SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSUDU,AGARAM VILLAGE,KUDAPAKKAMPOST,PUDUCHERRY-605502.

Date:10.8.2020

From
DR.BALAJI SUBRAMANIYAN. R
PROFESSOR AND HEAD,
DEPARTMENT OF DENTISTRY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,
CHENNAI.

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,
CHENNAI.

Sub: Permission to conduct value-added course: Diagnosis and prevention strategies for dental caries

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **__Diagnosis and prevention strategies for dental caries** on 10.8.2020. We solicit your kind permission for the same.

Kind Regards

DR.BALAJI SUBRAMANIYAN.R

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: DR.JAYAKUMAR

The HOD: DR.BALAJI SUBRAMANIYAN

The Expert: DR.BALAJI SUBRAMANIYAN

The committee has discussed about the course and is approved.

Dean | Subject Expert | HOD

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSUDU, AGARAM VILLAGE,
KOODAPAKKAM POST,
PUDUCHERRY - 605 502

DEPARTMENT OF DENTISTRY
Sri Lakshmi Narayana Institute of Medical Sciences
PONDICHERRY - 605 502.

Dr. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Pudu

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502.
[Recognised by Medical Council of India, Ministry of Health letter No. U/12012/249/2005-ME (P -II) dt. 11/07/2011]
[Affliated to Bharath University, Chennai - TN]

Circular

13.8.20

Sub: Organising Value-added Course: Diagnosis and prevention strategies for dental caries- reg

With reference to the above mentioned subject, it is to bring to your notice that SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES, **Bharath Institute of Higher Education and Research**, is organizing **"Diagnosis and prevention strategies for dental caries"**. The course content and registration form is enclosed below."

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before 13.8.20. Applications received after the mentioned date shall not be entertained under any circumstances.

Dr. P. JAYAKUMAR, M.S., M.Ch.,
DIRECTOR / DEAN
Sri Lakshmi Narayana Institute of Medical Sciences
Osudu, Agaram Post, Puducherry - 605 502.

Dean

Encl: Copy of Course content and Registration form.

COURSE PROPOSAL

Course Title: Diagnosis and prevention strategies for dental caries

Course Objective: To enlighten the basics and treatment options for dental caries

Course Outcome: In depth knowledge about the dental caries

Course Audience: MBBS STUDENTS

Course Coordinator: Dr. Jayakumar

Course Faculties with Qualification and Designation:

1. DR.BALAJI SUBRAMANIYAN. R. M.D.S& associate professor

Course Curriculum/Topics with schedule (Min of 30 hours)

SlNo	Date	Topic	Time	Hours
1.	19.8.20	Etiology of dental caries	4PM-6PM	3 hrs
2.	26.8.20	Pathogenesis of caries	4pm-7 pm	3hrs
3.	2.9.20	Staphylococcousmutans	5pm-8pm	3 hrs
4.	11.9.20	Sequalae of caries	4pm-7pm	3hrs
5.	24.9.20	Prevention of caries	5pm-8pm	3 hrs
6.	30.9.20	Treatment modalities for caries	5pm-8pm	3 hrs
7.	3.10.20	Dentoalveolar abscess	4pm-7pm	3 hrs
8.	11.10.20	Cellulitis	5pm-8pm	3 hrs
9.	19.10.20	Ludwig's angina	5pm-8pm	3 hrs
10.	29.10.20	Periodontal abscess	4pm-7pm	3 hrs
			Total Hours	30

REFERENCE BOOKS: (Minimum 2)

1. TEXTBOOK FOR DENTAL CARIES-VIMAL SIKRI

2. DIAGNOSIS AND RISK PREDICTION OF DENTAL CARIES-PER AXELSSON

Diagnosis and Prevention Strategies for Dental Caries

Abstract

Dental caries is one of the oldest and most common diseases found in humans. With the recent shift from the surgical model, which emphasized restorative treatment, to a medical model of disease management, newer strategies emphasize disease prevention and conservation of tooth structure. For early detection and monitoring of caries, rather than waiting until a cavity is formed and restorative treatment is needed, devices such as DIAGNOdent, Digital Imaging Fiber-Optic Transillumination, quantitative light-induced fluorescence, and the Electronic Caries Monitor have been introduced. For caries prevention, oral hygiene measures, fluoride application, pit-and-fissure sealants, the use of xylitol, the development of a dental caries vaccine, and the role of the primary caregiver for infants are briefly discussed.

