comparison of bipathology of collagen and inflammation in the extracellular matrix of oral epithelial dysplasia and inflammatory fibrous hyperplasia using Picrosirius red stain and polarising microscopy: a preliminary study	Giju George	Journal of Cancer Prevention	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4699755/pdf/jcp-20-275.pdf
Association of periodontitis, elevated C reactive protein levels and acute myocardial infarction- a case control study	Hima John	International Journal of Current Research	2015-16	https://www.researchgate.net/publication/310796733
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The Antiplaque Efficacy of Propolis-Based Herbal Toothpaste: A Crossover Clinical Study	Pradeep George Philip	J Nat Sc Biol Med	2015-16	https://pubmed.ncbi.nlm.nih.gov/26283831/
Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching anticay application: An in vitro study	Liza George, Allu Baby,	Contemp Clin Dent	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4632217/
A Confocal Microscopic Evaluation of the Dehydration Effect on Conventional, Resin Reinforced Powder/Liquid and Paste to Paste Glass Ionomer Luting Cements	Liza George	J Int Oral Health	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4588785/
Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching anticay application: An in vitro study	T. Prasanth Dhanapal	Contemp Clin Dent	2015-16	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4632217/

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Received: 25th January 2015 Accepted: 10th April 2015 Conflicts of Interest: None

Source of Support: Nil

Original Research

Effect of Rubber Dam on Arterial Oxygen Saturation in Children

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Contributors:

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How to cite the article:

Nara A, Chour R, Narasimman J, Latti P, Srinidhi PB. Effect of rubber dam on arterial oxygen saturation in children. J Int Oral Health 2015;7(6):54-56.

Abstract:

Background: The placement of rubber dam has the potential to alter the airflow through nasal and oral cavities. Pediatric dentist should be aware whether the use of a rubber dam affects the oxygen saturation (SpO_2) in children. To assess the effect of rubber dam on arterial blood SpO_2 in children of 6-12 years age.

Materials and Methods: Totally, 60 ASA Class I patients of 6-12 years age, randomly allocated in two groups: Group A: Rubber dam isolation of maxilla and Group B: Isolation of the mandible. A pulse oximeter was used to detect SpO_2. To establish a baseline, each patient's SpO_2 was recorded every 30 s for 2 min. A rubber dam was then placed which extended over the nose. Class I cavity and glass ionomer cements restoration were performed. The rubber dam was cut to expose the nasal cavities SpO_2 were recorded every 30 s for 5 min throughout the procedure. A two-way ANOVA test was applied.

Results: In both groups there was no significant difference in SpO_2 after rubber dam placement with nose covered or uncovered ($P > 0.05$).

Conclusion: There was no significant change in SpO_2 after rubber dam isolation with nose covered or uncovered in children of 6-12 years age.

Key Words: Oxygen saturation, pulse oximeter, rubber dam

Introduction

The rubber dam was introduced to the dental profession by Dr. Stanford C Barnum in 1864. Since then a number of publications have appeared related to its practicality and methods of application.[1] The use of a rubber dam has significant advantages in operative procedures especially in children. It protects the patient's oropharynx from aspiration of medicaments, instruments etc.[2,3] However, the use of rubber dam alters airflow in both the oral and nasal cavities depending on the method of application. This could result in a decrease in arterial oxygen saturation (SpO_2) which may cause serious problems in medically compromised patients. Any significant reduction in oxygen supply causes impairment of vital organs such as the brain, heart tissue. The pulse oximeter is a reliable, non-invasive instrument that measures hypoxia at its early stage.[4] Good-day and Crocker evaluated the effect of rubber dam on SpO_2 in dental patients and found no change in SpO_2 before or after rubber dam isolation.[5] Very few studies have been done assessing effect of rubber dam on SpO_2 in children.

Hence, the present study was carried out to evaluate the effect of rubber dam placement on SpO_2, while carrying out operative procedures in children of the 6-12 year age group.

Materials and Methods

The study consisted of 60 ASA Class I patients of the 6-12 years age group.[6] Informed consent was taken from the parents and patients. Ethical clearance was obtained from Ethical Committee of Navodaya Medical Institution Raichur, Karnataka, India. Totally, 60 children with Class I caries lesion on second primary molars were selected and randomly allocated in two groups: Group A: 30 children had rubber dam isolation of maxillary primary second molar and Group B: 30 children had rubber dam isolation of the mandibular second primary molar. A pulse oximeter was used to detect arterial blood SpO_2 at every 30 s in both the groups. To establish a baseline, each patient's SpO_2 was recorded every 30 s for 2 min (Figure 1). A rubber dam was then placed which extended over the nose (Figure 2). Operative procedure of Class I cavity preparation and glass ionomer cements (GIC) restoration were performed. Throughout the operative procedure patients, SpO_2 was recorded every 30 s for 5 min. Then the rubber dam was cut to expose the nasal cavities, and SpO_2 was recorded every 30 s for 5 min (Figure 3).

Statistical analysis

A two-way ANOVA test was performed to compare the measurements taken before and after rubber dam placement in each group. Repeated measures ANOVA were used to compare SpO_2 at different time points in both groups ($P < 0.05$) was taken as statistically significant. The data were entered and verified using the statistical software SPSS version 16.0.

Clin Pract. 2015 Sep 28;5(3):763. doi: 10.4081/cp.2015.763. eCollection 2015 Sep 28.

Comparison of Diagnostic Ability of Storage Phosphor Plate in Detecting Proximal Caries with Direct Measurement by Stereomicroscope: A Pilot Study.

Vivek V[1], Thomas S[1], Nair BJ[1], Vineet AD[1], Thomas J[1], Ranimol P[1], Vijayan AK[1].

