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# IDA HO NATIONAL AWARDS 2016



We are really happy to inform that our IDA - Madras branch has received three prestigious awards from IDA Head Office during the recently held 69th Indian Dental Association National Conference, New Delhi 2016.

## **Dr.I.R.Goela Award for the Best Local Branch Secretary**

**Dr. H.Thamizh Chelvan**

Hon. Branch Secretary

Madras Branch

## **IDA - Thane Branch Award**

For Best All Round Local Activity

IDA - Madras Branch

## **Dr.J.M.Rao Trophy**

For Student Membership

IDA - Madras Branch

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# PRESIDENT'S MESSAGE



**Dr. M.B. Aswath Narayanan**  
President  
IDA Madras Branch

With 302 Dental Colleges producing nearly 20,000 graduates a year & 232 Post graduate institutions producing nearly 5000 Post graduates, the oral health care delivery manpower of our country is slowly inching towards the Bhole Committee recommendations. However the distribution is still greatly skewed towards the urban population.

There are approximately 25,000 PHC's in the country. Posting one Dental Surgeon in each PHC makes oral care automatically available to the whole population. Tamilnadu is a leader in this regard, having a Dental Surgeon in 266 PHC's already. (Apart from the Medical Colleges, District HQ Hospitals, Taluk Hospitals, Corporation Hospitals & Municipal Hospitals all over the state and 1 Government Dental College).

The role of the Indian Dental Association becomes amply evident in such a scenario. It becomes the largest voluntary workforce in providing preventive oral health care by conducting mass screening camps, conducting school oral health programmes, advocating tobacco & alcohol cessation and at the same time educating its members with the latest knowledge. Another important duty is to bring the best out from all the Dental Under & Post graduate students to enable them to become the future torch bearers of the Profession.

In this context, Madras IDA has always been the Gold standard for the rest of the country. The MIDAS student festival for academic, sporting & cultural excellence, the regular monthly CDE programmes for the Dental practitioners & the now popular public expo & teachers training programme forming the core of the numerous CDH activity has taken our branch to great heights.

The three national awards given this year - Best Local Activity, Best Secretary & Best student activity- stand testimony to this. This branch has an illustrious & hoary past & it has been my proud privilege to follow in their footsteps as the President of this branch. That I am the first Public Health Dentist to hold this office has been the icing on the cake.

It gives me a great sense of joy & happiness to wish Dr. C.K. Dilip Kumar & his team for doing an extraordinary job in the new look Midas Newsletter & the Journal.

Wishing all the members of IDA Madras & All Dental Surgeons everlasting health.

A handwritten signature in blue ink, appearing to be 'M.B. Aswath Narayanan', written in a cursive style.

**Dr. M.B. Aswath Narayanan**

# SECRETARY'S MESSAGE



**Dr. H. Thamizhchelvan**  
Hon. Branch Secretary  
IDA - Madras Branch

Greetings to all,

Love provided by mother will never change throughout her lifetime, In accordance updating our knowledge should continue throughout our career.

IDA Madras takes pride in saying that we constantly conduct many education programmes and to reach on your desk this e Midas journal fulfils thirst of knowledge.

on behalf of IDA - Madras Branch let me congratulate the enthusiastic editorial team on release of this third issue.

A handwritten signature in blue ink, appearing to read 'H. Thamizhchelvan'.

**Dr. H. Thamizhchelvan**

# LETTER FROM THE EDITOR



**Dr. C.K. Dilip Kumar**  
Editor-in-Chief  
IDA - Madras Branch

The progress of a journal from its infancy into maturity depends on various factors. The initial hurdles are launching the journal and finding the right resources to run it. Once the sustenance is established the aim is to make it self-sufficient. The onus shifts to generating its own funds. For this, the primary goal is visibility. The journal needs to be seen, read, downloaded and used for referencing. Once this visibility comes in, the journal is not only respected but also patronized by people far and wide.

The time has come when we need to focus on making our journal more visible through quality work that is submitted, reviewed and published. It's a sincere request from the Editors desk that our contributors submit more original work that would enable us to increase the standards of our indexation.

I believe that this is not an impossible task; it just needs realization by each one of us to take a more serious step in improving the quality of submissions. This combined effort from our part would certainly bear fruit in a period of time in the form of a native journal with not only increased visibility but also popularity. Once again thanks to all our contributors and readers for their patronage.

**Dr. C.K. Dilip Kumar**

# EDITORIAL BOARD

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## Arise, Awake and Revive the Scope of Dentistry in India

The scope of dentistry as a choice of profession has witnessed morbid decline by the day. Though there is a lot of hue and cry in various platforms about the current status of the profession, proper representation from the dental fraternity is yet to happen.

Despite spending five years of gruelling academic schedule, there is no light at the end of the tunnel for young dental graduates. It is disheartening to see the young minds being clueless about their future. Blaming the increase in number of seats and unorganized geographical distribution of dental colleges will not solve the problem, instead positive and generous insights of the policy makers are the need of the hour.

\*Unlike engineering profession, where little can be done to clear the current quagmire, there are umpteen numbers of ways to clear the dental turbulence. India has about 3708 community health centres, 26952 primary health centres and 136815 sub centres, but most of them do not have a dentist. This clearly indicates that the government machinery lacks knowledge of importance of oral health care. Creating posts in the primary health centres will not only make a tremendous impact for dental graduates, it will improve public health as well.

\*Dental practice in rural centres should be encouraged by offering financial incentives like subsidised equipment and office set-up costs. This would significantly help avoid the saturation in the cities.

\*In addition to the job opportunities, dentistry should be made affordable across all strata of the society by improving the feasibility to afford

dental treatment. Properly structured dental insurance should be made mandatory for the upper and middle income groups. Lower income group can be provided with special dental health care schemes by the government.

Representation of the above issue can be effectively made by a fierce representation to the government of India by all of us at the association level. It is time the Indian dental association gathers support of all fellow dentists and send unified and continuous petitions to the government. This should definitely pave way for reviving the lost glory of dentistry.



**Dr. R. Ramya**  
Associate Editor,  
e-MIDAS Journal



# Mini implants in Orthodontics - A concept Review

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## ABSTRACT

Anchorage preparation has been a perennial problem in fixed orthodontic treatment and the success of orthodontic treatment depends on proper treatment planning and conservation of anchorage. Conventional anchorage systems like Trans palatal arch and Nance palatal arch have been using intra-oral sites to obtain anchorage and are not effective in controlling anchorage in all three planes of space. Extra oral devices like Head gear are dependent on patient compliance and have inherent limitations. The orthodontist can use Mini- implants as a part of the fixed appliance therapy used to obtain either direct or indirect for anchorage. This article gives an overview of the implant systems used in orthodontics, their indications, clinical management and of implants used in orthodontics, their potential complications and limitations.

**Key words:** Anchorage, Orthodontic Mini implant, Mini screws.

## Introduction

Anchorage preparation has always been a challenge in fixed orthodontic treatment and attempts were frequently made in developing an anchorage system that will offer absolute anchorage. The concept of metal components being screwed into the maxilla and mandible to enhance orthodontic anchorage was first published by Linkow in 1945 with the use of Vitallium Screws. In 1969, Branemark developed Titanium endosseous implants with long term success, which became a major influence in field of oral implantology and prosthodontics. Since then Implants made of titanium have been widely used by several orthodontists to obtain absolute Anchorage. Among several implant types available endosseous Mini-implants of screw were frequently used in orthodontics because of their reduced size.

The major disadvantage of using Titanium endosseous Implants to obtain orthodontic anchorage was the difficulty in removing the implant after orthodontic treatment due to the osseointegration. Osseointegration is not required in Orthodontic Mini-Implants when used exclusively for anchorage purpose as these Implants are meant to be removed at the end of fixed orthodontic treatment. Osseointegration of the implants to the bone may render removal difficult or impossible.<sup>1</sup> Hence stainless Implants or titanium Implants surface treated to discourage Osseointegration and Mini plates were developed and recommended for orthodontic use. These Orthodontic Mini-implants offered absolute anchorage with a low cost and a comparatively simpler technique for easy placement, and removal.

Absolute anchorage during orthodontic treatment may be obtained with these Mini-implants and Miniplates placed in various intraoral sites with thick cortical bone and dense trabecular bone. The use of Mini implants have increased the scope of corrections that can be achieved by orthodontics in all three planes of space from simple anterior intrusion or retraction to protraction or retraction of posterior teeth, molar distalisation, uprighting and intrusion.<sup>2</sup>

The success of the mini implant anchorage is dependent on understanding the mini-implant system, the anatomical structures of the sites in which they are being placed, indications and contraindications, the placement technique, the factors affecting the stability and biomechanical principles involved in construction of a precise force system to obtain the necessary changes.

## Classification of Implants

Implants used in orthodontics can be broadly classified based on the location and area in which they are placed, their morphology, surface characteristics and methods used for placement of the implants. (Table 1, 2, 3 & 4 & 5) of the various types present endosseous screw type, non porous implants made of stainless steel or titanium is the most commonly used implant in orthodontics.<sup>3</sup>

**Table 1. Classification of Implants based their location in the bone**

Subperiosteal Implants	Subperiosteal implants lie below the periosteum over the bony ridge. These type of implants have reduced long-term success rate, due to the fact that they lie above the cortical plates and are not threaded to the bone. The chances of getting dislodged are high and the stability is dependent on the surface area and the osseointegration of the implant to the underlying cortical bone. The Subperiosteal design currently in use for orthodontic purposes is the Palatal Onplant primarily used along with TPA for obtaining indirect anchorage.
Transosseous Implants	Transosseous implants penetrate the bone through and through encasing both the cortices completely. These implants enjoy good success rate however they are not widely in orthodontics because of the possible damage to the vital structures like the nerves, vessels, dental roots and maxillary sinus.
Endosseous Implants	These are partially submerged and anchored within bone encasing the cortex and the cancellous bone. These have been the most popular and the widely used implants in orthodontics. Various designs, sizes and composition are available for usage in specific conditions.

