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JOURNAL OF INDIAN DENTAL ASSOCIATION - KOCHI

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Dear Friends

Greetings from the editorial desk...

Learning is a continuous process. For the successful practice of dentistry, learning and sharing of one's learning is important. JIDAK aims at these two objectives. This issue has case reports, review articles,original research work and more . I hope this cocktail will enrich your learning experience.

I would like to take this opportunity to thank the contributors, reviewers, printing and publishing team , along with our editor in charge Dr Bindu Rachel Thomas.

Wishing you all a happy and enriching reading.

Dr Joy Kurian
Chief Editor- JIDAK
IDA Kochi

CONTENTS

ROLE OF DENTAL PROFESSIONALS IN MASS CASUALTY EVENTS
Navami Ashok, Geon Pauly, Pooja Latti 06-09

ROLE OF GINGIVAL CREVICULAR FLUID AS A POTENT BIOMARKER: AN OVERVIEW
Tharun Varghese Jacob 10-15

UNINTENDED CONSEQUENCES: IATROGENICALLY INDUCED PYOGENIC GRANULOMA - A CASE REPORT
Ashly Mathews, Lekshmi A.J., Jayan Jacob Mathew Majo Ambooken 16-20

PREVALENCE OF DISCOLOURATION OF TEETH AMONG STUDENT POPULATION
Vinitha Mariam Ittycheria, Sunu Alice Cherian Sharlene Sara Babu, Tibin K Baby, Sunil S 21-24

AESTHETIC RESTORATIONS IN PEDIATRIC DENTISTRY - A SHORT REVIEW
Anjana R, Miliya T Sebastian, Riswana A M, Swati R, Reshma A Joseph, Nidhi Mary Thampi 25-30

PREVALENCE OF FISSURED TONGUE IN ORAL CAVITY AMONG STUDENT POPULATION IN SOUTH KERALA
Aswathi, Sunu Alice Cherian, Sharlene Sara Babu Tibin K Baby,Sunil S. 31-34

REVIEW ARTICLE

ROLE OF DENTAL PROFESSIONALS IN MASS CASUALTY EVENTS

ABSTRACT

Disasters are as old as human history, but the dramatic increase and the damage caused by them in the recent past have become a cause of national and international concern; almost all of them resulting in high incidence of morbidity and mortality. Mass casualty situations arise in the most unpredictable manner with injuries of varying degrees of severity during the disasters. In such disaster events, due its magnitude, the roles of traditional first responders shift. The hospitals and clinics become overwhelmed with the victims and dental professionals and the dental establishments can serve as medical sites for providing primary treatment services and thus can contribute to the response to a major disaster in terms of personnel and facilities. Dental healthcare professionals can help in triaging and tagging the patients, providing medications and also can assist in surveillance. Hence, knowledge and skills of a dental graduate may be utilized by the public healthcare system in times of disasters.

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Authors:

Navami Ashok[1]
Geon Pauly[2]
Pooja Latti[3]

[1]Public Health Dentistry
Assistant Professor
Department of Public Health Dentistry
Annoor Dental College & Hospital, Muvattupuzha
Mail Id: navami.ashok05@gmail.com

[2]Oral Medicine and Radiology
Proprietor
SNAAP Oral Diagnosis and Radiology Centres
Thrissur, Kerala
Mail Id: geonpauly@gmail.com

[3]Public Health Dentistry
Professor and Head
Department of Public Health Dentistry
Annoor Dental College & Hospital, Muvattupuzha
Mail Id: drpooja.ml@gmail.com

Corresponding Author
Dr. Navami Ashok
MDS, Public Health Dentistry
Assistant Professor
Department of Public Health Dentistry
Annoor Dental College & Hospital, Muvattupuzha
Mail Id: navami.ashok05@gmail.com
Contact Number: +91 9072915001

INTRODUCTION

Disasters are as old as human history, but the dramatic increase and the damage caused by them in the recent past have become a cause of national and international concern; almost all of them resulting in high incidence of morbidity and mortality.[1] Mass casualty situations arise in the most unpredictable manner - multivehicle motor accidents, industrial accidents, natural disaster and terrorist attack being examples where large numbers of casualties may arise with injuries of varying degrees of severity.[2] Some of the major disasters in India include:

- 1984 Bhopal Gas Tragedy
- 2001 Gujarat earthquake
- 2004 Indian Ocean tsunami
- 2008 Mumbai terrorist attacks
- 2013 Uttrakhand floods
- 2014 Jammu Kashmir floods
- 2016 Uttarakhand Forest fires.
- 2018 Kerala Floods
- 2019-22 Corona virus pandemic[3]

Even as substantial scientific and material progress is made, the loss of lives and property has not decreased. In case of disaster events, due its magnitude, the roles of traditional first responders shift. The hospitals and clinics become overwhelmed with the victims.[4] Dentistry has much to contribute to the response to a major disaster in terms of personnel and facilities when the traditional medical care system in an area is overwhelmed.[2]

Why Dentists?

Dentists comprise an important aspect of health team, but their role or utility has not been emphasized. Dentists are well prepared to play an important role in response to catastrophic events as they are:

- Experts in barrier techniques and infection control
- Trained and skilled in administering drugs by injection
- Skilled in placing sutures and controlling bleeding
- Able to participate in interdisciplinary professional groups; and
- Adept at managing uncomfortable patients[4]

Dentists can be utilized successfully for the emergency medical response system in building the required partnerships, to identify and garner resources, and in facilitating training, development of suitable policy, surveillance and evaluation.[5] Dental professionals, with their knowledge of basic human science and sterile surgical techniques, were an invaluable resource in the COVID-19 pandemic response.[6] Thus, dentists can prove to be helpful during a major public health disaster in the following ways:

Dental Offices as Medical Sites

Dental offices are well equipped and supplies to serve as decentralized auxiliary hospitals in case the need arises. Availability of air and suction lines, X-ray equipment and sterilizing techniques in dental offices can be used as self-contained alternate medical sites. No other health professional has such well-equipped clinic to provide as alternative medical site for use during an event of catastrophic disaster.[3]

Triage and Tagging Services

Triage consists of rapid classification of the injured on the basis of the severity of their injuries and the likelihood of their survival[7]. Dentists are able to assist in this important function with relatively little additional training. This assistance allows physicians to provide definitive care for patients most urgently in need rather than screening casualties.[4] All victims should be identified with tags stating their name, age, place of origin, triage category, diagnosis and initial treatment.[8]

Primary Treatment Services

First-aid and basic life support services like emergency treatment of open wounds, relief of pain, control of haemorrhage, bandaging, splinting, infection control, treatment of shock and the mobilization of casualties towards the nearest medical facilities can be undertaken by dentists.[1] Dental professionals participated in the medical evacuation and transfer of suspected and confirmed cases of COVID-19 with negative pressure ambulances, paying special attention to the airway management and vital signs of patients during transit.[9]

Supporting other Health Professionals

Dentists and their dental auxiliaries can augment the existing medical professionals, in responding to a declared medical emergency. When the local medical resources are unable to cope adequately with huge number of victims, dentist can be recruited to provide certain services that will allow physicians to do things only they can do. Dentists can enhance the surge capacity of the local medical system until additional physicians arrive or demand for immediate care decreases.[2] Licensed dentists were eligible to administer diagnostic tests such as nasopharyngeal and oropharyngeal swabs during the pandemic situation.[6]

Surveillance

Dentists can be part of an effective surveillance network because they are scattered throughout a community much as the general population. [2] They can diagnose common oral diseases and notify it to the concerned authorities to take appropriate actions. In areas where there is an outbreak of epidemics or infectious diseases, the dentists can collect salivary samples and blood samples and thus aid in the control of the disease.[6] Dentists also participated in the collection of sputum and nasopharyngeal swab specimens for viral nucleic acid detection, which provided valuable diagnostic information of COVID 19 virus. [9]

