

JOURNAL OF ROYAL DENTAL COLLEGE

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2020



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JOURNAL OF ROYAL DENTAL COLLEGE

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JRDC
Vol.4, Issue 1,
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Compiled, Edited and Published by:

RECl ine

RESEARCH - EVIDENCE – CLINICAL

An exclusive integrated curriculum program
Royal Dental College, Palakkad, Kerala, India



ROYAL DENTAL COLLEGE

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Journal of Royal Dental College (JRDC) is the official scientific publication of Royal Dental College published exclusively by Forum for Advanced Studies and Continuing Education Program in the past. It has published 3 volumes of institutional journal. It is an annual peer-reviewed institutional journal publishing high quality articles in the field of Dentistry. The journal's full text is available online in college website. The journal allows free access to its contents and permits authors to self-archive final accepted version of the articles.

With the introduction of REcline, an exclusive integrated curriculum program at Royal Dental College, Palakkad, Kerala, India; focused on under graduate training program, the few editions of the Journal of Royal Dental College have been borrowed from Forum for Advanced Studies and Continuing Education Program (FASCEP) to issue special editions of UG research papers. This edition is such a special edition of JRDC having included only the UG research projects. The sole purpose of this journal would be to promote research activities among UG students of Royal Dental College.

Scope of this special edition journal of JRDC:

The special edition of Journal of Royal Dental College (JRDC Vol.4, Issue 1, July 2021) is completely devoted to publish the research projects carried out by the under graduate students of Royal Dental College, Palakkad.

Its goal is to create a research atmosphere in the training curriculum of dentistry among the dental science subjects, especially the basic science subjects. This edition intentionally aimed at instilling a research attitude among the under graduate students of RDC, which would enable them in learning dental profession in a critical evaluation method.

REcline

RESEARCH - EVIDENCE – CLINICAL

AN EXCLUSIVE INTEGRATED CURRICULUM PROGRAM

ROYAL DENTAL COLLEGE, PALAKKAD, KERALA

Dentistry is a fast-growing speciality owing to the enormous material science research happening in it and to meet with the diversified demands of patients. It is not possible to alter and update the dental college syllabus to incorporate every development that happen in this speciality from time to time. Moreover, it is not an easy task to train a dental college student with the recent developments in the science. Thus, it is often seen that the current syllabus that colleges follow lies far below from the contemporary dentistry in practice.

Royal dental college has always been meticulous in teaching its students the recent advances in dentistry through the vibrant professional enrichment programs and workshops. But such attempts seldom attain its ethical aim if the students are not taught to differentiate between the righteous of newly introduced techniques over the older ones. In this fast world of everchanging techniques, materials, equipments and practice controlled by the marketing world, creating a research attitude among students is the only way to make them choose the harmless and right path of medical practice beneficial to their patients.

Understanding this importance of creating a critical evaluatory thinking, the curriculum committee of Royal dental college decided to introduce a research-based curriculum exclusively for our college which would make every student develop a research attitude of believing things over their experience alone, not misguided by any other external influences.

This curriculum was named REcline shortened from the words of Research, Evidence and clinical, it was aimed at making every student do a research project on the subjects they study each year and to feel the evidence of its research conclusion achieved and to understand its clinical implication. This exclusive integrated curriculum program was Introduced in January 15th 2020.

It was initially introduced encouraging advanced learners of each BDS years to take up ordinary research projects and accomplish it and submit it as a research paper. Within a short span, REcline was completely accepted by the whole undergraduate students and today REcline is an exceptional practice of Royal dental college.

The project is today widely accepted as our institutional exceptional practice for all the activities it conducts in college especially bringing in 100 % undergraduate students of Royal Dental College is a part of a basic to advanced scientific research project in the college. The primary aim of this special edition of JRDC is to bring into light the research interests of RDC under graduate students, creating a research atmosphere in college.

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Today's article - Tomorrow's reference!!!

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Warm wishes to all readers of JRDC

There exists only a relative demarcation between past, present and future. Unless found worthy, no information gathered in past is carried to future. Authentic literature in medical science was a feeble database till recently, with few standard text books and journals monopolizing the review of literature world. Having a direct access to numerous search engines, online libraries and even through common social media network any one can update the recent developments in his interests, whether it is aimed at learning, training or guidance.

Having free access to any information for everyone may be a serious threat to medical literature. The only way to get access to right information is following the journals that pays true attention in selecting and publishing the most authentic articles scrutinized under their standard regulations. Getting an article published in such journals is an honor to any person who writes a worthy article. It is a great matter of fact that an article published today written, with past references of literature, is always an

article of reference for someone tomorrow. The best article is the one which become a reference of many such works in future.

RECLine is a novel project of Royal dental college that started with an aim of understanding the need to create a researcher inside the student as he learn a skill based profession like dentistry. The project promoted in making every student be interested in learning things out of their own experience. Here, students were given several scientific projects which they could perform of their own, experience the outcome as its experience and later integrate the experience in their clinical practice. This not alone helped a student in understanding the way dentistry developed in the past and transformed to what it is today, it also helped them in understanding the importance of one doing own original work to become a reference for someone tomorrow.

The article published here are all original works of a student of this college which once published become a reference work of some one tomorrow.

To identify various organisms present within mouth ulcers.



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INTRODUCTION

The oral cavity is colonized by wide range of micro organisms which may be harmless or harmful to respective individuals based on the level of immunity. Recurrent oral ulceration is a common condition , experienced by most of the people which causes transient soreness and consequently may lead to prolonged ulceration in the mouth, It causes difficulty.

Many patients with recurrent oral ulceration maintain a good health but some may have pre-existing medical problems which may be of relevance that includes anaemia, blood dyscrasias, autoimmune disease and diabetes. The medical history will include ascertaining

medication taken by the patient. "Ulcer is a complete breach of the epithelium", this becomes covered by fibrin slough and it appears to be a yellow /white lesion surrounded by erythema . It is more common in women than men of 10 to 40 years of age. Mouth ulcer is more common in individuals who are under the pressure of physical or emotional stress for example: during exams, also occurs due to Trauma during dental procedure , aggressive tooth cleaning, eating more spicy food, biting of tongue or cheek accidentally , due to deficiency of vitamin B12 or folic acid , due to some hormonal changes andin eating and speaking.sodium lauryl sulfate found in toothpaste also causes ulceration. Prolonged ulceration may leads to aphthous ulcer.

Aphthous ulcer are canker sores occurring in the mucous membrane of the mouth including gums, tongue and throat which may vary insize from 1-2mm to 1cm. It will be very painful , open mouth sores are in white or yellow colour with bright red surrounding area. It occurs in individuals of poor immune system

Selection of Patients

The study was conducted in the Department of Microbiology. A total of 10 samples were collected from mouth ulceration in outpatients royal dental college .The patients

Conflict of Interest: None declared

Source of Support: Nil

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presented with pain in the ulcer and redness of the surrounding area of the ulcer. They were registered at the General out patients department and their personal records: name, age, sex, and other relevant information were taken.

Collection of Samples

The patients were informed about the project and the swabs were taken with their consent. Mouth ulcer swabs were collected aseptically by a sterile swabs. The samples were sent to the Microbiology Laboratory immediately after collection of sample for analysis. Swabs were collected aseptically using sterile Evepon swab sticks. All the specimens collected were properly labelled with patient's number and date.

Examination of Samples

Ulcer swabs collected from mouth of the selected patients were examined microbiologically using culture technique and direct microscopy as describedby Cruickshank et al., (1985) and Chesbrough (1998).

ALBERT STAINING

Special stains have been developed over time for identifying bacteria species, differentiating them morphologically, and

even characterizing there very special features. The most common stain being Gram Staining, Acid-fast staining, endospore staining.

Albert stain is no different. Its application aim at identifying bacteria that contain special structures known as metachromatic granules. Albert stain distinctly identifies metachromatic granules that are found in *Corynebacterium diphtheriae*.

Corynebacteria are gram-positive, non-spore forming, non-motile bacilli that contain metachromatic (Volutin) granules

Metachromatic granules

Metachromatic (Volutin) granules which are intracellular inclusion bodies, found in the cytoplasmic membrane of some bacterial cells for storage of complexed inorganic polyphosphate (poly-P) and enzymes. When these granules are subjected to stain with methylene blue dye, they appear reddish-purple color and not the blue dye.

Objective

To stain and observe metachromatic granules from a *Corynebacterium diphtheriae* culture.

Materials Required

1. Albert stain.



2. slide Rack and slides



3. Cotton swab to collect the specimen



Collection of specimen using cotton swab



4. oil immersion microscope



Principle

Albert staining technique aims at detecting the presence of metachromatic granulated bodies of Corynebacterium diphtheriae. Albert stain is made up of two staining solutions; designated as Albert Solution 1 and Albert Solution 2, their compositions being;

Albert Solution 1:

- toluidine blue, malachite green, glacial acetic acid, and alcohol

Albert solution 2:

- Iodine and Potassium iodide in water

To use Albert's staining solutions, each of the two solutions must be prepared effectively with the right percentages of components in order to demonstrate the granules with the right color after staining.

Albert staining solution 1 acts as the staining solution while Albert solution 2 acts as the mordant, i.e an ion element that binds and holds a chemical dye, to make it stuck on the micro-organism.

Procedure

A. Staining:

1. Aseptically, take a loopful culture of Corynebacterium diphtheriae
2. Make a smear at the center of a clean sterile glass slide
3. Heat fix the smear, gently
4. On a staining rack, place the smeared glass slide.
5. Add Albert staining Solution 1 into the smear and leave it for 3-5 minutes
6. Wash the smeared slide with gently flowing tap water

B. Mordanting

1. Add Albert staining solution 2 and leave it for 1 minute
2. Wash the slide with gently flowing tap water.
3. Blot to dry the smeared glass slide
4. Add cedarwood oil on the smear
5. Then observe under a microscope by oil immersion at 1000x

Observation :

We have collected samples from 10 subjects using a cotton swab which was dipped in saline. The collected specimen was heat fixed and observed under the microscope. The observation is as follows:

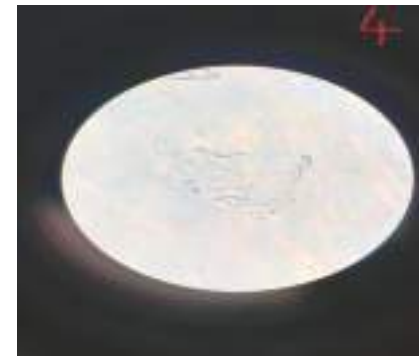
Subject 1 : Albert stain negative. No metachromatic granule was found.

Subject 2: Albert stain positive .Metachromatic granules we're

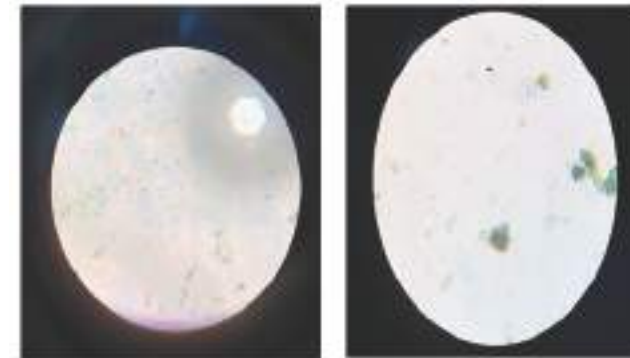
found.

Subject 3: Albert stain negative. No metachromatic granules.

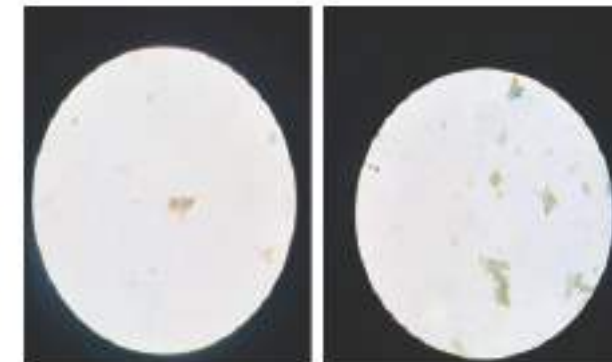
Subjects 4: Metachromatic granules was suspect full



Subject 5: Albert stain positive. Subject 6: Albert stain positive



subject 7: Albert stain positive Subject 8: Albert stain positive



Subject 9: Albert stain positive



10.subject 10 :Albert stain negative.No Metachromatic granules were found

Interpretation

Corynebacterium diphtheriae cytoplasmic membrane contains volutin granules, also known as metachromatic granules, which are a characteristic feature of this bacteria. The staining by Albert solutions, stains the granules making them appear as round-shaped blue-black dots at the bottom of L-shaped or V-shaped green Bacilli.

Limitations of Albert Staining

It can only be used to stain the metachromatic granular bodies and not any inclusions in the cytoplasmic membrane.

Result

The metachromatic granules stain bluish black while the rest of the microbial cell stains green

GRAM STAINING

Gram staining is a differential bacterial staining technique used to differentiate bacteria into Gram Positive and Gram Negative types according to their cell wall composition.

It is the most widely used and the most important staining technique in bacteriology, especially in medical bacteriology. It is generally the first test performed on bacteria during their identification and observation process.

This staining technique uses two stains; crystal violet as primary stain and safranin as a counterstain. Those bacteria with Gram-positive cell walls will retain primary stain and appear violet or purple. These bacteria are termed Gram-Positive bacteria.

The other group of bacteria with Gram-Negative cell wall will lose primary stain and take up the counterstain and appears pink or red under the microscope. These bacteria are called Gram-Negative bacteria.

Using this staining technique, bacteria can be differentiated into two groups hence; it is called the differential staining technique.

Objectives

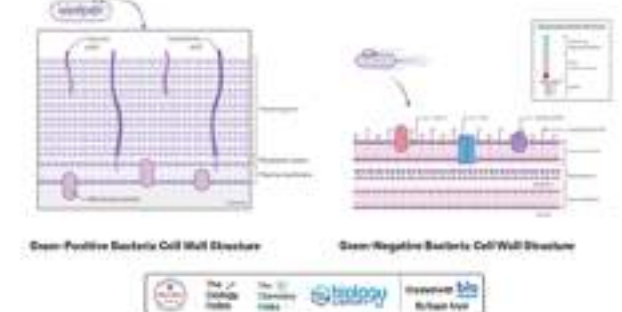
- To differentiate bacteria into Gram-Positive and Gram-Negative.
- To study the morphological structure of bacteria.

Principle

- Gram staining and differentiation are based on the

differences in cell wall structure and composition of bacteria. Bacteria having cell walls with a thick layer of peptidoglycan will resist decolorization of primary stain and appear violet or purple.

- Bacteria having a thin peptidoglycan layer with lesser cross-linkage lose primary stain during decolorizing and gain counter stain appearing pink or red.
- In an aqueous solution of crystal violet dye, their molecules dissociate into CV⁺ and Cl⁻ ions. These ions easily penetrate the cell wall components of both positive and negative bacteria.
- When Gram's Iodine is added as mordant, the iodine interacts with CV⁺ ion and forms CV-I complex within cytoplasm and cell membrane and cell wall layers.
- When decolorizing solution (ethanol or a mixture of ethanol and acetone) is added it interacts with lipids in the cell wall. The outer membrane of the Gram-Negative bacterial cell wall is dissolved exposing the peptidoglycan layer.
- Whereas in Gram-Positive bacteria, there is no outer membrane, and the peptidoglycan layer is also thick with higher cross-linkage. So, the decolorizing solution dehydrates the peptidoglycan layer trapping all the CVI complexes inside the cell wall and bacteria retain the purple or violet color of crystal violet.
- The peptidoglycan layer is thin with less cross-linking in the Gram-Negative cell wall, hence becoming leaky. This causes cells to lose most of the CVI complexes.
- When counterstain, positively charged safranin, is added, it interacts with the free negatively charged components in Gram-Negative cell wall and membrane and bacteria becomes pink/red.
- Whereas, there is no space to enter inside the dehydrated Gram-Positive cell wall due to CVI complex and dehydration. Hence, safranin can't stain them red or pink and Gram-Positive bacteria reveal the purple or violet color.



Materials Required

1. Gram staining Reagents.



2. Glass slide



3. cotton swab



collection of specimen



4. Microscope with 100x objective lens



Gram Stain Reagents

Gram staining procedure uses different chemicals and dyes that can be grouped such as

1. Primary Stain (Crystal Violet)

- It is an intensely purple-colored organic compound chemically called triphenylmethane dye. It is also known as hexamethyl pararosaniline chloride or methyl violet 10B or gentian violet.

- Its color depends on the pH of the dissolving medium such as,
- at pH -1.0 or below-appears yellow
- at acidic pH of 1 to 2 -appears green
- at neutral pH-appears purple (deep blue-violet)
- at highly basic pH -appears colorless.

In Gram Staining, it is used as a basic dye. It provides violet color to Gram-Positive bacteria.

2. Mordant (Gram's Iodine)

- It is an aqueous solution of iodine and potassium iodide used as mordant in Gram staining. It interacts with CV+ and forms a CVI complex which gets trapped in the dehydrated peptidoglycan layer of the Gram-Positive cell wall.

3. Decolorizing Solution

- It is either acetone or ethanol (95%) or a mixture of acetone and ethanol in ratio 1:1 by volume. The decolorizing solution dissolves the lipid content in the outer membrane of the Gram-Negative cell wall and increases its permeability.
- In the Gram-Positive cell wall the decolorizer dehydrates the peptidoglycan layer and traps the CVI complex within the cell.

4. Counter Stain (Safranin)

- It is a red-colored counterstain used to stain decolorized Gram-Negative cells in the Gram Staining technique. It is a basic dye that interacts with negatively charged components of the cell wall and membrane.
- Besides safranin, dilute carbol fuchsin solution is also used as a counterstain.

Procedure of Gram Stain Slide Preparation

1. Take a clean, clear, grease-free glass slide
2. Sterilize the inoculating loop by flaming and transfer a loop full of bacterial culture suspension in the middle of the glass slide.
3. Spread the suspension with the sterile inoculating loop to prepare a thin smear. The smear must not be too thin or too thick.
4. Let the smear air dry and fix it by passing over the flame. Fixing should be done over a gentle flame. Slide must be moved up and down or circularly over the flame to prevent from overheating. Flaming will fix the bacterial cells on the slide and prevent them from washing out.
5. Heat fixation



Gram Staining Protocol

1. Flood crystal violet solution over fixed smear.



2. After 30 – 60 seconds, pour off the CV solution and rinse with gentle running water.
3. Flood the Gram's Iodine solution over the smear.
4. Leave the iodine solution for 30 – 60seconds and pour off the excess iodine and rinse with gentle running water.
5. Shake off the excess water over the smear
6. Decolorize the smear by passing the decolorizing solution till the solution runs down in clear form. Alternatively, add a few drops of decolorizing solution and shake gently and rinse with distilled water after 5 seconds.



7. Rinse with distilled water to wash decolorizer
8. Shake off the excess water over the smear
9. Pour counter stain over the smear



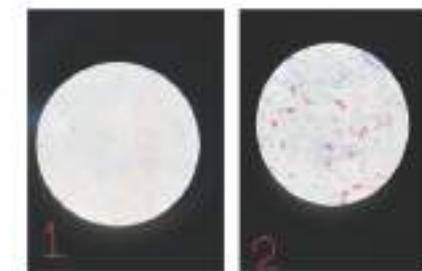
10. Leave for 30 – 60 seconds and wash with gentle running water
11. Air dry or blow-dry the smear



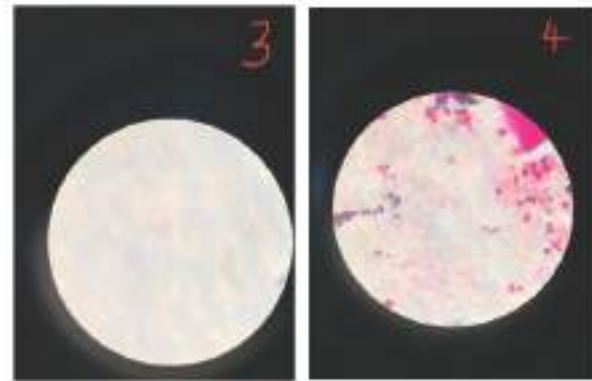
Observation

we have collected 10 samples from stomatitis patients. These specimens are stained by Gram's iodine and observed under microscope. The observation is as follows:

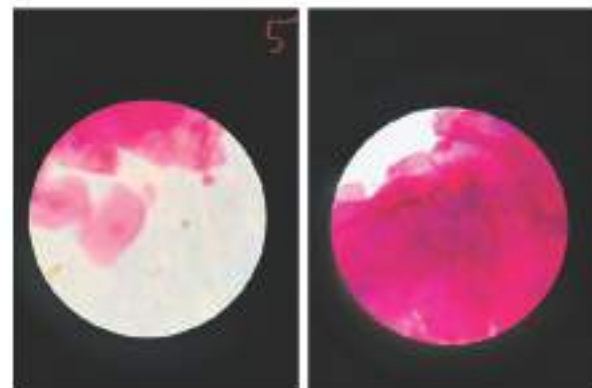
specimen 1: Gram negative bacilli. specimen 2: Gram positive cocci



specimen 3:Tissues.No bacteria isspecimen
4:Gram positive cocci found



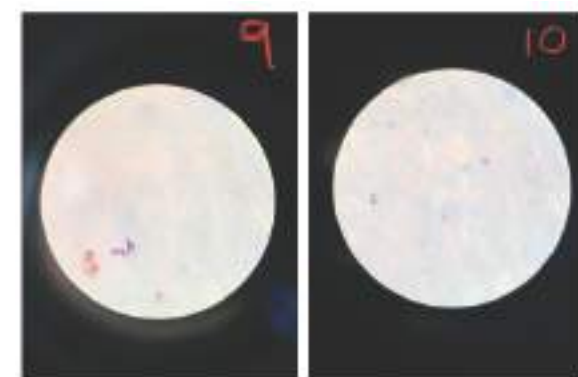
specimen 5:Gram negative cocci Specimen 6:No
bacteria is found and Gram positive cocci



specimen 7:Gram positive coccispecimen
8:No bacteria is found and Gram negative bacilli



specimen 9:Gram positive cocci.
specimen 10:Capsules of gram positive cocc



Result and interpretation

Gram staining reveals two categories of bacteria ie,gram positive and gram negative bacteria.