Author information

Abstract

Radiography plays an important role in detection of interproximal caries. The aim of study is to compare diagnostic ability of photo stimulable phosphor (PSP) with direct measurement using stereomicroscope in detecting proximal caries. Hundred proximal surfaces of 50 extracted human posterior teeth were radiographed with dental X-ray unit. The image receptors used was storage phosphor plate Vista scan (size 2), (time of exposure 0.4 s). Radiographs were interpreted and caries lesions were classified on a 4-point scale suggested by Abesi et al. The teeth were sectioned with diamond disc and were examined under a stereomicroscope with 20x magnification. Diagnostic accuracy of digital image is similar to that observed with stereomicroscope. The PSP plate digital X ray system can effectively be employed for detecting proximal caries as compared to direct observation by stereomicro-scope. Further study with more number of observer/evaluator and large sample size is recommended.

KEYWORDS: Proximal caries; intra oral radiography; sensitivity; stereomicroscope; storage phosphor plate

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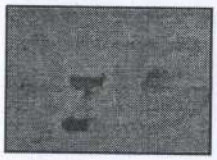

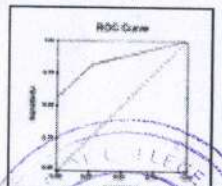

Format: Abstract

Contemp Clin Dent. 2015 Sep;6(Suppl 1):S163-6. doi: 10.4103/0976-237X.166835.

Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching anticay application: An in vitro study.

George L[1], Baby A[1], Dhanapal TP[1], Charlie KM[1], Joseph A[1], Varghese AA[1].

Author information

Abstract

AIMS AND OBJECTIVES: The purpose of the study was to evaluate and compare the microhardness of enamel after the application of anticay on bleached enamel with fluoride containing and fluoride free bleaching agent.

MATERIALS AND METHODS: Twenty freshly extracted teeth decoronated and divided mesiodistally into two halves were randomly divided into five groups with 10 samples in each group. The enamel surface was treated as follows: Group 1 - no treatment, Group 2 - fluoride free bleaching agent, Group 3 - fluoride containing bleaching agent, and Group 4 - fluoride free bleaching agent followed by anticay application. The samples were subjected to indentation to test the microhardness using Vicker's hardness analyzer.

CONCLUSION: Enamel microhardness significantly increased in samples where anticay was used after the application of bleaching agent.

KEYWORDS: Anticay; bleaching; microhardness

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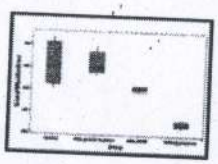

Received: 05th August 2014 Accepted: 03rd November 2014 Conflict of Interest: None

Source of Support: Nil

Original Research

A Comparative Study of Bio Degradation of Various Orthodontic Arch Wires: An *In Vitro* Study

S Gopikrishnan[1], Anil Melath[2], V V Ajith[3], N Binoy Mathews[4]

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How to cite the article:

Gopikrishnan S, Melath A, Ajith VV, Mathews NB. A comparative study of bio degradation of various orthodontic arch wires: An *in vitro* study. J Int Oral Health 2015;7(1):12-7.

Abstract:

Background: Orthodontic wires are the corner stones of the science and art of orthodontics and they remain in the patient's mouth for a prolonged period of 18-24 months. It is but natural to expect that they will undergo some biodegradation when in the oral environment during that period. This study aims to compare the biodegradation characteristics of four different orthodontic wires, stainless steel, nickel titanium (NiTi), titanium molybdenum alloy (TMA), and copper NiTi and to assess whether these biodegradation products, are within acceptable limits.

Materials and Methods: This study involved the incubation of four different wires in artificial saliva and analyzing the amount of metal released from them at the end of a 28 days study period. The metals analyzed for where nickel, chromium, copper, cobalt, manganese, iron, molybdenum, and titanium. The artificial saliva was changed on days 7, 14, and 21 to prevent the saturation of metals in the artificial saliva. At the end of 28 days, these four samples of artificial saliva of each wire were mixed together and analyzed for the eight metals using an inductively coupled plasma spectroscope.

Results: The results showed only the release of nickel, chromium, and iron from stainless steel wire, nickel from NiTi wire, nickel, and chromium from copper NiTi and none from TMA wire.

Conclusion: The metals released from arch wires are of such minute quantities to be of any biologic hazard. The amount of metals released is well within acceptable biocompatible limits. Though this study has analyzed the biodegradation of various orthodontic wires, orthodontic wires are never used alone in mechanotherapy. Orthodontic wires along with multiband appliance system with which it is always used and in combination with accessories like face bows may release more metals.

Key Words: Arch wires, corrosion, inductively coupled plasma spectroscope

Introduction

Orthodontic wires are the corner stones on which the science and art of orthodontics is based. These wires remain the mouth for a prolonged period of 18-24 months. It is natural to expect that these wires undergo some sort of biodegradation in the constantly changing oral environment.

Stainless steel wires have for long been the main stay of clinical orthodontics due to their outstanding combination of mechanical properties, bioinertness, and corrosion resistance in the oral environment. Stainless steel is an iron chromium nickel alloy with chromium content 18% and nickel content 8%.[1]

Nickel titanium (NiTi) has been widely used clinically due to its properties of shape memory and super elasticity. The general composition of these wire alloys are approximately 53.5% nickel, 44.9% titanium, and 1.6% cobalt.[1]

A beta titanium alloy titanium molybdenum alloy (TMA) is another commonly used alloy. TMA has nominal composition of 77.8% titanium, 11.3% molybdenum, 6.6% zirconium, and 4.3% tin. A noteworthy characteristic of these wires is that beta titanium is the only alloy to possess true weldability and formability.

Copper NiTi is a new quaternary alloy with distinct advantages over formerly available NiTi alloys. This thermally activated alloy wire contains nickel, titanium, copper, and chromium.

Metals leaching out of orthodontic wires can cause toxicity reactions if they exceed the maximum recommended daily intake levels. The daily intake of nickel should not exceed 300 µg, chromium 0.2 mg, manganese 5 mg, copper 3 mg, molybdenum 0.5 mg, iron 18 mg, and cobalt in minute traces. Average dietary intake for titanium is 300-2000 µg/day.[2]

Hence, this study was conducted with the following aims and objectives:

a. To compare *in-vitro* biodegradation characteristics of four different orthodontic wires stainless steel, NiTi, TMA, copper NiTi alloy
b. To assess whether the corrosion products were within acceptable biocompatible limits.