Medication and Immunization

During the time of disaster, the dentists along with the support of pharmacists, nurses and other healthcare professionals not only dispense the medications but also monitor and report the adverse drug reactions.[10] Dentists can participate in mass immunization programs with a minimum of additional training and may be the critical factor in the success of urgent programs.[2] Dental clinics can also be considered as immunization sites to minimize the concentration of potentially infected patients.[3]

Identification of Human Remains

Forensic dentists usually have a leading role in the forensic team when dental structures are the only source of information for the identification of human remains. The resistance of teeth and their supporting tissues, even to fire and decomposition, makes them extremely useful for identification purposes. Post-mortem dental profile will provide information on age of the deceased, ancestral background, sex, and even socioeconomic status.[11]

Emergency Psychotherapy

People in a disaster area are subjected to unusual psychological stresses. Dentists are highly competent and experienced in the management of persons who are apprehensive and emotionally upset, as they encounter them frequently to some degree in their normal practice of dentistry. Most dentists are very adept at allaying apprehension, and in the face of a severe shortage of psychologists and psychiatrists in a disaster situation, they could be used to great advantage.[2] Dental professionals participated in sharing knowledge about COVID-19, comforting people over the phone or online, relieving their stress and anxiety, and enhancing their confidence in successful resolution of the COVID-19 pandemic.[9]

CONCLUSION:

As per the prescribed syllabus for Bachelor of Dental Surgery course by Dental Council of India as published in the gazette of India, all dental colleges impart subjective knowledge of anatomy (including general and dental), physiology, pathology (including systemic and oral), forensic odontology, microbiology, pharmacology, surgery and medicine (oral as well as general), public health, biostatistics and research methodology, practice management and ethics, thus making the dentist a potential first responder.[5] Knowledge and skills of an average dental graduate may be utilized by the public healthcare system in times of crisis.[3] COVID 19 pandemic was a dawn of realization of the inadequacy of the national emergency response mechanism and importance of dentist in handling crisis situations. Thus, training in emergency response to a disaster event or a pandemic in the dental undergraduate curriculum and continuing educational programs for practitioners can prepare dentists to face any unforeseen circumstances in future.

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REVIEW ARTICLE

ROLE OF GINGIVAL CREVICULAR FLUID AS A POTENT BIOMARKER: AN OVERVIEW

ABSTRACT

The gingival tissue is constantly subjected to mechanical and bacterial aggressions. At present, studies reveal that gingival crevicular fluid (GCF) play a significant role in the defense mechanism of gingiva. From the rudimentary beginnings, many investigators have tried to find out the unique characteristics of GCF and to some extent, successfully revealed its composition. This review is directed towards the role of GCF in the diagnosis of various local and systemic changes influencing the oral cavity

Key words: GCF

Authors:

Tharun Varghese Jacob

Professor,
Dept.of Oral and Maxillofacial Pathology
Travancore Dental College, Kollam

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INTRODUCTION

Gingival crevicular fluid (GCF) or sulcular fluid is an exudate secreted by the gums that can be found in the crevices located at the point where the gum line meets the teeth. In normal gingiva, the concentration of this fluid is usually low but can spike when an inflammatory process occurs in the mouth. The presence of GCF has been known since 19th century. Some investigators considered GCF as a transudate but recent studies demonstrated that it is an inflammatory exudate.[1]

DISCUSSION

Methods of collecting GCF

Collection of GCF is the most difficult task due to scarcity of material that can be obtained from the sulcus. Many collection methods have been tried. Among them the most efficient methods are the placement of absorbing paper strips; Twisted threads around and into the sulcus; Micropipettes and Intra crevicular washings.[1]

Amount of GCF

The amount of GCF collected can be evaluated in various ways. The popular methods are staining with Ninhydrin and by an electronic method (an electronic transducer called Periotron). The measurements performed by Challacombe in human volunteers with a mean gingival index of less than 1, showed that the mean GCF volume in proximal spaces from molar teeth ranged from 0.43-1.56µl.[1]

Composition of GCF

GCF consist of cellular elements like bacteria, epithelial cells, leukocytes; electrolytes like sodium, potassium and calcium; organic compounds including carbohydrates and proteins; enzymes like acid and alkaline phosphatase, cytokines, endopeptidases, β-glucoronidase, hyaluronidase, lysozymes, immunoglobulins, PG-E2, etc...[1]

1. GCF IN PERIODONTITIS

GCF is regarded as the most appropriate fluid to investigate pathobiological reaction within the periodontal tissues rather than saliva or serum, which poorly reflects certain periodontal tissue processes and which have a markedly different antioxidant composition to GCF[2].

Levels of glutathione (GSH) in periodontitis patients

Glutathione levels in GCF in mild periodontitis patient seem to be significantly reduced. The high levels of GSH in GCF had led to the proposal that GSH reflects innate defense strategy at exposed and vulnerable epithelial surface[2].

The assessment of glutathione levels in GCF in periodontal patients was confirmed by HPLC analysis. As per studies and investigations, it is suggested that GCF contains millimolar concentration of glutathione and their concentration is lowered in periodontitis[2].

Levels of Matrix metalloproteinases- MMP-8, MMP-9, TIMP-2 and MPO in GCF of periodontitis patients

Matrix metalloproteinases (MMP) are enzymes that are responsible for periodontal remodeling. High levels of MMP-8, MMP-9, TIMP-2 and MPO were found in GCF of patients compared with controls and their markers are reduced 3 months after periodontal therapy.

Levels of MMP-8, MPO and TIMP-2 appeared to follow same pattern with increased levels found in chronic periodontitis patients versus control and decreased 3 months after therapy. There was no difference in TIMP-1 levels between groups at baseline or with in control or chronic periodontitis patient groups when samples collected before and after therapy where compared. Total MMP-9 was raised both in control and chronic periodontitis patients and decreased in both groups after therapy. Therefore the total MMP-9 results suggest that MMP is increased in both gingivitis and periodontitis[3].

Effect of scaling and root planning on IL-1β, IL-8 and MMP-8 levels in GCF

In a study, the influence of scaling and root planning was determined on amounts of IL-1β, IL-8 and MMP-8 in GCF from patients with chronic patients in relation to clinical parameters. The observation indicated that

short term non-surgical therapy (NST) resulted in a significant improvement in Periodontal Index and in a marked decrease of IL-1β, IL-8, MMP-8 GCF levels. Nevertheless no significant correlation was found between clinical parameters and levels of humoral factors after therapy.

The observation indicated that 4 weeks following NST there was significant improvement in clinical parameters. However the GCF levels of markers of inflammation were still elevated. It suggests that short term NST results in an improvement in clinical signs of inflammation but that inflammatory and destruction process within the periodontal tissues are not entirely eliminated.[4]

Levels of soluble triggering receptor expressed on myeloid cells (sTREM)-1 in severe periodontitis in GCF

In the study, an ELISA kit was used to quantify sTREM-1 levels in collected GCF. As per the investigation, the mean sTREM-1 level in collected fluid was higher in pathological sites than healthy sites from either periodontitis or control patients. It could be a marker of periodontal tissue destruction.[5]

2. GCF in Orthodontic Tooth Movement

According to current knowledge it is revealed that changes are supposed to occur in GCF in response to orthodontic forces and also GCF plays a significant role in remodeling and adaptive changes in paradental tissues during active tooth movement[6].

Changes occurring in GCF during orthodontic tooth movement

Longitudinal studies done by Pender found that volume of GCF is increased during active tooth movement and showed a marked decrease in retention phase when compared to pre-treatment phase. Teeth that showed the greatest amount of tooth movement determined by Reflex Metrography by the study, showed increased GCF flow as well as raised concentration of Choindrointin sulfatase enzyme until 22 weeks.

In animal models of localized disuse osteopenia, Prostaglandins (PG) are found to be increased at the site of bone loss and PG Inhibitors at least partially protect against the exaggerated resorption that occurs. This is also seen in models of orthodontic tooth movement, periodontitis and osteomyelitis. Goodson injected PGE containing solution under the skin of calvaria of adult rats. The PG solution induced a rapid resorption of bone within 7 days indicating that PGs had the ability to induce bone resorption in vivo.