Keywords: Dental caries, Prevention, Diagnosis, Detection, Risk assessment

INTRODUCTION

Dental caries is one of the oldest and most common diseases found in humans. While there have been continuous efforts to reduce its prevalence, it is still widespread, especially in lower socio-economic classes [1]. Traditional caries management strategies adopted a surgical model of treatment: after removing the decay, a more geometrically perfect cavity is created and filled with the most compatible and artificial material. This surgical model eventually created bigger and bigger cavities as secondary dental caries progressed even after restorative treatment, subsequently requiring re-treatment, until eventually the tooth was lost. With the shift from the surgical model to a medical model of disease management, the newer strategies emphasize disease prevention and conservation of tooth structure. This review briefly discusses the etiology of and current detection and prevention methods for dental caries.

ETIOLOGY

Dental caries is a multifactorial disease caused by host, agent, and environmental factors. Mutans streptococci (MS) is the primary etiologic agent of dental caries. Through adhesion, MS attaches to the dental pellicle and breaks down sugars for

energy to produce lactic acid, causing an acidic environment around the tooth. As a result, demineralization of the enamel and, subsequently, the dentin occurs [2]. Factors involved in the dental caries process include the tooth, bacteria in the form of a dental plaque, and a diet containing sugar. The quantity, quality, and frequency of sugar intake have a definitive influence on the incidence and prevalence of caries.

DETECTION AND PREVENTION OF DENTAL CARIES

More emphasis is being placed on dental caries prediction and caries risk analysis than mere detection of cavities which require immediate filling. While in the past, the cavities were filled at their earliest detection, now the indications for restorative treatment have narrowed; rather than restorative treatment, plaque control measures are employed to promote remineralization and reversal of the dental caries process.

1. Caries diagnosis

Traditionally, dental caries were detected by visible color and texture change, tactile sensation using a dental explorer, and radiographs. However, radiographs are not useful for detecting early enamel caries, and, using these methods, it is difficult to monitor the progress of dental caries and quantify its reversal. Recently, several new technologies have emerged to help diagnosis, especially of early lesions, which can help reverse the process before cavity filling is needed.

DIAGNOdent uses laser fluorescence technology to measure bacterial products in caries lesions, and it may be sensitive enough to detect early demineralization [3]. The intensity of fluorescence is displayed with a numerical value from 0 to 99. Digital Imaging Fiber-Optic Translllumination (DIFOTI) uses fiber-optic light to produce an image, which may be useful for detecting initial areas of demineralization, cracks, or fractures, and provides a quantitative characterization of the caries process [4]. Quantitative light-induced fluorescence (QLF) uses the ability of human enamel to show fluorescence under certain conditions. Demineralized enamel shows reduced fluorescence due to scattering, as the fluorescence is attributed to the cross-links between structural proteins [5]. The Electronic Caries Monitor (ECM) measures the changes in electrical impedance between sound enamel and demineralized tooth structure, as normal teeth have lower electrical conductivity compared to demineralized teeth [6]. Currently, there is no device available that accurately diagnoses whether the caries lesion is active and in need of intervention, and the dentist cannot rely solely on such equipment

Dental caries, a chronic disease is unique among human and is one of the most common important global oral health problems in the world today. It is the destruction of dental hard a cellular tissue by acidic by-products from the bacterial fermentation of dietary carbohydrates especially sucrose. It progresses slowly in most of the people which results from an ecological imbalance in the equilibrium between tooth minerals and oral bio films which is characterised by microbial activity, resulting in fluctuations in plaque p H due to bacterial acid production, buffering action from saliva and the surrounding tooth structure. The microbial community of caries is diverse and contains many facultatively and obligately-anaerobic bacteria.

S. mutans is the most primary associated with it. Dental caries can affect the humans in various ways i.e. presence of tooth pain, infection or dysfunction of the stomatognathic system can limit the necessary ingestion of energetic foods, affecting the growth in children and adults as well as their learning, communication skills and recreational activities. Moreover, oral and pharyngeal cancers and oral tissue lesions are also significant health concern. Cavernous sinus thrombosis and Ludwig angina can be life-threatening. Due to this, treatment is needed for dental diseases which cost is normally high and is not feasible for all community due to limited resources such as time, person and money. therefore, prevention is more affordable. Personal hygiene cares and dietary modification should recommended.

for treatment planning. Therefore, the dentist should also consider the overall caries risk and the susceptibility of individual patients.