Materials and Methods

The sample comprised of four orthodontic archwires of uniform dimension 17 mil × 25 mil and length of 100 mm. The archwires

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ORIGINAL ARTICLE

Evaluation and Comparison of the Biopathology of Collagen and Inflammation in the Extracellular Matrix of Oral Epithelial Dysplasias and Inflammatory Fibrous Hyperplasia Using Picrosirius Red Stain and Polarising Microscopy: A Preliminary Study

Soma Susan Varghese[1], Sreenivasan Bargavan Sarojini[1], Giju Baby George[3], Sankar Vinod[4], Philips Mathew[2], Anulekh Babu[5], Joseph Sebastian[1]

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Background: The role of tumour inflammation and the dysplastic epithelial-stromal interactions on the nature of collagen fibres in the extracellular matrix of dysplastic epithelium is not fully understood. The present study was aimed to evaluate and compare the inflammation and pathological stromal collagen (loosely packed thin disorganized collagen) present in mild, moderate and severe epithelial dysplasias with that of inflammatory fibrous hyperplasias. The basement membrane intactness of epithelial dysplasias was also evaluated to determine if dysplastic epithelial mesenchymal interaction has any role in the integrity of stromal collagen in epithelial dysplasia.

Methods: Oral epithelial dysplasias, inflammatory fibrous hyperplasia and normal oral mucosal samples were used for the study. Packing, thickness and orientation of collagen fibres in mild, moderate and severe grades of oral epithelial dysplasias (n = 24), inflammatory fibrous hyperplasia (n = 8) and normal oral mucosal samples (n = 8) were analysed based on the polarisation of collagen fibres in picrosirius red polarising stain under polarising microscope.

Results: All the grades of epithelial dysplasias showed greenish yellow birefringence confirming the presence of loosely arranged pathological collagen in the presence of moderate inflammation. All the cases of inflammatory fibrous hyperplasia showed red polarisation hue and moderate inflammation. A statistically significant difference was found in the packing and orientation of collagen when epithelial dysplasias and inflammatory fibrous hyperplasia were compared ($P < 0.01$). When the intactness of basement membrane integrity was compared in all the groups of epithelial dysplasia, a statistically significant result was obtained ($P < 0.05$).

Conclusions: Presence of significant amount of loosely packed thin disoriented collagen even in mild epithelial dysplasia suggests that tumourigenic factors are released to connective tissue stroma much earlier than expected. Hence we suggest considering the integrity of extracellular matrix collagen, intactness of basement membrane and inflammation associated with dysplasia along with the anaplasia of epithelial cells in the microscopic assessment of dysplastic epithelium.

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Key Words: Oral mucosa, Dysplasia, Extracellular matrix, Collagen

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RESEARCH ARTICLE

ASSOCIATION OF PERIODONTITIS, ELEVATED C REACTIVE PROTEIN LEVELS AND ACUTE MYOCARDIAL INFARCTION- A CASE CONTROL STUDY

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Acute myocardial Infarction,
CRP, Periodontal disease,
CPI, LOA.

ABSTRACT

Background & Objectives: Destructive periodontal diseases (PD) have been associated with increased risk of atherosclerotic complications, including acute myocardial infarction (AMI) and stroke. The ability of Periodontitis to produce systemic C-reactive protein (CRP) level elevations may represent the link with cardiovascular events. Hence, the aim of this study was to compare the serum levels of CRP in AMI patients (with and without periodontitis) and a control group. This study also explored the possibility of using CRP levels in patients with periodontitis as a possible risk marker and a screening tool for predicting future cardiovascular disease independent of the conventional risk factors.
Methodology: 40 cases of AMI were taken as cases and 40 age and sex matched healthy individuals were taken as controls. Community Periodontal Index (CPI) score and Loss of Attachment (LOA) score were determined, as well as CRP level estimated from blood for every individual examined.
Results: It was noted that CRP levels were higher in the individuals with PD both in cases and controls. CRP levels in the AMI patients with PD were much higher than the CRP levels in healthy individuals with a positive correlation of CPI, LOA and CRP. A cut off value for CRP level was determined using the ROC curve and noted that values above 0.45mg/L are at a higher risk.
Conclusion: The assessment of CRP levels in the individuals with PD would therefore work as a screening tool and help us in educating the patient about the adverse effects of periodontal ill health.

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INTRODUCTION

Periodontitis is an inflammatory reaction of the supportive tissues surrounding the tooth, including the periodontal ligament, cementum, and alveolar and supporting bone (Beck *et al.*, 1999). It is chronic in nature, progresses slowly, and usually there are no symptoms. Periodontitis is measured clinically as attachment loss, pocket formation and radiographic bone loss and affects 7% to 15% of adults, with varying amounts of severity (Deliargyris, 2004). Periodontal disease and cardiovascular disease (CVD) appear to have a number of characteristics in common because they are more likely to occur in persons who are older, male, who smoke, are diabetics and in both cases might lead to systemic inflammation. Periodontal diseases and oral infections themselves may be risk factors for systemic diseases, including CVD (Beck, 1999). C-reactive protein (CRP), an acute-phase reactant produced mainly in the liver, belongs to the pentraxin family of proteins. Its plasma concentration can increase rapidly in response to a wide range of inflammatory stimuli (Casula *et al.*, 2000). The ability of Periodontitis to produce systemic CRP level elevations may represent a possible mechanism underlying the link with cardiovascular events. Studies have shown that cytokines (interleukin-6 and interleukin-1) and acute-phase protein CRP in systemic circulation can be used as serum markers for future cardiac and vascular events (Widener, 2007). Destructive periodontal diseases have been associated with increased risk of atherosclerotic complications, including myocardial infarction (MI) and stroke. The finding comes at a time when the understanding of atherosclerotic complications are changing from a focus on the occlusion of arteries due to the buildup of plaque deposits, to an increased awareness of the role of inflammation played in plaque rupture and thrombus formation (Craig, 2004). With this background the aim of this study is to compare the serum levels of CRP in patients with acute myocardial infarction (AMI) (with and without periodontitis) and a control group (with and without periodontitis). This study will also explore the possibility of using CRP levels in patients with periodontitis as a possible risk marker and a screening tool for predicting future cardiovascular disease independent of the conventional risk factors.