The levels of pro-inflammatory cytokines such as IL-1β, IL-6 and TNF-α reached a significant level at 24 hours after application of orthodontic forces. IL-8 reached a significant increase after 1 month.

Substance P is another sensory neuropeptide released from peripheral endings of sensory neuron during inflammation, modifies the secretion of pro-inflammatory cytokines.

Cathepsin-B, Cathepsin-C and Cathepsin-L were increased in GCF on application of orthodontic forces and these may be involved in extracellular matrix degradation in response to mechanical stress. The expression of Cathepsin-K, a novel collagenolytic enzyme specifically expressed in osteoclast, was found to increase 12 hours after force application.

It was found that MMP-2 levels are significantly increased in GCF 4-8 hours after force application while MMP-1 level failed to show any significant increase.

Alkaline phosphatase (ALP) activity in GCF is known to decrease during first 5 months of active tooth movement and started to stabilize later. Aspartate transaminase (AST) levels in GCF were found to be highest in orthodontic force application and there was a gradual decrease in next 3 weeks. Thus it has a potential to serve as a biomarker to monitor orthodontic tooth movement.

Leptin, a polypeptide hormone plays a significant role in bone formation by virtue of its direct effect on osteoclast proliferation and differentiation and in prolonging the lifespan of osteoclast by inhibiting apoptosis. It was recently found that concentration of leptin in GCF is decreased by orthodontic tooth movement leading to suggestion that leptin may have been one of the mediators responsible for the orthodontic tooth movement.

During orthodontic tooth movement, there is local production of chemokines and an influence of leukocytes into periodontium.

CCL5 plays an important role in recruitment and activation of osteoclast. Recent research done by Andrade demonstrated that CCR5 receptor is known to down regulate osteoclast function in orthodontic tooth movement[6].

3. GCF in Diabetes Mellitus:

Gingival crevicular blood glucose level in periodontitis patient can be used as screening test for diabetes mellitus in dental office. The gingival crevicular blood collected during diagnosis of periodontal examination may be an excellent source of blood for glucometric analysis. For glucose measurement in a study, One Touch Horizon™ blood glucometer was used. IL-1β level in Type I diabetes patients were increased compared with healthy individuals. Differences were observed in MMP-9 levels between patients with or without Type I DM in 7-14 days[7].

Biomarker analysis by ELISA:

Biomarker selection was based on human cytokine micro assay, colorimetric assay results and previously studied inflammatory process. The pilot micro assay analysis of 14 human cytokines includes patient samples from both groups over the complete time course of study. Biomarkers having protein levels greater than zero were then selected for further analysis with entire patient population.

IL-1β, IL-8, MMP-8 and MMP-9 levels were determined by ELISA assay according to manufactures instructions. GCF samples were assayed at dilutions (1:5) for IL-8 and (1:10) for IL-1β, MMP-8 and MMP-9 and evaluated in duplicate. The commercial kits detected total MMP-8 and MMP-9 and active Il-1β. Biomarker quantification was performed using a Multiskan Ascent Plate reader. Results for IL-1βand IL-8 levels are reported as pg/ml and as ng/ml for MMP-8 and MMP-9.

It can be concluded as the mean GCF biomarker levels for IL-1β and MMP-8 were most significantly increased in TIDM subjects.[7]

4. GCF IN PREGNANCY

During pregnancy, the rate of fluid flow increases in gingival sulcus. The volume of GCF also increases due to increase vascular permeability and increase in sex hormones1

5. Influence of Drugs in GCF

Subantimicrobial-dose doxycycline (SDD) modulates gingival crevicular fluid biomarkers of periodontitis in postmenopausal (PM) osteopenic women[8].

Collagenase activity was significantly reduced by SDD treatment relative to placebo. Matrix metalloproteinase (MMP)-8 accounted for approximately 80% of total collagenase in GCF, with much less MMP-1 and 13, and SDD reduced the odds of elevated MMP-8 by 60% compared to placebo.

These observations support the therapeutic potential of long-term SDD therapy to reduce periodontal collagen breakdown and alveolar bone resorption in PM women; effects on serum biomarkers of systemic bone loss in these subjects are being analyzed.[8]

Effect of a chlorhexidine/ thymol-containing varnish on prostaglandin E2 levels in gingival crevicular fluid[9].

The mean PGE2 levels were significantly reduced after the test varnish treatment compared with baseline and differed significantly from placebo. The findings suggest that treatments with the antibacterial varnish result in reduced gingival inflammation and may thus be beneficial for patients with fixed orthodontic appliances.[9]

Evaluation of transforming growth factor-β1 (TGF-β1) level in crevicular fluid of cyclosporin A-treated patients[10].

The TGF-beta 1 levels in a total of 96 GCF samples from the 34 participants were analyzed by enzyme-linked SFV immunosorbent assay. The results were expressed in terms of total amount (pg/2 sites) and concentration (ng/ml). TGF-beta 1 total amounts in CsA GO + (Cyclosporin- A Gingival Overgrowth Positive) and CsA GO - (Cyclosporin A Gingival Overgrowth Negative) sites were similar and significantly higher than that of healthy sites.[10]

Comparison of some effects of acetylsalicylic acid and rofecoxib during orthodontic tooth movement[11]

Depending on the variations of fibroblast activation during orthodontic tooth movement, PGE2 levels increased at 24 and 48 hours and decreased at 168 hours. When the drugs were compared, it was found that the inhibition effect of aspirin on PGE2 was more than that of rofecoxib. The results suggest that rofecoxib can be used during orthodontic treatment, but further study is recommended.[11]

Influence of Metronidazole in the treatment of periodontitis:

A single administration of the 15% metronidazole gel released the drug in the GCF of dogs in levels several-fold higher than the minimum inhibitory concentration for some periodontal pathogens grown in sub gingival biofilms for up to one hour, but metronidazole could be detected in the GCF at least 48 hours after the gel application[12].

CONCLUSION

The biomarkers present in GCF are of immense significance in the determination of various pathological activities. From physical measurements by periodontal probing to sophisticated genetic susceptibility analysis and molecular arrays for the detection of biomarkers on the different stages of the disease, substantial improvements have been made in the understanding of the mediators implicated on the initiation, pathogenesis, and progression of periodontitis. Through the biomarker discovery process, new therapeutics have been designed linking therapeutic and diagnostic approaches together, especially in the area of host modulatory drugs for periodontal disease treatment.

Recent diagnostic technologies, such as microarrays and microfluidics, are now currently available for risk assessment and comprehensive screening of biomarkers. The future is bright for the use of rapid, easy-to-use diagnostics that will provide an enhanced patient assessment that can guide and transform customized therapies for dental patients, leading to more individualized, targeted treatments for oral health.

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CASE REPORT

UNINTENDED CONSEQUENCES: IATROGENICALLY INDUCED PYOGENIC GRANULOMA – A CASE REPORT

ABSTRACT

Iatrogenic occurrences in the realm of medical and dental procedures are not uncommon occurrence nowadays, often presenting clinicians with unexpected challenges. Pyogenic granuloma, a benign reactive lesion of the skin and mucous membranes, is a relatively frequent encounter in clinical practice. However, its iatrogenic induction, while infrequent, underscores the importance of careful and precise clinical interventions. In this case report, we present a noteworthy instance of an iatrogenically induced pyogenic granuloma, shedding light on the etiology, clinical presentation, diagnostic approach, and management of this uncommon clinical entity. Through this case, we aim to enhance the understanding of pyogenic granulomas among healthcare professionals and underscore the importance of vigilant clinical practice to prevent such iatrogenic complications.

Keywords: Pyogenic granuloma, overhanging margins, composite restoration, internal bevel gingivectomy.