Gram positive bacteria appear violet or purple.

Gram negative bacteria appear pink or red.

Limitations of Gram Staining

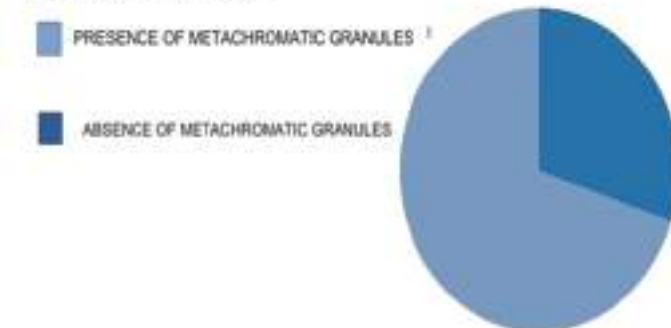
- Can't stain Acid Fast Bacilli and bacteria without cell wall like Mycoplasma.
- Unsuitable for minute bacteria like Ricktessia., Chlamydia., etc.
- Require multiple reagents.
- Over-decolorization may result in the identification of false gram-negative results, whereas under-decolorization may result in the identification of false gram-positive results.
- Smears that are too thick or viscous may retain too much primary stain, making the identification of proper Gram stain reactions difficult. Gram-negative organisms may not decolorize properly.
- Gram stains from patients on antibiotics or antimicrobial therapy may have altered Gram stain reactivity due to the successful treatment.

From this study, the 97 % were Gram Positive bacteria and 3%were Gram Negative for Gram staining . And for Albert staining out of 10 swabs collected 70% show presence of Metachromatic Granules while 30% were futile

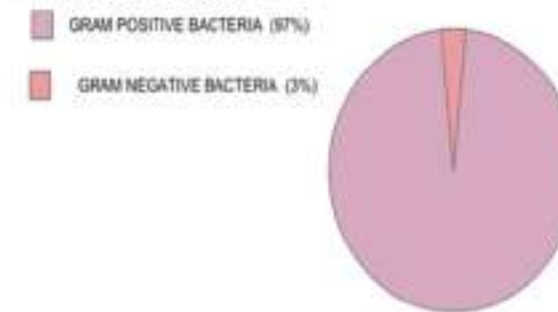
STATISTICS OF THE STUDY

A Total of 20 swabs were taken from 10 patients. 10 for each Gram staining and Albert staining were enrolled in this study .The mean age of the patients were 18 to 23 year old . We did two staining Techniques on the swabs collected , the GRAM STAINING and

ALBERT STAINING



GRAM STAINING



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Comparsion between three suture materials in periodontal surgery



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ABSTRACT

Following periodontal surgery, a range of suture materials are available for primary wound closure. The purpose of this study was to re-examine the suture threads characteristics, properties and biological interactions. Silk has been used as biomedical suture material for centuries and it provides important clinical repair options for many applications but the disadvantage is the biocompatibility problems reported for silk obtained from contamination of residual sericin (glue-like proteins). Now-a-days, Vicryl suturing material is the commonly used material in oral surgery, because it does not allow adherence of plaque and is well suited for handling. Nylon is a nonabsorbable, monofilament composed of polyamides, which has long-standing tensile strength and induces minimal cellular reaction, while Vicryl is a synthetic absorbable polyglactin suture (copolymer of glycolide and lactide) but induces more reaction.

INTRODUCTION

Despite the wide variety of suture materials that are available, specialised suture materials are frequently utilised to mend tissue and speed the healing of oral wounds. Due to the significance of certain oral cavity characteristics including the presence of saliva, different biota, high vascularization, mastication, and swallowing, clinicians must be aware of the nature of suture materials. The purpose of wound closure is to promote rapid healing, facilitate functional recovery, and preserve the aesthetics of the surgical site. Because of this, it is crucial to choose the suture material, needle diameter, and procedure very carefully. These factors enable the surgical flaps to be properly stable, which improves patient comfort. High tensile strength, low tissue reactivity, uniform thickness, flexibility for easy handling, the capacity to maintain knot security, minimal inflammatory response to aid in healing, and sterility are all desirable characteristics of a suture material. Suture materials can be roughly divided into two categories: absorbable and nonabsorbable. They can further be categorised into natural or synthetic, coated or uncoated, dyed or undyed, and monofilament or polyfilament depending on their structure.

Conflict of Interest: None declared

Source of Support: Nil

CONTENTS

NYLON

Nylon is a nonabsorbable monofilament suture which is most commonly used for skin closure. Nylon sutures are available from U.S.P. size 2 to size 10-0. Suture is available in black colour. Nylon sutures are composed of polymers made from 100% homo polymer of polyamide grade 6.6.

CLINICAL APPLICATION

Nylon sutures are widely used for general closure, skin and plastic surgery

Used in ophthalmic, plastic, neurological surgeries and micro procedures

Monofilament Nylon is a suitable material where considerable resistance for long period of time is required (tendons, ligaments, etc.).

ADVANTAGE

Possess excellent tensile strength

Pass through tissues easily

Nylon sutures have excellent knot security properties

Can be easily removed with no tissue adherence

It is infection resistant.

sutures do not elongate while knotting.

Extent to which absorbed fluid is transferred along the suture have good handling

DISADVANTAGE

They are usually not recommended for attachment of artificial prostheses in cardiovascular surgery

They also do not support infection and maintain tensile strength indefinitely in tissues

ETHICON

Ethicon sutures are synthetic sutures which may be absorbable or non-absorbable. Absorbable sutures are vicrylrapide, monocryl, coated vicryl and pdsII. Non absorbable sutures are ethibond, prolene, stainless steel etc.

CLINICAL APPLICATION

Vicrylrapide suture (coated) – Superficial soft tissue approximation of the skin and mucosa where short term wound support is required, Dental surgeries

Monocryl suture – General soft tissue approximation or ligation

Coated vicryl suture polyglactin- Used in ophthalmology and general soft tissue approximation or ligation

PDS II polydioxanone– Soft tissue approximation, including use in pediatric cardiovascular tissue where growth is expected

to occur. It is also used in ophthalmic surgery and fascia closure

ADVANTAGES

Monocryl sutures: Bactericidal and bacteriostatic effects.

Smooth surface, No capillarity and is more thinner

Vicryl: Minimal tissue reactivity and can be used in infected wounds

Coated with polyglactin 370 and calcium stearate which allows easy passage through tissues as well as easier knot placement

High initial tensile strength, Soft and pliable, Good handling, Good knotting

It gives wound support upto 12 days

Its absorption is associated with minimal tissue reaction facilitating improved cosmetics and reduction of postoperative pain

Polydioxanone : Ease of knot tying and knot security

Minimal tissue reaction and used for wounds under tension or contaminated wounds

DISADVANTAGE

Monocryl : Handling and knotting difficulty

Any knick or crimp in the material leads to breakage

Vicryl: Bacterial harbors- On skin wounds associated with delayed absorption as well as increased inflammation

Capillary action, Tissue trauma, Thicker

SILK

Silk suturing material is natural, multifilament and non absorbable suturing material. It is composed of two materials called fibroin and sericin. Fibroin is obtained from the domesticated species *Bombyx mori* of the family *Bombicidae*. Fibroin is covered by the protein called sericin which is a silk material. It has a smooth flow through the tissue while maintaining the knot security. It is coated with a bees wax. Silk material has an excellent strength and handling property and it is flexible, coated with wax for smooth passage and it has no tissue

reactions. At the same time, some biological responses to the protein have raised questions about biocompatibility.

ADVANTAGE

Medical suture requirements:

1. In the wound healing process to maintain sufficient strength, but also should be able to stretch to adapt to wound edema, and with the retraction of the wound and back to its original length.
2. After wound healing it can self-degradation absorption, no longer leave foreign body.
3. Does not produce inflammation.

- 4. Non-irritating.
- 5. Easy dyeing, sterilization, disinfection and other treatment.
- 6. Can form a secure knot.
- 7. Easy production, low prices, mass production.

DISADVANTAGE

- 1. Least tensile strength of any Suture Material
- 2. High tissue reactivity (similar to Catgut Suture)
- 3. Increases risk of infection due to high capillarity
- 4. High coefficient of friction

MATERIALS AND METHODS

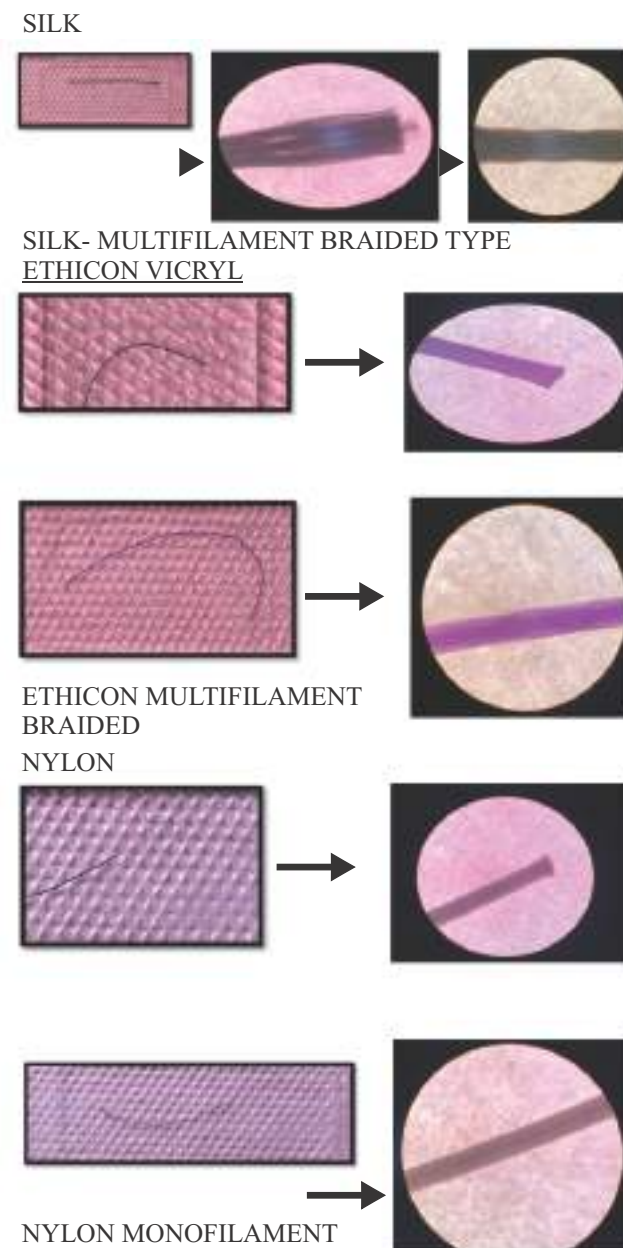
This study's objective was to assess and compare the mechanical characteristics of three suture materials: Silk, Ethicon, and nylon of size 3-0,4-0,4-0 respectively. The light microscope was magnified 10x to view these 3 suture materials.

DPX mountant was applied to three separate slides, for each suture material, and the mounting medium is holds the cover slip to the slide. Silk and Vicrylethicon appeared to be braided when viewed under a microscope, while nylon appeared to be a monofilament suture material.



RESULT

From this study we confirmed that vicryl ethicon and silk are multifilament braided type and nylon suture material is monofilament. Since multifilament braided are more stronger and good at handling they are commonly used than monofilaments.



DISCUSSION

Suture materials play an important role in wound repair by providing support to healing tissues. Selection of a suture material should be based on an understanding of the physical and biological properties of the material, assessment of the wound, the healing rate of different tissues, and the patient's physical condition. Too often, selection has been governed by the personal preference and training experience of the surgeon and by economic reasons.

Nylon sutures are non-absorbable sutures and possess excellent tensile strength. Nylon sutures are available in black colour. Nylon sutures have excellent knot security properties and can be easily removed with no tissue adherence. These sutures are

infection resistant..

Silk suture is a non-absorbable suture. Braided to improve the knot security. Coloured black to have a very good visibility during surgical procedures. Coated with bee wax for easy pull out suture. Easy pull out sutures. As it a natural material it is very slowly absorbed in the body over a period of 2 years hence removal is not required from the endodermis.

Vicryl (polyglactin 910) is an absorbable, synthetic, usually braided suture, manufactured by Ethicon Inc., a subsidiary of Johnson and Johnson. A monofilament version is also made for use in ophthalmic practice. It is indicated for soft tissue approximation and ligation.

Monofilament suture – a single stranded filament suture (e.g nylon). They have a lower infection risk but also have a poor knot security and ease of handling.

Multifilament suture – made of several filaments that are twisted together (e.g braided silk or vicryl). They handle easier and hold their shape for good knot security, yet can harbour infections.

The size of a suture represents its diameter and follows a scale similar to negative and positive numbers. In the center of the scale, you'll find zero. To the right of zero, the numbers and sizes progressively get larger. For example, a size-two suture is smaller than a three. A large suture might be used to stitch abdominal tissue

To the left of zero, suture sizes get progressively smaller. Small suture sizes are represented by a number followed by zero. For example, a 3-0 suture is smaller than a 2-0 suture. An extremely small suture, such as one with a 10-0 size, might be used to repair an eye incision.

As sutures get smaller, they lose tensile strength. Physicians typically pick the smallest suture possible that will adequately keep a wound closed to minimize tissue trauma.

In this study we used nylon and ethicon of size 4.0 and silk of size 3.0.

CONCLUSION

Literature review clearly suggests that the use of vicryl sutures will be beneficial than silk suturing material. Vicryl is an absorbable suture material that may be preferred over a non-absorbable suture material like nylon because the latter is more likely to require repeated administration of local anaesthetics due to complications and a higher risk of suture removal. Care should be taken to ensure secure knotting of vicryl sutures.

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Assessment of efficacy and compliance upon usage of electric toothbrush among hemiplegia patients



Anamika R Nair, Ashok Achuthan, Binija J M, Sreenima Prakash

Research question:

was there any change in brushing efficacy and compliance while using electric toothbrush when compared to manual technique in hemiplegic patients?

INTRODUCTION:

Tooth cleaning has been an integral part of oral hygiene routine across many cultures around the world from the times of antiquity. Oral hygiene practices involve the thorough daily removal of dental plaque and debris by the tooth brush without injuring the soft tissue. Tooth brushes are the most widely used oral hygiene aids. It is the principal instrument in general use for accomplishing the goal of plaque control

Patient At-Home Mechanical Debridement.

The mechanical reduction of supragingival plaque by removal with toothbrushes (manual or powered) significantly reduces the amount and composition of Subgingival microbiota around teeth. This reduction should translate to a decreased risk of periodontal disease initiation or recurrence. Furthermore, the decreased prevalence of periodontal pathogens in supragingival plaque lowers potential reservoirs of these species

Hemiplegia is a condition caused by brain damage or spinal cord injury that leads to paralysis on one side of the body. It causes weakness, problems with muscle control, and muscle stiffness. The degree of hemiplegia symptoms vary depending on the location and extent of the injury.

Conflict of Interest: None declared

Source of Support: Nil

An electric toothbrush is a toothbrush that makes rapid automatic bristle motions, either back-and-forth oscillation or rotation-oscillation (where the brush head alternates clockwise and counterclockwise rotation)

electric toothbrush is usually powered by a rechargeable battery charged through inductive charging when the brush sits in the charging base between uses.

The electric toothbrush is both efficient and surprisingly appealing to patients. For these reasons, it has a definite use for some patients such as individuals lacking fine motor skills, especially the physically challenged and those who lack digital dexterity.

Since the arrival and invention of the electric toothbrush, there has been continuing controversy whether or not it is more efficacious than a manual toothbrush. Some reports seem to indicate that powered toothbrushes are better than manual ones in maintaining good oral hygiene.[4] However, the results of previously conducted studies have concluded that both the brushing modalities have similar effect on plaque control.[5] Furthermore, like the manual brush, electric brushes are not very effective in removing plaque on the interproximal and lingual tooth surfaces. Consequently, other mechanical devices in the form of toothpicks, floss, single-tufted toothbrush,

interdental (bottle brush type) brushes, and water picks were devised and advocated to supplement a given brushing technique, for most effective and complete plaque removal.

NEED FOR THE STUDY :

To compare and evaluate the efficacy and compliance using electric toothbrush and manual toothbrush in hemiplegic patient.

AIM: Assessment of brushing efficacy between manual and electric toothbrush.

OBJECTIVE: To assess the brushing efficacy

To evaluate patient compliance

To compare both brushes among hemiplegic patients.

Methodology

In order to determine the effect of electric toothbrush for hemiplegic patients ,we prospectively enrolled health care providers as Volunteers. we to provided electric tooth brushes 15 hemiplegic patient for evaluating the effectiveness of brush in oral hygiene compared to manual brush . we recalled patients and conducted questionare to find the efficacy and any advantage of electric tooth brush over manual brush

Questionnaire QUESTIONNAIRE PATIENT'S PERSPECTIVE

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	a) YES b) NO
2.	How was the oral hygiene maintenance?	a) Easy to maintain b) Difficult to maintain
3.	Did it cause any trauma to the gingiva?	a) traumatic b) Atraumatic
4.	Was it accessible to all the areas of dentition?	a) Accessible b) Not accessible
5.	Was self brushing possible?	a) YES b) NO
6.	Was there any other difficulty during brushing?	a) YES b) NO
7.	Which brushing was preferable?	a) Electric tooth brushing b) Manual tooth brushing

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AHAMMED

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	NO
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Electric tooth brushing

HAMEED

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Electric tooth brushing

JAFFER

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Electric tooth brushing

MOHANAN

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Not Useful
2.	How was the oral hygiene maintenance?	Difficult to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Not Accessible
5.	Was self brushing possible?	No
6.	Was there any other difficulty during brushing?	YES-(Shivering)
7.	Which brushing was preferable?	Manual

LIBIN

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Electric tooth brushing

HASNA

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Manual tooth brushing

HISANA

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Traumatic- Initially traumatic and later it is atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Manual tooth brushing

SUMESH

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	YES
6.	Was there any other difficulty during brushing?	No
7.	Which brushing was preferable?	Manual tooth brushing

RAJU

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Manual tooth brushing

SINDHU

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Manual tooth brushing

NAMITHA

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	No
6.	Was there any other difficulty during brushing?	No
7.	Which brushing was preferable?	Electric tooth brushing

PRAJITHA

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Not Useful
2.	How was the oral hygiene maintenance?	Difficult to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Not Accessible
5.	Was self brushing possible?	YES
6.	Was there any other difficulty during brushing?	Yes
7.	Which brushing was preferable?	Manual tooth brushing

SANDHYA

SI No.	Questions	Response
1.	Was brushing with electric toothbrush useful?	Yes
2.	How was the oral hygiene maintenance?	Easy to maintain
3.	Did it cause any trauma to the gingiva?	Atraumatic
4.	Was it accessible to all the areas of dentition?	Accessible
5.	Was self brushing possible?	Yes
6.	Was there any other difficulty during brushing?	NO
7.	Which brushing was preferable?	Electric tooth brushing

RESULT

According to the survey conducted based on efficacy between manual and electric tooth brush among 13 hemiplegia patients, 6 patients opted for electric toothbrush since it is efficient and comfortable for use and 7 of them opted for manual tooth brushing since electric tooth brush was not found useful for oral hygiene.

CONCLUSION

According to a survey conducted based on efficacy between manual and electric tooth brushing among hemiplegia patients, majority of the patients did not find any change in efficacy and compliance while using electric tooth brush when compared to manual technique.

ORIGINAL RESEARCH

Patients perception regarding orthodontic needs and satisfactory level with the procedure



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ABSTRACT

Introduction: Orthodontics includes all preventive and corrective procedures of dental irregularities requiring the repositioning of teeth by functional and mechanical means to establish occlusion and pleasing facial contours. It has been reported that patients negative emotions towards the orthodontic treatment affects patients satisfaction with treatment and treatment itself. Hence this study was planned to evaluate the patient's perceptions of their orthodontic demands and the level of satisfaction of patients in relation to professional performance.

Methods: This cross-sectional study was conducted in Dental College and from Private Clinics in Calicut Kerala among 500 patients who had achieved orthodontic therapy. A self-administered questionnaire was prepared and mailed to assess the data. The data were collected on excel sheet and analyzed by SPSS 16.0 software (SPSS Inc., Chicago, IL, USA).

Results:

The study conducted among 500 participants included 202 boys and 298 were girls. A reason for 50% of the participants for late orthodontic treatment was high cost of the orthodontic treatment and males had more reasons for late orthodontic treatment. Girls had more reasons for undergoing orthodontic treatment than boys and for 50% participants the reason wastetooth alignment. Most of the patients reported that better oral hygiene & straight teeth were the outcome of treatment. According to gender it was seen that boys had more reasons for effectiveness of treatment outcome. Behaviour of orthodontist was the major contributing factor for the satisfaction with the procedure and girls were more satisfied with orthodontic treatment than boys.

Conclusion: Orthodontic procedure is the treatment of choice ranging from children to adults. This study concluded that response toward satisfactory level was good and significant according to gender and age.