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Original Research

Comparison of Shear Bond Strength of New Self-etching Primer with Conventional Self-etching Primers: An *In-vitro* Study

Abhinay Sorake[1], Rohan Rai[2], Gautham Hegde[1], Ridhima Suneja[3], Naveena Kumar[4], Jibin Skaria[5]

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Abstract:

Background: In the past few years, there has been a major research drive to increase bond strength between dental materials and dental hard tissue and to reduce the associated demineralization around fixed orthodontic appliances. Thus, a recent approach is to incorporate an antibacterial agent into the primer to reduce the demineralization and enhance bond strength. The objective of this study was: (1) To evaluate the shear bond strength of orthodontic preadjusted edgewise appliance brackets bonded to extracted premolar teeth with antimicrobial self-etch primer (Reliance self-etching primer, Clearfil Protect Bond) and self-etching primer without antimicrobial agent (Clearfil SE bond). (2) To compare the mean shear bond strength values of the tested materials to conventional self-etching primer Transbond Plus.

Materials and Methods: A total of 125 extracted human premolar teeth were randomly divided into five groups of 25 teeth each. Each sample was embedded in an acrylic block of polymethyl meth acrylate resin till coronal portion. Instron testing machine model LR LOYD 50 K was used for testing the shear bond strength of individual samples.

Results: The results of the study showed that all five groups had adequate clinically acceptable bond strength. In intergroup comparison, there was statistically significant difference in bond strength of Reliance self-etching primer, Promt L pop, Clearfil Protect Bond, clearfil SE bond and Transbond Plus.

Conclusion: Reliance self-etching primer showed highest bond strength, followed by Clearfil Protect Bond, clearfil SE bond, and Transbond Plus. Clearfil Protect Bond primer containing methacryloxy dodecyl pyridium bromide have been demonstrated to kill *Streptococcus mutans* within a short time of contact and also exhibits an inhibitory effect on the growth of bacteria on its surface.

Key Words: Methacryloxy dodecyl pyridium bromide, self-etching primer, shear bond strength, tooth demineralization

Introduction

Over the past 50 years, the bonding of various adhesives to enamel and dentine has developed a niche in nearly all areas of dentistry, including orthodontics. The direct bonding of orthodontic attachments has become a routine clinical procedure. It was Buonocore in 1955, who initially demonstrated the adhesions of acrylic filling materials to enamel, following acid etching with phosphoric acid. Newman in 1965 suggested that the technique might be used for orthodontic bonding. Since then, many attempts have been made using various different methods and materials for the enamel surface pre-treatment, as an important ingredient in the bonding protocol.[1] Recently, several bonding systems have been developed and proposed as the sixth generation of adhesive materials. These materials are known as one-step bonding systems. The sixth-generation systems are composed of an acidic solution that cannot be kept in place, must be refreshed continuously and have a pH that is not enough to properly etch enamel. Many researchers have studied adhesion to enamel. Although different modalities have been tested, at present, phosphoric acid etching seems to be the most frequently used method of enamel surface preparation. One of the potential disadvantages of etching with phosphoric acid is that the acid causes demineralization of the most superficial layer.[2]

Conventional adhesive systems use three different agents (an enamel conditioner, a primer solution, and an adhesive resin) in the process of bonding orthodontic brackets to enamel. Combining conditioning and priming into a single treatment step results in improvement in both time and cost effectiveness to the clinicians and indirectly to the patient. Contemporary self-etching primers, which were introduced in 1990's, and the recently introduced, all in one adhesives are attractive additions to the clinician's bonding armamentarium. They are user-friendly, in that the number of steps required in the bonding protocol is reduced. As the smear plugs are not removed prior to the application of these adhesives, the potential for post-operative sensitivity that is caused by incomplete resin

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The antiplaque efficacy of propolis-based herbal toothpaste: A crossover clinical study

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Abstract

Background:

In recent years, herbal products have been suggested as an economic, safe and probably effective alternative for prevention and control of various oral diseases. But still there are some products which need to be evaluated. Of lately, Propolis is one such product. To assess and compare the efficacy of herbal dentifrice containing Propolis with Miswak and Colgate total toothpastes in controlling plaque formation.

Materials and Methods:

A double blind, randomized, crossover study design was conducted among thirty healthy dental students. After oral prophylaxis all subjects were given a washout product for one week period. Subjects were then made to brush with (washout product) for 1 minute followed by 1 minute brushing with assigned test product. The baseline MGMPI plaque scores were recorded. Subjects were then refrained from oral hygiene for 24 hours, and were recalled to be re-disclosed and re-measured for plaque formation. This procedure was repeated according to crossover design after a washout period of (2 week). Statistical tests used were Krukalwallis and Wilcoxon sign rank test.

Results:

There was a significant difference in 24 hour score between the test products evaluated. When the change from baseline to 24 hours was analyzed, the test product Propolis resulted in a consistently and significantly ($p < 0.05$) lower MGMPI mean scores than the Colgate Total and Miswak toothpastes.

Conclusion:

Propolis was found to be safe and effective in reducing plaque accumulation when compared to Miswak and Colgate total toothpaste.

Keywords: Colgate, Miswak, modified gingival marginal plaque-index, plaque, Propolis

INTRODUCTION

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Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching anticay application: An *in vitro* study

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Abstract

Aims and Objectives:

The purpose of the study was to evaluate and compare the microhardness of enamel after the application of anticay on bleached enamel with fluoride containing and fluoride free bleaching agent.