**Table 2. Classification of Implants based on their configuration**

Root form Implants	These are the screw type endosseous implants with the head, neck and an endosseous portion with threads. The name root form has been derived due to their cylindrical structure.
Blade /plate Type Implants	The mini plate type Implants are derived from the blade type prosthodontic implants and the miniplates used in oral surgery for bone platings. The miniplates used in orthodontic have hooks for the engagement of power elements.

**Table 3. Classification of Implants based on their composition**

1.	Vitallium
2.	Stainless steel
3.	Cobalt Chromium Molybdenum (Co Cr Mo)
4.	Titanium -Alpha -Beta -Alpha- Beta phase -Ti -6Al -4V
5.	Ceramic Implants
6.	Vitreous carbon & composites

**Table 4. Classification of Implants based on their surface characteristics**

Threaded	The root form implants are generally threaded as this provides for a greater surface area and stability of the implant.
Non threaded	Non threaded implants are limited to their use in prosthetic dentistry, not used in orthodontics.
Porous	Porous Implants have vents in the implant body to aid in growth of bone and thus a better interlocking between the metal structure and the surrounding bone during osseointegration. They are not commonly used in orthodontics, Palatal onplants and retromolar implants are the only systems in orthodontics that are dependent on osseointegration for stability.
Non porous	Most of the orthodontic implants are non porous, and are surface treated by electropolishing to discourage osseointegration.

**Table 5: Classification of mini implants according to the type of drill used**

Self-tapping method:	In this method, the miniscrew is driven into the tunnel of bone formed by drilling, making it tap during implant driving. This method is used when we use small diameter miniscrews.
Self-drilling method:	Here, the miniscrew is driven directly into bone without drilling. This method can be used when we want to use larger diameter (more than 1.5 mm) miniscrews. <sup>4,5</sup>

## Parts of an Implant

The commonly used implant screw/plate has three parts the head, neck and the body. Implant head is the supragingival portion of the implants which serve as the source of attachment for force elements like elastics or coil-springs. Neck of the implant is the transgingival portion of the Implant which is embedded in the gingiva and the Implant body is the endosseous parts embedded inside cortical and cancellous bone. The endosseous portion is the one which is threaded into the bone and its design plays an important role in the retention and stability of the implant.

## Mini-implant site and location

Various intraoral sites are available for the placement of orthodontic mini-implants including interdental alveolar bone. In the Maxilla the possible insertion sites for placement of Implant includes the area below the nasal

spine, the palate, the alveolar process, the infrazygomatic crest and the retromolar area. In the mandible the implants can be inserted in the alveolar process, retromolar area and the symphysis.

## Mini-Implant size selection

The mini-implant size depends on the quality and quantity of the bone and soft tissue thickness in the site in which the mini-implant is indicated to be used. The stability of the implant depends on the surface area of the implant that is in contact with the bone, greater the surface area better the stability hence longer and greater diameter implants are preferred if the quantity of bone available is adequate. The major concern is not to injure the vital structures like dental roots, neurovascular bundles and maxillary sinus during the placement of implant. A minimum of 2 mm clearance is required between the mini-implant and the vital structures as mini-implants do move under orthodontic forces. If the thickness of the cortical bone at the insertion site is less and the stability is dependent on insertion into trabecular bone a longer screw is needed, but if cortical bone thickness is adequate and will provide enough stability, a shorter screw can be chosen. Hence longer implants are preferred in maxilla than in mandible. A mini-implant of 6mm length can provide adequate anchorage in mandible wherein a minimum of 8mm is required in most of the sites in maxilla. The thickness of the soft tissue in the insertion is another important factor in selecting the type and length of mini-implants. The thickness of mucosa is greater in palate and retromolar area hence longer implants or implants with greater neck length should be used. The length of the transmucosal part of the neck should be selected after assessing the mucosal thickness of the implant site.<sup>6,7</sup>

## Indication of orthodontic Mini-implants

Mini-implants are used to obtain anchorage in maximum anchorage requirement cases in which conventional anchorage systems cannot be used effectively. Anchorage can be obtained for various tooth movements including retraction of anteriors, intrusion of anteriors, simultaneous intrusion and retraction of anteriors, posterior protraction, molar intrusion, molar up righting, molar distalization, posterior segmental intrusion as in correction of open bite, orthopaedic traction and osteogenic distraction.

## Implant site Selection

The site in which the implant is to be placed is based on the type of tooth movement and the intended mechanics as the direction of force depends on the location of the implant to which the force element are directly attached. For posterior space closure the anterior-posterior location of the mini-implant is between roots of the first molars and the second bicusps or between the roots of first and second molar. Vertically the mini-implant should be located at or above the mucogingival line depending on the desired line of action. Placement of mini-implant in attached gingiva is desired as the placement in movable mucosa results in gingival hyperplasia.

To intrude the upper incisors the screw is placed between the upper lateral incisors and the canines. The placement of the mini-screws should be done after leveling and alignment, in order to maximize the interradicular space at the placement site.

For intrusion of maxillary molars two implants are placed diagonally one on buccal side and one on palatal interdental area. Retromolar implants are preferred for molar distalization. Indirect anchorage can be obtained for molar distalization from palatal implants. It is very hard to place the micro-screws precisely between the roots of first and second molars without interfering with the roots of the teeth either during implantation or during the intrusive movements. Moreover, sometimes the intrusion force need to be relatively high and more than one screw might be necessary in places where there is insufficient space available for the screw placement. For the above reasons it is suggested to limit the use of the miniscrews to cases where simple molar intrusion of one or two teeth.

It is possible to distalize the mandibular molars with anchor plates placed at the anterior border of the mandibular ramus or mandibular body. Distalization of the mandibular molars enables the clinician to correct anterior crossbites, mandibular incisor crowding, and mandibular dental asymmetry without extracting premolars.

Orthodontic mini-plates or retro molar implants can be used to obtain anchorage for enmasse distalization of buccal segments. Direct retractive force is applied from the anchor plates to the first premolars to perform en masse distalization of the buccal segments.

Th mini implants are place between the roots of lateral incisor and canine for olar mesialization. The mesial movements are usually very slow especially in the lower arch so not more than 2-3 mm of mesial molar movement should be attempted.

Mini -implants placed between the roots of the first and second lower molars or between the root of the second bicuspid and lower first molars, can be used for inserting class II elastics for retraction of upper arch without any unwanted dental effects on the lower teeth.

## Contraindication of mini Implants

The predictable use of implants as a source of orthodontic anchorage requires a careful evaluation of prospective patients for osteopenia, osteoporosis, or other medical problems. An evaluation of bone metabolism is a key element of the diagnostic workup. The minimal screening procedure involves a careful medical history, evaluation of signs and symptoms of skeletal disease and an assessment of risk factors associated with negative calcium balance like Renal osteodystrophy, Hyperparathyroidism, Thyrotoxicosis, Osteomalacia and Osteoporosis. Absolute contrac Indication for orthodontic mini-implants includes severe systemic disorder affecting bone metabolism, psychiatric diseases like psychoses dysmorphobia and

alcoholics drug abusers. Relative contraindication includes insufficient volume of bone poor bone quality, patients undergoing radiation therapy, Insulin dependent diabetes and Heavy smokers.

## Factors affecting success of orthodontic mini-implant

Factors affecting the stability of orthodontic mini-implants can be classified under the following headings (Table 6).

Table 6. Factors affecting stability of orthodontic mini-implants

Host factor	a) Systemic factors b) Local facors c) Hard tissue factor – Amount & density of bone d) Soft tissue factors e) Hygiene
Implant factor	Size & design
Technique	Insertion torque

The primary stability of the orthodontic mini-implant is based on the cortical bone thickness, bone mineral density at the site of insertion, Implant design and placement technique where as the Late stability (2-3months) is dependent on the Targeted bone remodeling rate, Bone mineral density and Peri-implant soft-tissue inflammation. Conical shaped implants offer better stability than the cylindrical shaped implants as tighter contact between the miniimplants and tissue is ensured due to the difference in diameter between tip and the head region but Conical mini implants require high insertion torque causing over compression of the surrounding tissue which may reduce the primary mechanical stability hence predrilling is recommended when a higher diameter conical mini-implant is used to reduce the insertion torque. The length and the diameter plays an important role in the stability of the implants. Miyawaki et al found when the diameter is 1.5mm or more the success rate was 85% and Costa et al recommended mini-implants ranging between 6mm and 10mm for better primary stability.<sup>8</sup>

Better the bone mineral density and thicker the cortical plate greater will be the stability of the orthodontic mini-implants. A minimum bone density of 850 HU and a minimum 1mm cortical bone thickness is required for adequate primary stability if the amount of bone available in the interdental area is greater bigger size implants can be used and better would be the stability.

The implants should be placed in attached gingiva, placement of implants in unattached gingiva results soft tissue proliferation over implant head and peri implant inflammation affecting the late stability and eventually leads to implant failure. If placed in mobile mucosa a gingival punch is done before insertion and a Periodontal pack is applied after placement.

Self drilling mini-implants are more stable because of greater bone implant contact as over heating or wobbling during pre drilling affects stability. But care should be taken to minimize the insertion torque of a self drilling implant as increased torque results in more micro compression of bone in the bone-implant interface and may affect the stability. Poor oral hygiene resulting in peri-implantitis also affects the implant stability.



Predisposing medical conditions like diabetes, local factors like periodontitis also reduce the secondary stability of the mini-implant.

## Complications and their management of implants

The various complications encountered during and after the placement of orthodontic implant, the method to manage the failures should be properly understood for proper execution of orthodontic mini-implant anchorage system.<sup>9</sup>

### i. Loosening of mini-implant

#### a. Immediate

#### b. Delayed

### ii. Root Damage

### iii. Implant fracture during insertion

Immediate failure may occur due to Poor insertion technique like wobbling of instruments, Abrupt change in the path of insertion, Overheating of bone during drilling, Site with poor cortical bone thickness and density and redundant soft tissue in the site of insertion.<sup>10,11</sup>

Delayed failure may be due to excessive loading, root contact of implants resulting in trauma from masticatory forces, insufficient remodelling of bone around the implants, Poor oral hygiene maintenance, Root contact may also occur during the orthodontic tooth movement when the tooth moves towards the mini-implant. Failed mini-implants should be removed and new mini-implant should be inserted in an adjacent site. If the same site is to be used the reinsertion is performed after 2-3 months and a wider mini-implant is used.