Conflict of Interest: None declared

Source of Support: Nil

Key words: Orthodontic treatment,oral hygiene, orthodontist, dental irregularities

INTRODUCTION

Orthodontics is that specific area of the dental profession that has responsibility to study and supervise growth and development of the dentition and its related anatomical structures from birth to dental maturity.¹It includes all preventive and corrective procedures of dental irregularities requiring the reposition of teeth by functional and mechanical means to establish occlusion and pleasing facial contours.²

The prevalence of malocclusion is certainly greater in adults.American data from the early 1990s demonstrate that the percentage of adult orthodontic patient in specialized orthodontic clinic was 30% and this percentage was expected to increase until the end of decade .³Numerous studies,from a bio- psychosocial model,shows that patients negative emotions towards the orthodontic treatment affects patient satisfaction with treatment and treatment itself.⁴

It is described as psychological typology of patients related to anxiety levels based on their adherence to treatment.⁵ Some refusal factors includes; subgroup of patients may still experience problems such as anxiety or depression to the greater satisfaction with their physical appearance.⁶Pain is a determinating variable of adherence to orthodontic treatment (90-95% of patients report experiencing pain during treatment).⁷

Because of the idea having a painful experience discourages many patients from such treatment.⁸Patient should be aware of the adverse effects of the treatment such as;root resorption,pulpal changes, periodontal diseases and temperomandibular dysfunction.Orthodontist should be aware of these risk factors,linked to root resorption include the duration of the treatment,length,and shape of the root,trauma history, habits and genetic predisposition.⁹

Among the most important goals of dental care is helping patients in attempt to reach an acceptable level of satisfaction for the success of treatment.¹⁰Hence, this study was planned to evaluate the patient's perceptions of their orthodontic demands and the level of satisfaction of patients in relation to professional performance.

Materials and Methods

This cross-sectional study was conducted among a sample of 500 patients who had achieved orthodontic therapy. The sample was chosen from the Dental College and from Private Clinics in Calicut Kerala.

Mail-id of patients were collected from the orthodontist treating the patients and directly mailed to the patients. The details of patients those who are willing to participate in the survey were collected. Patients with medical problems and had

orthognathic surgeries were excluded from the study. Written consent was taken from participants along with the questionnaire. A pilot questionnaire was made to fill by 20 participants in order to ensure the level of validity and degree of repeatability.

A self-administered questionnaire was prepared and mailed to assess the reasons for late orthodontic treatment of patients ,reasons for undergoing orthodontic treatment, factors that determine effectiveness of treatment outcome and cost of treatment. Questionnaires included information regarding long duration of orthodontic treatment, teeth alignment, facial profile, behaviour of orthodontist, healthy lifestyle etc.

There were five questions which checked effectiveness of the treatment outcome as did your treatment straitened the teeth, did your smile get better, did the treatment helped in mastication, better oral hygiene, and healthy lifestyle.

Data analysis

The data were collected on excel sheet and analyzed by SPSS 16.0 software (SPSS Inc., Chicago, IL, USA). Student's t-test and ANOVA test were used to analyze results regarding satisfaction with the treatment. The level of significance was set at P=0.05.

Results

The study was finalized among 500 participants who had received the treatment and out of total sample were 202 boys and 298 were girls. The age of the participants was from 16 to 19 years.

Table 1 showed that most of the participants faced problems due to their high cost of the orthodontic treatment (24.9%) which was a reason for late orthodontic treatment. Which included long duration (23.10%), uneasthetic appearance (19.5%),oral hygiene maintenance (17.5%),other reasons(15%).

In Table 2 when the participants were asked about the reasons for undergoing orthodontic treatment the most common answer was teeth alignment(39%).Other reasons included facial profile(30%)comfortable chewing and speaking (21%)and other reasons(10%).

In Table 3, when patients were asked about the effectiveness of treatment outcome with the procedure better oral hygiene & straight teeth was the most common answer .Other reasons included;better smile, mastication and healthy life style.

In Tabe-4, when patients were asked about the level of satisfaction with the procedure behaviour of orthodontist was the major contributing factor. Proper instructions to the patient by orthodontist, pain, facial appearance were other reasons.

Gender wise comparison shows that boys were more satisfied with orthodontic treatment than girls.

TABLE - 1 REASONS FOR LATE ORTHODONTIC TREATMENT

Reasons	Boys	Girls	Total
1.High cost	9.9%	15%	24.9%
2.Long duration	12.7%	10.3%	23.1%
3.Uneasthetic appliances	9.3%	10.2%	19.5%
4.oral hygiene maintenance	8.1%	9.4%	17.5%
5.other reasons	8%	7%	15%

TABLE-2 REASONS FOR UNDERGOING ORTHODONTIC TREATMENT

Reasons	Boys	Girls	Total
1.Teeth alignment	22%	17%	39%
2.Facial profile	19.1%	9.9%	30%
3.Comfortable chewing speaking	9.2%	11.8%	21%
4.Other reasons	5%	5%	10%

TABLE-3 EFFECTIVENESS OF TREATMENT OUTCOME

Reasons	Boys	Girls	Total
1.Straighten teeth	20.1%	9.9%	30%
2.Better smile	4.2%	7.8%	12%
3.Mastication	8%	12%	20%
4.Better oral hygiene	16%	14%	30%
5.Healthy lifestyle	4%	4%	8%

TABLE-4 LEVEL OF SATISFACTION WITH THE PROCEDURE

Reasons	Boys	Girls	Total
1. Behaviour of orthodontist	20.3%	15%	35.3%
2. Decreased pain	15%	12.7%	27.7%
3. Proper instruction to the patient by orthodontist	10%	7%	17%
4. Facial appearance	8%	12%	20%

Discussion

This study was done to determine the patient's perception regarding orthodontic needs and level of satisfaction among patients undergoing orthodontic treatment.

The objective for undergoing orthodontic treatment is to improve dental occlusion, which could result in a good functioning and aesthetically pleasing dentition in harmony with the face.¹¹

There are many reasons for late orthodontic treatment and it depends on patient's perception. Most important reason for late orthodontic treatment was found to be high cost and long duration.

The nature of orthodontic treatment, being time consuming and costly, makes it even more complicated for people to decide to go for such treatment. Even when the need for orthodontic treatment exists, barriers such as high costs, long duration of treatment, might prevent an individual to express that need.¹²

Other reason for late orthodontic treatment is unaesthetic appliance.

Patients self confidence might be affected by visibility of the unaesthetic appliance especially during social interaction when attention is focused on the face eyes and mouth.¹³

Reason for undergoing orthodontic treatment revolved around teeth alignment, facial profile, comfortable chewing speaking etc.

Attaining straight teeth was cited the most important motivating factor in almost half (48%) of the respondents in pilot survey conducted by A.A.A. Abdullah, Z.Yassin, N.ZamZam.¹⁴

This was in line with our study where 30% of people chose straight teeth as main reason for undergoing orthodontic treatment.

Social psychological impact to any malocclusion whether noticed by the patient himself or by other people such as low self-esteem, frequent teasing experiences and dissatisfaction to appearance may develop the desire for orthodontic treatment.¹⁵

Orthodontic treatment can influence facial esthetics in a number of ways, including well-aligned teeth and a pleasing facial profile.¹⁶

Most of the patients felt that their confidence and self-esteem would be increased if their teeth were straightened.

Facial profile has long been a desirable physical characteristic in all societies for many centuries.¹⁷

Of course, there have been studies (in specific countries like Australia) that found that functional aspects (such as comfortable chewing and speaking, 18.69%) were more important than aesthetic aspects (such as crowding 10.25%) in

the determination of the importance of orthodontic treatment to the lay people.¹⁸ This was also in agreement with our study where 21% of people had the same reason for undergoing orthodontic treatment.

Effectiveness of treatment outcome was determined by factors like straight teeth, better oral hygiene, mastication, better smile etc.

Attaining straight teeth to improve dental appearance was undoubtedly the most important motivating factor for seeking orthodontic treatment.¹⁹

It is proven that benefit of orthodontic treatment was to straighten the teeth and enhancing beautiful smile.²⁰

Behaviour of orthodontist and decreased pain are the reasons for level of satisfaction with the procedure.

In any dental healthcare set up, patient satisfaction with respect to the quality of treatment provided by the dentist is very important.²¹

It is rational to judge that the level of patient's satisfaction may differ according to the dental procedures performed.²²

The study by Farishta showed that (29.7%) majority of the patients were satisfied with orthodontic treatment by the behaviour of orthodontist.²³ This also came in line with our study where (35.3%) were satisfied by behaviour of orthodontist.

In a study done by Kvam et al. in which it was mentioned that small amount of patients (20%) only experience pain after orthodontic treatment and among them very few experience severe type of pain.²⁴ This came in agreement with our study where only (27.7%) showed pain after orthodontic treatment which is nearly similar.

A good quality refinement of the orthodontic care is in relation to patient's understanding and consent about the physician's indications which aims mainly to make better oral hygiene and device preservation.

Negligence to fulfil with these conditions may result in harm to the components of orthodontic braces leads to damage of oral structures.²⁵

Conclusion

Orthodontic procedure is still the treatment of choice ranging from children to adults, while there are risks with any treatment but with orthodontic treatment is minimum in comparison to other medical and dental treatments. This study concluded that response toward satisfactory level was good and significant according to gender and age.

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Aerosol contamination with and without pre-rinsing during oral prophylaxis – a comparative study



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RESEARCH QUESTION

A study to compare the efficacy of pre – procedural mouth rinsing in reducing bacterial count in aerosol produced during ultrasonic scaling.

INTRODUCTION

The spread of infection through aerosol and splatter has long been considered one of the main concerns in the dental community because of possible transmission of infectious agents and their potential harmful effects on the health of patients and dental personnel. Aerosol is a suspension of solid or liquid particles containing bacteria, viruses, suspended (for at least a few seconds) in a gas. Particle size may vary from 0.001 to >100 mm. The smaller particles of an aerosol (0.5 to 10 mm in diameter) have the potential to penetrate and lodge in the smaller passages of the lungs and are thought to carry the greatest potential for transmitting infections. The oral cavity harbors numerous bacteria and viruses from the respiratory tract, dental plaque, and oral fluids. Any dental procedure that has a potential to aerosolize saliva will cause airborne contamination with organisms. Dental hand pieces, ultrasonic scalers, air polishing devices, and air abrasion units produce airborne particles by the combined action of water sprays, compressed air, organic particles such as tissue and tooth dust, and organic fluids such as blood and saliva from the site where the instrument is used. Miller found that aerosols generated from patients' mouths contained up to a million bacteria per cubic foot of air. Other studies have reported association of these aerosols with respiratory infections, ophthalmic and skin infections, tuberculosis, and hepatitis B. Current research suggests that having patients use an antimicrobial rinse before treatment may decrease microbial aerosols.

Aerosol is also capable of penetrating deep into the respiratory system and the pulmonary alveoli. The ultrasonic scaler generates aerosol, with bacteria peaking over 300 CFU/ft of the dental clinic. A study demonstrated that aerosols remained detectable in the air for at least 10 minutes following the completion of a procedure

Conflict of Interest: None declared

Source of Support: Nil

and were detected at 2 feet or more from the dental chair. Bacterial count in the air increased by 30 fold during ultrasonic scaling. Such data indicates that it is important to control the production of aerosol and splatter during ultrasonic scaling to prevent cross contamination in the dental office. Aerosol is defined as minute particles, which are 50 µm or less in diameter, suspended in air. It is also capable of penetrating deep into the respiratory system and the pulmonary alveoli. The ultrasonic scaler generates aerosol, with bacteria peaking over 300 CFU/ft of the dental clinic. A study demonstrated that aerosols remained detectable in the air for at least 10 minutes following the completion of a procedure and were detected at 2 feet or more from the dental chair. Bacterial count in the air increased by 30 fold during ultrasonic scaling. Such data indicates that it is important to control the production of aerosol and splatter during ultrasonic scaling to prevent cross contamination in the dental office.

CHLORHEXIDINE

Chlorhexidine (CHX) is a commonly used antiseptic mouthwash, used by dental practitioners and the public, due to its antimicrobial effects. It is a gluconate salt; a biguanide compound, that has been around since the 1950s for clinical use. It is also a broad-spectrum anti-microbial agent, causing disruption of cellular membranes. It is thus currently used as a disinfectant agent for cleaning non-living clinical surfaces and catheters. It is also generally biocompatible, being used orally as an antiseptic mouthwash by dental practitioners and the general public to prevent bacterial biofilm and plaque accumulation. As an antiseptic mouthwash, CHX has an antimicrobial effect on bacteria, fungus and viruses causative for a number of different oral diseases. In vitro, the anti-bacterial effects of

CHX all relate to altered cell membrane permeability. At low concentrations (0.02%-0.06%) CHX causes displacement of Ca²⁺ and Mg²⁺ and loss of K⁺ from the cell wall, resulting in a bacteriostatic effect. At high concentrations (>0.1%) CHX causes leakage of all the main intracellular components out of the cell, resulting in a bactericidal (cell lysis and death) effect.

In response to dental procedures, including the use of the high speed drill, 3 in 1 air and ultrasonic scaler, microbes can aerosolise and splatter up to 6 feet away from the dental chair.

Recent systematic review has demonstrated moderate evidence that pre-procedural mouth rinsing with antiseptics can reduce dentally generated aerosolisation of viable microbes. This includes 0.2% CHX reducing the number of colony forming units (CFUs) of bacteria produced (approximately 70%) in response to ultrasonic scaling, as measured on an agar plate placed within the dental surgery

POVIDONE IODINE

Povidone-iodine is considered to have the broadest spectrum of antimicrobial action compared with other common antiseptics such as chlorhexidine, octenidine, polyhexanide and hexetidine showing efficacy against Gram-positive and Gram-negative bacteria, bacteria spores, fungi, protozoa and several viruses. Persistency of effect has also been demonstrated in a study that assessed 1% PVP-I as a preprocedural antibacterial agent in individuals with varying degrees of oral hygiene. Reducing the incidence of airborne or droplet-transmitted respiratory infections (e.g. SARS, avian flu, swine flu), undiluted PVP-I can be used as a protective measure by rinsing the mouth for 2 min up to four times a day.

NEED OF THE STUDY

To understand the efficacy of pre procedural mouth rinses in reducing the presence of bacterial colonies in aerosols during ultrasonic procedure.

RATIONALE OF THE STUDY

Cross infection during health care delivery is a concern among dental professionals. The rationale of this study is to analyse the efficacy of pre procedural mouth rinse during ultrasonic scaling in reducing aerosol bacterial count.

AIM

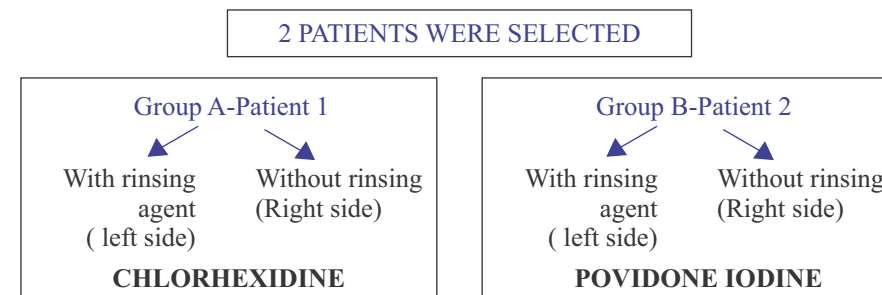
Assess the need and importance of pre-rinsing with an antimicrobial agent during oral prophylaxis in reducing the aerosol contamination.

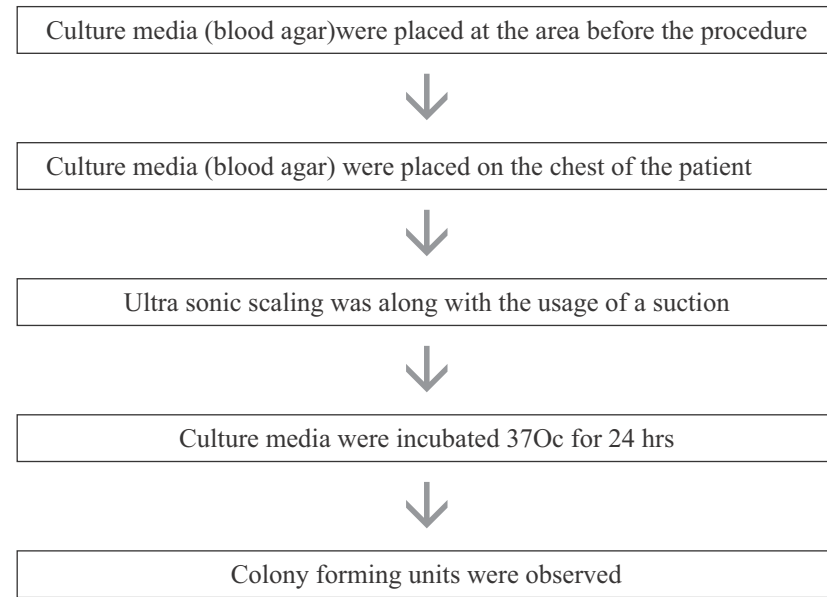
OBJECTIVE

- To evaluate the efficacy of antimicrobial agent for pre rinsing in oral prophylaxis using ultrasonic scaler

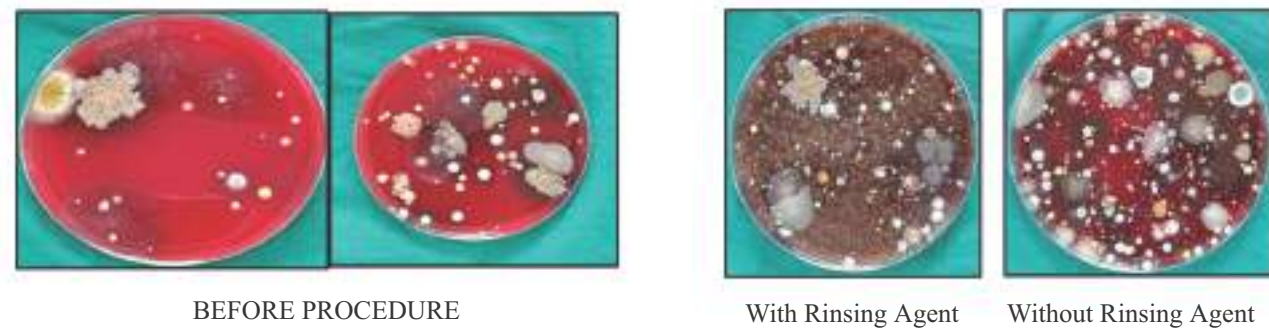
To compare the antimicrobial effect of chlorhexidine and povidone iodine as an antimicrobial agent.

METHODOLOGY

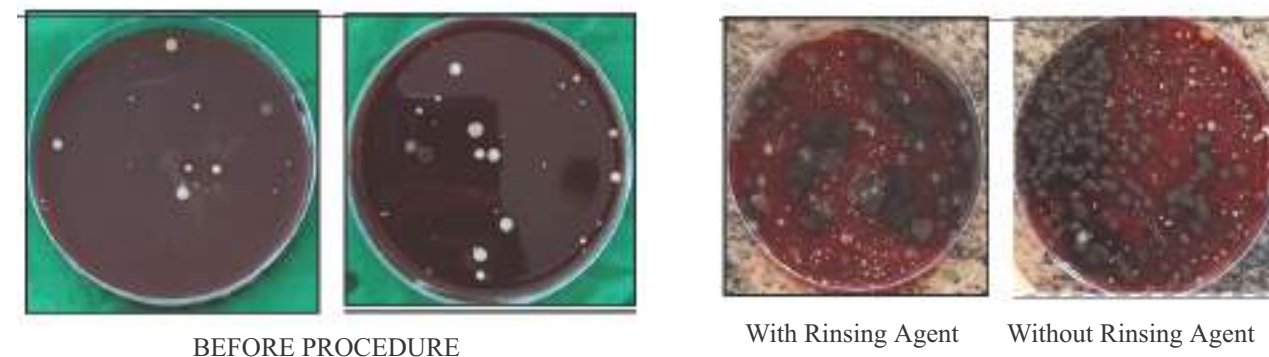




POVIDONE-IODONE



CHLORHEXIDINE



RESULT

Experiment shows that the contamination from spatter and aerosol dissemination remains a significant hazard for dental personnel. By the use of chlorhexidine and povidone iodine, Chlorhexidine can significantly reduce colonies more than povidone iodine.

CONCLUSION

Overall, the results of our investigation clearly indicate that a pre-procedural rinse containing chlorhexidine can be considered as a promising alternative in reducing aerosol contamination during ultrasonic scaling procedures when compared to the povidone iodine with tempering the rinse showing the definite edge. Also, it can be concluded that the amount of viable bacteria in aerosol is maximum at the patient's chest area followed by the operator and assistant in a descending manner, thus reinforcing the use of personal protective barriers to minimize the risk to dental professionals.

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Newer periodontal pathogens and their potential role in Periodontitis



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Abstract:

Periodontitis, a biofilm-associated inflammatory disease of the periodontium, is a major cause of tooth loss in the world. This disease appears to have multiple etiologies, the most studied of which are microbial and immunological causes. Socransky and Haffajee using checkerboard DNA-DNA hybridization gave us clarity into the key microbial players in dental plaque associated biofilm. However researchers have since then found out many other organisms which seem to play an equally important role in the causation of periodontitis, be it adult periodontitis, aggressive periodontitis or refractory periodontitis. This review aims to highlight those newer periodontal pathogens which have been discovered but haven't been given due importance as causative factors of periodontitis. Knowledge about these pathogens may be essential in the future to treat periodontitis in a site specific and patient specific way.

Key words: Newer periodontal pathogens, checkerboard DNA-DNA hybridization, oral synergistetes,

INTRODUCTION

Periodontitis is a chronic inflammatory disease of the supporting structures of the periodontium thought to be caused by an interplay of microbial invasion and host immune inflammatory response leading to loss of alveolar bone and eventually tooth loss. From the discovery of microbes on tooth surface by Leuwenhoek to the dysbiotic theory by Hajishengallisperiodontology has taught us that these organisms are not to be ignored but to be taken very seriously as they are the harbingers of disease entity.