Materials and Methods:

Twenty freshly extracted teeth decoronated and divided mesiodistally into two halves were randomly divided into five groups with 10 samples in each group. The enamel surface was treated as follows: Group 1 - no treatment, Group 2 - fluoride free bleaching agent, Group 3 - fluoride containing bleaching agent, and Group 4 - fluoride free bleaching agent followed by anticay application. The samples were subjected to indentation to test the microhardness using Vicker's hardness analyzer.

Conclusion:

Enamel microhardness significantly increased in samples where anticay was used after the application of bleaching agent.

Keywords: Anticay, bleaching, microhardness

Introduction

Bleaching although not new to dentistry has gained much popularity in recent years. It is the most preferred conservative method to lighten discolored teeth.[1] Bleaching agents contain either hydrogen peroxide or carbamide peroxide (CP). One of the popular bleaching techniques is night guard bleaching that utilizes 10% CP in a customized tray that is worn by the patient at night. CP is formed from hydrogen peroxide and urea and about one-third of CP is released as hydrogen peroxide.[2] The color change in enamel and dentin is the result of penetration of hydrogen peroxide through the enamel and

A Confocal Microscopic Evaluation of the Dehydration Effect on Conventional, Resin Reinforced Powder/Liquid and Paste to Paste Glass Ionomer Luting Cements

Liza George and D Kandaswamy

Abstract

Background:

The purpose of this study was to evaluate the effect of dehydration of resin-modified glass ionomer powder/liquid system, resin-modified glass ionomer paste/paste luting cements in three different quantities and to compare them with a conventional glass ionomer luting cement using confocal laser scanning microscope.

Materials and Methods:

A conventional glass ionomer (Group I), a resin modified powder/liquid system (Group II), and a resin-modified paste/paste system (Group III) were selected for the study. In Group III, there were three subgroups based on the quantity of material dispensed. 50 premolar teeth were selected and randomly divided among the groups with 10 samples in each. The teeth were ground flat to expose a flat occlusal dentin. A device was made to standardize the thickness of cement placed on the teeth. The teeth were stored in distilled water for 24 h and then longitudinally sectioned to examine the tooth dentin interface under a confocal microscope. The specimens were allowed to dehydrate under the microscope for different time intervals. The width of the crack after dehydration near the dentinal interface was measured at definite intervals in all the groups and analyzed statistically using Student's *t*-test.

Results:

Conventional glass ionomer cement showed the maximum width of the crack followed by resin modified paste/paste system during the dehydration period. Resin modified powder/liquid system did not show cohesive failure.

Conclusions:

Conventional glass ionomer luting cement is more susceptible to cohesive failure when subjected to dehydration compared to resin-modified glass ionomer paste/paste luting cement. Among the luting cements, resin-modified glass ionomer powder/liquid system showed the best results when subjected to dehydration.

Keywords: Confocal mieroscopy, dehydration, glass ionomer, luting cements

Introduction

Glass Ionomer cement introduced by Wilson and Kent in 1972 was initially used as a substitute for silicate cement, for anterior esthetics.1 Zinc phosphate cement has long been the material of choice for luting permanent cast restoration because of its good manipulative properties and relatively high strength. However, this material relies on mechanical interlocking for its retentive effects.2 The quest for improved alternative cementing material that can form a physiochemical bond to the tooth structure led to the development of glass ionomer luting cement in 1977.3 It has showed considerable promise as a means of reducing secondary caries by its fluoride release. Other favorable traits include significantly less disintegration *in vivo*, a film thickness comparable to that of zinc phosphate and biocompatibility.4

The conventional glass ionomer cement, however, is susceptible to moisture contamination and dehydration in the early stages. Resin modified glass ionomer cement shows less early water sensitivity and their tensile strength and flexural strength exceeds the conventional glass ionomer.5,6 However, they remain susceptible to water loss and exhibit crack formation when subjected to dehydration stress.7

The glass ionomer is also highly sensitive to power/liquid ratio and the material cannot be under proportioned or over proportioned. Premeasured glass ionomer in the form of capsule was introduced to obtain a correct ratio of powder and liquid, but it also could not solve the problem of wastage.

A later introduced, paste to paste system was provided with a dispenser to ensure dispensing the required amount of material without altering the proportion. The low film thickness of 3 μ also permits stress-free seating of restoration and reduce the chances of high occlusion.

Confocal laser scanning microscope (CLSM) enables to view subsurface features of tooth/cement interface under normal environmental conditions without disrupting the interface morphology.8 This is especially useful to study the interaction of glass ionomer cement with the tooth surface, which is very sensitive to dehydration.9

Format: Abstract

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Evaluation and comparison of the microhardness of enamel after bleaching with fluoride free and fluoride containing carbamide peroxide bleaching agents and post bleaching anticay application: An in vitro study.

George L[1], Baby A[1], Dhanapal TP[1], Charlie KM[1], Joseph A[1], Varghese AA[1].

Author information

Abstract

AIMS AND OBJECTIVES: The purpose of the study was to evaluate and compare the microhardness of enamel after the application of anticay on bleached enamel with fluoride containing and fluoride free bleaching agent.

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CONCLUSION: Enamel microhardness significantly increased in samples where anticay was used after the application of bleaching agent.

KEYWORDS: Anticay; bleaching; microhardness

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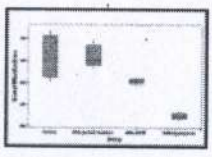

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A comparative study of the relationship between interalar width and inter commissural width on circumferential arc width of maxillary anterior teeth in different age groups	Cherian K P	J Ind Prosthodont Soc	2014-15	https://pubmed.ncbi.nlm.nih.gov/25489157/
Assessment and comparison of p53 and p63 expression in oral epithelial dysplasia and squamous cell carcinoma	Rekha KP	SRM Journal of Research in Dental Sciences	2014-15	https://www.srmjrds.in/temp/SRMJResDentSci53149-2637856_071938.pdf
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A comparative study on the relationship between inter alar width, and inter commissural width on circumferential arc width of maxillary anterior teeth in different age groups.