Author:

Ashly Mathews[1]*
Lekshmi A.J.[2]
Jayan Jacob Mathew[3]
Majo Ambooken[4]

[1]Post-graduate Student
Department of Periodontics
Mar Baselios Dental College
Kothamangalam 686691
Mob: 9778179032
Email: mathews.ashly1997@gmail.com

[2]Assistant Professor
Department of Periodontics
Mar Baselios Dental College
Kothamangalam 686691

[3]Professor
Department of Periodontics
Mar Baselios Dental College
Kothamangalam 686691

[4]Professor and Head
Department of Periodontics
Mar Baselios Dental College
Kothamangalam 686691

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INTRODUCTION

"Primum non nocere" -Above all, do no harm - often attributed to Father of Modern Medicine, Hippocrates is a proposition that every doctor pledges on in their oath that they take on the day that designates them as healers for a life time. Unfortunately, stories of medical remedies causing more harm than good have been recorded from time immemorial. An iatrogenic disorder occurs when the deleterious effects of the therapeutic or diagnostic regimen causes pathology independent of the condition for which the regimen is advised.[1] Dental iatrogenic treatment can produce injury either on the tooth or the periodontium or both. During dental and periodontal treatments, various instruments, chemical substances (i.e., drugs, restorations, endodontic materials and retraction agents), and physical appliances (partial dentures and orthodontic appliances) come in contact with the oral cavity, and inappropriate use or application of these may result in traumatic gingival lesions.[2] One such occurrence is an iatrogenically induced pyogenic granuloma which is a benign reactive lesion, the most common cause of which is a is local irritating factor.

A healthy periodontium forms the foundation for proper esthetics, function, and comfort to the dentition. Dental restorations or appliances are frequently associated with the development of gingival inflammation especially when they are located subgingivally or impinging the gingival tissues. In this case report, we present a noteworthy report of an iatrogenically induced pyogenic granuloma caused by the presence of an overhanging rough margins of a composite restoration.

CASE REPORT

A 47-year-old systemically healthy male patient reported to the department of periodontics, Mar Baselios Dental College, Kothamangalam with a chief complaint of painless gingival swelling and discomfort in the outer side of upper anterior teeth since one and half week. The swelling was gradual in progression, associated with pain and bleeding on trauma while eating or brushing and applying digital pressure. He gave history of a similar lesion one and a half year back at the same site for which the he had undergone surgical excision. He also gave a history of getting a composite restoration done for the cervical abrasion in the adjacent teeth two years back.

On clinical examination, a localised pedunculated gingival swelling having pale pink colour with pinpoint erythematous spots measuring 0.7 cm X 1.5 cm was present with respect to labial aspect of right maxillary lateral incisor and canine which showed bleeding upon probing the area (figure 1). The growth was soft to firm on palpation, non-tender with absence of discharge. Physical examination revealed no cervical lymphadenopathy or any other abnormality. On hard tissue examination, there was no trauma from occlusion or mobility. There was moderate supragingival and sub gingival calculus present in relation to the associated teeth. The periapical radiograph showed no detectable bony changes (figure 2). Based on the history,

Figure 1: Pre-operative view

Figure 2: Pre-operative radiograph

clinical and radiographic features a provisional diagnosis of pyogenic granuloma was made and the lesion was planned for an excisional biopsy under local anaesthesia.

After non-surgical periodontal therapy, excision of the lesion was planned. Under local anaesthesia, with the help of a No 15 BP blade, the lesion was excised at the peduncle (figures 3, 4). Upon excision, an overhanging cervical composite restoration was detected on 13 (figure 5). The overhang was removed and the remaining portion of the lesion was excised by an internal bevel gingivectomy (figure 6). Sutures were placed and a non-eugenol periodontal dressing was (Coe Pack) was given. Antibiotics and analgesics were prescribed for one week. The excised tissue was sent for histopathological examination.

Histopathological examination showed parakeratinised stratified squamous epithelium with long slender rete-ridges and stroma-type connective tissue (figure 7). The connective tissue showed dilated numerous blood vessels, and chronic inflammatory cells like lymphocytes and plasma cells. Extravasated RBCs were also seen. The histopathological examination confirmed the clinical diagnosis of pyogenic granuloma. The patient was recalled after a week and the

Figure 3: Excision of the lesion

Figure 4: Excised tissue

Figure 5:
Overhanging Class V composite restoration

Figure 6: Overhang removed and internal bevel gingivectomy done

Figure 7: Histopathological view

Figure: Post-operative view after two weeks

excised area was evaluated, which showed satisfactory healing (figure 8). The patient is presently under supportive periodontal care.

DISCUSSION

Healthy and stable periodontium is a prime prerequisite for all prosthetic and restorative therapies. The relation between periodontics and restorative dentistry is present at various levels, including location of restorative margins, crown contours, and response of the gingival tissues to restorative preparations.[3] This was recognized by Black as early as in 1912.[4]

Pyogenic granuloma, a non-specific conditioned enlargement is a tumour like gingival enlargement that is considered as an exaggerated conditioned response to minor trauma. The lesion varies from a discrete spherical, tumour like mass with a pedunculated attachment to a flattened, keloid like enlargement with a broad base. It is bright red or purple and either friable to firm, depending on its duration.[5] It is known by a variety of names such as Crocker and Hartzell's disease, granuloma pyogenicum, granuloma pediculatum benignum, benign vascular tumour, and during pregnancy as granuloma gravidarum. Various causes like chronic low-grade trauma, local irritants like calculus, foreign material in the gingiva, physical trauma, hormonal factors, bacteria, viruses and certain drugs have been implicated as causative factors in the development of this lesion.[6] The treatment of pyogenic granuloma consists of surgical excision of the lesion with the elimination of irritating local factors. This case report brings into notice an iatrogenically induced pyogenic granuloma, the most common cause of which is a is local irritating factor, which in this case was a class V composite restoration.

Dental restorations or appliances are frequently associated with the development of gingival inflammation, especially when they are located subgingivally or impinging on gingiva. This is seen in subgingivally placed onlays, crowns, fillings, and orthodontic bands. Restorations may impinge on the biologic width by being placed deep in the sulcus or within the junctional epithelium.[4] This biologic width violation may promote inflammation and loss of clinical attachment with apical migration of the junctional epithelium and reestablishment of the attachment apparatus at a more apical level.[5] At times, a hyperplastic response of the gingiva is noted resulting in conditions like pyogenic granuloma.

Features of dental restorations and removable partial dentures that are significant to the maintenance of periodontal health include,

(1) The placement of the gingival margin for the restoration,

(2) The space between the margin of the restoration and the unprepared tooth,

(3) The contour of restorations,

(4) The occlusion,

(5) Materials used in the restoration,

(6) The restorative procedure itself, and

(7) The design of the removable partial denture.[3]

Over hanging margins of dental restorations add to the severity of periodontal disease by,

1. Altering the ecologic balance of the gingival sulcus to an area that favours the growth of disease-associated organisms (predominantly gram-negative anaerobic species) at the cost of the health-associated organisms (predominantly gram-positive facultative species)
2. Preventing the patient's access to remove accumulatedplaque[3]

Even though controversial, there are conflicting reports on effects of composite

restorations on gingiva. Studies by Larato et al, Willershausen B reported more frequent inflammatory processes of the gingiva in the presence of composite resin restorations, than those with the placement of metal restorations.[7,8] Also, placement of margins of the restorations are of prime importance. Subgingival margins lead to increased plaque accumulation, more severe gingivitis, and deeper pockets.[3]

In this case, the patient presents with the history of similar enlargement excised one and half years back which occurred six months post restoration of the cervical defect in right maxillary canine with composites. The overhanging margin of the Class V composite restoration has been a contributing source of plaque retention and gingival inflammation resulting in pyogenic granuloma. Hence, for prevention of recurrence of the lesion surgical excision along with removal of the irritant factor - the overhanging margins of the class V restoration is of prime importance. So, a thorough scaling and root planing was performed before the surgical excision of the lesion and internal bevel gingivectomy along with recontouring of overhanging restoration done after excisional biopsy. Satisfactory healing was seen after two weeks of surgery without any sign of recurrence and patient discomfort.