The establishment of a microorganism as a true pathogen should be based on two

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main levels of evidence: (1) the organism should be present in higher prevalence and/or levels in disease than in health ("association" studies), and (2) its suppression or elimination should reduce or stop disease progression.[1]

HISTORY

The microbial etiology of periodontitis had been established since 1976 when the non-specific plaque hypothesis was proposed by Loesche. Socransky[2] and Haffajee brought greater clarity into the oral microbiota when they grouped organisms into coloured complexes by checkerboard DNA-DNA hybridization. In 2001, using cloning and Sanger sequencing, Paster[3]et alsuggested a possible role of cultivable and not-yet cultivable/unrecognized microbial species in the etiology of periodontitis, confirming the idea that the diversity of the oral microbiota was more complex than previously known. Several molecular approaches, sequencing techniques, were published in the periodontal literature by Kumar[4]et al; Matarazzo[5]et al; Teles[6]et al; Griffen[7]et al and Abusleme[8]et al.Haffajee[9] et alattempted to study the complexes in supragingival plaque adopting cluster analysis

and community ordination.The red complex observed in subgingival plaque was strengthened with the addition of Eubacteriumnodatumand Treponemasocranskii. Similar additions were observed in orange and yellow complex.[9]

Normally pathogenic organisms likePorphyromonasgingivalis and Aggregatibacteractinomycetemcomitans being observed in healthy sites was contrary to specific plaque hypothesis, microbial shift and keystone pathogen hypothesis. The Polymicrobial synergy and dysbiotic[10] theory gives credit to the fact that these organisms can be present even at healthy sites but can elevate the virulence of a community following interactive communication with other pathogens like Streptococcus mitis.

All speculations about different micro-organisms in a biofilm still remain as more microbes get discovered and their interactions with other groups of pathogens still remain unexplored. However too much attention to red complex organisms as being primarily responsible for disease has been paid when hitherto undiscovered microbes may be the real culprits.

Organisms strongly implicated in periodontitis ^{6, 11}	Newer species implicated in the causation of periodontitis ^{6, 11}
Porphyromonasgingivalis	Filifactoralocis
Tannerella forsythia	Dialisterpneumosintes
Aggregatibacteractinomycetemcomitans	Fretibacteriumfastidiosum
Prevotellaintermedia	Jonquetellaanthropi
Prevotellamelaninogenica	Pyramidobacterpiscolens
Fusobacteriumnucleatum	Solobacteriummoorei
Eikenellacorrodens	Treponemalcithinolyticum
Prevotellanigrescens	Parvimonasmicra
Capnocytophagagingivalis	Methanobrevibacteroralis
Treponemadenticola	Bulleidiaextracta, Slakiaexigua
Treponemasocranskii	Porphyromonasendodontalis
Eubacteriumnodatum	Prevotellahisticola
Campylobacter rectus.	Cryptobacteriumcurtum.

Therefore the aim of this review is to shed light on these newer micro-organisms which have been implicated in periodontitis through various studies and which have clinical relevance as etiological agents of periodontitis.

NEW ADDITIONS IN DIFFERENT COMPLEXES:[9]

TREPONEMA SOCRANSKII

A new species, *Treponemasocranskii*, and three new subspecies, *T. socranskiisubsp. socranskii*, *T. socranskiisubsp. buccale*, and *T. socranskiisubsp. paredis*, were isolated from supragingival and subgingival samples from patients with periodontitis and from patients with experimental gingivitis by Smibert et al. These organisms ferment carbohydrates and require rumen fluid or fatty acids for growth. The major products of fermentation are acetic, lactic, and succinic acids.[12]

T. socranskii, *T. denticola*, and *P. gingivalis* are associated with the severity of periodontal tissue destruction.[13] Later Haffajee et al found this organism in periodontitis patients along with *P. gingivalis* and *T. denticola* and suggested addition of this organism into the red complex.[9] According to a systematic review by Rakic et al on the microbiologic profile on peri-implantitis, *T. socranskii* is a prominent member of peri-implant microbiota.[14]

FILIFACTOR ALOCIS (filum, thread; factor, a maker; Filifactor, thread-maker. alox -okos, a furrow; alocis, of a furrow, referring to its isolation from a crevice of the gums)[15]

It is a fastidious, gram-positive, obligatory anaerobic rod possessing trypsin-like enzymatic activity similar to *P. gingivalis* and *T. denticola*. This organism has been found in elevated numbers in aggressive periodontitis (77.8%) and chronic periodontitis (76.7%) compared with periodontally healthy individuals due to its potential to withstand oxidative stress and inflammatory microenvironment provided by periodontal pocket.[16]. Filifactor is attributed as the second most prevalent in chronic periodontitis and third most prevalent in generalized aggressive periodontitis and proposed to be an excellent marker organism for periodontal disease.[16, 17,18] Moffat[19] et al in examined the responses of primary cultures of gingival epithelial cells (GECs) to infection with *F. alocis*. Secretion of the pro-inflammatory cytokines IL-1b, IL-6 and TNF- α from GECs was stimulated by *F. alocis* infection.

EUBACTERIUM NODATUM

These species are all obligatory anaerobic, asaccharolytic, nonreactive and they grow poorly and slowly on media commonly used to isolate anaerobic bacteria. Three new species, *E. nodatum*, *Eubacterium timidum*, and *Eubacterium brachy*, were described, primarily from subgingival samples taken from patients with moderate and severe adult periodontitis. Except for the isolation of *E. brachy* from a pleuropulmonary infection, these species have not been

reported from other infected body sites. The organism shows cellular and morphological properties of Actinomycetaceae. *Actinomyces israelii*. [9, 20] Haffajee et al. reported higher mean counts, proportions and percentage of sites of *P. gingivalis* and *T. forsythia* as well as *E. nodatum* and *T. denticola* from subjects with periodontitis than from periodontally healthy subjects. Hence they found merit in including *E. nodatum* as a part of the red complex. [20]

DIALISTER PNEUMOSINTES

These are small, gram-negative rod that grows with punctiform, convex, transparent, shiny, smooth colonies on blood agar.[21] *D. pneumosintes* is a frequent isolate from the oral cavity and has been implicated in periodontitis; closely associated with *Tanarella forsythia*. With refinements in molecular microbiology especially 16S ribosomal RNA (rRNA) polymerase chain reaction (PCR) identification method, Ghayoumi et al. determined the presence of *D. pneumosintes* from periodontal pockets and implicated it as "candidate pathogen."

D. pneumosintes may provide growth factors for *T. forsythia* or vice versa. *D. pneumosintes* was detected in 83% of patients having severe periodontitis and in 19% of patients having slight periodontitis. Hence it was suggested to add *D. pneumosintes* to the group of suspected periodontal pathogens.[21, 22] Cytomegalovirus presence is associated with the presence of this organism.[23, 24] *D. pneumosintes* was detected in refractory periodontitis by Colombo et al.[25] Higher counts in subgingival plaque of 156 chronic patients and 66 aggressive periodontitis patients by Silva et al.[26] Smokers harbored significantly higher numbers of *D. pneumosintes* associated with moderate and deep pockets.[24, 25]

ORAL SYNERGISTETES

These include *Fretibacterium fastidiosum*, *Jonquetella anthropi*, *Pyramidobacter pisolens*. [27] Al-hebshi [27] et al in explored associations among classical and new putative pathogens in subgingival biofilm and assessed their relative importance in chronic periodontitis. The log counts of oral Synergistetes were the best marker of periodontitis followed by those of *T. forsythia*, *P. micra* and *T. denticola*.

Oral Synergistetes are divided into clusters A and B by Vartoukian et al [28]. A includes species of the new genus *Fretibacterium*, including *F. fastidiosum* (Downes J), while cluster B include *J. anthropi* and *P. pisolens*. Oral Synergistetes are presented as new members of the red complex, with relative importance to periodontitis exceeding that of the classical members.

SOLOBACTERIUM MOOREI

Named in honor of an American microbiologist Moore [29] it is

a gram-positive, non-spore forming, anaerobic bacillus originally isolated from human feces. In the last decade, *S. moorei* has been associated with halitosis and subgingival plaque from patients with refractory periodontitis.

Kazor [29] et al. found *S. moorei* in three of six subjects with halitosis and in one of five normal subjects. Haraszthy [30] et al. using PCR identified *S. moorei* on the dorsal surface of the tongue in eight of eight subjects with halitosis but in zero of five normal subjects. *S. moorei* strains produce volatile sulfur compounds through a process involving the β -galactosidase activity of the bacterium and an exogenous source of proteases.[30,31] *S. moorei* is susceptible to the antimicrobial agents' tea tree oil and alpha-bisabolol, suggesting that these compounds might be beneficial in oral healthcare products.[32]

BDELLOVIBRIO BACTERIOVORUS

Bdellovibrio (BALO) are small (0.25 \times 1.0 μ m), flagellate gram-negative organisms. They are obligatory predators. They invade and kill other gram-negative bacteria. Van Essche [33] et al was the first to evaluate the potential use of *B. bacteriovorus* for combating *A. actinomycetemcomitans* in oral infections. Sliepen [34] reported that *Bdellovibrio* was able to attack *A. actinomycetemcomitans* biofilms successfully. *B. bacteriovorus* has an ability in vitro to remove biofilms as well as to detach metabolically inactive biofilms.[35]

Bdellovibrio, *Bacteriovorax* (called 'BALOs'- *Bdellovibrio* and like organisms) bacterial predation as a possible approach to combat periodontal pathogens was investigated by Van Essche [36] et al. Almost all periodontal pathogens are gram-negative and potentially susceptible to BALO predation. Beneficial, periodontal microbiota are mainly gram-positive and therefore resistant to BALO predation. Their use as an antibiotic remove harmful and pathogenic bacteria and as probiotic help curb and control the bacterial populations within the intestinal tract. Hence the term "amphibiotic" was coined by Mohammed Dwidar [37] et al for these kind of bacteria. Dashiff [38] demonstrated that by coculturing *B. bacteriovorus* 109J and *M. aeruginosavorus* ARL-13 with selected pathogens, predatory bacteria are able to attack bacteria from various genii.

Significance and Impact of these organisms: Infectious complications caused by micro-organisms that have become resistant to drug therapy are an increasing problem in medicine, with more infections becoming difficult to treat using traditional antimicrobial agents. The work presented here highlights the potential use of predatory bacteria as a biological-based agent for eradicating multidrug-resistant bacteria.

PORPHYROMONAS ENDODONTALIS

P. endodontalis is an asaccharolytic, black-pigmented, gram-

negative anaerobic bacterium which is highly sensitive to oxygen and is therefore difficult to cultivate from clinical samples. *P. endodontalis* has been isolated from endo-perio lesions as well as from periodontitis patients. Tran [39] et al. first reported the detection of this species in periodontal pockets. Lombardo [40] et al. showed a high prevalence of *P. endodontalis* in addition to *P. gingivalis* and *T. forsythia*, in diseased periodontal sites when compared to healthy sites, with a statistically significant reduction after periodontal therapy. *P. endodontalis* was significantly correlated with the presence of *T. forsythia* and *P. gingivalis* in the diseased group.

TREPONEMA LEICITHINOLYTICUM

Treponema leicithinolyticum is a recently described oral treponeme that exhibits strong phospholipase activity and is present at high frequency in the subgingival plaque samples of aggressive periodontitis patients. In a study by Wyss C [41], *Treponema parvum* sp. nov., a small, glucuronic or galacturonic acid-dependent oral spirochaete from lesions of human periodontitis and acute necrotizing ulcerative gingivitis (ANUG) was identified. Small oral spirochaetes with a strict dependence on either glucuronic acid or galacturonic acid were isolated from European patients with periodontitis and from Chinese patients with either gingivitis or ANUG.[42, 43]

PEPTOSTREPTOCOCCUS MICROS/ PARVIMONAS MICRA

P. micros is a gram-positive anaerobic commensal of the oral cavity, comprising <3% of the subgingival flora in periodontally healthy subjects. Rams [44] et al. in a cross-sectional study involving 907 people reported prevalence of *P. micros* in 58-63% of periodontitis subjects. In culture-positive patients, *P. micros* averaged 12-15% of total viable counts and it was concluded to be potential pathogen in adult periodontitis.[44]

ARCHAEA

Archaea (Methanogens) present distinct features from bacteria and eukaryotes. The diversity of archaea is limited to a few phylotypes, constituted in particular by methane-producing archaeal organisms. Although they are possibly symbionts, methanogens may play a role in the establishment of mucosal diseases by favouring the growth of certain bacterial groups. Archaea were harbored by 36% of periodontitis patients and were restricted to subgingival sites with periodontal disease.[45] Probing depth was decreased at treated sites in association with clinical improvement. *Methanobrevibacter oralis* were frequently found in subjects with periodontal health and generalized aggressive periodontitis, especially the levels were found to be more in generalized aggressive periodontitis. Matarazzo [46] reported these organisms as an environmental modifier in generalized aggressive periodontitis.

OTHER PUTATIVE PERIODONTOPATHOGENS

Booth et al[47] designed oligonucleotide probes for *Bulleidiaextracta*, *Eubacteriumnodatum*, *Mogibacteriumtimidum* and *Slackiaexigua* and extracted them from the samples with a chemiluminescent detection method. The levels of both *E. nodatum* and *S. exigua* was significantly higher in deep than shallow pockets. The level of *E. nodatum*, but not *S. exigua*, was higher in patients than matched controls. Both *E. nodatum* and *S. exigua* were associated with clinical indicators of periodontal disease.

CRYPTOBACTERIUM CURTUM (Kryptos- hidden; curtum-shortened; a hidden rod-shaped bacterium)

Cells are short gram-positive rods, occasionally gram-variable. They are obligatory anaerobic, non-motile and non-sporing, catalase negative and asaccharolytic. Individual cells occur singly or in masses. *C. curtum* is characterized as an opportunistic pathogen with a typical occurrence in the oral cavity, involved in dental and oral infections such as periodontitis, inflammation and abscess. Nakazawa[48] et al. isolated novel *Eubacterium*-like isolates, from the periodontal pocket of an adult patient and necrotic dental pulp and named it *C. curtum*.

PREVOTELLA HISTICOLA (histus: tissue; cola; inhabitant, histicola inhabitant of tissue)

They are gram-negative nonmotile bacilli that are obligatory anaerobes. *Prevotellahisticola* is found in the mucosal tissues of the human oral cavity and is considered a normal flora of the human oral microbiota. It is generally commensal but is known to intrude the epithelial cells lining the cheeks. 16S rRNA gene sequence analysis and DNA-DNA hybridization revealed that the strains constituted a novel group within the genus *Prevotella*, being most closely related to *Prevotellamelaninogenica* and *Prevotellaveroralis*. [49] Colonies are 1.5-2.0mm in diameter, circular, entire, convex, cream-coloured and opaque. Some strains produce black colonies in the presence of metronidazole and other strains form bull's-eye colonies with reddish-brown pigmentation centers. Cells are saccharolytic and are able to ferment common sugars. Major amounts of acetic acid, succinic acid, lactic acid are produced as end products of metabolism in peptone/yeast extract broth. [49]

Newer species implicated in the causation of periodontitis are uncultivated clones D084 and BH017 from the *Deferribacteresphylum*, AU126 from the *Bacteroidetesphylum*, *Megasphaera* clone BB166 and clone I025 from the TM7 phylum, and *Eubacteriumsaphenum*. Species or phylotypes more prevalent in periodontal health included two uncultivated phylotypes, clone W090 from the *Deferribacteresphylum* and clone BU063 from the

Bacteroidetes, and named species *Atopobiumrimae* and *Atopobiumparvulum*. [11]

SIGNIFICANCE OF KNOWING ABOUT NEWER PATHOGENS

The subgingival pocket is a complex environment that harbours a highly diverse microbiota. It seems evident that other microorganisms might be involved in the onset and/or progression of periodontitis. In periodontitis bacteria and other pathogens could be described as the initiators of disease and the host immune inflammatory response as the promoter of tissue destruction. However owing to the chronic nature of periodontitis early initiators might have long induction periods of months or years because of which disease does not occur immediately as soon as the bacteria learns to thrive in its environment. Host immune response also throws its weight around determining if the individual becomes susceptible to disease or not.

However bacteria alone may not promote disease progression. Viruses like human cytomegalovirus and herpes virus can alter the subgingival environment increasing the pathogenicity of harmless commensals in the periodontal pocket. For instance, Slots[50] showed that the conversion of a gingivitis lesion to a periodontitis lesion and of a stable lesion to a progressing one could reflect cycles of activity and latency in herpesvirus infection of the periodontium.

It is the author's view that our current knowledge about pathogens in the dental plaque biofilm will help us to tailor-make a treatment plan for every patient. Most of our current treatment modalities still depend on the old non-specific plaque hypothesis. By investigating the susceptibility of periopathogens to mechanical therapy, probiotic therapy, surgical intervention or any other therapy we will be able to treat and control the epidemic of periodontitis without depending wholly on chemotherapeutic agents. In order to make progress of such an idea, advances have to be made in targeting individual organisms rather than the community as a whole. This will lead to major disruption of the biofilm colony formation (cutting off their major nutrient supply) and collapse the biofilm thereby giving us huge leeway into treating periodontitis. This translates in the form of reduction of probing pocket depth or clinical attachment gain. This will also help researchers find out exactly how much host responses pave the way to progression of periodontitis.

CONCLUSION

The etiologic role of newer microorganisms would need to be confirmed by risk assessment and interventional studies to evaluate whether their reduction or elimination would be accompanied by clinical improvements and whether their persistence would lead to disease progression. In addition,

further investigation into their mechanisms of pathogenicity and their ability to promote or evade host immune response would be required. Let us hope that future researches into this new world of microbial periodontics help us to treat the global epidemic of periodontitis in a better fashion.

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SHORT RESEARCH

Comparative study of iga antibody in covid and non covid patients



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RESEARCH QUESTION

A study to compare IgA antibody levels in covid and non covid patients

INTRODUCTION

A SARS-CoV-2-related cluster of acute respiratory illnesses has been reported in Wuhan, Hubei Province, China, in December 2019. Following that, the illness has quickly spread from Wuhan to other areas and other nations.

Adaptive immunity to viral infection relies heavily on humoral responses .IgA is the most abundant Ig generated in humans (66 gm/kg/day) and the most prevalent isotype at mucosal location. IgA-mediated mucosal immunity development may be crucial for preventing COVID-19 infection. Furthermore, by neutralising viruses or blocking virus attachment to the mucosal epithelium, secretory IgA is essential for the defence of mucosal surfaces.

AIM

To evaluate the levels of IgA in covid and non covid patients

OBJECTIVE

To compare the levels of IgA antibody in covid and non covid patients

RATIONALE OF STUDY

IgA is the major antibody class found in mucosal membranes including saliva, gastrointestinal tract and especially the respiratory epithelium which plays an important role in SARS-CoV-infections. Hence the rationale of the study is to compare levels of IgA in covid and non covid patients.

Conflict of Interest: None declared

Source of Support: Nil

METHODOLOGY

- Two samples of saliva was collected from a Covid-19 patient and a non infected patient.
- The specimen was collected in a 15 ml container and placed with icepacks in a non-absorbent container box.
- The sample was sent to MALABAR CANCER CENTRE, Thalassery via Dtdc.
- Result was mailed to our account .



RESULTS

SAMPLES	Ig-A levels
Sample 1	Less than 40%
Sample 2	Less than 40%

Sample 1- Covid-19 infected patient
 Sample 2- non infected patient

OBSERVATION

Based on the observation of the research study it was found that the Ig-A levels in both covid-19 infected and non-infected patients were less than 40%. There was no significant change in the Ig-A levels of an infected and non-infected patient.

CONCLUSION

- It was shown that the total serum IgA level is significantly associated with the severity of COVID-19. Since a low level of IgA is asymptomatic and high frequent in many countries, we suggest the evaluation of serum IgA levels in high risk people and strengthening immune system in subjects with a low level of IgA, in order to reduce rate of death.
- IgA serum concentrations peaked 3 weeks after symptom persisted for several more weeks in saliva. In this regard, oral or nasal mucosal vaccines in combination with parenteral vaccination are recommended due to increasing immunity versus COVID-19 by further secretion of the IgA antibody and preventing virus transmission.

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SHORT RESEARCH

Biopsy and microscopic examination of normal gingiva



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INTRODUCTION

The gingiva is the part of the oral mucosa that covers the alveolar processes of the jaws and surrounds the necks of the teeth. Normal gingiva covers the alveolar bone and tooth root to a level just coronal to the cemento-enamel junction. The gingiva is divided anatomically into marginal, attached, and interdental areas. Although each type of gingiva exhibits considerable variation in differentiation, histology and thickness according to its functional demands.

The marginal, or unattached, gingiva is the terminal edge or border of the gingiva surrounding the teeth in collar like fashion, it is demarcated from the adjacent attached gingiva by a shallow linear depression, the free gingival groove, usually about 1 mm wide. The attached gingiva is continuous with the marginal gingiva. It is firm, resilient, and tightly bound to the underlying periosteum of alveolar bone. The facial aspect of the attached gingiva extends to the relatively loose and movable alveolar mucosa and is demarcated by the mucogingival junction.

Histopathologically, gingiva is composed of the overlying stratified squamous epithelium and the underlying central core of connective tissue. Although the epithelium is predominantly cellular in nature, the connective tissue is less cellular and composed primarily of collagen fibers and ground substance. The major components of the gingival connective tissue are collagen fibers.

MATERIALS AND METHODS

Study sample: The samples in the present study collected from the gingival tissues during gingivectomy procedure. Histopathological findings were evaluated and reported at four levels: outer epithelium, the junction of the epithelium and the connective tissue, the connective tissue and the sulcular epithelium.

Sample size: sample size consist of 6 biopsy samples of 9-4 mm of length.

Conflict of Interest: None declared

Source of Support: Nil

Exclusion criteria: Subjects with the following criteria were excluded from the study: gingiva with severe inflammation, with periodontal pockets and other periodontal findings.

Procedure: The sample was collected during gingivectomy procedure which include both attached and marginal gingiva, by incisional biopsy. The gingival tissue sample was placed in 10% formalin for 48 h, followed by rinsing with water, trimming, Dehydrating in ethyl alcohol and immersing in paraffin. The samples underwent a staining procedure with hematoxylin and eosin (H&E) to evaluate and examine histopathological appearance of normal gingiva under light microscope.