2. Caries risk assessment

Past caries experience, current caries index, oral hygiene measures such as the use of fluoride toothpaste and mouth rinse, calculus deposit, deep pits and fissures, MS level, snacking habits, and salivary flow may all help assess individual caries risk and predict dental caries progression. These factors should be considered in deciding whether preventive measures should be taken or restorative treatment is necessary.

3. Prevention methods

1) Oral hygiene:

Since dental caries do not progress without the bacteria present in dental plaques, daily plaque removal by brushing, flossing, and rinsing is one of the best ways to prevent dental caries and periodontal disease. Proper brushing and flossing methods may be taught at the dental office during routine check-ups.

2) Fluoride application:

Fluoride prevents dental caries by inhibiting demineralization of the crystal structures inside the tooth and enhancing remineralization. The remineralized surface is resistant to acid attack. In addition, fluoride inhibits bacterial enzymes [7]. Methods of fluoride application include water fluoridation, fluoride tooth paste, fluoride mouth rinse, dietary fluoride supplements, and professionally applied fluoride compounds such as gels and varnishes.

3) Pit and fissure sealants:

The majority of dental caries in young children occur in pits and fissures. Pits and fissures are more susceptible to dental caries because the anatomy favors plaque accumulation; these areas are often too narrow for any oral hygiene measures to be effective. By filling such irregularities with flowable restorative material, the area becomes less morphologically susceptible [8]. This is especially recommended in young patients with erupting teeth and adults with a high caries index.

4) Xylitol:

Sucrose is a well-known cause of dental caries, and higher sucrose intake increases the risk of dental caries. However, it is impossible to eliminate sugar from the modern diet. Therefore, sugar substitutes have been developed to reduce caries risks. Xylitol is one of these sugar substitutes. Xylitol has a sweet flavor comparable to sugar, and it is not only non-cariogenic, but also anti-cariogenic. It keeps sucrose molecules from binding with MS, thereby blocking its metabolism. It also reduces the adhesion ability and number of MS [9]. The anti-cariogenicity of xylitol is affected more by the frequency of intake than by the amount consumed.

5) Vaccine:

As dental caries is an infectious microbiologic disease, there have been attempts to develop a vaccine. Some vaccines against MS in the form of proteins, recombinant or synthetic peptides, or protein-carbohydrate conjugates, as well as those based on DNA, have been successful experimentally, and an immune intervention can be undertaken by blocking the receptors which are necessary for the colonization of MS or by inactivating glucosyl transferases. However, none of these vaccines have appeared on the market thus far [10,11] due to difficulty in inducing and maintaining high levels of antibodies in oral fluids; research is still ongoing for clinical applications.

6) Role of the primary caregiver in children:

As dental caries is an infectious disease, the primary caregiver of infants (most often the mother) can transmit caries-causing microorganisms to a child, resulting in the colonization of MS in the infant's oral cavity. In fact, there is a direct relationship between MS levels in parents and their children [12]. Therefore, efforts to reduce the MS level in the parent, including maintaining oral hygiene and undergoing dental treatment when necessary, are also important for prevention of dental caries in young children.

CONCLUSION

Despite the advancements in dental caries detection and prevention, it is still a common infectious disease. Even with recent dental caries research, most clinical practice is still based on treating the disease by restorative treatment once it is

detected, rather than on prevention. Future education and clinical research efforts should continue to emphasize early detection and caries prevention.

Annexure- II

Diagnosis and prevention strategies for dental caries
DI-01

List of Students Enrolled Sep 2020 – NOV- 2020

MBBS Student		
Sl. No	**Roll no**	**Name of the student**
1	U13MB281	THOTA SHARMILA JANAKI
2	U13MB282	UMA MAHESHWARI. D
3	U13MB283	UMAYAL @ UMA.V
4	U13MB284	VANAJA KATE GARFINSUNDARAM.B
5	U13MB285	VANI.V
6	U13MB286	VEDARATHINAM.S

Dr. Balaji Subramaniyan. R
RESOURCE PERSON

Dr. Jayakumar
COORDINATOR

Bharath Institute of Higher Education and Research

SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

Participant list of Value added course: Diagnosis and prevention strategies for dental caries

Sl.No	Reg.No	Name of the candidate	Signature
1	U13MB281	THOTA SHARMILA JANAKI	
2	U13MB282	UMA MAHESHWARI. D	
3	U13MB283	UMAYAL @ UMA.V	
4	U13MB284	VANAJA KATE GARFINSUNDARAM.B	
5	U13MB285	VANI.V	
6	U13MB286	VEDARATHINAM.S	

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

Diagnosis and prevention strategies for dental caries

QUESTIONS

Course Code: DI -1

I. ANSWER ALL THE QUESTIONS

1. Etiology/pathogenesis of dental caries?

2. Staphylococous mututans?

3. Oral hygiene?

4. Brushing technique?

5.Early childhood caries?