CONCLUSION

The perilous association between iatrogenic restorations and periodontal disease has been recognized for more than 20 years.[4] When clinicians fail to hold fast to the biological principles that govern the resto-perio inter relationships, the results can be disastrous. The periodontium must remain healthy for restorations to last long term, so that the teeth are maintained. Vice versa, for maintaining a healthy and intact periodontium, restorations must be in harmony with the gingival tissues. With proper treatment planning, adhering to the principles, and the judicious use of high-quality dental materials, iatrogenic challenges such as this can be clearly avoided.

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REVIEW ARTICLE

PREVALENCE OF DISCOLOURATION OF TEETH AMONG STUDENT POPULATION

Author:

Vinitha Mariam Ittycheria[1]
Sunu Alice Cherian[2]
Sharlene Sara Babu[3]
Tibin K Baby[4]
Sunil S[5]

[1]Intern
[2]Lecturer
[3]Associate professor
[4]Reader
[5]Professor & Head

Department of Oral and Maxillofacial Pathology
Pushpagiri College of Dental Sciences
Pushpagiri Medical Society Kerala
India

ABSTRACT

Discoloration of the tooth is one of the frequent reasons why a patient seeks dental care. Tooth discoloration is aesthetically displeasing and psychologically traumatizing. We need to understand the etiology of tooth discoloration to make the correct diagnosis.

Aim:

To determine the prevalence of discoloration of teeth among students attending a dental college and pharmacy college in South Kerala.

Materials and methods:

A cross-sectional study was done among 300 students in central Kerala. The participants were examined for tooth discoloration.

Results:

The prevalence of discoloration was found to be 82.3%; intrinsic stains were found to be 45.6% and 36.3% extrinsic.

Conclusion:

This study showed extrinsic stains are more predominant than intrinsic stains.

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INTRODUCTION

Discoloration of the tooth is one of the frequent reasons why a patient seeks dental care. Tooth discoloration is aesthetically displeasing and psychologically traumatizing. A dentist needs to understand the etiology of tooth discoloration to make the correct diagnosis. The exact nature of the condition of the patient can only be explained by the dental practitioner after knowing the cause of discoloration[1,2].

There are two types of tooth discolorations: those related to intrinsic factors and extrinsic factors[3]. The intrinsic discoloration due to the chromogens that get deposited within the bulk of the tooth, which may be of local or systemic origin[4]. Extrinsic discoloration is located on the tooth structure's outer surface and is caused by topical or extrinsic agents[5]. Several metabolic diseases and systemic factors can cause discoloration of teeth in a developing dentition[6]. Amelogenesis imperfecta, dentinogenesis imperfecta, tetracycline staining, fluorosis, enamel hypoplasia, pulpal hemorrhagic products, root resorption, aging, and local factors, such as injury are also recognized. The origin of the stain can also be metallic or non-metallic[1].

Since this type of study has never been conducted in South Kerala, the aim of this study was to assess the frequency of tooth discoloration in permanent dentition among students of a healthcare institution in South Kerala.

MATERIALS AND METHODS

A Cross-sectional study was conducted among 300 students attending a dental and pharmacy college in South Kerala over a period of one month.

Inclusion criteria included tooth discoloration due to endogenous factors such as fluorosis, tetracycline, nonvital teeth, dental caries, trauma, amelogenesis imperfecta, and dentinogenesis imperfecta, and exogenous factors such as food/beverage stains, plaque/calculus, chlorhexidine stain, chromogenic bacteria, smoking stain, tobacco chewing stain, and pan chewing stain[7]. Exclusion criteria included having crowns and orthodontic appliances.

The purpose of the study was explained to the participants and written consent was obtained. The clinical examination was done by the principal investigator and checked by the second examiner.

The examination was carried out on a dental chair under good illumination, using sterile diagnostic instruments like a mouth mirror, straight probe, tweezers, and cotton rolls.

RESULTS

In this study, a total of 300 students were evaluated. The mean age was 20.76+1.7 years. Discoloration of teeth was found among 82.3% of the participants. Localized discoloration was more common (70%) (Fig 1). Among stains,