Figure 1: A. Gingivectomy procedure , B. 6 Biopsy samples , C. Dehydration and clearing procedure , D. Wax block , E. Microtome , F. Staining Procedure

MICROSCOPIC EXAMINATION AND DISCUSSION

Microscopic examination reveals that gingiva is composed of the overlying stratified squamous epithelium and the underlying central core of connective tissue. Although the epithelium is predominantly cellular in nature, the connective tissue is less cellular and composed



Figure 2 : I.Free marginal gingiva, II.Attached gingiva, A.Outer gingival epithelium , B.Sulcular epithelium , C.Parakeratinized layer , D.Non-keratinized layer

primarily of collagen fibers and ground substance. These two tissues are considered separately. Gingiva is thick (250 um), either orthokeratinized or parakeratinized stratified squamous epithelium with a stippled surface.

Figure 2 shows the types of gingival epithelium including sulcular epithelial , outer epithelial of marginal gingival and attached gingiva, outer gingival epithelium is parakeratinized and sulcular epithelium is non keratinized.

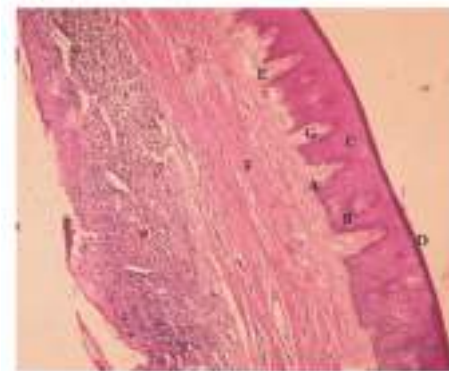


Figure 3 : A.Stratum basale , B.Stratum spinosum , C.Stratum granulosum , D.Stratum corneum (keratinised cell layer), E.Rete pegs , F.Connective tissue layer , G.Connective tissue papillae

Figure 3 shows keratinizing oral epithelium has the keratinocytes arranged in four cell layers : basal, spinous, granular, and cornified. These are also referred to in Latin as stratum basale, stratum spinosum, stratum granulosum, and stratum corneum.

Stratum Basale , Basal cell layer comprised of cuboidal cells. Progenitor cells that divide and provide new cells by mitotic division that migrate to the surface to replace cells that are shed.

Stratum spinosum , The spinous cells which make up this layer are irregularly polyhedral and larger than the basal cells. On the basis of light microscope, it appears that the cells are joined by 'intercellular bridges' . Tonofibrils seem to course from cell to cell across these bridges.

Stratum granulosum , This layer contains flatter and wider cells. These cells are larger than the spinous cells. This layer is named for the basophilic keratohyalin granules (blue staining with hematoxylin and eosin) that it contains. The nuclei show signs of degeneration and pyknosis. This layer still synthesizes protein, but reports of synthesis rates.

Stratum corneum , The stratum corneum is made up of keratinized squamae, which are larger and flatter than the granular cells. Thickness of stratum corneum varies at different sites in the oral cavity and is thicker than most areas of the skin. Here all of the nuclei and other organelles such as ribosomes and mitochondria have disappeared . The layer is acidophilic (red staining with hematoxylin and eosin) and is histologically

amorphous. The keratohyalin granules have disappeared.

The superficial cells are dead but retain the nucleus in parakeratinized epithelium but the nuclei are lost in orthokeratinized epithelium. The rete pegs are long and slender in keratinized epithelium.



Figure 4 : A.Elongated rete pegs showing an arcading pattern , B. Connective tissue papillae

In figure 3 , healthy attached gingiva "stippling" is seen which appears as small pits in the epithelium and are due to deep rete pegs. The rete pegs are long and slender in keratinized epithelium.

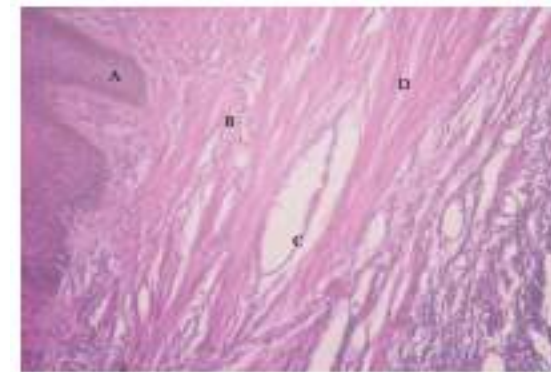


Figure 5 : A.Epithelial layer , B.Connective tissue layer , C.Blood vessel , D.Collagen fibers

Figure 5 shows lamina propria, it is made up of dense connective tissue composed of bundles of collagenous fibers, fibroblasts, blood vessels, lymphatics and nerves. The lamina propria consists of papillary layer and a reticular layer. The papillary layer is formed of tall, numerous and slender papillae. Few elastic fibers are confined to the walls of blood vessels. The texture of these fibers is fine in the young and tends to increase in coarseness with the advance of age. The reticular

layer is formed of the same kind of tissue, the fibers being arranged in a delicate network. In the attached gingiva, the fiber bundles, which arise from the cementum and alveolar crest radiate to the papillary layer of the gingiva further, strengthen the attachment of the gingiva.



Figure 6 : A.Collagen fibers B.Fibroblastic nuclei

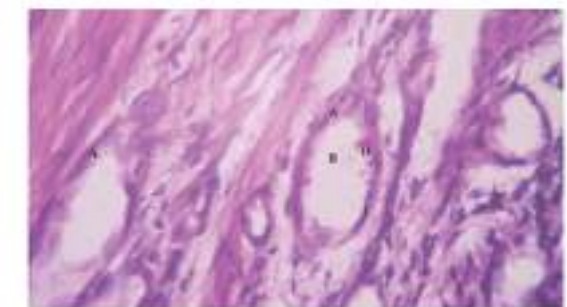


Figure 7 : A. Blood vessel , B. Lumen , C. Endothelial cells , D. Red blood cells

Figure 6&7 shows , The cellular elements of the lamina propria are mainly fibroblasts. These are found in the free gingiva where the fibers are more finely textured. Presence of plasma cells and lymphocytes are not uncommon in the clinically normal gingiva, especially near the bottom of the gingival sulcus. These cells have an important function in the defense mechanism of the body and in repair. Mast cells are found in the gingival connective tissue in a great number, however, the function of mast cells in the gingiva remains speculative. It has to be noted that in the gingiva a definite layer of submucosa cannot be recognized, instead the dense fibers of the lamina propria fuse with the periosteum of the alveolar process or cementum at the cervical region. In figure 7, blood vessels appears are a hollow space.

CONCLUSION

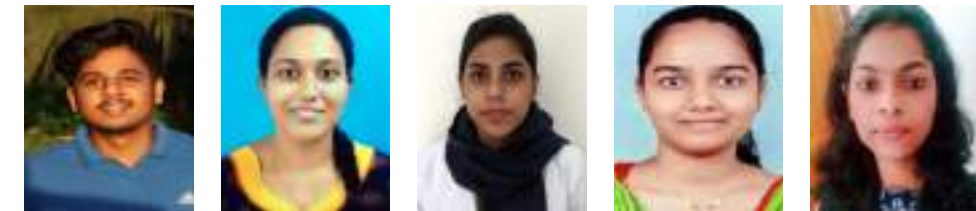
In this study we have observed the normal microscopic appearance of normal gingiva. Each type of gingiva exhibits considerable variation in differentiation, histology and thickness according to its functional demands, all types are specifically structured to function appropriately against mechanical and microbial damage. Specific structure of different gingiva reflects its effectiveness as a barrier to the penetration by microbes and noxious agents into the deeper tissue.

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BASIC RESEARCH

Project topic: Isolation and identification of Streptococcus species based on haemolytic properties on blood agar from patients with gingivitis.



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Materials used: Sterile cotton swab, blood agar medium, Mc Intosh and Fields anaerobic jar, incubator

INTRODUCTION

Gingivitis is a multifactorial disease with microbial dental plaque as the initiator of the disease. This condition usually composed of bacteria which includes both Gram positive and Gram negative groups. Streptococci are Gram positive organisms which is predominantly causes oral health problems especially Streptococcus mutans. Streptococci are classified based on the haemolytic properties into alpha, beta and gamma. Alpha is incomplete haemolysis, beta is complete haemolysis and gamma is non-haemolytic on blood agar plates.

PROCEDURE

Samples are collected using sterile cotton swab from patients with gingivitis. Blood agar plates are prepared aseptically prior to the sample collection. Swabs are inoculated on to blood agar medium. These plates are placed inside Mc- Intosh and Fields anaerobic jar. This jar placed inside incubator at 37 degree Celsius for 12 hours. After incubation the haemolytic pattern of the colonies formed is observed.



Conflict of Interest: None declared

Source of Support: Nil



RESULT

A total of 10 samples tested growth is observed in 7 plates. Among that 4 plates showed complete haemolytic colonies that is beta haemolytic colonies, two plates showed alpha haemolytic colonies and one plate showed gamma haemolytic colonies.

CONCLUSION

This study revealed that the predominant organism in patients with gingivitis is beta haemolytic Streptococci. This organism can be Streptococcus pyogenes and which requires further molecular diagnostic methods for the speciation of the organism.

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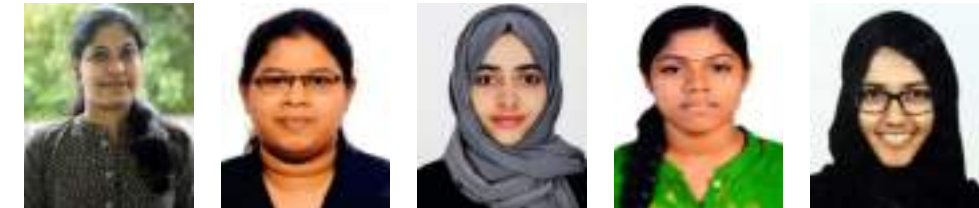
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BASIC RESEARCH

Identifying MRSA -methicillin Resistant Staphylococcus Aureus



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Methicillin resistant staphylococcus aureus is a group of gram positive bacteria that are genetically distinct from other strains of staphylococcus aureus. MRSA is responsible for several difficult to treat infections in humans. It cost more than 1 lakh deaths attributable to antimicrobial resistance in 2019. MRSA is a common hospitals, prisons and nursing home, where people with open wounds ,invasive devices such as catheters and weak immune system are at great risk of health care associate infection. MRSA begun as hospital acquired infection but has become community acquired as well as life stock acquired.

- HA-MRSA ; healthcare associated/hospital acquired MRSA
- CA-MRSA ; community associated MRSA
- LA-MRSA ; livestock associated MRSAAIM

To detect nasal MRSA in health workers

OBJECTIVES

- To detect presence of staphylococcus aureus in nasal swab from healthworkers.
- To confirm the presence of MRSA among these staphy aureus positive health workers by antibiotic disc diffusion test .

MATERIALS REQUIRED

Materials needed

- Sterile cotton swab
- Petri dish
- Conical flask
- Glass rod

Conflict of Interest: None declared

Source of Support: Nil



PROCEDURE

- Samples were collected from anterior nostrils of the patients using clean cotton swab.
- The swab were rotated in clockwise direction using slight pressure to ensure adequate collection of sample. The same procedure was repeated in others nostrils.
- The collected sample were inoculated immediately on to the

culture media containing mannitol salt agar.

- The culture plate incubated overnight at 37°C and look for the presence of staphylococcus aureus colony

Staphylococcus aureus colonies were represented as yellow color colonies

- To confirm the presence of MRSA in the staphylococcus aureus colonies cefoxitin disc diffusion test was performed

- For that, the colonies were lawn cultured on Mueller Hilton agar and cefoxitin in disc of 30 mg was placed on the centre of each plate
- After overnight incubation at 37°C the zone of inhibition

is found to be zero but there are presence of staphylococcus aureus.

CONCLUSION

In taking account of previous studies done in our college, which



around the antibiotic disc was measured

The zone of inhibition with diameter ≤ 19 mm were taken as MRSA positive

RESULT

Out of 20 samples taken , test result of positive cases of MRSA

showed a huge rise in MRSA cases this study reveals that the cases are drastically reduced. But preventive measures should be taken to reduce the further outbreak of the condition.

Presence of candida albicans in dental caries



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AIM: To test the presence of candida albicans in dental caries

MATERIALS NEEDED:

- sterile cotton swab
- Petridish
- Conical flask
- Glass rod
- Weighing machine
- Inoculation loop
- Autoclave

Chemicals required:

- Culture media
- Sabouraud chloramphenicol agar

Distilled water Microbiological test Antibiotic sensitivity test



Conflict of Interest: None declared

Source of Support: Nil

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PROCEDURE

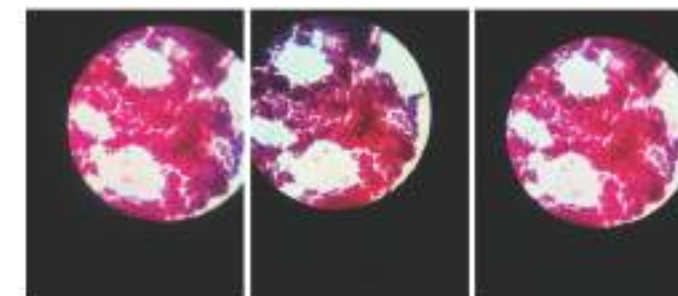
- Preparation of culture medium: suspended 6.5 gm of sabour aud chloramphenicol agar in 100ml distilled water in a conical flask.
- The conical flask was completely covered with a cotton and covered it properly.
- The solution is heated to boiling to dissolve the medium completely.

- Sterilized by auto claving for 15 minutes.
- Cool to 45-50°C, mix well and pour to sterile petri dish.
- Sample collection: 5 samples were collected from patients with dental caries using a sterile cotton swab.
- The collected sample inoculated immediately on to the culture medium.



RESULT

Out of 5 samples taken test result of positive cases of candida albican was found to be 2
The presence of candida albicans is confirmed.



No win no fee ; a questionnaire survey on legal aspects of medical negligence among dental practitioners



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ABSTRACT

Background

Medical negligence is defined as a medical practitioner's failure to exercise reasonable care and skill, or purposeful carelessness, in the treatment of a patient, resulting in bodily injury or death. 'Duty, breach, and resulting damage' are the three key elements of negligence. Medical negligence that is legally recognised has three types of consequences: (i) criminal liability, (ii) monetary liability, and (iii) disciplinary action. The goal of this study was to determine how well medical professionals (from general practitioners to specialists) were aware of various ethical and legal concerns and codes of behaviour

Materials and methods

During April 2022 to May 2022, a cross-sectional questionnaire-based survey was done among dental practitioners in South India using a self-reported closed ended questionnaire with 25 items and was organised using Google Forms using Survey Heart.

Results

There were a total of 5131 responders, 30% (1527) from Kerala, 19% (978) from Tamil Nadu, 17% (884) from Karnataka, 20% (1038) from Andhra Pradesh and 14% (704) from Telangana. The awareness was average among dentists for most of the questions. Majority of them knew the term medical negligence but term least known was indemnity claim.

Conclusion

This survey assessed the knowledge of the dentists and also enlightened the

Conflict of Interest: None declared

Source of Support: Nil

respondents with answers pertaining to the questions. More awareness must be created so that doctors are more careful and hence patients benefitted. The participants were aware of Consumer Protection Act and informed consent, but their understanding of record keeping and medical negligence was limited, and they were unaware of finer details. To raise understanding of medico-legal issues in medical practise, local bodies and medical associations should enhance their engagement in providing seminars. In terms of medico-legal aspects, students' education should be more extensive.

Key words

Medical Negligence, Medico-legal, Informed Consent, Consumer Protection Act.

INTRODUCTION

Medical negligence is defined as a medical practitioner's failure to exercise reasonable care and skill, or purposeful carelessness, in the treatment of a patient, resulting in bodily injury or death.[1] The doctor-patient relationship is built on trust and confidence, but this trust, sanctity, and confidence have become a thing of the past, and it now sounds false.[2] 'Duty, breach, and resulting damage' are the three key elements of negligence.[3] All clinical practitioners and healthcare providers (e.g., physicians, nurses, medical technicians, paramedics, and other healthcare professionals) are responsible for any mistakes that may result in medical negligence. Medical negligence can occur in a variety of ways, including technical errors during surgical procedures, misdiagnosis of disease, or prescribing the wrong medicine or dose [4] Medical carelessness has not only left people in poorer health than before, but it has also resulted in the death of persons suffering from major medical conditions.[5] Clinical medicine is seen to be moving toward a patient-centred contract, with the term "informed decision" expressing a patient's entitlement to autonomy.[6] Doctors' services are regulated by the Consumer Protection Act of 1986, and patients can go to the Consumer Courts to get their complaints resolved.[7] Medical negligence that is legally recognised has three types of consequences: (i) criminal liability, (ii) monetary liability, and (iii) disciplinary action[8]. According to a survey, the number of medical negligence cases in India is increasing by 110 percent per year.[9] The goal of this study was to determine how well medical professionals (from general practitioners to specialists) were aware of various ethical and legal concerns and codes of behaviour[10]

MATERIALS AND METHODS

STUDY POPULATION

During April 2022 to May 2022, a cross-sectional questionnaire-based survey was done among dental

practitioners in South India using a self-reported closed ended questionnaire with 25 items and was organised using Google Forms using Survey Heart.

<https://surveyheart.com/form/6267768f19cd7251528a443d>

SAMPLE SIZE AND TECHNIQUES

The poll included a convenient sample of 5131 respondents from both private and public sector. Through the Indian Dental Association State Branches of respective states, the survey heart link was shared with faculties via WhatsApp group

OFFICIAL PERMISSION

An ethical permission from the ethical committee was received before the start of the survey, and informed consent from all survey participants were obtained via WhatsApp group.

DATA COLLECTION

Only 5131 people out of 6000 responded to the validated questionnaire. Among the 5131 respondents, 1527 practitioners from Kerala, 978 from Tamil Nadu, 884 from Karnataka, 1038 from Andhra Pradesh and 704 from Telangana were included. The data was collected using a standardised questionnaire. This questionnaire was distributed to dental practitioners in 5 South Indian States via an online Google form, and they were invited to complete it. In the report analysis, only completed surveys were used. The topic of legal aspects of medical negligence knowledge and awareness contains 25 questions. The questions focused on consumer understanding of CPA provisions, informed consent, conditions under which a consumer falls under CPA, the time period during which a patient can sue the relevant doctor, and the maximum time period during which a patient can sue the concerned doctor. The responses were categorised as dichotomous variables (yes or no).

DATA ANALYSIS

The data was analysed using statistical software, namely SPSS version 20.0.

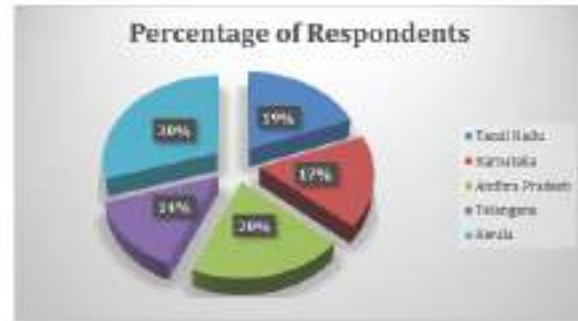
ETHICAL CONSIDERATIONS

The study's subjects were completely self-selected. No personal information such as IP addresses, email ID names, or other identifiers were collected.

RESULT

The pie chart depicts the number of dental practitioners from Kerala, Tamilnadu, Karnataka, Andhra Pradesh and Telangana who answered to the survey. There were a total of 5131 responders, 30% (1527) from Kerala, 19% (978) from Tamil Nadu, 17% (884) from Karnataka, 20% (1038) from Andhra Pradesh and 14% (704) from Telangana.

Figure 1: Distribution of Respondents According to Place Of Origin:



Percentage of Respondents

The table depicts the knowledge and awareness of the legal aspects of medical negligence among the dental practitioners in

different states of South India :

TABLE 1: Distribution of participants indicating the knowledge on legal aspects of medical negligence

The respondent's understanding of importance of legal aspects of medical negligence was measured. According to this, the term medical negligence is known most by the dental practitioners of Kerala (98%) and least known by Karnataka (92%). Only 10% of dental practitioners in Tamil Nadu are aware of different types of medical negligence whereas 21% of practitioners in Andhra Pradesh are aware of different types of medical negligence. 90% of dental practitioners in Telangana are aware of Consumer Protection Act whereas 98% dental practitioners in Kerala are aware of the same. The chart also demonstrates that the dental practitioners in southern states of India are well versed in various aspects of medical negligence.