Mini-implant breakage during insertion occurs due to insertion torque higher than the torque resisting force of the implant<sup>12,13</sup>. If resistance is encountered during the insertion a pilot drill is recommended. Fractured mini-implants should be retrieved and a new mini-implant should be inserted in a new site. Perforation or root fracture are extremely rare, Minor injuries of the cementum will undergo spontaneous healing<sup>14</sup>.

## Conclusion

This article has highlighted the mini-implant system, the anatomical structures of the sites in which they are being placed, indications and contraindications, the placement technique, the factors affecting the stability and the potential risks and complications for clinical usage of orthodontic anchor screws with the hope of educating clinicians. The ideal implant would be one that would be simple to place as well as remove, causing minimum discomfort to the patient. Miniscrews are not a magic wand, but rather a valuable tool to enhance the quality of orthodontic treatment if they are properly used. Implants for the purpose of conserving anchorage helps the Orthodontist to overcome the challenge of unwanted reciprocal tooth movement.

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# Oral Lichen Planus: A Review with Emphasis on Etiopathogenesis and Differentiating Features from Lichenoid Lesions

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## ABSTRACT

Lichen planus (LP) is an mucocutaneous disease affecting mainly the skin and oral mucosa of unknown etiology. The various mechanisms hypothesized to be involved in immunopathogenesis are immune response mediated by antigen-specific cells, autoimmune response, Humoral immunity, Nonspecific mechanisms and other etiologies like viruses. Lichen planus also has a tendency for malignant transformation. Oral Lichenoid Lesions share the clinical features of OLP and presentations as plaques or erosive patches with presence of Wickham's striae. However, there are certain distinctive features that the lichenoid lesions exhibit that differentiate them from OLP. This article highlights the key features essential for lichen planus diagnosis and its etiopathogenesis.

## Introduction

Lichen planus (LP) is an inflammatory disease of unknown etiology that affects mainly the skin and oral mucosa. Other mucous membranes, such as those of the genitalia, esophagus, and conjunctiva, as well as skin appendage areas such as the scalp and nails may also be affected. It is a common mucocutaneous disease, first described by Wilson in 1869<sup>[1]</sup>. It Affects 0.5-1% of world's population. Annual Age adjusted incidence rate was 2.1 and 2.5 per 1000 among men and women. Prevalence in Indian Population is 2.6%.<sup>[2]</sup>

## Etiopathogenesis of Lichen Planus

The antigens that trigger the inflammatory immune response in oral lichen planus, remains unknown. Countless factors have been proposed as relevant to the etiology of the lesions, including genetic history, dental materials, drugs, infectious agents such as bacteria and viruses, autoimmunity, associations with other autoimmune diseases, immunodeficiency, food, allergies, stress, habits, trauma, diabetes and hypertension, malignant neoplasms, and intestinal diseases. The T-Cell autoimmune disease in which cytotoxic CD8+ T cells trigger the apoptosis of oral epithelial cells (Type IV Hypersensitivity reaction)

The various mechanisms hypothesized to be involved in immunopathogenesis are:

- (i) An immune response mediated by antigen-specific cells;
- (ii) An autoimmune response;
- (iii) Humoral immunity;
- (iv) Nonspecific mechanisms.

## Immune response mediated by antigen-specific cells

The lymphocytic infiltrate in lesions of LP consists mainly of T cells, including CD4+ and CD8+ lymphocytes, that migrate to the epithelium either by random antigen match during routine surveillance or in a process mediated by cytokines. The degeneration of basal keratinocytes observed in LP is attributed to cytotoxic CD8+ T lymphocytes, which represent the main component of the

infiltrate located within the epidermis and adjacent to damaged keratinocytes. As the disease progresses, a gradual accumulation of CD8+ T lymphocytes occurs. The main event in the pathogenesis seems to be the increased production of cytokines that induce recruitment of Langerhans cells and clonal expansion of cytotoxic cells.<sup>[3]</sup>

Cytotoxic lesional CD8+ T cells can be activated by keratinocyte basal antigen associated with class I MHC, which releases many cytokines such as interleukin-2 (IL-2), tumor necrosis factor (TNF), and interferon- $\alpha$  (IFN- $\alpha$ ), which induce not only the expression of HLA-DR in basal keratinocytes but also the activation of dendritic cells, including Langerhans cells thereby attracting more lymphocytes. The possible mechanisms that induce keratinocyte apoptosis by CD8+ T cells are<sup>[3]</sup>:

- (I) TNF- $\alpha$  secreted by T cells, binding to TNF- $\alpha$ 1 receptor on the surface of keratinocytes;
- (ii) expression of CD95L (Fas ligand) on the surface of T cells, binding to CD95 (Fas) on the surface of keratinocytes;
- (iii) Entry through the pores of the membrane induced by perforin in granzyme B keratinocytes, secreted by T cells.

## Autoimmune Response

Deficiency of transforming growth factor- $\alpha$ 1 (TGF- $\alpha$ 1) may predispose to autoimmune lymphocytic inflammation. In 2014, Shen et al. demonstrated the increased expression of Foxp3 and IL-17 in LP lesions including oral and cutaneous variants. The expression of Foxp3 in oral LP was higher than that in cutaneous LP, a finding that may reflect the difference in clinical behaviour between the two variants of the disease.<sup>[3]</sup>

## Humoral Immunity

Autoantibodies have been identified in OLP patients. Anti-smooth muscle antibody (SMA) occurs at a significantly higher frequency in patients with OLP than in healthy control subjects. In the erosive form of OLP, the concentrations of circulating antibodies against desmoglein 1 and 3 are significantly increased in comparison with those in healthy controls.<sup>[3]</sup>

## Nonspecific mechanisms

Some of the T cells in OLP lymphocyte infiltrates are unspecific. They can be attracted and retained within OLP lesions by various mechanisms associated with the pre-existing inflammation. The non specific mechanisms include the following<sup>[3]</sup>:

**Epithelial basal membrane:** Keratinocyte apoptosis by CD8+ cytotoxic T lymphocytes may result in disruption of the basal membrane in OLP, which allows nonspecific T lymphocytes present in the subepithelial area to migrate to the epithelium.

**Metalloproteinases:** In OLP, activation of MMP-9 results in the disruption of the basal membrane.

**Chemokines:** Chemokines play a critical role in OLP through the recruitment of lymphocytes, monocytes, natural killer cells, eosinophils, basophils, and mast cells. Eg: RANTES, secreted by OLP lesional T cells, can attract mast cells that, by undergoing degranulation, release TNF- $\alpha$  and chemokines that stimulate more RANTES secretion.

**Mast cells:** Studies show an increase in the density of mast cells in OLP, 60% of which have undergone degranulation.

**Vascular endothelial growth factor:** serum levels of VEGF to be significantly elevated in patients with OLP.

**Langerhans cells:** These cells produce greater amounts of IFN- $\alpha$  to induce more apoptosis mediated by cytotoxic cells via a cascade of caspase.

## Viruses and oral Lichen Planus

Viruses that are suspected of having an association with Oral Lichen Planus (OLP) can be divided into two groups. The first group includes viruses for which associations have been anecdotally suggested, such as varicella zoster virus, Epstein-Barr virus, cytomegalovirus, herpes virus, human papillomavirus (HPV), and human immunodeficiency virus (HIV). The second group includes viruses for which an association with LP has been documented, such as HCV. The relationship between HCV and OLP remains controversial.

Several studies suggest that the relationship between the two diseases may be the result of genetic, environmental, geographic, and other factors. It is estimated that patients with hepatitis C are twice as likely to develop LP than the general population. HCV is not sufficient by itself as a causative agent in the development of OLP and that host factors play an important role in the pathogenesis of HCV associated with OLP. HCV-positive patients with HLA-DR6 are more prone to develop OLP lesions. Figueiredo et al. observed the rate of HCV infection to be six times higher among patients with OLP and the rate of OLP to be eight times higher in patients with HCV than in the general population.<sup>[3][4]</sup>

## Diagnosis of Lichen Planus

In 1968, Andreassen divided OLP into 6 clinical forms<sup>[5,6]</sup>:

1. Reticular
2. Papular
3. Plaque like
4. Atrophic
5. Erosive
6. Bullous

The reticular form is the most common type. It clinically presents as papules and plaques with interlacing white keratotic lines (Wickham's striae) surrounded by an erythematous border. Wickham's striae are usually bilateral and seen on buccal mucosa, mucobuccal fold, gingiva and rarely on palate, tongue and lips. This type is reportedly more common in males than females and it is usually asymptomatic. OLP usually present as a bilateral symmetrical lesion or involves multiple areas individually. OLP involving the gingival is termed as "desquamative gingivitis" which clinically manifest as a fiery red erythema of attached gingiva. OLP lesions which are associated with patchy brown melanin deposits in the oral mucosa are termed as inflammatory melanosis. Reticular form of oral lichen planus is usually asymptomatic<sup>[5,6,7]</sup>.