NAME:- VANI. V

ROLL NO:- U13MB286

28½
50

(1) Explain in details - Pathogenesis of Dental caries / Etiology

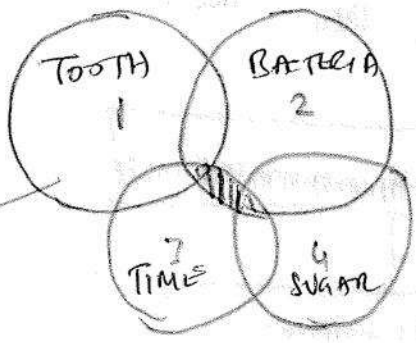
- Dental caries, a bacterial infection which destroys the tooth structure, dissolving the enamel, dentin and cementum.

Most commonest problem in children and adults.

- Basic etiological factor is due to consumption of sugar content foods.

The first sign of a caries lesion is the appearance of chalky white spot on the surface of tooth, indicating the demineralization of the tooth.

ETIOLOGY OF DENTAL CARIES



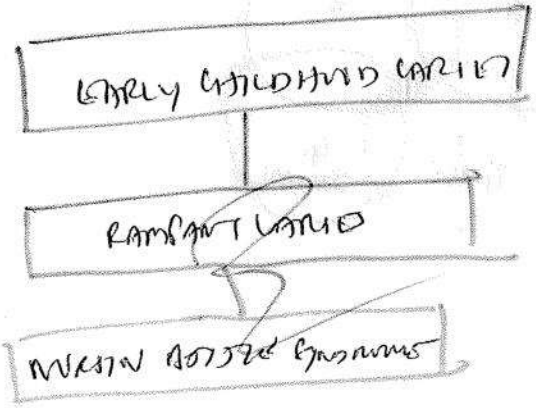
Four things ① tooth surface
② Caries causing bacteria
③ fermentable carbohydrates
④ Time.

- The most common bacteria are Streptococci mutans, Streptococcus sobrinus and lactobacilli. Cariogenic bacteria are present in the dental plaque.

Streptococcus mutans — gram +ve bacteria.