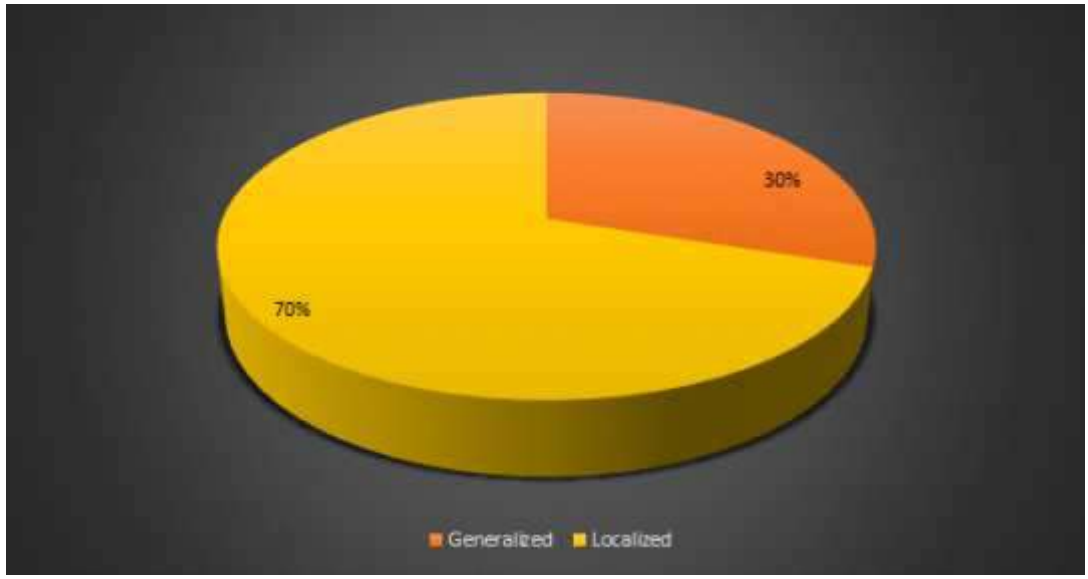

FIG 1: Distribution of stains

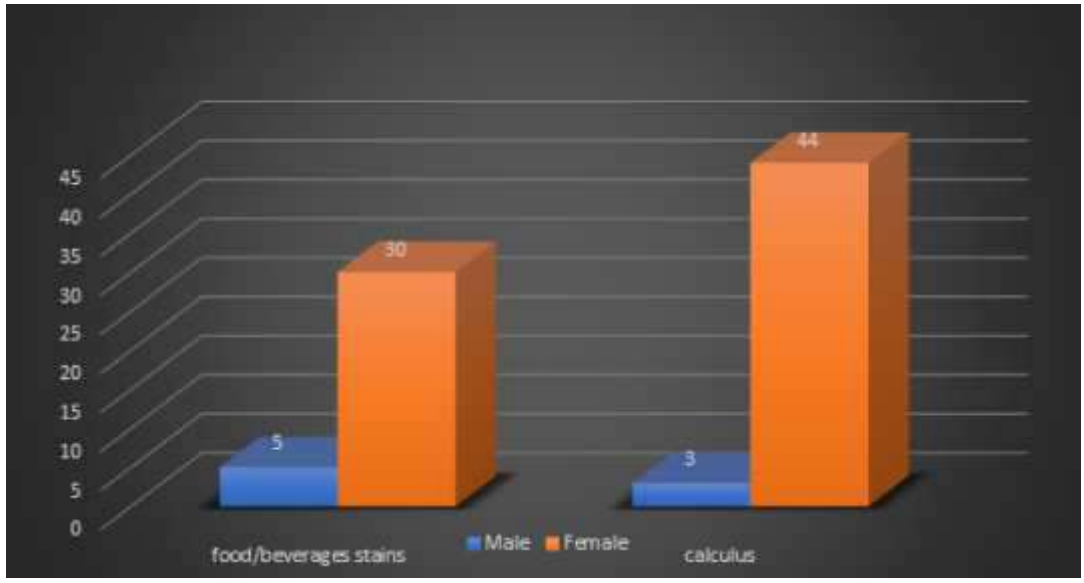

Fig 2: Distribution of extrinsic stains according to gender

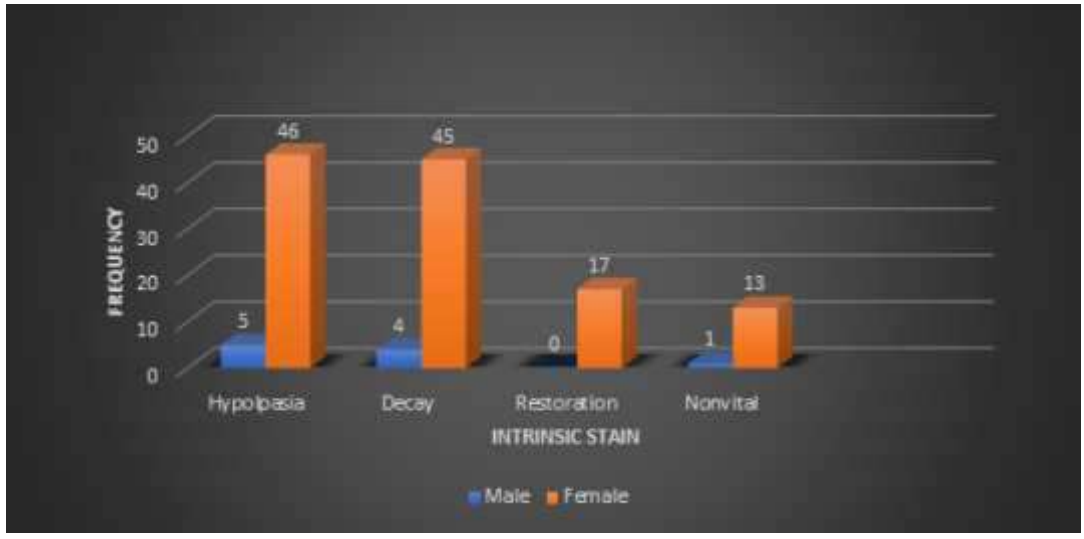

Fig 3: Distribution of Intrinsic stains according to gender

15.6% were extrinsic and 38% were intrinsic. Fig 2 and Fig 3 show distribution of extrinsic and intrinsic stains according to gender.

DISCUSSION

Among the intrinsic stains, hypoplasia, decay, stains due to filling, and non-vital tooth were evaluated in which hypoplasia predominated. Enamel hypoplasia is a quantitative defect of enamel laid down in the tooth and the defect can be a small pit or dent in the tooth or widespread, making the entire tooth small and/or misshaped[8,9]. Out of total students 17% presented with hypoplasia and 37.2% of students presented among the intrinsic stains alone. Hypoplasia was the first to predominate among intrinsic stains.

In this study, discoloration of teeth was found among 247(82.3%) of the participants. Among the various classes of population studied, dental caries was second predominating tooth discoloration (35.7%) among intrinsic stains and 17% of students presented caries totally. A study conducted among 288 dental students in Iraq found that 69.9% of them had dental caries[8].

Stains due to fillings was also recognized and 12.4% of students presented with it among intrinsic stains and 5.6% presented totally.

Trauma was also found to be a likely etiological source. 4.6% of students who had experienced dental trauma reported tooth discoloration of non-vital tooth following the incident[9].

Among extrinsic stains, food or beverage stains, plaque or calculus, chromogenic stains were evaluated in which food or beverage stains predominated. In this study, among extrinsic stains, 15.6% of students have stains on the calculus which was the most common.

Food or beverages also depicted a positive relation of discoloration and frequency and a significant association was derived between consumers of coffee and discoloration[9].

Among extrinsic stains, 11.6% of students have stains due to food and beverages. Chromogenic bacteria cause non-metallic stains on teeth due to plaque, food, and beverage build-up on the tooth surface deposits such as plaque or acquired pellicle[10]. Specific types of stains are associated with oral hygiene status, such as green and orange in patients with poor oral hygiene and black/brown stains in patients with good oral hygiene and low caries experience[11].

CONCLUSION

This study showed extrinsic stains more predominant than intrinsic stains. Discoloration of teeth was found among 82.3% of the participants.

It is important to raise awareness on the causes of tooth discoloration for prevention and early management.

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REVIEW ARTICLE

AESTHETIC RESTORATIONS IN PEDIATRIC DENTISTRY - A SHORT REVIEW

Author:

Anjana R[1]
Miliya T Sebastian[2]
Riswana A M[3]
Swati R[4]
Reshma A Joseph[5]
Nidhi Mary Thampi[6]

[1,2]Post Graduate Student
[3,4,5]Assistant Professor

Department of Pediatric & Preventive Dentistry,
Annoor Dental College & Hospital
Muvattupuzha

ABSTRACT

The author describes various esthetic crowns available for Pediatric dentistry. It's a short review on introducing the various new crowns available in the market. The article describes the merits and demerits of these crowns so that the clinician can choose the best crowns for each case.

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INTRODUCTION

"A smile of a child is packaged sunshine and rainbows" This gift of God may be hampered by premature loss of teeth which is, unfortunately, a very common occurrence in children due to the lack of knowledge regarding oral hygiene procedures and negligence toward the maintenance of dental health. While the traditional concept of Jean Piaget stated that a child's perception of self and care about their appearance only developed by the age of 8 years; there have been recent studies in the field of the child psychology that have challenged this concept, showing that, with increased media exposure, children as young as 3-5 years of age have a sense of consciousness of body image.[1-3]

Today there are many solutions available for aesthetic problems in Pediatric Dentistry. But the biggest dilemma is choosing the best treatment modality for a particular patient and situation which depends on various factors like the age of the patient, motivation of the parents, the child's behavior in the dental clinic, and the socio-economic status of the patient.

Early restorations mostly included placement of stainless steel crowns(SSCs) or bands on severely decayed teeth. They were unesthetic and their use was limited to posterior teeth. Over the last two decades, a higher esthetic standard is expected by parents for the restoration of their children's carious teeth. Esthetic full coverage restorations are available for anterior and posterior primary teeth, which preserve the functions of primary teeth until their exfoliation in healthy state.[4,5]

CLASSIFICATION

Cemented Crowns

1. Metal Crowns with Facing
2. Zirconia Crowns
3. Nu-Smile Crowns
4. Kinder Crowns
5. Cheng Crowns
6. Pedo Pearls
7. Dura Crowns
8. Figaro Crowns.

BONDED CROWNS

1. Pedo Jacket Crowns
2. Polycarbonate Crowns
3. Artglass Crowns
4. Strip Crowns
5. New Millenium Crowns.

Open-faced Stainless Steel Crowns

This is a form of the use of SSCs in the anterior section of the dental arch. The procedure includes adapting proper SSC. If needed, the crown is trimmed, crimped, and polished. After the crown is cemented and the cement sets, the labial wall of the crown is cut out and the luting cement is partially removed to create undercuts. In the following step, the space is filled with a more aesthetic material such as composite.

Indications to use open-faced SSC:

1. Crown fracture;
2. Pulp protection.

Contraindications to use open-faced SSC:

1. Allergy or vulnerability to nickel.
2. Uncooperative patient;
3. A primary tooth near its exfoliation time;
4. A radiograph showing resorption of more than half of the tooth root;
5. Tooth fracture level below gingival margin.
6. Their main advantage is better aesthetics compared to traditional SSCs, however, the procedure is time-consuming and requires a dry restoration area. The restoration may have poor color stability and the metal margins of the crown might still be visible.

Pre-veneered Stainless Steel Crowns

PVSSCs combine the mechanical properties of SSCs with the additional aesthetic factor of

composite resin or thermoplastic resin. The aesthetic part is either chemically or mechanically bonded to the crown. At first, the restoration of anterior primary teeth was introduced to their indications; later on, they were also developed to restore primary molars. The examples of PVSSCs available on the market are Nusmile Primary Crowns, Kinder Crowns, Cheng Crowns, Flex Crowns, Dura Crowns, and Whiter Biter.