Atrophic/erythematous and erosive/ulcerative lesions are symptomatic. Symptoms include mucosal sensitivity, burning sensation and continuous debilitating pain. Oral lichen planus lesions usually persist for many years. OLP patients have periods of exacerbation and quiescence. Periods of exacerbation are generally associated with psychological stress and anxiety and during this time there is increased erythema or ulceration with increased pain and sensitivity. OLP resulting from mechanical trauma either during dental treatments or due to cheek biting is termed as Koebner phenomenon.<sup>[5,6,7]</sup>

The 6 P's of Lichen Planus<sup>[7,8]</sup>:

1. Pruritic
2. Purple
3. Polygonal
4. Planar
5. Papules
6. Plaques

The key histological features include, Liquefaction degeneration of basal layer, overlying keratinisation, Lymphocytic infiltrate within the connective tissue that is dense and resembles a band. Hyper orthokeratosis or hyperparakeratosis, with acanthosis, which is thickening of the granular layer with intercellular edema., Rete pegs characteristically are "saw tooth" in appearance. Mononuclear infiltration of the T-cells and histiocytes form a typical band like an appearance subepithelially. The intraepithelial T-cells and degenerating keratinocytes form the colloid bodies, the homogeneous globules that are eosinophilic in nature called the Civette, cytoïd, hyaline bodies are seen. The characteristic feature of Max-Joseph space that is formed from the degeneration of basal keratinocytes and anchoring units disruption. They are regarded as histologic clefts. The colloid bodies ultrastructurally are apoptotic keratinocytes revealing DNA fragmentation in these cells. The basement membrane of when examined under electron microscope reveal duplications, branches, and breaks.

The investigations include Direct Immunofluorescence that show positive linear and/or granular IgG, IgA, IgM and complement at BMZ, and exhibit positive fluorescence with antifibrinogen. IgA, IgG, complement C3 are seen on



colloid bodies. Indirect immunofluorescence: shows “annular fluorescence” or the “string of pearls” appearance.<sup>[8]</sup>

Corticosteroids have been the mainstay of management of OLP; yet, other modalities like calcineurin inhibitors, retinoids, dapsons, hydroxychloroquine, mycophenolate mofetil and enoxaparin have contributed significantly toward treatment of the disease. Oral photochemotherapy and extracorporeal photochemotherapy are indicated in low doses in the treatment of oral lichen planus. Analysis of current data on pathogenesis of the disease suggests that blocking IL-12, IFN- $\gamma$ , TNF- $\alpha$ , RANTES, or MMP-9 activity or upregulating TGF- $\beta$ 1 activity in OLP may be of therapeutic value in the future.<sup>[4,9]</sup>

Oral lichen planus is a potentially malignant disorder with a capacity, although low, for malignant transformation. Of all the factors related to the process of malignant transformation, it is believed that the chronic inflammatory process plays a key role in the development of oral cancer. This inflammatory process is capable of providing a microenvironment based on different inflammatory cells and molecules that affect cellular growth, proliferation and differentiation.<sup>[10]</sup> The Overall frequency of malignancy is 0.3-3.5%. c-Jun, a transcription factor, activation in human skin is involved in proliferation and could potentially participate in the transformation of LP from an inflammatory to a carcinogenic state.<sup>[11]</sup> In a recent systematic review, by Fitzpatrick, the most common subsite of malignant transformation was the tongue. They also demonstrated slight female predilection of Lichen planus<sup>[12, 13]</sup>. The average time from diagnosis of OLP to transformation was 51.4 months.<sup>[14,15]</sup>

## Differentiating Features of Oral Lichen Planus from Lichenoid Lesions

Oral Lichenoid Reactions or Lesions (OLRs/OLLs) are clinical and histological contemporaries of Oral Lichen Planus (OLP) often indistinguishable in manifestations. The benchmark of differentiation between the two groups is the association of the former with known inciting factors, which when identified and eliminated, often cause a regression of the lesion. The classification of lichenoid lesions is highlighted in table 1 below. The associated factors with OLRs may broadly be divided into four groups<sup>[16]</sup>:

- Dental restorative materials (modified from original description)
- Drugs and medications
- Graft-versus-host disease (GVHD)
- Other factors

Oral Lichenoid Lesions share the clinical features of OLP and presentations as plaques or erosive patches with presence of Wickham's striae are seen. OLLs are known to occur in all clinical varieties of presentation seen in OLP like reticular, atrophic, erosive, bullous, and keratotic. However, there are certain distinctive features that the lichenoid lesions exhibit that differentiate them from OLP. OLLs are usually unilateral, have a topographical

association with a dental restorative material and a causative association with a drug or medication, if it is the inciting factor, and rarely occur in sites like tongue and palate. The causal effect can be confirmed by withdrawal of the suspected drug, if medically feasible, and observation of the regression of the lesion. Occasionally, when dental material association is suspected then epicutaneous patch tests and replacement of the material may bring about the desired result.<sup>[17,18]</sup>

**Table 1: Classifications of Oral Lichenoid Lesions<sup>[16]</sup>**

Ims et al., 2005<sup>[9]</sup>

- a) Classified clinically into three groups:
  - White patches, striated, plaque, or reticular lesions
  - Erosive or atrophic lesions
  - Ulcerative lesions
- b) Classified according to their relationship with restorations:
  - OLLs only in contact with restorations
  - OLLs in clinical contact, and at least one additional site without clinical contact with restorations
  - OLLs without clinical contact with restorations
- c) Classified according to their oral location:
  - OLLs located on the buccal mucosa (unilateral or bilateral)
  - OLLs located on the tongue (lateral or dorsal surface)
  - Gingival lichenoid lesions
  - Other part of oral mucosa; lips, floor of the mouth, and palate

Van der Waal (2009)<sup>[16]</sup>

- 1. Amalgam restoration topographically-associated OLL
- 2. Drug-related OLL
- 3. OLL in chronic graft-versus-host disease
- 4. OLL, unclassified (e.g., erythematous changes limited to the gingiva without signs of “classic” OLP elsewhere in the oral cavity, or lesions that have a lichen planus like aspect, but that lack one or more characteristic clinical features, such as bilateral presentation)

Modified World Health Organization criteria for the diagnosis of OLRs, OLLs, and oral lichen planus (OLP) (Van de Meij et al., 2007)<sup>[16]</sup>

Clinical criteria

- 1. Bilateral presentation, more or less symmetrical lesions
- 2. Presence of white striae (reticular pattern)
- 3. Erosive, atrophic, bullous, or plaque manifestations are only accepted as subtypes when always accompanied by reticular lesions located anywhere in the mucosa. The term “clinically compatible with” is to be used with all lesions similar to OLP that do not meet the mentioned criteria

Histological criteria

- 1. Well-defined, mainly lymphocytic band infiltration in the most superficial zone of the connective tissue
- 2. Signs of degenerative liquefaction in epithelial basal layer.

The term “histologically compatible with” is to be used in application to all histopathological findings less clearly compliant with the mentioned criteria

Final diagnosis of OLP and OLLs

- 1. The clinical and histopathological criteria must be included in order to establish a final diagnosis
- 2. Both the clinical and histopathological criteria must be met in order to diagnose OLP
- 3. The term OLLs is to be used under the following conditions:
  - (1) Clinically characteristic of OLP, but histologically only “compatible with” OLP
  - (2) Histologically characteristic of OLP, but clinically only “compatible with” OLP
  - (3) Both clinically and histologically “compatible with” OLP

OLP: Oral lichen planus, OLLs: Oral lichenoid lesions

The Histological features include, The subepithelial infiltrate in OLP is limited to the lamina propria, it is more diffuse and penetrating in OLLs. The nature of the infiltrate is also lymphohistiocytic compared with the mixed variety of OLP. There is a tendency for perivascular congregation of the inflammatory cells. Epithelial changes include focal parakeratosis, focal interruption of the granular layer, and presence of cytooid bodies in the granular and keratinized layers. Mast cell presence in OLL is more subdued. Various minor features like increased vascularity and increased positivity of periodic acid-schiff (PAS) material in the basement membrane of OLP are not usually found in OLLs. The malignant transformation rate of OLP is variably listed as 0.5-2% in various studies.<sup>[19,20]</sup> The key differentiating factors have been highlighted in Table 2 below.

**Key differentiating features between oral lichen planus (OLP) and oral lichenoid lesions [16]:**

Criteria	OLP	OLL
Clinical	Usually bilateral and symmetrical	Usually unilateral
	In established well-defined sites like buccal mucosa, tongue	In less well-established sites like gingiva, lips, and palate in addition to the well-established sites
	Idiopathic	Association with factors listed in Table 1
Histopathological	Classical white striae (Wickham's striae), and in various manifestations like reticular, papular, erosive, erythematous, and bullous	Mostly similar in clinical presentation
	Mixed subepithelial infiltrate	Strict lymphohistiocytic infiltrate
	Limited to lamina propria	Diffuse and more deeper distribution in lamina propria and superficial submucosa
	No such changes usually seen	Focal parakeratosis, focal interruption of granular layer, cytooid bodies in keratinized and granular layers
	Increased numbers of granulated mast cells in areas of basement membrane degeneration	No such changes
	Increased vascularity	No such changes
	Increased PAS-positive basement membrane thickness	No such changes
Malignant transformation rate	0-2% (0 cases in 65 patients) <sup>[20]</sup>	2.7% (3 cases in 111 patients) <sup>[20]</sup>
PAS: Periodic acid-schiff, OLP: Oral lichen planus, OLL: Oral lichenoid lesions		

## Conclusion

Lichen planus (LP) is a mucocutaneous disease with well-established clinical and microscopic features. The oral mucosa and skin may present clinical and microscopic alterations similar to those observed in LP, called lichenoid reactions (LRs), which are triggered by systemic or topical etiological agents. Differentiation between the two diseases allows an effective and correct therapeutic approach. Clinically and histologically, LP and lichenoid reactions cannot be distinguished with certainty in many cases. Treatment is mainly symptomatic and can be difficult. The first-line therapies for LP are topical or systemic corticosteroids; however, some studies have mentioned acitretin leading to similar improvement. Medical treatment, together with patient education and psychosocial support, can significantly benefit patients' quality of life.

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# Evaluation of the microbial contamination of Indian currency notes and coins - A pilot study

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## ABSTRACT

Indian currency notes and coins of Chennai city were surveyed for microbial contamination. This study was carried out on 20 samples of notes and coins collected from different sectors and tested for Gram staining. Identification and characterization revealed the active participation of micro-organisms in the descending order of colony forming units/ml as slaughter houses with  $>300 \times 10^2$  cfu/ml, bus conductors  $36 \times 10^2$  cfu/ml, hospitals  $25 \times 10^2$  cfu/ml, hotels  $12 \times 10^2$  cfu/ml and banks  $12 \times 10^2$  cfu/ml. The study suggested that Indian paper currency were commonly contaminated with micro-organisms that may play a significant role in the transmission of various diseases, so great care should be taken care during handling of money and the preparation and handling of food to avoid cross-contamination.