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Abstract

This study was done to determine the relationship between interalar width and inter commissural width on circumferential arc width of maxillary anterior teeth in dentulous subjects between the age groups of 20-50 years. The study involved 300 subjects, in whom measurements were made from the distal aspect of each maxillary canine, across the facial surfaces of the six anterior teeth, using brass wire and a Vernier calliper. Interalar and inter commissural width were recorded after placing two points and measured with a Vernier calliper. Results were statistically analyzed using unpaired t test, Kolmogorov-Smirnov and Pearson's correlation coefficient test. This study confirmed the reliability of interalar width to determine the circumferential arc width which can be used as a reference in edentulous patients.

KEYWORDS: Circumferential arc widths; Inter commissural width; Interalar width

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ORIGINAL ARTICLE
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Assessment and comparison of p53 and p63 expression in oral epithelial dysplasia and squamous cell carcinoma

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India

Abstract

Aim: p53 and p63 are the important genes associated with oral cancer. The aim of this study was to evaluate and compare the immunohistochemical expression of p53 and p63 in oral epithelial dysplasia and squamous cell carcinoma (SCC). **Materials and Methods:** Immunohistochemical expression of p53 and p63 was graded in total of 60 archival cases, which included 30 cases of oral epithelial dysplasia (10 cases each of mild, moderate, and severe dysplasia) and 30 cases of oral SCC (10 cases each of well-differentiated, moderately differentiated, and poorly differentiated SCC). **Results:** Our study showed statistical significant difference on comparison of p53 and p63 expression in oral epithelial dysplasia. In oral SCC cases, p53 and p63 did not show significant correlation in expression. **Conclusions:** Our study demonstrated a progression in expression of p53 and p63 along the grades of oral epithelial dysplasia to SCC, suggesting their role in stages of carcinogenesis. However, p53 and p63 may have independent role in oral tumorigenesis.

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Full Text

INTRODUCTION

Oral cancer is the sixth most common cancer worldwide, accounting for approximately 4% of all cancers. Squamous cell carcinoma (SCC) of the oral cavity may comprise up to 50% of all cancers in developing and underdeveloped countries. [1]

Oral SCC is usually preceded clinically by evident precancerous lesions which appear as white (leukoplakia) or red lesions (erythroplakia). At the microscopic level, these lesions show varying degrees of epithelial dysplasia, from mild to severe. Long-term studies have shown that the overall risk of malignant transformation of all grades of epithelial dysplasia is approximately 16%. A higher grade of dysplasia is generally associated with a higher risk of neoplastic transformation. [2]

The development of oral SCC is a multistep process requiring the accumulation of multiple genetic alterations, influenced by a

ORIGINAL ARTICLE

Assessment and comparison of fingerprints between Kerala and Manipuri populations of India: A forensic study

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Keywords
Fingerprints, Kerala population, Manipuri population, population identification

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Abstract

Background and Objective: The study of the epidermal ridges and the patterns formed by them is known as dermatoglyphics, a word coined by the anatomist Harold Cummins of Tulane University. The potential of fingerprints to determine sex and individual identification has been well exhibited and documented. However, few studies have been conducted using fingerprints for population identification. The objective of this study was to determine predominant fingerprint patterns in males and females in relation to Kerala and Manipuri population and also to compare the fingerprint patterns between these populations.

Materials and Methods: The study sample consisted of 200 subjects, which included 100 Kerala and 100 Manipuri populations in the age group of 18-21 years. Each subject was asked to press their fingertip on the stamp pad and then to the plain chart paper to transfer the fingerprint impression. All the individuals' fingerprints were identified and classified into loops, whorls, and arches. The data were statistically analyzed using the *Z*-test.

Results: Loops were found to be the most common fingerprint pattern among the entire study subjects. Manipuri population showed the highest frequency of loops and arches, whereas Kerala population showed more whorls. Further in our study, comparison of all fingerprint patterns between Kerala and Manipuri population revealed a significant difference for whorls and arches.

Conclusion: Difference in the fingerprint patterns between Kerala and Manipuri population exists for whorls and arches. This variation in fingerprints patterns between two populations suggests further study in associating persons to groups in more number of populations.

Introduction

The increasing alertness regarding the biometric system of dermatoglyphics pattern is one of the surest methods of identification. The study of the epidermal ridges and the patterns formed by them is known as dermatoglyphics. This word was coined by the anatomist Harold Cummins of Tulane University. The word dermatoglyphics means "a skin carving".[1]

The dermatoglyphics patterns of dermal ridges that constitute human fingerprint are produced during early intrauterine life, between the 7th and 21st week of gestation and are fully created at about 7 months of fetus development. It has been reported that ridges are influenced by blood vessel-nerve pairs at the border between the dermis and epidermis during prenatal growth.[2]

Fingerprints gathered at a crime scene can be used to identify the perpetrator of the crime, victims and other persons who touched the surface. Fingerprints scan can be used to validate electronic registration, cashless catering, library access particularly in school and colleges and office attendance. The secretions in the fingerprints contain residues of various chemicals and metabolites which can be detected and used for the identification of forensic purposes.[3]

The potential of fingerprints to determine sex and individual identification has been well exhibited and documented. However, few studies have been conducted using fingerprints for population identification. Fingerprint characteristics depict people and groups. A person can be described approximately by fingerprint patterns and uniquely by fingerprint minutiae.