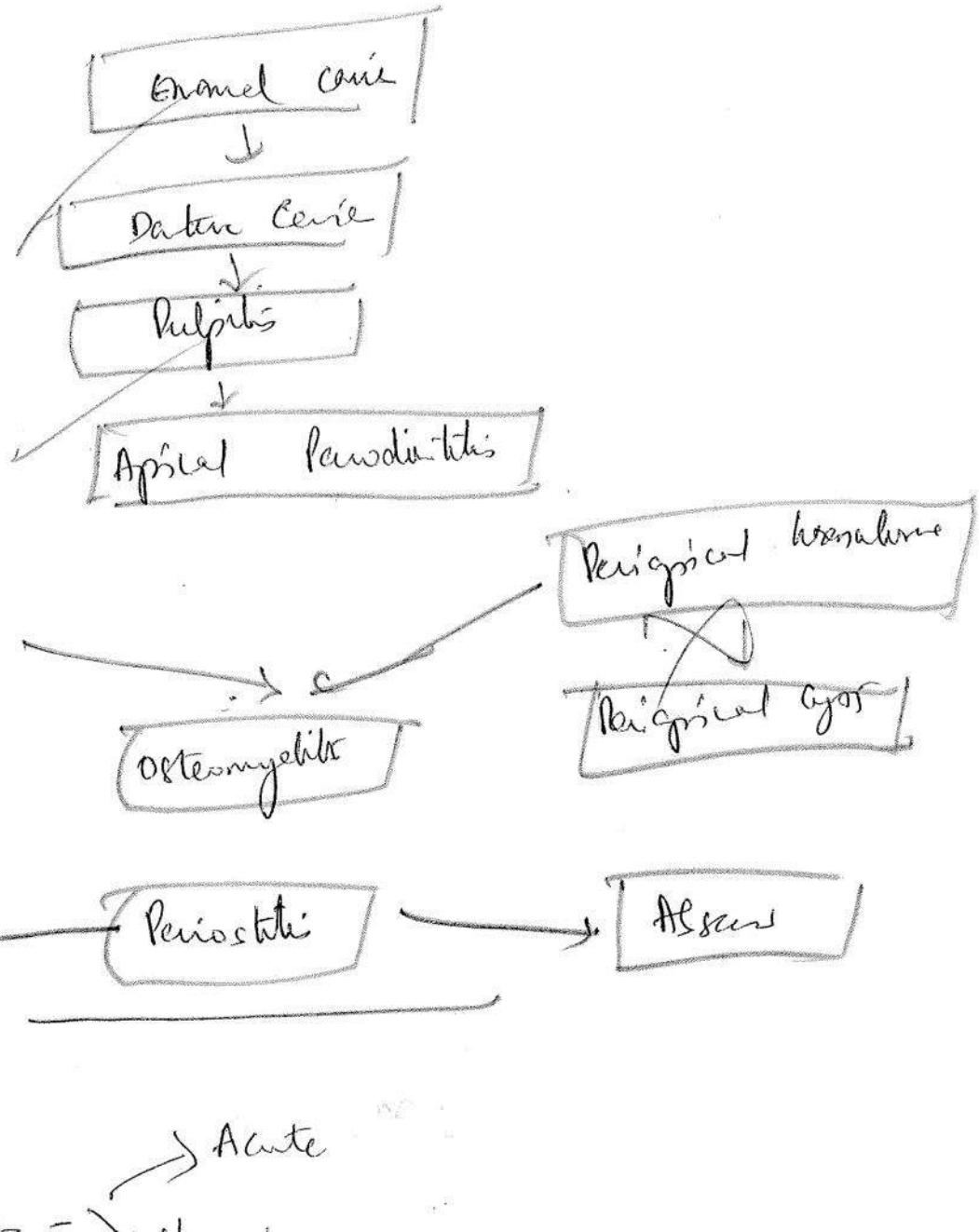
- Dental caries is diagnosed as dental cavities.
- Early childhood caries / Rampant caries also known as Baby Bottle caries (Nursing bottle syndrome).

Mesially acting teeth are the most commonly affected.



SEQUENCE OF DENTAL CARIES

- Dental caries initially starts from dental enamel structure, progressively to dentin and reaches pulp tissue.



Periapical Abscess - → Acute
→ Chronic

localized collection of pus is the abscess but the most often pathway dealt of pulp tissue

Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research
(Deemed to be University under section 3 of the UGC Act 1956)

CERTIFICATE OF MERIT

This is to certify that VANI.V has actively participated in the Value Added Course on *Diagnosis and Prevention Strategies for dental caries* held during Sep 2020– Nov 2020 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605 502, India.

Dr. Balaji Subramaniyan.R
RESOURCE PERSON

Dr. Jayakumar
COORDINATOR

Student Feedback Form

Course Name: DIAGNOSIS AND PREVENTION STRATEGIES FOR DENTAL CARIES

Subject Code: DI - 1

Name of Student: UMA MAHESWARI. D Roll No.: U13MB282

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear			✓		
2	Course contents met with your expectations		✓			
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand			✓		
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful				✓	
7	The level of the course			✓		
8	Overall rating of the course	1	2	✓ 3	4	5

** Rating: 5 – Outstanding; 4 - Excellent; 3 – Good; 2– Satisfactory; 1 - Not-Satisfactory*

Suggestions if any:

Signature

Date: 10.8.2020

COURSE COMPLETION

Date: 30.10.20

From
DR.BALAJI SUBRAMANIYAN.R,
DEPARTMENT OF DENTISTRY,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,
CHENNAI.

Through Proper Channel

To
The Dean,
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
BHARATH INSTITUTE OF HIGHER EDUCATION AND RESEARCH,
CHENNAI.

Sub: Completion of value-added course: diagnosis and prevention strategies for dental caries

Dear Sir,

With reference to the subject mentioned above, the department has conducted thevalue-added course titled: **DIAGNOSIS AND PREVENTION STRATEGIES FOR DENTAL CARIES** on 30.10.20. We solicit your kind action to send certificates for the participants,that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards

DR. BALAJI SUBRAMANIYAN.R,

Dr. R. BALAJI SUBRAMANIYAN
Associate Professor
Department of Dentistry
Sri Lakshmi Narayana
Institute of Medical Sciences
Osudu, Agaram, Puducherry.

Encl: Certificates

Photographs