**Key words:** Indian paper currency, Indian coins, microbial contamination, Staphylococcus.

## Introduction

Money is a crucial part of trade from ancient times, since its introduction in China approximately 1000 AD<sup>1</sup>. Transaction is assayed by using money as a measuring unit, as a medium for goods exchange and services, settlement of debts and for deferred payments in economic activities<sup>2</sup>. As exchangeable fomites, currency notes and coins are persistently subjected to microbial contamination. Handling of paper currencies and coins under unhygienic conditions could result in their contamination with various microbes, thus transforming them into prime multiplication media, constituting a major health hazard. Spread of communicable disease occurs through contact with fomites<sup>3,4</sup> which is of great importance in the health of many populations in developing countries.

In periodical transactions, money is handled by people of varying health and hygienic standards like in banks, hotels, slaughter houses, hospitals and buses<sup>5</sup>. Creases and pouches that are created in currency notes during folding, harbor micro-organisms, some of which remain in a quiescent period which later on find a suitable environment to grow and multiply.<sup>6,7</sup> When counting money many people tend to tongue-wet their fingers, thereby contaminating their fingers as well as currency notes. Also in slaughter houses, the meat sellers usually collect money from buyers with hands contaminated with blood and animal waste. This leads to the incidence of food related public health incidents by the simultaneous handling of food and money.

The contamination level and the strains of organisms on the currency alters based on the country, season, environmental factors, money type and material, local community flora, the population's general hygiene level and persons likely to be handling the money. Multiple studies have reported high rates of microbial contamination of currency notes and coins in circulation.<sup>8,9,10</sup> In an earlier study, potential pathogens like *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella* species, *Pseudomonas aeruginosa*, *Proteus mirabilis* were found to

contaminate 42% of money got from laboratory workers.<sup>11</sup> Fungi such as *Candida* species, *Aspergillus niger*, *Penicillium* species, *Rhizopus* species were also reported to be present in paper currency.<sup>5,12</sup> Though the bacteria isolated, varies in between studies, in general, gram positive organisms were the most predominant.

## Materials and Methods

### Source of sample

The currency notes and coins were collected from banks, hotels, slaughter houses, hospitals and butcher shops in Chennai city, after informed consent from willing volunteers.

### Sample collection

A total of 20 samples of denomination Rs.1 coin (C1,C2) and Rs.10 (N1,N2) currency note were collected (10 coins and 10 notes) from the various sources. The samples were collected aseptically by letting the individuals drop the paper currencies and coins into a Ziplock cover. They were promptly sealed. Notes or coins of same monetary value were offered in exchange. The polythene bags were immediately transported to laboratory of microbiology of Ragas Dental College and examined for bacterial contamination.

### Microbiological analysis

Swabs from currency notes and coins were inoculated into 1ml sterile BHIB (Brain Heart Infusion Broth) and incubated for 15minutes with vigorous shaking. With a 4mm inoculation loop, the inoculum from each sample was streaked onto BHIA (Brain Heart Infusion Agar) and the plates were incubated at 37°Celsius for 24 hrs. Gram's staining was done to identify the morphological characteristics of bacterial isolates. The counted colonies were expressed in colony forming units (cfu/ml).

### Statistical analysis

Descriptive statistical analysis has been used in this study.



## Results

Out of the 10 currency notes and 10 coins, 9 notes and 5 coins were found to be contaminated and that various morphological characteristics of bacteria were present on the surfaces of currency notes and coins used for transactions among different sectors. Table 1 showed that currency notes and coins were reservoir of bacteria. N1, C1, C2 of slaughter house have higher bacterial loads that constituted  $>300 \times 10^2$  cfu/ml Gram positive cocci cluster,  $57 \times 10^2$  cfu/ml Gram positive cocci chain and  $12 \times 10^2$  cfu/ml Gram positive cocci cluster respectively. Similarly, the money collected from bus conductor also had N2 containing  $32 \times 10^2$  cfu/ml Gram positive Cluster and Gram positive cocci pair of  $36 \times 10^2$  cfu/ml. In contrast, hospitals had only N1 of  $25 \times 10^2$  cfu/ml Gram positive cocci long bacilli. Out of 10 currency notes, eight has shown the presence of Gram positive cocci and one has shown the presence of Gram negative bacilli.

**Table 1: The Gram's character and the microscopic morphology of the contaminated currency notes with bacterial isolation ( $\times 10^2$  cfu/ml)**

Sample source	Sample No.	Sample type	Gram Positive Cocci cluster	Gram Positive Cocci chain	Gram Positive Cocci pair	Gram Positive Bacilli (Long)	Gram Positive Bacilli chain	Gram Negative Bacilli (Short)	Gram positive Bacilli chain with endospore
Slaughter house	1	N1	>300	0					
		C1	12	23					
	2	N2	0	16					
		C2	15	57					
Bus conductor	1	N1	2	0					
		C1	1	0					
	2	N2	32	0	36	0			
		C2	0	0	0	0			
Hospital	1	N1	0	0	0	25			
		C1	0	0	0	0			
	2	N2	0	0	0	0	0	0	
		C2	0	0	0	0	3	0	
Hotel	1	N1	0	0	0	0	0	12	
		C1	0	0	0	0	0	0	
	2	N2	11	0	0	0	0	0	
		C2	2	0	0	0	0	0	
Bank	1	N1	0	0	0	0	0	0	2
		C1	0	0	0	0	0	0	0
	2	N2	12	0	0	0	0	0	0
		C2	0	0	0	0	0	0	0

## Discussion

According to our study, currency notes showed greater contamination levels as compared to coins. Previous studies have explained this effect on the basis that currency notes offer larger surface area to microbes for attachment<sup>14,15</sup> when compared to coins. Various morphological characteristics of bacterial isolates were found to present in various sectors.<sup>16</sup> The higher concentration of micro-organisms in slaughter houses in this study was due to their way of exchanging money by simultaneously touching the meat and then exchanging the currency notes by the same people. In contrast, the hospital showed lower microbial loads probably indicating minimal circulation of lower denomination notes and that they are more likely to be conscious of safe personal hygiene. In a study by Pradeep NV et al. the concentration of bacteria was found to be high in butcher and municipal corporation samples when compared to bank samples.<sup>17</sup> Similarly, in a study conducted by Agarwal et al. the currency notes that were collected from beggars and slaughter houses were maximally contaminated.<sup>18</sup>

Certain pathogenic microorganisms thrive in the tropics which coupled with other factors like poor water and sanitary conditions, non-availability of good health services and poverty make the people become afflicted with infections and diseases.<sup>19</sup> The microorganisms implicated in currency contamination included members of the family Enterobacteriaceae, Mycobacterium tuberculosis, Vibrio cholerae, Bacillus species, Staphylococcus species, Micrococcus species and

Corynebacterium species. Most likely contaminants of paper money are environmental organisms such as Gram-positive flora (especially Bacillus species) and those arising from human normal skin flora such as Staphylococcus aureus. From the results, the predominant isolate could be Gram positive cocci (Staphylococcus aureus) in cluster.

To minimize the hazards that may arise from use of dirty and contaminated notes, currency notes should be disinfected and that paper money should be quarantined for 24 h before being re-circulated. The importance of basic hygiene in terms of frequent and thorough hand washing with soap and water especially before and after eating, after using the toilet, after handling paper money, before and after handling food and before and after visiting hospitals should be emphasized. These intervention measures need to be enforced to ensure safety from pathogens among paper money handlers. The limitation of this study is that smaller sample size may not demonstrate the clear picture and the results cannot be generalized.

## Conclusion

Thus, from the above fact it can be inferred that currency notes appeared to be more highly contaminated than coins which confirms that currency note provides a large surface area as a breeding ground for pathogens and might be a vector playing a significant role in the transmission of various diseases. Therefore, there is need for sensitization of the public on proper handling of currency notes that will reduce the transmission of pathogens.

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# Periodontal knowledge and awareness among South Indian medical professionals: A questionnaire based survey

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## ABSTRACT

To evaluate the knowledge and awareness about periodontal disease its etiology and its management among medical professional. Three hundred medical professionals including in the questionnaire based survey from government medical colleges and consultants in various specialities in private hospitals and clinics. Equal number of subjects in the medical profession included were interns, post graduates and consultants. The results from questionnaire based survey indicated that knowledge about periodontal terminologies was high among medical professionals. However mixed response was elicited regarding etiology, treatment and current trends in periodontal practice.

**Keywords:** awareness, medical personnel, periodontics

## Introduction

Periodontal disease is one of the common cause for tooth loss in urban and suburban population. Most of the people seek periodontal treatment at an advanced stage of disease<sup>[6]</sup> in which salvaging of natural tooth is one of the main course of treatment. To prevent unnecessary tooth loss and create an awareness among general population, it would be better if medical professionals had an awareness and knowledge<sup>[1]</sup> about the disease process. To achieve this, questionnaire based survey aims at evaluating periodontal awareness among medical professionals.

## Materials and Methods

Three hundred medical professionals out of which interns, post graduates, consultants were included in the survey. These medical professionals were randomly selected from various government medical colleges and also from private hospitals in Chennai.

The survey was conducted through a questionnaire based response to avoid bias in sample size, equal number of subjects were sampled. The subjects included 100 interns, 100 post graduates and 100 consultants.

The questionnaire in the survey were categorized into four major subjects:

- 1) Knowledge and awareness about periodontal terminologies<sup>[7]</sup> (ques1-3)
- 2) Role of multifactorial etiology<sup>[8]</sup> in periodontal disease (ques4-12)
- 3) Concepts about treatment<sup>[3]</sup> (ques13-17)
- 4) Current trends in periodontal practice<sup>[3]</sup> (ques18-26)

The obtained samples were pooled together and categorized into three groups and statistical analysis was performed by Pearson's Chi-square test<sup>[1]</sup>.