Sl.No	Questions	Response	Kerala	Tamil Nadu	Karnataka	Andhra Pradesh	Telangana
1.	Have you heard about the term medical negligence?	Yes	1500 (98%)	950(97%)	813(92%)	986(95%)	654(93%)
		No	27(2%)	28(3%)	71(8%)	52(5%)	49(7%)
		Total	1527	978	884	1038	704
2.	Are you aware of different types of medical negligence?	Yes	214(14%)	98(10%)	151(17%)	218(21%)	106(15%)
		No	1313 (86%)	880(90%)	733(83%)	820(79%)	598(85%)
		Total	1527	978	884	1038	704
3.	Do you know how to write informed consent form?	Yes	1519 (99%)	958(98%)	839(95%)	975(96%)	675(96%)
		No	16(1%)	20(2%)	45(5%)	63(4%)	29(6%)
		Total	1527	978	884	1038	704
4.	Do you know what is Consumer Protection Act(COPRA)?	Yes	1496 (98%)	919(94%)	857(97%)	986(95%)	633(90%)
		No	31(2%)	59(6%)	27(3%)	52(5%)	71(10%)
		Total	1527	978	884	1038	704
5.	Do you know how negligence is determined?	Yes	1325 (86%)	631(64%)	603(68%)	771(74%)	517(73%)
		No	202(14%)	347(36%)	281(32%)	267(26%)	187(27%)
		Total	1527	978	884	1038	704

6.	Do you know which is the most common serious form of negligence?	Yes	1038 (68%)	489(50%)	548(62%)	498(48%)	401(57%)
		No	489(32%)	489(50%)	236(38%)	540(52%)	303(43%)
		Total	1527	978	884	1038	704
7.	Do you know what professional indemnity claim is?	Yes	1052 (69%)	528(54%)	539(61%)	654(63%)	458(65%)
		No	475(31%)	450(46%)	345(39%)	384(37%)	246(35%)
		Total	1527	978	884	1038	704
8.	Should medicolegal issues be taught in UG dental courses?	Yes	1481 (97%)	929(95%)	813(92%)	934(90%)	662(94%)
		No	46(3%)	49(5%)	71(8%)	104(10%)	42(6%)
		Total	1527	978	884	1038	704

TABLE 2: Distribution of participants indicating the awareness on legal aspects of medical negligence

Table 2 lists awareness of dental practitioners among the five southern states of India in the field of medical negligence. 97%

of dental practitioners in Kerala are aware about the duration within which a medical negligence claim is settled and 91% of dental practitioners are least aware. Only 1% of dental practitioners in Kerala are not aware of importance of consent. 46% of dental practitioners in Tamil Nadu are not acquainted of

Sl.No	Questions	Response	Kerala	Tamil Nadu	Karnataka	Andhra Pradesh	Telangana
1.	Do you know treatment free of cost comes under Consumer Protection Act?	Yes	1389 (91%)	880(90%)	777(88%)	882(85%)	626(89%)
		No	138(9%)	98(10%)	107(12%)	156(15%)	78(11%)
		Total	1527	978	884	1038	704
2.	Are you aware about the duration within which a medical negligence claim is settled?	Yes	1481 (97%)	929(95%)	804(91%)	965(93%)	661(94%)
		No	46(3%)	49(5%)	80(9%)	73(7%)	43(6%)
		Total	1527	978	884	1038	704
3.	Are you aware of importance of consent?	Yes	1511 (99%)	948(97%)	848(96%)	986(95%)	661(94%)
		No	16(1%)	30(3%)	36(4%)	52(5%)	43(6%)

		No	16(1%)	30(3%)	36(4%)	52(5%)	43(6%)
		Total	1527	978	884	1038	704
4.	Do you ensure consent form from your patient before treatment?	Yes	1297 (85%)	782(80%)	689(78%)	913(88%)	577(82%)
		No	230(15%)	196(20%)	195(22%)	125(12%)	127(18%)
		Total	1527	978	884	1038	704
5.	Are you aware of time limit within which a medical negligence lawsuits have to be filed?	Yes	1374 (90%)	831(84%)	822(93%)	913(88%)	668(95%)
		No	153(10%)	147(15%)	662(7%)	125(12%)	36(5%)
		Total	1527	978	884	1038	704
6.	Do you think you can practice during you are being trialed?	Yes	1496 (98%)	929(95%)	795(90%)	913(88%)	682(97%)
		No	31(2%)	49(5%)	89(10%)	125(12%)	22(3%)
		Total	1527	978	884	1038	704
7.	Are you aware about difference between medical negligence and malpractice?	Yes	1252 (82%)	753(77%)	663(75%)	705(68%)	499(71%)
		No	275(18%)	225(23%)	221(25%)	333(32%)	205(29%)
		Total	1527	978	884	1038	704
8.	Do you maintain patient records?	Yes	1450 (95%)	841(86%)	742(84%)	840(81%)	619(88%)
		No	77(15%)	137(14%)	142(16%)	198(19%)	85(12%)
		Total	1527	978	884	1038	704
9.	Do you know the records of a patient is legally his/her property?	Yes	1221 (80%)	743(76%)	663(75%)	788(76%)	492(70%)
		No	306(20%)	235(24%)	221(25%)	250(24%)	212(30%)
		Total	1527	978	884	1038	704
10.	Do you know how long you have to keep the record of patient?	Yes	1328 (87%)	802(82%)	636(72%)	810(78%)	563(80%)
		No	199(13%)	176(18%)	248(28%)	228(22%)	141(20%)

			1527	978	884	1038	704
11.	Have you taken any insurance coverage to protect yourself against claims?	Yes	1420 (93%)	851(87%)	734(83%)	913(88%)	570(81%)
		No	107(7%)	127(13%)	150(17%)	125(12%)	134(19%)
		Total	1527	978	884	1038	704
12.	Have you ever have to pay the settlement due to any injury to the patient?	Yes	92(6%)	88(9%)	97(11%)	104(10%)	56(8%)
		No	1435 (94%)	890(91%)	787(89%)	934(90%)	648(92%)
		Total	1527	978	884	1038	704

DISCUSSION

Negligence is a violation of one's duty of care (duty to meet a particular standard).[11] Managing complaints necessitates awareness, a well-structured process, communication, documentation, and empathy.[12].

The survey showed , 94.8 % of dental practitioners are aware about Consumer Protection Act.The knowledge of the Consumer Protection Act was found to be below average in Radhika K research which is in contrast with the above study. [13] Concepts like informed consent, participation in decision making is not considered important in the Povl Riis research which is in contrast with the above study. [14]According to Abdelmoneim K. ,almost 76% of the respondents agreed that keeping the record of the patient upto 5-10 yrs is necessary in medicolegal case ,which is in accordance with the above study [15] Almost all of the participants in this study were aware of informed consent, which is consistent with Heywood R.'s 2007 study, which revealed that 98 percent of medical students were aware of consent. [16]The majority of respondents are not much aware of the importance of knowledge of medical negligence, with only a few opposing it. . This is in contrast with the Dash S.K. conducted a study in 2010 where majority of the respondents agreed that knowledge of medical negligence is important.[17] On knowledge about extend of the records of the patient to be maintained , 79.8% of dental practitioners were knowledgeable which is in accordance with the study conducted by Kesavan R on the topic of Knowledge of Dental Ethics and jurisprudence among dental practitioners. [18] Senthilkumar and colleagues conducted a cross-sectional study that revealed minimal awareness of medical-legal concerns among dental practitioners which is in contrast with this study. [19] In research conducted by Ravesh B, slightly more than a quarter of healthcare professionals didn't have medical

indemnity insurance. The comparison revealed that only about 10% of dental health practitioners across South India did not have medical indemnity insurance which is in contrast with the above study.[20]

The following are the limitations of the survey: Not everyone had internet access. Rural dwellers could not be included. Our survey included close ended questions. Hence respondent had no choice but to select an answer.Sometimes people won't participate in a survey. When a good portion of survey takers don't respond and their answers may have been very different from those who did respond, it could create misleading conclusions. Lack of an interviewer can often be a negative aspect because a skilled interviewer can often coax answers out of a participant that isn't very forthcoming with their responses.

Our study would recommend to inculcate the legal aspects of medical negligence at a greater depth in educational systems . It would be better if IDA takes better initiative to enlighten their dental practitioners about legal aspects of medical negligence.

CONCLUSION

Though doctors are revered as gods, people believe that they would improve and be healed as a result of the treatment. However, it is not uncommon for doctors to make mistakes that harm patients in a variety of ways. Furthermore, in some cases, their errors are so severe that the patient is forced to deal with problems and endure excruciating pain.

The utilisation of equipment and medical tools in health care sector should be made with proper care and caution as it might lead to an injury to the consumer which may further result in the filing of a complaint against the doctors and the other authorities concerned. However, there is no such clause.

To summarise, negligence in the dental field necessitates a

unique treatment. To suggest haste or carelessness on the part of a professional, additional concerns apply in the case of a doctor. An example of occupational negligence is distinct from professional negligence. A simple carelessness, a blunder, or a miscalculation is not a proof of dental malpractice as long as a doctor follows an accepted procedure.

Our study was designed to know the dental practitioners knowledge of consumer protection Act, record keeping, informed consent, and medico-legal concerns. The participants were aware of consumer protection Act and informed consent, but their understanding of record keeping and medical negligence was limited, and they were unaware of finer details. To raise understanding of medico-legal issues in medical practise, local bodies and medical associations should enhance their engagement in providing seminars. In terms of medico-legal aspects, students' education should be more extensive.

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REVIEW

Internal derangement of temporomandibular joint



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INTRODUCTION

The temporomandibular joints (TMJ) are the two joints connecting the jawbone to the skull. It is a bilateral synovial articulation between the temporal bone of the skull above and the mandible below. Temporomandibular disorders (TMDs) is a collective term for conditions that involve pain and / or dysfunction of the temporomandibular joint (TMJ), and the related structures. An estimated 8–15% of women, and 3–10% of men currently suffer from TMD. Most TMDs involve either muscular or skeletal structures or both.

Internal derangement of a synovial joint is not a disease. The biomechanical joint dysfunction that is associated with internal derangement represents a failure of the intra-articular tissues caused by the loss of the structure and function. Identifying the cause of the breakdown of the tissues within a synovial joint that leads to internal derangement is an important component of successful treatment. Clinicians must ask what disease process is causing the tissue breakdown. Is there a history of acute or chronic trauma to the joint? Is there a systemic disorder that is contributing to the breakdown of connective tissues? Is there an infection or a tumor present that is causing the nonspecific symptoms of internal derangement? A clear understanding of this concept by clinicians is essential and has significant implications on patient management and the outcome of therapy. On review of the literature on temporomandibular joint disorders over the past 35 years, the problem of internal derangement of the temporomandibular joint is often the central focus of the diagnosis and management of patients with orofacial pain caused by temporomandibular disorders (TMDs). Clear guidelines for diagnosis and management of internal derangement of the temporomandibular joint are often elusive, although there has been much excellent research on the validation of classification systems, such as the Research Diagnostic Criteria for TMDs (more

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recently updated to the Diagnostic Criteria [DC] for TMDs) and the Wilkes Staging System for temporomandibular joint disorders. For any given diagnosis, there are multiple management options that have been recommended, including no treatment, nonsurgical therapies, minimally invasive surgical procedures (arthrocentesis, arthroscopy), arthroplasty (repair of intra articular tissues), discectomy, and total joint replacement. The main focus of this article the concept of internal derangement and temporomandibular joint disorders from a new perspective, based on clinical research, basic science research on synovial joint pathophysiology, and the principles of diagnosis and management from the perspective of the specialties of rheumatology and orthopaedics. This information ultimately leads to new concepts in the classification of internal derangement based on cause and pathophysiology, and leads to new perspectives on the management and treatment of internal derangement of the temporomandibular joint.

NORMAL ANATOMY AND FUNCTION OF TEMPOROMANDIBULAR JOINT

The stomatognathic system includes various anatomical structures, which allow the mouth to open, swallow, breathe, phonate, suck and perform different facial expressions. These structures are the temporomandibular joint (TMJ), jaw and mandible, muscle tissues and tendons, dental arches, salivary glands, as well as the hyoid bone and the muscles that connect the latter to the scapula and the sternum, the muscles of the neck. TMJ through its complex movements, on different orthogonal planes and multiple rotation axes, works in synergy with all the structures just listed. The TMJ must also work in coordination with the contralateral TMJ to coordinate tandem dynamic function.

Its position and structure make it an intersection of information and influences that expand throughout the body, and vice-versa; the mechanical information of other body districts can reflect in the TMJ.

The article reviews functional anatomy, embryological development, differences in the anatomy of the child and the adult, with a look at the surgical, clinical and other physiological variables that influence the temporomandibular function. The text reviews the manual approach to TMJ, which is often used as a support for joint rehabilitation, in synergy with the doctor.

The temporomandibular joint (TMJ) is a diarthrosis, better defined as a ginglymoarthrodial joint. TMJ is composed of a synovial cavity, articular cartilage and a capsule that covers the same joint. We find the synovial fluid and several ligaments. The joint is the union of the temporal bone cavity with the mandibular condyle.[1]

Anatomy

The cranial surface of TMJ consists of the squamous area of the temporal bone; it takes the name of glenoid fossa and welcomes the condyle of the jaw. The posterior area of the fossa is known as posterior articular ridge; sideways to the latter, we find a bone portion called postglenoid process. The postglenoid process area contributes to forming the upper wall of the external acoustic meatus.[1]

The anterior limit of the glenoid fossa of the temporal bone constitutes the articular eminence, which forms a medial bone prominence at the posterior border of the zygomatic bone. The preglenoid plane is slightly inclined, which leads into the articular eminence; the latter is anterior to the fossa, along with the base of the skull. The preglenoid plane is slightly inclined, which leads into the articular eminence; the latter is anterior to the pit, along with the base of the skull. This area allows and facilitates the movements of the articular disk and the condyle. On the lateral surface of the articular eminence, there is a bone ridge, known as the articular tubercle, near the root of the zygomatic process.

The glenoid fossa is wider in its mediolateral portion, compared to the anteroposterior area. The inferior articular surface of the glenoid fossa represents the superior area of the mandible.[1] It consists of the condyle of the mandible with a transverse diameter of about 15 to 20 mm and a measurement of about 8 to 10 mm in the anteroposterior direction.

The articular disc that covers the condyle and interposes below the glenoid fossa has a biconcave or oval shape; the cartilaginous disc has an anterior (about 2 mm) and posterior (about 3 mm) portion, with a thinner diameter in the middle. The anterior portion of the disc consists of a layer of fibroelastic fascia (above) and a fibrous layer (inferiorly). The upper portion is in contact with the postglenoid process, with the function of preventing the disc from slipping during the opening of the mouth. The lower portion of the disc has the task of avoiding excessive rotational movements of the disc relative to the mandibular condyle. The anterior portion of the articular disc is in contact with: the joint capsule; articular eminence; condyle; the upper area of the lateral pterygoid muscle. The posterior portion of the articular disc relates to: bilateral retro-disc tissue (behind the condyle), glenoid fossa; condyle; temporal bone. The medial and lateral aspect of the cartilaginous disc is attached to the condylar formation of the mandible. The edges of the disc partly fuse with the fibrous capsule surrounding the joint.

Several ligaments manage the TMJ forces and send multiple proprioceptive afferents. The proprioception of the joint is provided by various components, such as the capsule, masticatory muscles, skin receptors and receptors within the periodontal ligaments. The tension perceived by the articular ligaments plays an important role in the function of TMJ.

1) Sphenomandibular ligament - The sphenomandibular ligament (SML) is a Meckel cartilage residue. It originates from the sphenoid spine (from which also originates the pterygospinous ligament) and in its path towards the jaw, is inserted in the medial wall of the TMJ joint capsule. Through the petrotympanic fissure, it involves the malleus and forms some fibers of the anterior ligament of the malleus. It continues its descent to attach itself to the lingula of the mandible (sphenoid, middle ear, jaw). The mylohyoid nerve and several vessels cross the ligament; has contacts with the pterygomandibular fascia. It is in a superior and lateral relationship with the lateral pterygoid muscle, the internal maxillary artery and the auriculotemporal nerve, the inferior alveolar nerve, and the medial meningeal artery. Its main task is to protect the TMJ from an excessive translation of the condyle, after 10 degrees of opening of the mouth.

2) Stylomandibular ligament - The stylomandibular ligament (STML) arises from the styloid process of the temporal bone up to the posterior margin of the jaw or the jaw angle. It is considered a thickening of the deep cervical fascia (in particular of the parotid fascia). It serves to limit excessive protrusion of the jaw. Its embryological derivation concerns the first and second branchial arch, from which the middle ear stapes will derive (through the Reichert cartilage). In its path, it covers the inner portion of the medial pterygoid muscle.

3) Pterygomandibular ligament - The pterygomandibular ligament or raphe (PTML) is a thickening of the buccopharyngeal fascia. It arises from the apex of the hamulus of the internal pterygoid plane of the skull up to the posterior area of the retromolar trigone of the mandibular bone. Some muscles are in contact with PTML: the buccinator muscle (anterior) and the pharyngeal constrictor muscle (posteriorly). Embryologically, the ligament derives from the mesenchymal connection of two branchial arches (first and second). PTML limits excessive jaw movements.

4) Pinto or malleolomandibular or discomalleolar ligament - From an embryological point of view, it derives from the tympanic portion. The ligament has two portions. The first concerns the middle ear involves the malleus relative to the anterior ligament of the malleus; the second involves the extra-tympanic area, that is, the portion of the TMJ joint capsule, posterosuperior, in contact with the retro-discal tissues (passing through the petro-tympanic fissure). The functions are twofold. For TMJ protects the synovial membrane with respect to the tensions of surrounding structures. For the middle ear, it would seem to manage or influence adequate pressure for this area of the ear.

5) The collateral ligament consists of 2 bundles of symmetrical fibers that originate at the level of the intermediate fascia of the articular disk and insert at the medial and lateral poles of the mandibular condyle. It serves to anchor the disk to the condyle.

TMJ is related to different muscles that have the function to move and protect the joint itself. The muscles that function to close the jaw are masseter, temporal, lateral or external pterygoid. The muscles that open the jaw are medial or internal pterygoid, geniohyoid, mylohyoid, digastric.

Function

When the mouth opens there is a combination of rotational movement of the discomandibular space and action of the translational discotemporal space; the rotation occurs before the translation. The condyle can move laterally through a rotation and then an anterior sliding of the same condylar structure, and an anterior translation/rotation in the medial direction of the opposite condyle. The condyle can move backward, while the opposite condyle slides forward. The bilateral or ipsilateral TMJ protrusion occurs by anterior sliding. The complex movements of TMJ allow multiple functions:

- Chewing
- Sucking
- Swallowing
- Phonation
- Facial expressions
- Breathing
- Protrusion, retrusion, lateralization of the jaw
- Opening the mouth

Maintain the correct pressure of the middle ear

- Weighing machine
- Inoculation loop
- Autoclave

Chemicals needed

- Culture media
- Mannitol salt agar base
- Mueller Hilton agar

Microbiological test

- Antibiotic sensitivity test



CLASSIFICATION OF TEMPOROMANDIBULAR JOINT DISORDERS

American Association of Orofacial Pain (AAOP) Taxonomic Classification for TMDs

1. Joint Pain
 - a. Arthralgia
 - b. Arthritis
2. Joint Disorders
 - a. Disc Disorders
 - b. Hypomobility disorders other than disc disorders
 - c. Hypermobility disorders
3. Joint Disease
 - a. Degenerative joint disease
 - b. Systemic arthritides
 - c. Condylitis/Idiopathic condylar resorption
 - d. Osteochondritis dissecans
 - e. Osteonecrosis
 - f. Neoplasm
 - g. Synovial chondromatosis
4. Fractures
5. Congenital/developmental disorders

DISC DISORDERS

1. Disc displacement with reduction
2. Disc displacement with reduction & intermittent locking
3. Disc displacement without reduction & limited opening
4. Disc displacement without reduction without limited opening

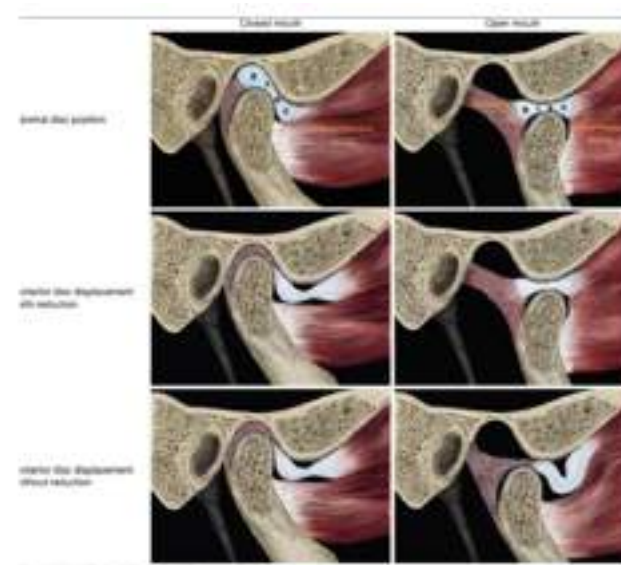
INTERNAL DERANGEMENT

The most popular definition of internal derangement of the temporomandibular joint has generally alluded to joint dysfunction associated with an abnormal disc position. The Merck Manual describes internal derangement of the temporomandibular joint as a condition with damage to the internal structures of the joint and “the most common form of internal temporomandibular joint derangement is anterior misalignment or displacement of the articular disc above the condyle.” Molinari and colleagues defined internal derangement as follows: “the term derangement refers to an alteration in the normal pathways of motion of the TMJ [temporomandibular joint] that largely involves the function of the articular disc.” A definition of internal derangement of the temporomandibular joint that has been widely used by the dental profession for the past 4 decades describes a disruption

of the internal aspects of the joint involving displacement of the disc from a normal functional relationship between the condyle of the mandible and the articular eminence of the temporal bone. This definition has been widely accepted in the dental profession.

WILKES STAGING OF INTERNAL DERANGEMENTS

1. Stage I: early
Painless clicking, anterior disc displacement with reduction
2. Stage II: early/intermediate
Clicking with intermittent pain and locking, anterior disc displacement with reduction
3. Stage III: intermediate
Pain, joint tenderness, frequent and prolonged locking, restricted motion, anterior disc displacement with or without reduction, no degenerative changes
4. Stage IV: intermediate/late
Chronic pain, restricted motion, no clicking, anterior disc displacement without reduction, degenerative bony changes, adhesions
5. Stage V: late
Variable pain, painful/reduced function, crepitus, anterior disc displacement without reduction, advanced degenerative bony changes, gross disc deformity and/or perforation, advanced adhesions.



DISC DISPLACEMENT WITH REDUCTION

An intra-capsular biomechanical disorder involving the condyle–disc complex. In the closed mouth position, the disc is in an anterior position relative to the condylar head, and the disc reduces upon opening of the mouth. Medial and lateral

displacement of the disc may also be present. Clicking, popping, or snapping noises may occur with disc reduction. A history of prior locking in the closed position coupled with interference in mastication precludes this diagnosis.

History

1. In the last 30 days, any TMJ noise(s) present with jaw movement or function, or patient report of any noise present during the exam.

Examination

1. Clicking, popping and/or snapping noise detected during both opening and closing, with palpation during at least one of three repetitions of jaw opening and closing;

or

2. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of opening or closing; and

3. Clicking, popping, and/or snapping noise detected with palpation during at least one of three repetitions of right or left lateral movements, or protrusive movements.