Assessment and comparison of fi ngerprints between Kerala and Manipuri populations of India: A forensic study

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Immunohistochemical Expression of Calretinin in Ameloblastoma, Adenomatoid Odontogenic Tumor, and Keratocystic Odontogenic Tumor: A Comparative Study

Anila Koneru;Kaveri Hallikeri;Ganesh Nellithady;Rekha Krishnapillai;Sudeendra Prabhu;

+ Author Information

Abstract

Calretinin is expressed primarily in the central and peripheral nervous system and extensively studied in colon adenocarcinoma and mesotheliomas. Calretinin is known to be expressed in the odontogenic epithelium and odontogenic tumors. However, the role of calretinin in the pathogenesis of odontogenic tumors is yet to be confirmed. Hence, the aim of the present study was to evaluate the expression and role of calretinin in selected odontogenic tumors. The study included 30 ameloblastomas, 30 adenomatoid odontogenic tumors, and 30 keratocystic odontogenic tumors. Staining intensity, pattern, and localization of the immunopositive cells were determined. Statistical analysis was performed using Mann-Whitney *U* test and Kruskal-Wallis analysis of variance test. *P*-values <0.05 were considered to be statistically significant. Results showed that 90% ameloblastomas and 80% keratocystic odontogenic tumors were immunopositive to calretinin, whereas none of the adenomatoid

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Prevalence of supernumerary teeth in permanent dentition among patients attending a dental college in South Kerala: A pilot study

Devi Gopakumar, Jincy Rachel Thomas, Prasanna Ranimol, Daniel Alex Vineet, Sunila Thomas, Vivek Velayudhan Nair less

Background: Supernumerary teeth are excess number of teeth formed as a result of disturbances occurring during odontogenesis. The objective of the study was to investigate the prevalence of supernumerary teeth in permanent dentition among patients attending a dental college in South Kerala. Materials and Methods: In this study, 11,141 subjects attending the out-patient department of PMS College of Dental Science and Research, Thiruvananthapuram, Kerala were examined for supernumerary teeth like... CONTINUE READING

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Indian Journal of Dental Research

ORIGINAL RESEARCH
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A study of sister chromatid exchange in patients with dental amalgam restorations

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Study Background: Dental amalgam is still widely used as a restorative material in developing countries due to its low cost and ease of manipulation. The health risks associated with the components of this restorative material has always been a matter of concern. Our study was designed to address this question regarding dental amalgam. **Objective:** To study sister chromatid exchange (SCE) as an indicator of systemic genotoxicity, due to the exposure from the components of amalgam restorations during its placement and chronic use. **Materials and Methods:** Systemic genotoxicity in subjects exposed to amalgam during its placement (Group II; $n = 5$) and subjects with chronic exposure to amalgam (Group III; $n = 5$) were compared with controls (Group I; $n = 5$) by SCE assay in cultured peripheral blood lymphocytes. **Result:** Subjects exposed to amalgam during its placement and subjects having chronic exposure to amalgam showed an increase in the frequency of SCE, but the change was not statistically significant ($P = 0.84$, $P = 0.123$ respectively). **Conclusion:** Systemic genotoxicity was not observed due to the components of amalgam restorations released during its placement and chronic use. The findings of this study can be considered as preliminary information on the systemic toxicity due to the components of amalgam restorations.

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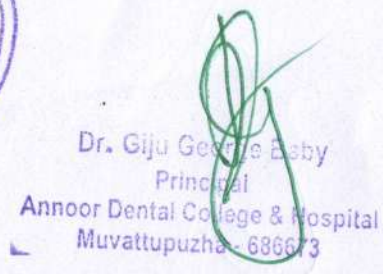

Format: Abstract

J Oral Implantol. 2014 Jun;40(3):239-49. doi: 10.1563/AAID-JOI-D-11-00163.

A comparative study on microgap of premade abutments and abutments cast in base metal alloys.

Lalithamma JJ[1], Mallan SA, Murukan PA, Zarina R.

Author information

Abstract

The study compared the marginal accuracy of premade and cast abutments. Premade titanium, stainless steel, and gold abutments formed the control groups. Plastic abutments were cast in nickel-chromium, cobalt-chromium and grade IV titanium. The abutment/implant interface was analyzed. Analysis of variance and Duncan's multiple range test revealed no significant difference in mean marginal microgap between premade gold and titanium abutments and between premade stainless steel and cast titanium abutments. Statistically significant differences ($P < .001$) were found among all other groups.

KEYWORDS: cast abutments; internal hex implant; microgap; premade abutments; screw loosening

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Frequency of Patients Presenting with Recurrent Aphthous Stomatitis: A Pilot Study

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Abstract: *Recurrent Aphthous Stomatitis (RAS) is considered as the most common ulcerative condition of the oral mucosa. A study was conducted to evaluate the prevalence of RAS in a rural population from South Kerala, India. A total of 10518 patients attending PMS College of Dental Science and Research over a period of one year were examined for RAS according to age, gender, and site of lesion. RAS was identified in 0.48% of patients with 1.3:1 female to male ratio and lower labial mucosa showing maximum incidence among patients attending outpatient department of dental college located in a rural area of South Kerala. RAS is a condition that commonly affects young adults. Even though not life threatening it can significantly affect the health related quality of life of an individual. In our study population the prevalence of RAS was 0.48% with female predilection. Lower labial mucosa was found to be most affected site followed by tongue.*

Key words: *Recurrent Aphthous Stomatitis, Prevalence, Pilot study, South Kerala*

I. Introduction

RAS is considered as the most common ulcerative condition of the oral mucosa [1, 2]. Aphthous ulcers are classified on the basis of ulcer size in to major, minor, and herpetiform. Minor aphthous ulcers are small (less than one cm in diameter), well defined, shallow, and heal within 2 weeks without scars (Fig. 1). Major ulcers are bigger, deeper, and take up to six weeks to heal leaving a scar behind (Fig. 2). Herpetiform ulceration is also characterized by small (3-6mm), shallow ulcers which takes weeks to heal, but with many numerous ulcers at once [3]. Occurrences begin at about 5 years of age and continues throughout life with a peak onset between 10 and 19 years [4]. The etiology of RAS is not understood. RAS may be precipitated by, or with local trauma, stress, food hypersensitivity, hormonal changes, microorganisms, vitamin and trace element deficiencies. Systemic conditions including genetic predisposition, immune deregulation, and family history might play a role in recurrent aphthous ulceration in some patients [3].Prevalence of aphthous ulcers were reported to vary from 5-66% among different nations [5, 6]. The prevalence of RAS was 28.2% in Iraq [7]. Even though not life threatening it can significantly affect the health related quality of life of an individual.In this article, a dental college based pilot study was carried out using already existing data collected during a period of one year. We attempt to report the frequency of occurrence of RAS in the patients of the population visiting PMS college of dental science and research, Trivandrum, Kerala.