The questionnaire used for the survey is given in [Table 1]

**Table 1: Questionnaire Used for the Survey**

### DEFINITIONS:

- 1) Gingival recession is a) infolding of gingiva b) loss of gingiva
- 2) Halitosis is a) bad breath b) foul taste
- 3) Epulis means a) inflammation b) overgrowth of gingiva

## ETIOLOGY:

- 4) Do you think calculus (deposits) is the main cause of periodontal disease?
- 5) Can genetic factor be a contributing factor to periodontal disease despite good oral hygiene?
- 6) Are you aware that smoking leads to early tooth loss?
- 7) Do you know that periodontal disease is the 6th common complication of diabetes mellitus?
- 8) Gingival enlargement can be caused by a) deposits b) drugs c) hormonal changes
- 9) Can periodontal disease be a risk factor in certain systemic conditions?
- 10) Do you know that hard tooth brushing leads to tooth substance loss?
- 11) Can periodontal disease in pregnancy lead to preterm low birth weight delivery?
- 12) Do you think root exposure can cause hyper-sensitivity to hot and cold foods apart from dental caries?

## CONCEPTS ABOUT TREATMENT:

- 13) Do you think periodic visit to dentist is mandatory to prevent periodontal disease?
- 14) If yes, visits should be made in a) 2-3 months b) 6 months c) 12 months
- 15) Subgingival deposits can be removed by Surgical/ non-surgical therapy?
- 16) Do you think scaling can contribute to tooth substance loss?
- 17) Can acute gingival/ periodontal infections be treated by systemic antibiotics alone?

## AWARENESS ABOUT AVAILABILITY OF TREATMENT:

- 18) Can "smile design" be achieved by esthetic periodontal surgery?
- 19) Are you aware that systemic antibiotics can be delivered locally (subgingivally)?
- 20) Can mobility of tooth be treated?
- 21) Are you aware that Plastic surgery, Microsurgery and LASER's have made their way into dentistry?



- 22) Can bone grafts be used for regeneration of alveolar bone?  
 23) Can platelet rich plasma and platelet rich fibrin be used for regenerative therapy for periodontal disease?  
 24) Are you aware that Host Modulation Therapy is used in treatment of periodontal disease?  
 25) Are you aware that stem cells from human exfoliative deciduous tooth can produce blood cells and nerve cells?  
 26) Are you aware that dental implants are used for replacing lost tooth?

## Results

**Table 2: knowledge and awareness about periodontal terminologies among medical professionals**

Terminologies	Interns (N=100)	Postgraduates (N=100)	Consultants (N=100)	p value <0.05
Gingival recession is loss of gingival	86	99	99	.000
Halitosis is bad breath	98	100	100	.134 (NS)
Epulis is gingival overgrowth	93	100	100	.000

\*p value < 0.05 is statistically significant

**Table 3: Role of multifactorial etiology in periodontal disease**

Etiology	Interns (N=100)	Postgraduates (N=100)	Consultants (N=100)	p value < 0.05
Calculus	84	93	98	.001
Genes	75	89	89	.007
Smoking	91	89	99	.014
Diabetes mellitus	74	78	90	.012
Gingival enlargement caused by drugs	48	64	76	.002
Risk factor in systemic condition	79	76	84	.365 (NS)
Hard tooth brushing	57	58	68	.211 (NS)
PLBW	24	46	52	.000
Hypersensitivity due to root exposure	70	76	89	.004

\*p value < 0.05 is statistically significant

**Table 4: Concepts about treatment**

Concepts about treatment	Interns (N=100)	Postgraduates (N=100)	Consultants (N=100)	P value < 0.05
Periodic dental visits mandatory	100	100	100	Constant
Dental visits once in 6 months	40	69	83	.000
Subgingival deposits removed surgically	39	70	75	.000
Scaling leads to tooth substance loss	26	58	74	.000
Acute infections not treated by systemic antibiotics alone	68	62	70	.458

\*p value < 0.05 is statistically significant

**Table 5: Current trends in periodontal practice**

Availability of treatment methods	Interns (N=100)	Postgraduates (N=100)	Consultants (N=100)	p value < 0.05
Smile design	70	73	79	.336 (NS)
Local delivery of systemic antibiotics	40	40	53	.102 (NS)
Tooth mobility treated	74	68	77	.345 (NS)
Plastic surgery, microsurgery, LASER's used in dentistry	26	54	56	.000
Bone grafts regenerates alveolar bone	46	77	82	.000
Regeneration of alveolar bone by PRP, PRF	13	45	62	.000
HMT	32	52	53	.003
Stem cells from SHED	29	58	83	.000
Implants replaces lost tooth	65	77	92	.000

\*p value < 0.05 is statistically significant

## Discussion

The present survey among the medical professionals in terms of terminologies<sup>[7]</sup> about periodontal disease was outstanding. Majority of the participants were able to recognize [Table 2].

In terms of etiology and pathogenesis<sup>[4][8][9]</sup> of periodontal disease majority of healthcare professionals believed that calculus is the main etiological agent for initiating periodontal disease. And 253 respondents believed that genes do have contributing factor in periodontal disease process [Table 3].

In terms of risk modifiers and risk indicators, majority believed that smoking had deleterious effects on periodontal tissues and that can contribute to early tooth loss [Table 3].

Periodontal disease is a two way relationship as far as systemic health<sup>[4]</sup> is concerned. Looking at the knowledge as far as systemic health is concerned, majority of individuals believed that Diabetes mellitus is the 6th complication as periodontal disease is concerned. But considering other systemic diseases as a risk factor of periodontal disease is not statistically significant [Table 3].

Medical professionals believed that gingival hyperplasia was induced by drugs rather than other factors contributing to gingival hyperplasia<sup>[9]</sup>. Other few individuals believed that factors like hormonal changes, deposits also contribute to gingival hyperplasia. Awareness is also high about occurrence of dentinal hypersensitivity<sup>[3]</sup> to hot and cold foods in case of root exposure [Table 3].

Medical professionals believed that long term periodontal health was achieved by periodic recall and maintenance. There was a difference in opinion regarding frequency of dental visits.

Advanced periodontal care for periodontally compromised patients was seemed to be mandatory treatment protocol. 184 of medical professionals from present survey indicated that surgical approach<sup>[5]</sup> for removal of subgingival deposits is a better treatment option [Table 4].

Among present subject group, there was misconception that routine scaling could cause removal of tooth substance was proportionally high. In tooth mobility due to periodontal disease, most of the practitioners believed that extraction<sup>[2]</sup> is the main treatment option [Table 4] and [Table 5].

200 professionals agreed that acute gingival and periodontal disease called for additional treatment, apart from systemic antibiotic intake. Only 133 of the professionals surveyed were aware about local delivery of systemic antibiotics, hence it is statistically insignificant [Table 4] and [Table 5].

Knowledge about achieving a good smile by periodontal treatment was statistically insignificant among medical professionals [Table 5].

About current trends in periodontal practice, the overall awareness among medical professionals was higher regarding various treatment modalities.

When questioned about plastic surgery, microsurgery and LASER's<sup>[5]</sup> in dentistry, 136 of the professionals aware that these treatment modalities could be used in dentistry [Table 5].

Awareness about regenerative periodontal therapy aided by bone grafts and biological mediators<sup>[2]</sup> was comparatively low among the interns [Table 5].

137 of the professionals were aware that host modulation therapy<sup>[8]</sup> can be used as an adjunct in preventing progression of periodontal disease. Awareness about stem cells used to regenerate lost periodontal tissue was higher among consultants [Table 5].

Dental implants used for replacement of lost tooth was well accepted as a treatment modality among the healthcare professional groups [Table 5].

## Conclusion

Within the present scope of study, the result of the above study indicated that there was good amount of knowledge and awareness among healthcare professional groups. But certain voids in periodontal practice needs to be addressed.

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# Duration of Trailer Time related to use of Tobacco and Alcohol related products in Tamil Movies released in 2015

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## ABSTRACT

**AIM:** This study was aimed to access the duration of trailer time related to use of tobacco and alcohol products in Tamil movies released in 2015. **METHOD:** The total movies released in 2015 were accessed from www.prokerala.com and www.Wikipedia.com. The total numbers of movies released were 192 and the trailers were watched by 4 investigators. The movies trailers were categorized into those with or without scenes depicting onscreen use of tobacco and alcohol products. The former were further divided into one which did not have statutory warning and other one which had statutory warning. The total time duration of scenes which had tobacco & alcohol related products were recorded. **RESULT:** Among 192 trailers, 28 trailers (14.58%) depicted the use of tobacco or alcohol related products. In these 28 trailers, 18 trailers (9.37%) had statutory warning whereas 10 trailers (5.20%) had no statutory warning. **CONCLUSION:** Among 192 movies released in 2015, about 14.5% of the film trailers depicted the use of tobacco or alcohol products. Among these 9.37% trailer displayed statutory warnings and 5.2% were without statutory warning which is in contradiction to the Cigarettes and Other Tobacco Products Act.

**KEYWORDS:** Statutory warnings, Movie trailers, Cigarettes and Other Tobacco Products Act.

## Introduction

Exposure to mass media may impact the use of tobacco, a major source of illness and death in India. At the same time, research has shown that mass media can be successful in discouraging all forms of tobacco use<sup>1</sup>. Initial research in India showed that specific media content such as media advertising is associated with higher smoking rates and exposure to cigarette brand names or actors smoking on television have been found to be related to increased youth smoking in India<sup>2</sup>. Despite dissemination and availability of the WHO- Framework Convention on Tobacco Control recommendations on smoking cessation and treatment of tobacco dependence, few countries had taken sufficient action. The Surgeon General report in the year 2012, concluded that exposure to onscreen smoking in movies causes young people to start smoking and exposure to these made the viewer's attitude and beliefs about smoking and smokers more favourable.<sup>3</sup>

When tobacco is glamorized in movies, it provides a powerful message that tobacco use is an appropriate and desirable activity. Warning label is required when actors and actresses light up a smoke or use of alcohol is depicted. What the young person sees is someone he or she looks up to, living a life that he or she would like to live and doing it by using tobacco<sup>4</sup>.