Imaging

When this diagnosis needs to be confirmed, then TMJ MRI criteria are positive for both of the following:

1. In the maximum intercuspal position, the posterior band of the disc is located anterior to the 11:30 position and the intermediate zone of the disc is anterior to the condylar head;

and

2. On full opening, the intermediate zone of the disc is located between the condylar head and the articular eminence.

DISC DISPLACEMENT WITH REDUCTION WITH INTERMITTENT LOCKING

An intracapsular biomechanical disorder involving the condyle–disc complex. In the closed mouth position, the disc is in an anterior position relative to the condylar head, and the disc intermittently reduces with opening of the mouth. When the disc does not reduce with opening of the mouth, intermittent limited mandibular opening occurs. When limited opening occurs, a maneuver may be needed to unlock the TMJ. Medial and lateral displacement of the disc may also be present. Clicking, popping, or snapping noises may occur with disc reduction.

History

In the last 30 days, any TMJ noise(s) present with jaw movement or function; or patient report of any noise present during the exam.

and

In the last 30 days, jaw locks with limited mouth opening, even

for a moment, and then unlocks.

Examination

Same as specified for Disc Displacement with Reduction. Although not required, when this disorder is present clinically, examination is positive for inability to open to a normal amount, even momentarily, without the clinician or patient performing a specific manipulative maneuver.

Imaging

When this diagnosis needs to be confirmed, then the imaging criteria are the same as for disc displacement with reduction if intermittent locking is not present at the time of imaging. If locking occurs during imaging, then an imaging-based diagnosis of disc displacement without reduction will be rendered and clinical confirmation of reversion to intermittent locking is needed.

DISC DISPLACEMENT WITHOUT REDUCTION WITH LIMITED OPENING

An intracapsular biomechanical disorder involving the condyle–disc complex. In the closed mouth position, the disc is in an anterior position relative to the condylar head, and the disc does not reduce with opening of the mouth. Medial and lateral displacement of the disc may also be present. This disorder is associated with persistent limited mandibular opening that does not resolve with the clinician or patient performing a specific manipulative maneuver. This is also referred to as “closed lock.”

History

1. Jaw lock or catch so that the mouth would not open all the way; and
2. Limitation in jaw opening severe enough to limit jaw opening and interfere with ability to eat.

Examination

Maximum assisted opening (passive stretch) <40 mm including vertical incisal overlap.

Imaging

When this diagnosis needs to be confirmed, then TMJ MRI criteria are positive for both of the following:

1. In the maximum intercuspal position, the posterior band of the disc is located anterior to the 11:30 position and the intermediate zone of the disc is anterior to the condylar head, and

2. On full opening, the intermediate zone of the disc is located anterior to the condylar head.

DISC DISPLACEMENT WITHOUT REDUCTION WITHOUT LIMITED OPENING

An intracapsular biomechanical disorder involving the condyle–disc complex. In the closed mouth position, the disc is

in an anterior position relative to the condylar head and the disc does not reduce with opening of the mouth. Medial and lateral displacement of the disc may also be present. This disorder is not associated with limited mandibular opening.

History

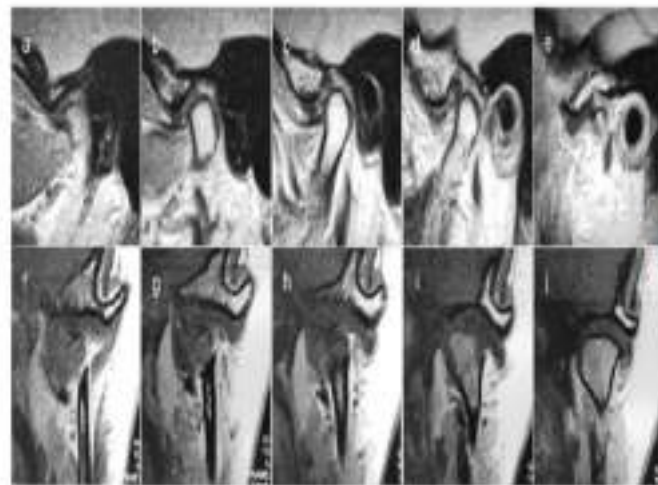
Same as specified for Disc Displacement Without Reduction With Limited Opening.

Examination

Maximum assisted opening (passive stretch) >40 mm including vertical incisal overlap.

Imaging

When this diagnosis needs to be confirmed, then TMJ MRI criteria are the same as for disc displacement without reduction with limited opening.



MANAGEMENT

1. Anterior disc displacement with reduction
 - a. Stage 2 A
 - Hegab TMJ Splint Therapy
 - Functional modification
 - Physiotherapy for the muscles of mastication
 - b. Stage 2 B
 - TMJ Splints
 - Functional modification
 - Pharmacotherapy (chondroitin sulfate & glucosamine for 1 year)
 - TMJ Arthrocentesis with joint injection
 - c. Stage 2 C
 - TMJ Splint followed by TMJ Arthrocentesis & blood injection with splint in situ.
 - Functional modification
2. Anterior disc displacement without reduction
 - a. Stage 3 A
 - TMJ Splints

- Functional modification
 - Pharmacotherapy (chondroitin sulfate & glucosamine for 1 year)
 - TMJ Arthrocentesis with joint injection
 - Physiotherapy for the muscles of mastication
- b. Stage 3 B
 - TMJ Splints
 - Functional modification
 - Pharmacotherapy (chondroitin sulfate & glucosamine for 1 year)
 - TMJ Arthrocentesis with joint injection
 - c. Stage 3 C
 - TMJ Splints
 - Functional modification
 - Pharmacotherapy (chondroitin sulfate & glucosamine for 1 year)
 - TMJ Arthrocentesis with joint injection.

CONCLUSION

Internal derangement is a type of TMJ dysfunction. The signs and symptoms associated with internal derangement are caused by loss of the structure and function of the intraarticular tissues, ultimately leading to a failure in the biomechanics of the temporomandibular joint. The cause of this tissue failure is most often joint overload, leading to tissue failure and an inflammatory/degenerative arthropathy of the temporomandibular joint. However, the intra-articular changes associated with internal derangement of the temporomandibular joint can also be caused by a systemic arthropathy or a localized atypical arthropathy involving the temporomandibular joint. Clinicians must be diligent in establishing the correct diagnosis and cause of the internal derangement, which ultimately leads to the appropriate management of patients with these disorders.

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REVIEW

Shared risk factors: Periodontitis and Cardiovascular disease; a review



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ABSTRACT:

Periodontitis is a common chronic disease worldwide. It is a major cause of tooth loss among adults and recently has been suggested to increase the risk for developing several systemic diseases, including cardiovascular disease. Populations are not equally affected by periodontal disease because there are several environmental and host factors modulating susceptibility. Cardiovascular disease shares many of the same susceptibility factors. The purpose of this report is to identify risk factors and indicators common to periodontitis and cardiovascular diseases, and also to discuss their possible interrelationship in this association.

Key words : Coronary artery disease, periodontitis, risk factors

INTRODUCTION:

Periodontitis is a common chronic disease that leads to loss of both periodontal attachment and bony support of the tooth. It is a multifactorial disease in which gram-negative bacteria are the essential etiologic factor. Presence of a virulent periodontal pathogen in a susceptible individual is likely to lead to manifestation of the disease. Among several factors that have been suggested to increase an individual's susceptibility to infection are smoking, diabetes and stress [1]. Cardiovascular disease (CVD), also a common chronic condition has recently been suggested to be related to periodontitis.

SHARED RISK FACTORS AND INDICATORS

Sociodemographic characteristics

Age : Age is suggested as a determinant (non modifiable risk factor) for periodontitis. Several studies have shown that the severity and prevalence of periodontal attachment loss is directly associated with age. [1,,2,3] Abdellatif and Burt have challenged the impact of age on periodontitis in their analysis of first national health

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and nutrition examination survey(NHANES III) data. They found that the effect of age on the periodontal condition of the study population was negligible after controlling oral hygiene, whether age is a risk factor for periodontitis is still unclear. [4] In contrast, the relationship between age and CVD is well established. The risk of coronary heart disease increases markedly with increasing age in both males and females. Death from CVD also increases with age.

Race : Studies from US National Surveys have reported a higher prevalence of periodontitis in African Americans than in whites. The prevalence of CVD is also more common among African Americans than among whites. In a recent study, African Americans were found to be almost twice more likely to die from coronary heart disease than their white counterparts.

Gender : In developed countries males are more likely to develop periodontal disease than females. In parallel CVD also is more common among males than in females. It has been reported that males are three times more likely to develop coronary artery disease and five times more likely to die from heart disease than females.

Socioeconomic status : Persons of low income and/or low education attainment are more likely to have periodontitis than individuals of high socioeconomic status[1]. It is interesting that the relationship between socioeconomic factors and CVD has changed during the last three to four decades. Income and CVD are inversely related. Individuals with higher income are 47% less likely to have an ischemic heart disease.

Systemic factors

Diabetes mellitus: The increased risk of periodontitis in patients with either Type 1 or Type 2 diabetes has been confirmed in both cross sectional and longitudinal studies[5]. Diabetes is also a major risk factor for CVD independent of other risk factors. Diabetes has a greater prevalence of coronary ischemia and is more likely to have myocardial infarction and silent myocardial ischemia.

Genetics : The role of genetic factors in the occurrence of chronic periodontitis is unclear but the occurrence of aggressive periodontitis (localised juvenile periodontitis) is widely accepted[1,4]. The contribution of genetics in the etiology of CVD is also unclear. CVD develops as a result of interaction between genetic and environmental factors. Genetic susceptibility test, however, have already been introduced to predict individuals at higher risk for CVD. The use of these tests is premature and requires further basic and epidemiologic research.

Health behaviours

Smoking : One of the strongest risk factors for periodontitis is cigarette smoking. Several cross sectional studies have

documented increased prevalence of periodontitis in smokers compared to non smokers[6,7,8]. Smokers are 2 to 6 times more likely to develop periodontitis. The temporal relationship between cigarette smoking and periodontitis was confirmed by longitudinal studies[9,10]. Smoking is also a strong risk factor for CVD among both males and females. The risk for coronary heart disease is 2 to 4 times greater among smokers than non-smokers. Heavy smokers are more likely to have CVD than light smokers. Smoking cessation reduces the risk for developing both the diseases.

Stress : Stress, distress and coping behaviour are found to be associated with periodontitis. Genco et al [11] reported that people with financial strain are 70% more likely to have severe chronic periodontitis than individuals without financial strain, independent of other risk factors for periodontitis. Strong evidence indicates that there is an independent casual association between different stress components, example, depression, social isolation and lack of quality social support, anxiety, work related stress and coronary heart disease.

Diet quality : The relationship between several nutritional factors and periodontitis has been studied extensively with controversial results. A recent study showed that poor overall diet quality was significantly associated with higher prevalence of periodontitis. Unhealthy diet is also implicated as a significant risk factor for CVD. It has been suggested that 20% of death from coronary heart disease may be prevented through diet modification. Studies clearly show that fruits and vegetables (rich sources of vitamin C) protect against CVD.

Physical activity: Physical activity has recently been suggested to be possible protection against periodontitis. Merchant et al reported that physical activity was associated with a lower risk for developing periodontitis. A recent analysis of the NHANES III found that the individuals who maintained the recommended level of physical activity were 42% less likely to have periodontitis.

The role of physical activity on improving an individual's general health is well documented. Maintaining regular physical activity reduces the risk for developing several chronic conditions including CVD. Regular physical activity consistently lowers the risk for coronary heart disease. For example, the results from a large cohort study show that women who were engaged in vigorous physical activity were 25% to 45% less likely to have coronary heart disease than inactive women.

Obesity : Influence of obesity on periodontitis is not clear. A recent study showed that individuals who had high quality diet, engaged in recommended levels of physical activity and maintained normal weight were 40% less likely to have periodontitis than individuals who maintained none of these health enhancing behaviours. It must be noted, however, that

because these studies were cross sectional, it is not clear whether obesity is a true risk factor for periodontitis. On the other hand, obesity is associated with increased risk for developing several chronic conditions including CVD. A person's risk for coronary heart disease was found to be increased 1.8 to 2.7 times by a weight gain of 22 to 44 pounds[12].

PERIODONTITIS/CORONARY ARTERY DISEASE CONNECTION

Mounting evidence shows a link between chronic periodontitis and CVD[13]. Studies have shown that persons who have periodontitis are nearly twice as likely to suffer from coronary artery disease as are those who do not, and also chronic periodontitis can worsen existing untreated heart conditions. In a cross sectional study, subjects with coronary artery disease were found to have fewer remaining teeth than those without CAD. In another cross sectional study, a significant positive relationship between science of clinical inflammation and CAD was found[14]. Furthermore, a higher C-reactive protein concentration was found in patients with unstable angina or myocardial infarction and severe periodontitis than in patients with stable angina and mild periodontitis. C-reactive protein is an acute-phase reactant produced by the liver in response to diverse inflammatory stimuli such as infection.

SUMMARY

Substantial evidence documents a relationship between periodontal and cardiovascular disease. The relation between periodontitis and cardiovascular disease could be explained by the shared risk factors for these two conditions. Aging, diabetes mellitus and cigarette smoking are established risk factors for both diseases. Moreover, physical activity, diet quality and obesity which are known risk factors for cardiovascular disease was recently known to be associated with periodontitis. Therefore, it may be more beneficial for the individuals and the public at large to develop a common preventive modality that deals with multiple behavioural risk factors related to both diseases rather than dealing with a single risk factor that is related to one disease.

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Animal Dentistry



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ABSTRACT:

Veterinary Dentistry is the field of Veterinary Sciences which is acquiring more importance. As the tooth structure and supporting structures of tooth is similar in humans and vets, so a dentist may venture into the field of Veterinary Dentistry. Scope of Dentistry has increased from scaling and extractions to more complex procedures, so a veterinarian cannot do justice as a dentist can do. Today Veterinary Dentistry can be counted as a challenging field indentistry as performing procedures on pets can be challenging considering the differences and similarities between humans and vets, probable risk factors, difficulty in handling vets, need to complete procedures in single sitting to avoid multiple anesthesia procedures, differences in drug dosage and monitoring, adequate precautions to be taken keeping in mind the possible zoonotic, viral and bacterial infections. Further, it is well known to us that the pets are commonly kept by rich people and they are generally ready to spend any amount on them. So, it may be considered as a worthwhile alternative of general dentistry

INTRODUCTION

Veterinary dentistry is the field of dentistry applied to the care of animals (1). In recent years, dentistry has been touted as the fastest growing sub-specialty in veterinary medicine(2).The oral cavity, teeth and associated tissues are structures of fundamental importance for the health of all animals, both domestic and wild (3). Dental disease is very frequent in dogs and veterinary professional dental cleaning and examination, together with daily dental home care, is the foundation for good dental health(4)Radiography is a vital diagnostic tool in veterinary dentistry (5). A lot of pathology will remain undiscovered if clinical examination does not involve radiography(6).

Conflict of Interest: None declared

Source of Support: Nil

In the 1980s, a flow of interest in veterinary dentistry occurred world-wide. Before that time, some centers and practices in the United States and Europe practiced veterinary dentistry of relatively high standard. In the United States, more and more private practitioners devoted their time only to this specialty. They indorsed the demand for veterinary dental services by presenting continuing education courses to their colleagues, and by making the public aware of the importance of their pets' oral health (7).

Veterinary dentistry is a demanding science, in which decisions are made not only for an individual patient, but also for individual teeth, which may vary in severity of disease.

Some animals have dental workers, such as equine dental technicians , who conduct routine work on horses. oral disease, is one of the most common diseases seen in dogs and cats (8). It is caused by the forming of various anaerobic bacteria in the mouth which forms plaque, eventually hardening into tartar on the teeth along the gum line, and is related to the development of gingivitis(9). Domestic animals and horses with dental problems should be referred to dental veterinarians.(10) a degree in veterinary medicine is a prerequisite for performing dental procedures in animals.(11) Concepts such as oral-health veterinarian and dental care technician will be part of animal dental care in the future.(12)When determining on the plan of treatment, veterinarians should pay attention to the symptoms, examination, and pain response Veterinary dentistry has evolved to the point that consumers now demand and expect the best oral health care possible for their pets.(13) The gold standard is an attainable goal for all veterinary practices that provide oral health Veterinary standard of care is peer-regulated, measured as the level of care provided and acceptable among most veterinary care(14)

DEFINITION

Veterinary dentistry is the arena of dentistry applied to the care of animals. It is the art and science of prevention, diagnosis, and treatment of conditions, diseases of the oral cavity, the maxillo-facial region, and its associated structures as it relates to animals. (1)

COMMON ORAL HEALTH ISSUES

Periodontal Disease

Infection that damages the tissue and bones that support dogs' and cats' teeth. It starts as immune reaction to plaque (called gingivitis) but then will progress to major inflammation (called periodontitis), pain and bone loss. If left untreated, periodontal disease may also affect vital organs. (18)

Tooth Fractures

Tooth fractures can be complex, with pulp exposed, or uncomplicated, without pulp exposure. Fractures are painful and direct pulp exposure will become infected. Both types of

fractures should be treated immediately. May exhibit plaque and calculus , gingival recession, mobile teeth, excessive salivation, chewing difficulties and halitosis. However, note that these symptoms are a late sign (18) , minimally invasive repair techniques are chosen whenever possible(19)

Tooth Resorption

Cats are susceptible to lesions that erode their teeth over time. Tooth resorption begins below the gum line and extends into the oral cavity. These lesions are excruciatingly painful, but most pets will not show physical signs; therefore, this issue is often unnoticed without an exam under anesthesia combined with dental X-rays.(18)

Caries

We must watch for areas at risk or already undergoing decay and recommend such preventive or restorative treatments . Oral Cavity should form part of every physical examination. They can occur in the pits sometimes found on the occlusal tables of the molars. Other locations at risk are the deep developmental grooves on the buccal surface of the maxillary 4th premolars and on the lingual side of the mandibular 1st molars between the mesial and central cusp. These grooves are often filled with calculus, but on deep exploration, there may be soft, carious dentin at the base. For caries, the decayed enamel and dentin and all debris are removed from the lesion. Intraoral dental radiographs are required to determine if there are any signs of endodontic disease. The depth of the lesion needs to be examined and explored if there is pulp exposure or near pulp exposure. Endodontic (root canal) therapy is performed if there is indication. (1) When dental decay is advanced, extraction of the affected tooth is done (17).

PREVENTION AND CARE

Successful treatment and prevention of periodontal disease in animals requires a multidimensional approach to identify and remove exacerbating factors, provide professional examinations and care, and plan and implement a dental program. Over the years, many therapeutic and preventive interventions have been developed for periodontal disease, but evidence of efficacy is highly variable. (16)

EXTRACTION

many techniques have been developed to extract teeth in different animal species regularly seen in veterinary practice. Many of these techniques have a lot of familiarity with human extraction techniques, whereas others are species specific treatments. In dogs, simple extraction can be used for removing of all incisors, and for the 1st premolar and 3rd molar, whereas in cats it can be used for removing of the upper 2nd premolar and upper 1st molar, depending on the periodontal health . However, several authors recommend the use of surgical extraction techniques in cats because of the fragile nature of their teeth and because the increased chance of root ankylosis .

Closed extraction is the usual technique for oral extraction of cheek teeth in horses. The incisors of rabbits and rodents can be readily extracted using with closed technique. In pet animals, the use of elevators as well as luxators of appropriate size has been described, although scalpel blades have also been used for the same purpose. The shape of the 'Crossley luxator' has been specifically developed to break down the periodontal ligament of incisors and cheek teeth in rodents. (1)

DENTAL CLEANING

dental scaling is a very important part of keeping your patients' mouths healthy, but many technicians are not aware of the most effective way to perform scaling.

professional dental cleaning includes a complete oral assessment, supra- and subgingival scaling (ultrasonic and/or hand-scaling), polishing, dental radiographs, and formating treatment plan. The procedure should be performed under general anesthesia with the animal intubated (endotracheal tube), and connected to an anesthetic circle, enabling a thorough cleaning (subgingival as well as supragingival) and dental examination while reducing the risk of debris and aerosol entering the airways. (4) The removal of supra- and sub-gingival plaque is done by a combination of mechanical scaling and hand scaling. (15)

VETERINARY EDUCATION

As recently as the 1990's, veterinary curriculums contained little dental training. Primary areas of focus are client education, the treatment of periodontal disease, dental prophylaxis, dental radiology, endodontics and pain control. Students receive instruction followed by laboratory training and finally clinical experience. Dental anatomy is incorporated into the first year curriculum. third year students participate in a laboratory covering extraction techniques, intra-oral radiology and pain management. Concepts and techniques are reinforced during a six-week general clinical rotation designed to simulate a private small animal practice in which dental procedures play a crucial role. In addition to routine practice procedures, students are exposed to more advanced techniques by referral cases. A two-week elective course in veterinary dentistry is selected during the fourth year. Students receive more intense hands-on training in routine and intermediate diagnostic procedures and treatments. (2)

VETERINARY DENTAL ORGANIZATIONS

Three main organizations are there to assist in the training and delivery of veterinary dental education and services. The American Veterinary Dental Society (AVDS) is a membership-based organization for veterinary dental specialists as well as DVM practitioners. Specialty certification is awarded by successful completion of a residency and extensive examination process through the American Veterinary Dental College (AVDC). A veterinarian can also achieve Fellowship

status in the Academy of Veterinary Dentistry (AVD) by completing training and completing a qualifying examination. There are currently 100 boarded Diplomates of the AVDC and that same number of Fellows of the AVD. These three organizations have been instrumental in encouraging the growth and improvement of dentistry in veterinary medicine by sponsoring wet labs, equipment and providing support to programs.. (2)

ROLE OF VETERINARY TECHNICIANS

Veterinary technicians are the paraprofessionals of veterinary medicine. many private practices hire assistants and provide on-the-job training, many smaller private practices and most large practices and universities employ certified veterinary technicians. Technicians, much like their DVM counterparts, are seeking specialty certification. The National Association of Veterinary Technicians in America (NAVTA) is the main body for veterinary technician specialists, offering technician specialization in the area of veterinary dentistry as well as others. A qualified veterinary technician may enter a two year program stressing veterinary dentistry. After successful completion of 3000 or more hours of dental training, publication of case reports and other achievements, a candidate is allowed to sit for the qualifying examination conducted by the exam committee of the Academy of Veterinary Dental Technicians (AVDT). The technician must then maintain their credentials with the AVDT by continuing their education in dentistry through recertification processes provided by the AVDT. This requires a certain number of hours devoted to CE, lecture, labs, polishing and teaching. (2)

OCCUPATIONAL HEALTH HAZARDS IN VETERINARY DENTISTRY

Veterinary practices are unique that they bring humans into close contact with many different species of ill animals. Some of the zoonotic infection have occurred in veterinary personnel include: brucellosis, rabies exposure, animal bites, erysipelothrix infection, leptospirosis, salmonellosis, plague, MRSA, Dermatophysis, tuberculosis, toxoplasmosis, Q-fever. Animal related injuries because pathogens are found in the mouth of many species, animal bites will cause cellulitis, abscesses, sepsis, arthritis (on exposure to latex gloves, blood proteins, parasites) endocarditis, CNS infections, risk of occupational asthma. Routes of transmission may be aerosol, droplet spray, direct contact, indirect contact (fomites), through body fluids, contaminated tools or surface. (2)

Precautions:

1. Use of disposable articles such as bowls, , gowns.
2. Protective eyewear, gloves, facial protection, use of 0.12% chlorhexidine to reduce bacterial aerosolization during dental solution.
3. Barrier protection: Gloves should be worn during

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venipuncture of animals suspected with an infectious disease.