Their advantages are long durability and a good aesthetic. PVSSCs allow restoration when the treatment area cannot be perfectly dry. On the other hand, they require more aggressive tooth preparation compared to SSCs. They come with some limitations such as prefabricated resin shade, which can look artificial. They are also wide mesio-distally, which can cause problems with placing them in patients with crowding. The labial section cannot be crimped, because it might weaken the aesthetic facing and cause premature failure. It is also worth noting that clinically try-in crowns that do not meet the proper parameters and require sterilization procedure, which can exert stress on the resin. To reduce the impact of stress, it is recommended to use steam sterilization.

Source: **Article A Review of Esthetic Crowns for the Primary Anterior Dentition**

Nusmile Crowns

NuSmile Signature Crowns are another notable addition to PVSSCs since 1991 and have become most popular among both the dentists and parents. These crowns efficiently restore correct anatomy with the available two sizes of regular and short in universal styles, providing excellent esthetics and durability. In addition, heat sterilization does not have any significant effect on their bond strength and color. These full coverage restorations have been found to be clinically successful for anterior primary teeth with severe decay. Gupta et al. concluded that veneer resistance to fracture for NuSmile crimped crowns was comparable to non-crimped crowns.[16] However, caution should be taken while crimping the lingual aspect of these crowns for the risk of facial veneer fracture. Guelmann et al. were significantly higher than the non-veneered ones, when crimped and cemented together. A study by Oueis H et al. in 2010 also reported that 51% of the pediatric dentists utilized PVSSCs amongst which, NuSmile crowns (61%) took the forefront followed by Kinder Krowns (35%) and Cheng crowns (28%).1reported the retention of NuSmile crowns, Dura crowns and Kinder Krowns.

Kinder Crowns

Pre-veneered Kinder Krowns® were introduced in 1989 with the IncisaLock internal design modification that offered better bonding and mechanical retention to the tooth crowned. These natural looking crowns are faced with high quality composite and are available in contoured or universal styles with regular and short lengths. These are available in two shades of Pedo 1 and 2 in bleached white and in most natural shade, respectively with reported lower failure rate and good parental satisfaction.

Cheng Crowns

Cheng Crowns Classic were developed in 1987 as world's first esthetic pediatric crown. They come with thin pre-contoured veneers over SSC and offer exclusive retentive pre-crimping. The high quality composite facings of these crowns provide color stability and plaque resistance. In addition, these can undergo heat sterilization without significant effect on their bond strength and color. These are available in suitable pedo-shades and in six sizes each for upper left and right incisors, and upper and lower cuspids.

Flex Crowns

Flex Crowns are new overall white faced pediatric crowns that can be crimped on facial and lingual and can also be squeezed onto the mesial and distal to allow for better adaptation. These can be trimmed easily with scissors or green stone.

Source: Pearson dental lab

Dura Crowns

Dura Crowns presented another facet to pediatric esthetic anterior crowns with tooth colored high density polyethylene facing over SSC. These crowns can be compressed, shortened and crimped both labially and lingually. In addition, Dura crowns are available in a single shade with full knife-edged margins and offer ease in festooning and trimming with scissors.

White Biter Crowns

Whiter Biter Crowns have polymeric coating with a polyester/epoxy hybrid composition. These crowns are however no longer used now.

Pedo Pearl

These crowns can be included in the group of pre-veneered crowns. The base of these crowns is made of aluminum covered with epoxy paint which gives them an aesthetic tooth colour. They are easy to adapt by cutting and crimping. If necessary, they can be covered with composite. Their disadvantages are their soft structure and possible shorter durability.

New Millennium Crowns

The New Millennium Crowns are made of laboratory-improved composite resin material and are also similar to strip crowns. Their advantages include high aesthetics and parental satisfaction. They can be adapted by reshaping them with a high-speed but, however their disadvantages include a fragile structure, the need for a dry restoration area, as well as the possible discoloration of the crown by the hemorrhage. They also cannot be crimped. Preparation for New Millennium crowns is similar to strip crown preparation.

Artglass Crowns

An anterior primary tooth restoration called an artglass crown, also referred to as Glastech, is made of artglass, a polymer glass. It is a brand-new multifunctional methacrylate with the capacity to create highly cross-linked, three-dimensional molecular networks. In comparison to strip crowns, they offer superior durability and aesthetics thanks to the use of

micro-glass and silica as filler materials. It offers two benefits: the longevity and aesthetics of porcelains, as well as the bondability and feel of composites.

Strip Crowns

Strip crowns are transparent plastic forms used to simplify work within upper incisors restoration. They can be filled with both chemical and light curing composite material. Once the material has set, they can be easily removed, leaving a smooth surface. According to Kupietzky et al., their advantages ease of fitting, trimming, and removal. They are also thin and transparent, which makes them easier to match to natural dentition and control composite color.

Polycarbonate Crowns

Polycarbonate crowns are made of aromatic polyesters of carbonic acids. They can be described as thermoplastic resins. The use of high temperature (around 130^{0}C) and pressure makes the material easy to mold and shape into the desired form. The material properties are thin structure and flexibility greater than that of acrylic resin crowns. On the other hand, these crowns do not resist high abrasive forces which can cause fracture or premature crown loss Polycarbonate crowns are at risk of fracture, dislodgement, and discoloration, all of which contribute to a possible unsuccessful treatment outcome. For this reason, many clinicians choose to use a different type of polymer crown type, strip crowns.

Source: Various Types of Preformed Crowns Used in Pediatric Dentistry: A New Appraisal

Zirconia Crowns

Prefabricated zirconia crowns are an incredibly strong ceramic crown that provide more aesthetic and biocompatible full coverage for primary incisors and molars(EZPedo, Loomis, CA, USA; NuSmile ZR Primary Crowns, Houston, TX, USA; Hu-Friedy Mfg. Co., LLC, Chicago, IL, USA; Kinder Krowns, St. Louis Park, MN, USA; Cheng Crown, Exton, PA They have anatomical contours, are free of metal, are entirely bio-inert, and are decay-resistant. By switching from one crystalline phase to another, zirconia has the unusual ability to resist crack propagation. The resulting volume increase blocks the break and stops it from spreading. The first paediatric zirconia crown to be made commercially available in the United States was EZ-Pedo (EZ-Pedo, Loomis, Calif., USA), which debuted in 2008.

Bioflx Crowns

NuSmile BioFlx is the FIRST flexible, durable, and esthetic pediatric crown in the market. With tooth preparation similar to a traditional SSC crown, BioFlx offers pediatric dentists the perfect blend of tooth-colored restoration and ease of placement. BioFlx crowns are made of a biocompatible, high-impact, high-strength hybrid material with the flexibility and adaptability to provide an active fit to the tooth. The crowns are pre-contoured and pre-crimped for tooth preparation and handling like an SSC, saving chair time.

CONCLUSION

In pediatric dentistry, a great deal of effort is required to obtain proper restoration. The first difficulty is to ensure the child's cooperation due to their age; a fear of dentistry is a frequent obstacle in the treatment process. Therefore, it is vital for treatment procedures performed in pediatric dentistry to utilize the simplest and least traumatic procedures that have the best prognosis regarding long-term durability. This review presents one of the approaches for full coverage restoration in pediatric dentistry practice.

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PREVALENCE OF FISSURED TONGUE IN ORAL CAVITY AMONG STUDENT POPULATION IN SOUTH KERALA

Authors:

Aswathi[1]
Sunu Alice Cherian[2]
Sharlene Sara Babu[3]
Tibin K Baby[4]
Sunil S.[5]

[1]Intern
[2]Lecturer
[3]Associate professor
[4]Reader
[5]Professor & Head

Department of Oral and Maxillofacial Pathology
Pushpagiri College of Dental Sciences
Pushpagiri Medical Society Kerala
India

ABSTRACT

Fissured tongue is a benign condition in which there are multiple prominent ridges or fissures on the tongue's dorsal surface. The development and symptoms of this disease may be influenced by ageing, malnutrition or local factors such as infection.