Before 2012, movies and television channels in India carried no health warnings, about tobacco. But nowadays regardless of the language and contents, anti-smoking messages are displayed before, during and after the broadcast<sup>5</sup>. The reason for this being the federal law passed in the year 2011, mandating that all films that show even one scene including oral or smoking should carry health messages at the beginning and in the middle. They must also display prominent anti-tobacco messages at the bottom of the screen for the duration of the segment<sup>6</sup>.

With this background this study was contemplated to assess the duration of trailer time related to use of tobacco and alcohol related products in Tamil movies in 2015.

## Materials and Methods

The permission to conduct the study was obtained by the institutional review board of Ragas Dental College and hospital. The databases of the Tamil movies released in the year 2015 were assessed from the websites such as www.prokerala.com and www.wikipedia.com during March 2016. After obtaining a list of all the Tamil movies, the official trailers for each movie were accessed and viewed from www.youtube.com. The trailers were thoroughly viewed and the movies were divided into two categories such as trailer with scenes related to use of tobacco and alcohol products. The trailers which depicted use of tobacco and alcohol products were further divided into two groups such as those with the warnings displayed and no warnings displayed. The total duration of the trailers were recorded and the duration of the smoking scenes were also recorded in seconds.

## Results

The total number of Tamil movies released in the year 2015 was 192 with the mean trailer duration of 115.8 seconds. Out of the total movie released, the movies which had no scenes related to use of tobacco and alcohol products in the trailers were about 164 (73.2%) and the trailers which had use of tobacco and alcohol products scenes were 28 (14.5%). The movies which had statutory warning in the trailers were 18 (64.3%) and movies which had no statutory warnings were 10 (35.7%).

Total trailer time for the 28 movies which had use of tobacco and alcohol products depicted was 3661.84 seconds and the total time of the appearance of on scenes in these trailer were 163.84 indicating 4.47% of total time was used to display scenes related to use of tobacco and alcohol products. Among the trailers which depicted smoking only 18 trailers had statutory warning of total time 106 seconds. This indicates about 5.88% time was allotted for the warning along with the display of the smoking scenes. The movies according to their release time in the year were grouped as Group 1 containing movies released during the time period from January to April, Group 2 from time period May to august and Group 3 in the time period from September to December.

The total number of movies which included scenes related to use of tobacco and alcohol products in trailers in group 1 were about 11 in which 7 movies had statutory warning and 4 did not any warnings. The numbers of movies in group 2 were 10, which included 5 with statutory warnings and 5 without warnings. In group 3 there were total of 7 movies among which 6 were with warnings and 1 were without any warnings displayed.

**Table: 1 Distribution based on Duration of use of Tobacco and Alcohol products among Tamil Movie Trailers in 2015**

Total no. of Trailers released in 2015		Total no. of Movie Trailers with Tobacco and Alcohol products with statutory warning		Duration of Tobacco and Alcohol products scenes with statutory warning	Movie Trailers with Tobacco and Alcohol products scenes without statutory warning		Duration of Tobacco and Alcohol products scenes without statutory warning
Number	Seconds	Number	Seconds	Seconds	Number	Seconds	Seconds
192 (100%)	22236	18 (9.37%)	2413	106	10 (5.20%)	1249	58

## Discussion

Among the Indian population nearly 250 million tobacco users, Cigarette users comprise just 14% of the total tobacco using population, the rest being the other tobacco products. This presents a big opportunity for cigarette manufacturers who are increasingly looking at youth to grow their sales. The Indian government has recognized the harm that is caused by tobacco and has prohibited tobacco manufacturers from advertising tobacco products on television and imposed a partial ban on advertising on print. So the strategies generally adopted are surrogate brand extension, outdoor, events sponsorships and cinema.

Research studies and surveys have documented the volume of smoking and related product placements in movies and how exposure to this imagery increases smoking levels among the youth.<sup>7</sup> The WHO has also stated to rate movies as R rated movies, that portray tobacco use in a bid to prevent children and adolescents from starting to smoke cigarettes and use other forms of tobacco.<sup>8</sup>

A review of 275 Hindi films and 60 Tamil and 60 Telugu films was done from the year 1996-2002. They found tobacco portrayal is prevalent in 76% of the films. Cigarette incidents account for 85% of all tobacco incidents in 2002, which is very high compared to 1991.<sup>11</sup> There was tremendous decrease in this after the law passed by the Ministry of Health and Family welfare in the year 2011 which stated all new films and television programmes have to submit "strong editorial justification" to the censors, the Central Board of Film Certification, to depict smoking at all, and such films are automatically classified UA, which means that children cannot watch them in the cinema without adult supervision.<sup>5</sup>

A recently published study found that the Bollywood film industry, the largest in India, delivered some 14.3 billion images of tobacco use to its audience, nearly 15 times the number estimated to be presented by Hollywood films to UK audiences.<sup>9</sup> In our study among the Tamil movies released in the year 2015 we found about 164 of the 192 movies released had no smoking scenes. There were about 28 movies which had scenes related to use of tobacco and alcohol products in the trailers. The general mood in India is that films and film stars glorify smoking and other forms of tobacco use, and that this has an adverse effect on impressionable minds, which explains why these government measures enjoy widespread public support.<sup>10</sup>

In a study by Heatherton TF, 2009 reported that on-screen smoking is only 1 to 2 minutes, on average, per film. In our study we found average time of smoking scenes in the movies to be around 130.78 seconds which is approximately 2 minutes. Heatherton TF also stated that the exposure preceded the behavior nearly, 20% of those in the highest-exposure quartile tried smoking compared to only 3% in the lowest-exposure quartile.<sup>12</sup>

Another study done by Shmueli D, et al 2010, reported that there is a direct link between viewing smoking scenes and immediate subsequent smoking behavior.<sup>13</sup> Our study findings showed that about 163.84 seconds of the total 3661.84 seconds were the depiction of smoking scenes in the trailers indicating 4.47% of total time was used to display smoking scenes. This would indicate high amount of people watching the same and might be influenced by it according to the above study. There is a need of further research to assess the influence of this duration of smoking scenes in trailer in Tamil movies.

There are various Governmental bans to use tobacco and alcohol related products on screens which have resulted in the reductions of the usage of same from the past. Still there is need to impose strict bans regarding the usage and further research to indicate the strong influence of the same to promote or initiate smoking the young ones. Smoking in the movies should be monitored just as we would monitor any environmental exposure that adversely affects health. Various studies have provided a validated metric to determine this effect and progress should be made in reducing depictions or completely remove the depiction of smoking by the entertainment industry.

## Conclusion

Among 192 movies released in 2015, about 14.5% of the film trailers depicted the use of tobacco alcohol products. Among these 9.37% trailer displayed statutory warnings and 5.2% were without statutory warning which is in contradiction to the Cigarettes and Other Tobacco Products Act. About 163.84(4.47%) seconds of the total 3661.84 seconds of trailers had smoking scenes. Among this about 106 seconds of the smoking trailers had statutory warnings indicating the rest without any warnings. It was also found that movies released in the first two quarters of the years had more smoking scenes and warnings than the rest of the year.



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# “To Give or Not To Give” – A Comparative Study of Pre-operative Medications as Adjuvants to Local Anaesthetic Effect during Pulp

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## ABSTRACT

**Aim:** The aim of this study is to compare the effects of different medications administered to children regularly and to identify whether these medications reduce the sensation of pain during access opening and extirpation of pulp. **Method:** 100 children between the ages of 6 to 11 years needing pulp therapy were selected and randomly divided into five groups group 1 -Paracetamol + Ibuprofen combination, group 2 - Menfenamic acid - 100mg/250 mg, group 3 - Antibiotic - amoxicillin 125 mg/250mg, group 4 – h folic acid acting as a positive control, group 5 - no medication as a negative control. Medication was administered 30 minutes before procedure. The visual analogue scale was used to score the perception of pain. **Results:** interestingly, the group who were not administered any medication showed significantly less experience of pain on access opening followed by the group who were administered mefenamic acid (P value >0.020). **Conclusion:** The findings suggest that in children, unlike in adults, the non-pharmacological means of reducing anxiety would be more effective rather than pharmacological reduction of pain.

## Introduction

Pain is a highly complex and multidimensional phenomenon which attracts attention, regardless of real or apparent tissue damage forcing one to take action in relieving or alleviating its presence.

As Pedodontists our primary aim is to provide painless and comfortable treatments to children. Dental caries involving the pulp is a common occurrence in the pediatric population, necessitating pulp therapy in them. In today's busy and fast paced work environment there are often times when we cannot attend to a child in pain immediately. As a solution some of us prescribe analgesics and antibiotics prior to pulp therapy in the belief that it will reduce the discomfort of pulp therapy. There is a sizable literature available with regard to the use of analgesic as both preoperative and post-operative medication in adults but there is limited literature to identify this in children.

Lack of profound anesthesia in teeth with inflamed pulp is a well know clinical fact. Prophylactic administration of acetaminophen or a non-steroidal anti-inflammatory drug like ibuprofen has been shown to reduce or prevent postoperative dental pain (Hargreaves KM, Hutter JW. Endodontic pharmacology: pain management strategies. Pathways of pulp 2002)

“To Give or Not to Give” – pre operative medication to children is a question that haunts Pedodontists everyday. Is the giving of pre operative medication justified in children or is it a myth where by we take an effective treatment in adult and adopt it in children.

The aim of this study is to compare the effects of different medication administered to children regularly and to identify whether these medication reduce the sensation of pain during access opening and extirpation of pulp.

## Materials and Methods

### Patient selection:-

- 100 children between the ages of 6 to 11 years reporting to the Dept of Pedodontics and Preventive dentistry with one or more carious teeth requiring pulp therapy.
- Pre operative behavioural assessment was done on the patients using the Frankl behavioural scale. Only the children who demonstrated positive or definitely positive behaviour in the pre-treatment evaluation were included.
- All parents were informed about the treatments and treatment procedures and an informed consent was obtained.
- Patient should be free of any systemic conditions.
- Patient should show no contraindications to NSAIDs or Local Anaesthesia.
- Child should not be under any sort of medications except for the prescribed medications for treatment one week prior to the study.
- Child should be indicated to undergo pulp therapy in either vital primary or permanent molars. Teeth were selected for pulp therapy on the basis of clinical and radiographic findings.