II. Materials & Methods

Ethical committee clearance for this study obtained from institutional ethical committee. A total of 10518 patients from Vattappara, a rural area near Trivandrum who attended the outpatient department of PMS college of dental science and research over a period of one year from March 2012 to February 2013 were examined for clinical evidence of RAS. The data on age, gender, and site of lesion were recorded. RAS was diagnosed depending on clinical history and examination.

III. Results

Out of the 10518 patients examined, RAS was identified in 51 patients. Out of 51 patients with RAS, 22 (43%) were males and 29 (56%) were females (Fig. 3). The female to male ratio was 1.3: 1. Overall

Original Article

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Dentistry Section

Histological and Histometrical Evaluation of two Synthetic Hydroxyapatite Based Biomaterials in the Experimental Periodontal Defects in Dogs

JOHNSON PRAKASH D'LIMA[1], JOSE PAUL[2], PLATO PALATHINGAL[3], BRR VARMA[4], MAHALINGA BHAT[5], MIRA MOHANTY[6]

ABSTRACT

Aim: The present study was to evaluate histologically and histometrically the efficacy of Chitra granules in the regeneration of alveolar bone and to compare it with that of OsteoGenR (HA Resorb)™ in iatrogenically created alveolar bone defects in mongrel dogs.

Materials and Methods: Four dogs (16 sites) were used for this split-mouth study. The animals were divided randomly into two groups of two animals. Same animals were used as control and test. Each dog had four implantation sites. The periodontal defects were prepared by acute defect model. Animals were sacrificed at 3 months (n=2), 6 months (n=2) and histologic and histometric evaluation was carried out.

Statistical Analysis: The data was analysed using statistical package Graph pad Software. Comparison of the hard and soft tissue parameters in the two groups was done using the Wilcoxan (Man Whitney), two tailed t-test. A p-value less than 0.05 were considered significant.

Results: Maturing bone with immature periodontal ligament fibers were observed at three months and advanced osteogenesis at six months with both the types of bone graft materials. The mean values showed that amount of new bone formed with OsteoGenR (HA Resorb)™ was slightly more than that obtained by Chitra granules in histometric evaluation.

Conclusion: Histological study showed similar healing pattern with both the types of bone graft materials with maturing bone at 3 months and advanced osteogenesis at six months in experimental intraosseous periodontal defects in dogs. However, histological evaluation for longer period is necessary to determine the time taken for complete replacement of the bone graft materials with new bone.

Keywords: Chitra granules, Intrabony alveolar bone defects, Mongrel dogs, Osteogenr (Ha Resorb) ™, Osteogenesis

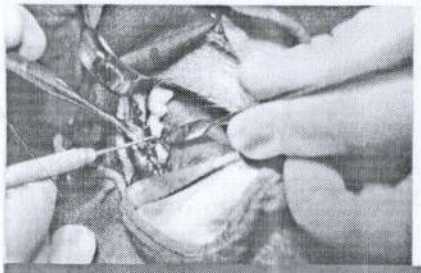
INTRODUCTION

Modern concept of osseous surgery considers the importance of conserving the alveolar bone and emphasizes more on the significance of reconstructive osseous surgery. In 1970's Schallhorn [1] stated that, when attempting new attachment by flap procedure, bone graft should be inserted into infrabony defects in order to attain bone regeneration.

The quest for an ideal graft material led to the development of alloplastic graft materials which act as a scaffold over which new bone forms. The current scientific interest in alloplastic replacement is focused primarily on hydroxyapatite, because of its close chemical and structural resemblance to the bone mineral.

OsteoGenR (HA Resorb)™ Impladent Ltd., Holliswood USA is a synthetic, highly micro-porous, non-sintered, osteoconductive, bio-active bone grafting material with a predictable, controlled resorption rate and active as a mineral reservoir as it resorbs [2,3]. Morphologically, the granules are closely formed clusters of relatively hexagonal shaped crystals of 300-400 microns, bound to a single nucleus forming a 360° lattice mechanism for the host bone. The highly hydrophilic response of OsteoGenR (HA Resorb)™ is due to the spherical shaped crystal clusters which when packed provide a mechanism for high microporosity.

As a part of the development of bioceramics for hard tissue applications, the Biomedical technology wing of Sri Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum, has developed hydroxyapatite in powder and granule forms. The hydroxyapatite powder (Chitra powder) is synthetic and non-porous having a particle size in the range of 100 to 300 microns. The Chitra granules is porous hydroxyapatite ceramic granule material derived from Chitra powder have a particle size of 0.5 to 1 mm with a pore size of 100-200 microns. Chitra granule resulted a better regeneration of alveolar bone and periodontal fibers as compared to Chitra powder and OsteoGenR (HA Resorb)™ in experimental osseous defects on Newzealand dwarf rabbits [4].



[Table/Fig-1]: Williams periodontal probe showing the depth of osseous defect., **[Table/Fig-2]:** OsteoGenR (HA Resorb) TM at 3 months: Photomicrograph showing the surgical defect on the mesial aspect of a premolar with A. Implant spaces B. New bone. In decalcified section (Magnification 15 X) **[Table/Fig-3]:** OsteoGenR (HA Resorb) TM at 3 months: Photomicrograph showing A. Implant spaces B. fibrous connective tissue C. New bone D. Osteocytes in decalcified sections (Magnification 180X) **[Table/Fig-4]:** Chitra Granules at 3 months: Photomicrograph showing A. Implant spaces B. Fibrous connective tissue C. New bone D. Osteocytes in decalcified sections (Magnification 180 X)