4. Disposable particulate respirator fits closely to face and are made to filter small particles.

CONCLUSION

Dentistry-related problems are the most common medical/surgical problem in daily small animal practice (1). Increasing outlooks of the pet-owning public with the recent advancements of training opportunities available for veterinary students, graduate DVMs and certified veterinary technicians make veterinary dentistry an emerging practice (2). Most dental emergencies follow general trauma. Treatment should be arranged and initial attention given to serious problems and complications. Good surgical principles of lavage, debridement, technique and tension-free closure (if appropriate) should be followed for all oral soft-tissue injuries.(5). A greater awareness of dental disease in the dog and cat among the veterinary practitioners and pet owners will greatly contribute to the early recognition and prevention of dental problems, in particular periodontal disease. This is crucial, because periodontal disease may have a serious impact on a pet's well-being and general health (7).

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DISEASES OF THE TEETH AND THEIR SUPPORTING STRUCTURES

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Pedodontist in management of cleft lip and palate



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ABSTRACT

Cleft lip and palate team consists of persons who are associated with patients general development, dental development, speech, esthetics, and psychological well being. Pedodontist is an important member of the team who helps in providing feeding plate, presurgical orthopedics, obturators and also helps in maintaince of growth and oral health . This review discusses the role of pedodontist in the management of cleft lip and palate.

Keywords: Cleft lip and palate, developmental anomalies of face, CLAP

INTRODUCTION

Clefts of the lip and palate (CLAP) are the most common congenital deformities involving the orofacial region. It is estimated that the overall global prevalence of orofacial clefts is one in every 800 new born babies [1]. Cleft palate may be inherited as an autosomal dominant condition. Family history in a first degree consanguinity increases the risk by a factor of 20 percent[2,3] . Environmental factors include maternal epilepsy, alcoholism, certain drugs like steroids, diazepam, phenytoin ,accutane and folic acid deficiency,. Cleft lip and palate also occur as a part of many syndromes, including Down's syndrome and Treacher Collin's syndrome.[3]

For a child is born with CLP , the services of a team of specialists are needed to care and treat them till adolescence. Careful planning by team members is essential that any proposed procedure keeping with the development of the child[4]. In the early stages to neonatal period the intervention of pedodontist is of great importance . He is a key member of cleft palate team who can provide feeding plate and pre surgical orthopedic treatment for the baby, monitor the growth and development, perfect oral

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health and guide the occlusion and facial growth[5].

MANAGEMENT:

Parents face the unexpected birth of a baby with a CL/P, and usually experience shock, denial, sadness, anger, and great anxiety before being able to bond with their baby. In the management of cleft lip and palate a diversity of treatments and a team of experts has to work hand in hand. The team includes a plastic surgeon, an oral and maxillofacial surgeon, an orthodontist, a speech pathologist, a pediatric dentist, an oral surgeon, an otorlaryngologist, a psychologist and a social worker. The team works in a concerted manner to achieve better understanding and alleviation of the problem in affected children and their families.

In the early stages i.e. from birth to 18 months the pedodontist can provide feeding plate and pre surgical orthopedic treatment for the baby, monitor the growth and development, perfect oral health. In the primary dentition stage the treatment carried out are mainly adjustments in obturators, restoration of carious teeth, maintenance of oral hygiene and evaluating of erupting dentition and facial growth. Orthodontic treatment is not normally recommended for the primary dentition, lest it damages the underlying permanent dentition follicles. However, in patients with a moderately underdeveloped maxilla and no Class III hereditary defect, reverse headgear treatment may be advocated at the age of 4 to 7 years. The reverse headgear is an orthopedic device, specifically designed to stimulate forward maxillary skeletal development, and produces clinically encouraging results in the short term[6]

In the mixed dentition period many problems are encountered due to ectopic eruption of teeth and malalignments . during the mixed dentition period treatment is concentrated on correction of traumatic occlusion and teeth alignment and are mainly centered about correction of crossbites , and expansion of maxillary arches by routine palatal expanders[6].

Feeding plate

Feeding is the most immediate problem encountered in the daily care of an infant with a cleft lip and/or cleft palate .It is because of leakage of air from the mouth through the nose causing regurgitation of fluids, difficulty in swallowing and breathing[2,3]. These problems can be alleviated by mechanical assistance, such as the use of a feeding plate, and squeeze bottle ,Haberman feeder, NUK nipple, Mead Johnson Nurser5 .The feeding plate obturates the cleft and restores the separation between oral and nasal cavities. It creates a rigid platform towards which the baby can press the nipple and extract the milk (figure 1)

It facilitates feeding, reduces nasal regurgitation, reduces the incidence of choking and shortens the length of time required for feeding. The feeding plate also prevents the tongue from entering the defect and interfering with the spontaneous growth

of palatal shelves towards the midline. It also helps to position the tongue in correct position to perform its functional role in the development of jaws, and contributes to speech development. The feeding plate reduces the passage of food into the naso-pharynx thus reducing the incidence of otitis media and naso-pharyngeal infections. Feeding plate restores the basic functions of mastication, deglutition and speech production until the cleft lip and/or palate can be surgically corrected. mechanical feeding is more suitable if breastfeeding is difficult[3,5,7]. While feeding mother should carry the baby in her arm in a semi sitting posture with the infants body upright and tilted slightly backward. feeding plate is placed only during feeding .However Masarei et al8 and Bessell[9] showed no evidence to support the use of maxillary plates in babies with clefts.

Presurgical infant maxillary orthopedics

Naso alveolar moulding may prove to be beneficial to the surgeon if a better alignment and closer approximation of the cleft segments is achieved before the actual surgical repair. Naso alveolar molding reduces size of cleft, gives proper form to lips, avoids alveolar grafting, opened up nostrils and airways and also reduces tension after large cleft lip surgery. Some studies view that when used as an adjunctive procedure to definitive lip repair, infant maxillary orthopedics provides presurgical benefits,[10] . Many different appliances exist for use in the cleft infant for maxillary orthopedics and may be broadly grouped under active, semi- active or passive categories . In addition, are the presurgical nasoalveolar molding (PNAM) plates[10,11] . Active orthopedic force is given in three pieces of tape joined by two elastic bands (figure 2). The central portion of the tape tends to cup the premaxilla in bilateral cleft cases, thus stabilizing the segment. strapping should be applied immediately after birth and continue until the time of surgery[11].

Prevention and treatment of dental diseases

Treatment in primary dentition phase is initially focussed on keeping good oral health [4]. Oral hygiene protocol should be emphasised to the patient and the parent for optimal oral health . Delay in eruption of teeth is common in cleft patients[5] . Parents may be nervous to brush in the region of the cleft following the primary lip and palate surgery. They often think that bleeding from gingival inflammation is caused by damage from toothbrushing. Parents need to be educated about the value of brushing. They should be shown in detail how to brush the teeth and gums properly.

Where the upper lip has been repaired, parents should be shown how to lift it, stretching the lip carefully by sliding an index finger along the labial gingival, without doing any damage to the scar[10]. Topical fluoride gel application, fluoride varnish application twice-yearly is very useful preventive measure for teeth that are at high risk from caries. Three months periodic

examination of cleft children can be useful

SUMMARY

The successful treatment of cleft lip and palate needs a good multi disciplinary team of specialists and has to work with a definite protocol for management . the role of the pedodontist starts from the birth and extends upto adulthood.



figure 1: Child bottle fed with feeding plate in position



Figure 2: Presurgical infant maxillary orthopedics

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REVIEW

A review about covid-19 vaccine: myths and facts



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ABSTRACT

The current coronavirus disease pandemic (COVID-19) is a global emergency, and researchers are collaborating to find a safe and effective COVID-19 vaccine. The World Health Organization recognizes vaccine hesitancy as The world's most serious hazard to public health, especially in low- and middle-income countries. Vaccine anxiety might come from a lack of knowledge, incorrect religious beliefs, or anti-vaccine advertising. With so much false information freely available, persuading people to get vaccinated has proven to be a difficult task. Anti-vaccine sentiment is at an all-time high, with potentially fatal repercussions. While the rapid development of COVID 19 vaccines is impressive, From manufacture to distribution, deployment, and, most crucially, acceptability, the entire world faces numerous problems. Governments must be able to communicate the benefits of vaccination and provide vaccines in a safe and effective manner to retain public trust in vaccinations...Researchers have asked for "radical transparency" in the rapid development and rollout of COVID-19 vaccines, in which vaccination information is freely shared to the public, even if negative information can reduce vaccine uptake. These calls forecast that a lack of openness will weaken trust in health authorities and accelerate the propagation of conspiracy ideas, which will hinder health authorities' long-term capabilities during and after the pandemic, according to theories about the psychology of conspiracy views. This review delves into some of the myths and their debunking.

KEYWORDS

COVID-19 Vaccine, Vaccine hesitancy, Immunization, Vaccine safety, Misconceptions, Efficacy

INTRODUCTION

COVID-19 is a highly contagious respiratory disease caused by the SARS-CoV-2

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coronavirus (severe acute respiratory syndrome-coronavirus-2). SARS-CoV-2 is distinct from other coronaviruses that cause minor illnesses in humans, such as the common cold. It's critical to comprehend the pandemic's impact and consequence. (1)

COVID-19 vaccinations have been shown to be safe, efficacious, and potentially life-saving. They do not totally protect everyone who is vaccinated, as do all vaccinations, and we do not yet know how well they can prevent people from spreading the virus to others. As a result, we must continue to take various efforts to battle the pandemic in addition to getting vaccinated. (2) A lot of information on the newly released COVID-19 vaccines is available, but what we hear isn't necessarily reliable. (3)

False information and myths travel quickly, making it more difficult for the public to find verified facts and guidance from reliable sources such as their local health authority or the World Health Organization. (4) However, in the aftermath of global sorrow, humanity came together and put resources into the world's largest-known vaccine drive. Almost every country is promoting Covid immunization to safeguard its citizens and stop the pandemic from spreading. So, in addition to getting vaccinated, we must continue to take other steps to combat the epidemic and stop it from spreading indefinitely. However, like with any societal issue, the admirable endeavor of vaccination is greeted with criticism as a result of the myths that surround it. (5)

DETERMINANTS OF VACCINE ACCEPTANCE AND HESITANCY

Vaccination, although being one of the most effective public health strategies, is becoming seen as harmful and unneeded by a rising number of people. Lower vaccine coverage and a rise in the risk of vaccine-preventable disease outbreaks and epidemics are suggested to be due to vaccine anxiety. (6) The intention to get vaccinated, which is influenced by barriers and facilitators, shapes vaccination uptake. Intention is influenced by motivation (attitude, social influence, and self-efficacy), awareness (awareness, knowledge, and perceived danger), and information and predisposing factors. (7)

According to the study, around 60% of Indians are concerned about obtaining the COVID-19 vaccine in general. The level of apprehension varies by location, with rural communities having a higher level of apprehension. During the third and early stages of the fourth vaccination phase, vaccine uptake was low and falling. (8)

Several factors were linked to both refusal and delay: being younger, losing income during the pandemic, having no intention of getting the flu vaccine, having low confidence in the COVID-19 vaccine and the health-care response during the pandemic, having a negative perception of government

measures, and having a negative perception of the information provided (9)

Mothers with PTSD had much lower confidence in the COVID-19 vaccine and were less likely to acquire it for themselves or their children in a study comparing mothers with other mental health conditions and PTSD. Institutional distrust was found to be the cause of these effects (i.e., significant indirect effects). Mothers who had previously been diagnosed with PTSD expressed different reasons for vaccine concern (e.g., a lack of faith in science) and gave healthcare and governmental sources less influence in vaccine decision-making. (10)

VACCINATION AND SOCIAL MEDIA

The key platforms for gathering information and discussing COVID-19 are social media. COVID-19 vaccination-related information on social media has the potential to shape the public's intention to vaccinate, as previous studies have shown that online information influences people's perceptions, attitudes, and intentions regarding vaccination. There are few empirical studies that look at such connections. People frequently use social media to obtain professional knowledge on vaccine safety and efficacy. Correct vaccination information can help people have more faith in vaccines. (11)

There is a strong link between social media organization and public concerns about vaccine safety. Furthermore, there is a strong link between foreign disinformation tactics and falling vaccination rates. (12) The COVID-19 vaccination has also gotten a lot of attention online and on social media, with over 50 million mentions across all languages. With over 31 million mentions, Twitter leads the group, followed by news, forums, blogs, Reddit, and Tumblr. (13)

As technology has progressed, social media has become more widely used around the world. Unlike traditional media, social media allows users to quickly generate and share material throughout the world without the need for editorial oversight. Users can choose which content streams they want to see, which contributes to ideological isolation. As a result, anti-vaccination rhetoric on such platforms raises substantial public health concerns, including the possibility for downstream vaccine hesitancy, as well as jeopardizing public trust in future vaccine development (14)

FAITH AND NEGATIVE BELIEFS

Vaccination refusal is usually linked to philosophical and moral convictions about health and immunity, with "natural" medications being preferred over "manufactured" ones. It's also been linked to strong religious convictions. In 2011, anti-vaccine propaganda intensified, claiming that vaccines are a Western plot to sterilize Muslim girls and that vaccines are composed of porcine gelatin, which is haram and hence forbidden in Islam. It's also worth noting that some vaccines are

made with porcine-based enzymes, which some Islamic scholars find unbearable, especially when it comes to children's vaccines (15)

Religious leaders were shown preaching to their congregations, persuading them not to get the vaccine because it "may promote gay tendencies" and "controls the mind." Similarly, some religious leaders use their moral and theological values to speak out against the vaccine. Many other religious leaders, on the other hand, argue that the vaccine sends a message of optimism. (16)

People may not be willing to get vaccinated just because vaccines are available. Different conspiracy theories about vaccine side effects may encourage people to forgo taking preventative health actions. (17)

MISCONCEPTIONS AND FACTS DEBUNKED

There are certain false assumptions and ideas that are circulating among the public through many sources and these myths discourage people from getting immunized.

Fear of the COVID-19 vaccine is fairly pervasive among the general public. Acceptance of a vaccination is inextricably linked to an understanding of the relevance of the group. Vaccine public awareness that emphasizes prosocial advantages could be particularly beneficial. Factors that generate mistrust and destroy societal cohesion, such as conspiracy theories, will reduce vaccine uptake. (18) One of the most common misconception is that since covid vaccine was developed within a short period of time, its efficacy is being questioned but the vaccines are proven safe and effective. They went through the same rigorous Food and Drug Administration process as previous vaccinations, meeting all safety standards, despite being developed in record time. There were no steps that were skipped. Instead, we can praise unprecedented global collaboration and investment for the vaccines' development being completed in less time. Clinical studies and safety reviews took about the same length of time as they did for other vaccines. (19) Some individuals are concerned that vaccines will stimulate the production of covid variations, but the truth is that variant formation is a continuous process since the virus is constantly multiplying, thus variants can form even if vaccines are used. (20)

Many women believe that immunizations would affect their fertility, however this is a fallacy. Vaccines have no effect on fertility, injure the placenta, or raise the risk of preterm or stillbirth. The vaccine aids our bodies in producing spike proteins that help us fight the coronavirus in a safe manner. These are distinct from the spike proteins involved in the formation and attachment of the placenta during pregnancy. (21) People who have already been infected with COVID-19 are hesitant to get vaccinated because they believe they are

immune, but research continues to indicate that getting vaccinated against COVID-19 is the greatest way to prevent infection, whether you have already been sick or not. According to a study published in August 2021, if you've had COVID-19 before but haven't been vaccinated, your chances of reinfection are more than twice as high as those who have been infected but have been vaccinated. (22) Although there is no microchip in the vaccination and the vaccine would not track users or store personal information in a database, a false rumor was spreading on the internet that the vaccine contained microchips/transducers. Bill Gates of the Gates Foundation made comments about a digital certificate of immunization records that prompted this misunderstanding. He was referring to technology that isn't a microchip, hasn't been used in any way, and has nothing to do with COVID-19 vaccine research, testing, or distribution (23) Another concern was that the covid-19 vaccination would cause people to become magnetic; however, the vaccine contains no metals and will not cause anyone to become magnetic. (24) Many people believed and were afraid of the COVID-19 vaccination because it included aborted fetal cells. There are no fetal cells in the approved vaccinations. Pharmaceutical companies evaluated the vaccinations' effectiveness in cells that were the offspring of fetal cells derived from tissue extracted during an elective abortion in 1973. The vaccinations are not manufactured or produced using fetal cells. (25) The COVID-19 vaccine is said to have severe side effects, but the truth is that there can be mild or moderate vaccination reactions that heal without consequence or damage. Headache, chills, weariness, muscle soreness, or a fever that lasts a day or two are some of the side effects. It's vital to keep in mind that these side effects are signs that your immune system is reacting to the vaccine. (26) The myth that covid vaccinations disrupt DNA has also surfaced. The COVID-19 vaccines, on the other hand, do not enter our DNA and have no effect on it. (27) Some people claim that after I obtain a COVID-19 vaccine, I won't need to wear a mask. It's unclear whether you may still spread the virus after getting vaccinated. As a result, it is recommended that you continue to wear your mask. (28) It is a fallacy that the COVID-19 vaccine causes covid; according to medical tests, the vaccine contains no live virus. In any event, it cannot cause COVID-19. The vaccine does not infect a person; rather, it teaches the disease's defense mechanism. (29) Vaccines Should Not Be Taken When you're on your menstrual cycle, this is one of the most widely held misconceptions concerning COVID-19 vaccinations in India. The vaccine is known to disrupt your menstrual cycle. However, there is no proof to back up this claim. In addition, the second phase of the vaccine campaign began with the vaccination of persons above the age of 45. At this age, women are on the verge of menopause. They all said their menstrual cycles were on time. Now that immunization has reached the third phase in India, every woman over the age of

18 is getting vaccinated, and no woman has reported a menstrual cycle delay as a result of the vaccine. This, too, is a myth with no evidence to back it up. (30)

VACCINE PROMOTION

The Centers for Disease Control and Prevention's (CDC) strategic framework for raising vaccination confidence and avoiding outbreaks of vaccine-preventable diseases is called Vaccinate with Confidence. Misinformation spread through social media and other channels can have an impact on COVID-19 vaccine confidence. Individuals should be encouraged to listen to and trust the information provided by the government and other prestigious institutions rather than listening to misleading facts. The public should be encouraged to engage with and listen to the government in order to logically analyze perceptions (31) This should be done in both individual talks and well-crafted media campaigns delivered by credible messengers who represent people of color and other groups who are fearful about vaccinations (32)

The benefits of any COVID-19 vaccine, whether highly, moderately, or modestly effective by any trial-defined outcome, will be determined at least as much by how quickly and broadly it is implemented, as well as the epidemiological environment into which it is introduced, as by the vaccine's physiological properties as demonstrated in clinical trials. Although these latter vaccine-specific traits are set in stone, the medical, public health, and government communities can effectively intervene in the context of a vaccine's introduction to improve its advantages. (33)

CONCLUSION

We need to get the vaccine into people's hands because it's useless if it sits in freezers and bottles. Clinicians and public health specialists must anticipate, validate, and respond to the concerns and questions of the public. We must boost sound knowledge to combat widespread misconceptions. Finally, we must demonstrate that we believe the benefits of vaccination outweigh the risks by getting vaccinated as soon as possible. Each person who receives the COVID-19 vaccine becomes a vocal proponent of vaccination in the most straightforward terms possible. As COVID-19 immunization programmes spread over the world, we're seeing an increase in vaccine-related falsehoods. Providing facts to employees is an important endeavor that employers may take. The World Health Organization (WHO) has stated that a COVID-19 vaccine is a "essential instrument" in combating the present pandemic, and as a result, unprecedented resources have been poured into the race to produce and distribute vaccinations. The creation of an efficient and safe vaccine is only the beginning of the problems of a vaccine-based solution to the COVID-19 pandemic. If citizens all around the world refuse to be vaccinated, a quickly manufactured vaccine will have no

effect. Given the emergence of more contagious and potentially vaccine-resistant coronavirus variants, a large proportion of the population will need to be vaccinated and may need to be revaccinated in order to achieve herd immunity. Given that several international studies have discovered widespread vaccine fear among the general public, maintaining proper vaccine acceptance today and in the future is a major challenge. The social, cultural, and political circumstances all play a part in vaccine acceptance and refusal decisions. Anti-vaccine arguments about vaccine safety are extensively shared on social media, raising vaccine fear among community members. Anti-vaccination attitudes in the community as a result of misinformation could jeopardize the COVID-19 vaccine campaign and have knock-on consequences on other vaccination programmes. To boost the adoption of COVID-19 vaccine when it becomes accessible in the near future, measures to dispel myths and conspiracy theories about COVID-19 and vaccinations involving multi-sectorial elements are required.

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