### Operator:-

- Medication was administered by a single operator.
- The operator performing the pulp therapy was blinded to the medication administered.

### Medications used:

- Paracetamol + Ibuprofen combination (IBUCLIN JR/ COMBIFLAM)
- Menfenamic acid - 100mg/250 mg (Meftal/Meftalp)
- Antibiotic - amoxicillin 125 mg/250 mg (MOX)
- Folic acid tablets as a placebo (FOLVITE)

### Groups:

The patients were randomly divided into 5 groups according to the medication administered.

- Group 1 - IBUCLIN JR/ COMBIFLAM
- Group 2 - Meftal 250 mg/ Meftal kid



- Group 3 – Antibiotic + Analgesic administered upto a week prior to treatment (Tab Mox 250mg/ Tab Mox Kid 125mg + Combiflam/Ibuclin Jr)
- Group 4 – Folic acid tablets, as placebo
- Group 5 – no medication administered

### Clinical Procedure

Diagnosis of irreversible pulpitis was confirmed in all the patients by corroborating clinical and radiographic findings.

100 children were randomly divided into 5 groups. There were 20 children in each group. In groups 1, 2 and 4 the children were given the medication half an hour before treatment.

Each operator was given a questionnaire and explained the visual analogue scale which had been used to grade the pain felt by the child.

After half an hour, topical anesthetic gel (5% lidocaine) on a cotton roll was applied to the injection site. This was followed by the injection of the Local anesthesia. To check if adequate anesthesia had occurred soft tissue signs were confirmed.

The pulp therapy procedure was performed with a rubber dam isolating the working field. Access opening was done. The pulp chamber was deroofed. The operator was asked to score the pain experience of the child using the visual analogue scale. The scale used to measure pain was the revised Wong-Baker facial image pain scale.

The self-reporting pain experience of the children was measured using the facial image pain scale after access opening and then again after pulp extirpation. Following which treatment was completed.

If for any reason local anesthesia was not successful the child was recalled and the procedure was repeated.

### Results

100 patients, 48 boys and 52 girls, aged between 6 to 11 years participated. Each group comprised 20 patients each. Group1 were administered either ibuclin JR (combination of paracetamol and ibuprofen) or combiflam based on age and body weight of the child. Group2 were administered mefenamic acid, Group 3 were administered both antibiotics and analgesic (amoxicillin + ibuclin JR). Group 4 were administered the placebo and Group5 were not given any medication.

On access opening across all groups

52 children – scored 0  
29 children – scored 2  
12 children – scored 4  
4 children – scored 8  
3 children – scored 10

52 children had no pain on access opening. 81 children scored 2 or less indicative of having experienced hardly any pain. Most of these children were in group 5 (no medication) followed by group 2 (mefenamic acid). This difference was statistically different at a significance of 5% level with a P-value of 0.020

		On access opening
Medication used	MEAN	SD
Ibuprofen +combiflam	2.90	3.14
Mefenamic Acid	1.40	2.35
Antibiotic+analgesic	1.30	1.34
Folic acid	2.10	2.63
No medication	0.70	1.87

On extirpation of pulp across all groups

45 children – scored 0  
40 children – scored 2  
10 children – scored 4  
3 children – scored 6  
1 child – scored 8  
1 child – scored 10

On extirpation of pulp 45 children experienced no pain and 85 children scored below 2. None of the groups showed any statistical significance a larger no of children in the mefenamic acid group showed lower scores on extirpation of pulp followed by the antibiotic + analgesic group.

		On extirpation of pulp
Medications used	MEAN	SD
Ibuprofen+combiflam	2.10	2.55
Mefenamic acid	1.10	1.37
Antibiotic + analgesic	1.10	1.37
Folic acid	2.30	1.75
No medication	1.20	1.88

### Discussion

Alleviating pain is of utmost importance when treating dental patients, as it has far reaching effects for both the patient and the clinician alike.

Anesthetizing mandibular teeth with an inferior alveolar nerve block has been regarded as one of the most technically difficult local anesthesia injections. In the absence of pulpal or periapical pathosis, inferior alveolar nerve block provides clinically adequate anesthesia for restorative dentistry 85 to 90% of the time. However, in cases of irreversible pulpitis, the rate of success is greatly reduced; reportedly as low as 20%.

It has been suggested that inflammation and infection lower tissue pH altering the ability of local anesthetic to provide clinically adequate pain control (Malamed SF, Handbook of local anesthesia, 1997). Various studies have concluded that there are several reasons for this failure in healthy or inflamed pulp. The reasons include pulpitis anatomic differences, concentration of anesthetic agent, volume of anesthetic solution, patient's level of anxiety and a patient's past history with successful anesthesia. These articles have concluded that local anesthetics are less effective for inflamed pulp, with failure rates at 30 to 80 %. It has been suggested that if pulpal inflammation can be reduced before anesthesia delivery, local anesthesia might be more successful.

O'Keefe (1976) showed a significant relationship in endodontic patients between pre-operative, operative and post-operative pain levels. Patients presenting with extreme pre-operative discomfort were more likely to have the same degree of discomfort both operatively and postoperatively.

The aim of this study was to see whether the administration of premedication in children had any effect on their perception of pain operatively or are there other factors which dictate a child's perception of pain.

The recording of pain is difficult, especially in children, and the accuracy of recording pain can be challenged because of the subjective and personal nature of pain. Numerous pain recording devices exist, including biological measurements, behavioural observation and self-report.

Self report is considered to be the most accurate method of recording pain as pain perception varies in individuals. Visual analogue scales are the easiest for children to use and have been shown to be employed successfully when testing for the effects of analgesia. O' Donnell et al (2007) conducted a pilot study of 3 visual analogue scales to determine which was the easiest. They were the Wong and Baker Pain Scale, the Barts and the London Paediatric Pain Ladder and a Colour Intensity Ladder. The WBPS was chosen as being the easiest by almost 85%.

The use of ibuprofen as well as other NSAID in managing pain in patients with endodontic problems has been shown to be effective. A limitation of this drug however is what has been referred to as the 'ceiling effect' (Desjardins & Cooper 1998). Despite administration of an increased dosage the patient may not experience sufficient relief. Supplementing the initial dosage with a second drug that acts in an alternative manner may allow sufficient analgesia. Another commonly used analgesic to control dental pain is acetaminophen. It is a weak inhibitor of peripheral prostaglandin synthesis and it is active in the central nervous system. This is the action via which it causes inhibition of central analgesia induced by pain producing neurotransmitters.

The analgesics prescribed by dentists in India commonly, been seen to be either a combination of paracetamol and ibuprofen or mefenamic acid. This is the reason why these drugs were included in the study due to their easy availability and their known analgesic effect.

As observed in the results obtained almost 70 – 80 % of children scored above 2 meaning they either didn't feel any pain or even if they did it was very mild that it did not cause them any form of discomfort. Another element of contradiction in the results were that children who were not given any medication showed the lowest scores i.e. least amount of discomfort irrespective of their age this was followed by those children who were administered mefenamic acid.

Staci R Ianaro et al in 2007 have stated that the administration of premedication with acetaminophen or a combination of acetaminophen and ibuprofen on the success of inferior alveolar nerve block for teeth with irreversible pulpitis appears promising although there is no statistically significant difference versus the placebo.

These results show that unlike in adults, in children the perception of pain or discomfort operatively is not dependent much on the medication administered to them but depended more on the behavior management adopted by the pedodontist to decrease the child's anxiety levels.

In children it has been observed that it is the local anaesthetic injection that produces pain and anxiety in them (Asarch T et al,1999). Thus there have been continual efforts to search for techniques that make injections less painful. Some of these techniques have been behavioral modulations, such as reframing and using distraction and suggestions.

There is a strong relationship between a child's dental anxiety and a successful dental treatment (Wright GZ, 2000) and also between anxiety and pain. Painful dental operations cause fear, whereas fear and anxiety increases the amount of perceived pain. Factors other than tissue damage that have been suggested to affect or have involvement in the experience of pain include emotion, previous painful experiences, pre-existing dental pain, anxiety, gender and age. (Primosch RE, Nichols DI, Courts FS J Dent Child 1996; Seymour R, Meechan J, Blair G Br J Oral Maxillofac Surg 1985).

Therefore another reason why in this study most children may have shown lower scores are because most of the participants were rated 3 or 4 on the Frankl scale. Out of 100 children only 2 showed scores of 8 and only one child showed a score of 10 on the Wong and Baker Pain Scale. These children become uncooperative after the administration of local anesthesia thus making them more anxious. Thus they may have felt more pain than the majority of children due to their increased anxiety levels and preconceived idea of dental treatment. To understand this better the children anxiety levels showed also have been analysed and score.

Visual analogue scales are the easiest in children to use and are shown to be employed successfully when testing for the effects of analgesia. (Beyer et al,1990). The chosen scale was used in the study for its simplicity in understanding it in children as young as 5 years. Though the scale used has been proven to be effective, it has its own limitations through the various age groups who used it thereby giving a varied interpretation. As the understanding of the scale, is dependent on the patience of the dentist in explaining the scale properly. In our case the scale had to be translated into the local language for a better understanding by the child. Some amount of clarity may have been lost in translation. Also the children found it difficult to differentiate between scores 6, 8 and 10 due to similar pictures and almost similar description which may be a challenge for the child to differentiate.

Therefore a conclusion from this study is that anxiety plays the most important role in the perception of pain in children. Therefore we should be cautious in administering medication whether analgesics or antibiotics to children until absolutely necessary. Instead we should understand

the concept of non-pharmacological management of pain in children and spend a few earnest minutes to remove all preconceived fear in children. In this way we will be able to increase our efficiency in treating children.

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