Aim

The purpose of the current study was to determine the prevalence of fissured tongue in students attending a pharmacy and dental college in South Kerala.

Methodology

In this study, students were examined for fissured tongue. Written consent was obtained from each participant.

Result

Fissured tongue was found among 104(35%) of the participants. 70(67.3%) students had central longitudinal type, 6(5.8%) had central transverse type, 4(3.8%) had lateral longitudinal type, 8(7.7%) had branching type and 16(15.4%) had diffuse type.

Conclusion

The study concluded that 35% of the students were presented with fissured tongue, among which central longitudinal type were the majority and lateral longitudinal type were the least.

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INTRODUCTION

The tongue has been believed to be an indicator of health in the medical philosophies for several decades. It is considered to be a mirror of the oral and general health. Hippocrates, Galen and others considered the tongue as the barometer of health[1].

Tongue lesions constitute to significant proportions in the oral mucosal disorders. Different countries have reported variable range of prevalence rates. Racial factors, gender, systemic disorders and so forth also contribute to this difference[2].

Fissured tongue or scrotal tongue or lingua plicata is an inherited disorder characterised with grooves of varying size and depth. A definite aetiology does not exist but a polygenic mode of inheritance is postulated. During the routine intraoral examination, it is diagnosed as an incidental finding. Fissured tongue is usually asymptomatic[3].

The superficial epithelial cells may be shielded from mechanical stress by the hairs of filiform papillae present on the mucosa of the dorsal surface of the tongue. Fissures may be deep or shallow, presenting with food entrapment, bad breath, burning and soreness in the tongue[4].

MATERIALS AND METHODS

A cross sectional study was done among 300 students of a dental and pharmacy college in South India. Patients with limited mouth opening, any trauma to the tongue, severe ankyloglossia, limited protrusion of the tongue, or any previous tongue surgery were excluded from the study. The purpose and details of the study was explained to the participants and written consent obtained. All the personal details of the participants in the study were kept confidential.

All of the participants were interviewed to obtain medical history, and examination of tongue was done using mouth mirror, wooden spatula to retract the tissues. All clinical examination was done by two examiners, and data was recorded. The data recorded age, sex, presence or absence of fissured tongue. The study was conducted over a period of one month.

The presence or absence of fissures were recorded. Depending on the pattern of fissures, they are classified into the following types based on the classification given by Sudarshan et al in 2015.

(a) Central longitudinal pattern: vertical fissure running along the midline of the dorsal surface of the tongue.

(b) Central transverse pattern: horizontal fissure/fissures crossing the midline.

(c) Lateral longitudinal pattern: vertical fissure/fissures running laterally to the midline.

(d) Branching pattern: transverse fissures extending from the central longitudinal fissure (branching tree appearance).

(e) Diffuse pattern: fissures diffusely distributed across the dorsal surface of the tongue.

RESULTS

The study population comprised 300 participants, of which 271 (90.3%) were females. Fissured tongue was present in 35% of the participants.

Based on pattern of tongue fissures, the most common pattern of tongue fissure was central longitudinal (67.3%) followed by diffuse pattern (15.4%), followed by branching pattern (7.7%), followed by central transverse pattern (5.8%) and the least common was lateral longitudinal pattern(3.8%).

DISCUSSION

In less than 10% of the population and perhaps genetically motivated, fissured tongue can be regarded as normal. It is not known exactly what causes the fissure in the tongue. In view of the clustering of families, it is alleged that a polygenic inheritance pattern exists[5]. The condition can be congenital, present at birth, or may become apparent during childhood or later in life. During intraoral examination as a secondary finding that varies between two and

six mm in depth, the asymptomatic fissured tongue is frequently observed[5,6].

Aging and local environmental factors may also contribute to its development. Fissured tongue can be seen as an independent manifestation or in association with certain syndromes or hereditary conditions[7,8]. Those diseases include Melkerson Rosenthal syndrome, Down syndrome, acromegaly, Sjogren Syndrome, orofacial granulomatosis, psoriasis and geographic tongue[9].

Fissured tongue based on position may be medial and lateral types[10]. In the tongue, those are usually found in the dorsolateral area. The next pattern is a central fissure with numerous fissure branches at right angles to the central one. The diffuse form is characterised as numerous fissures covering the entire dorsal surface which divides the tongue papillae into multiple separate “ice lands”. It's a severe form[11].

In most cases the fissured tongue is not symptomatic. There are reports of mild pain in some patients[11]. In patients with impaired oral hygiene and nutrition, this condition is further exacerbated by food particles trapped in the fissures[12].

Systemic factors and poor oral hygiene may contribute to a burning sensation in the tongue. In their epidemiology, local factors include impaired fit for prosthesis, infection, parafunctional habits, allergy reaction, xerostomia, galvanism and so on[13]. Systemic factors include the following: medication, anaemia, oesophageal reflux, insufficiency of vitamin B complex, zinc, iron and psychological factors[14].

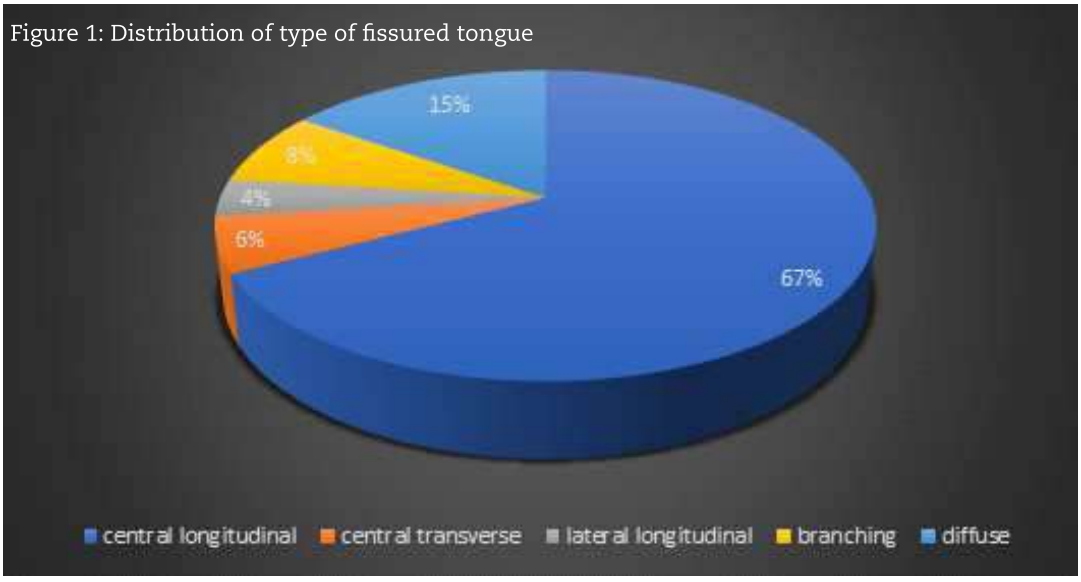
Clinical presentation is diagnostic and biopsy is done rarely. In a fissured tongue the most important histology findings are inflammation except in tongues that appear normal filiform papillae. Histological examination shows that the thickness of lamina propria is increasing, rete peg hyperplasia, neutrophilic micro abscess in upper epithelial layers and mixed inflammatory infiltrates[15].

Due to the benign nature of the fissured tongue, no specific treatment is indicated. The first priority of management in very severe conditions is, however, to identify the irritating cause. In order to correct the signs and symptoms, localized measures may be attempted. Maintaining oral hygiene and a proper diet should be encouraged in the patient[15].

CONCLUSION

In the present study, the prevalence of fissured tongue was found to be 35%. Fissured tongue constitutes significant proportion of tongue lesions. Dental practitioners and health workers should be familiar with the clinical appearance, aetiology and diagnosis of fissured tongue. Patients should be advised to implement dental home care on a regular basis. Brushing of the tongue should be included in the oral hygiene habits.

Figure 1: Distribution of type of fissured tongue



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