

DENTAL CARIES-THE MOST PREVAILING DISEASE-AN OVERVIEW

ABSTRACT:

Dental caries, a persistent illness, is distinct to humans and ranks among the most significant global oral health issues currently faced. The breakdown of dental hard acellular tissue occurs due to acidic by-products from bacterial fermentation of dietary carbohydrates, particularly sucrose. In most individuals, it advances gradually, stemming from an ecological imbalance between oral biofilms and tooth minerals, characterized by microbial activity that leads to fluctuations in plaque pH, influenced by bacterial acid production, the buffering effects of saliva, and the adjacent tooth structure. The microbial community involved in caries is varied and comprises numerous facultative and obligate anaerobic bacteria. *S. Mutant* is the most closely linked with it. Dental caries can impact humans in various ways, such as causing tooth pain, infections, or dysfunction in the stomato-gnathic system, which may hinder the essential consumption of nutritious foods, influencing growth in both children and adults, along with their learning, communication abilities, and leisure activities. Additionally, cancers of the mouth and throat, along with lesions in oral tissue, represent a major health issue. Thrombosis of the cavernous sinus and Ludwig's angina can pose a serious threat to life. As a result, dental disease treatment is necessary, but it can be costly and impractical for various communities due to limited resources like time, personnel, and finances. Consequently, prevention is less expensive. Recommendations should include personal hygiene practices and dietary changes.

Key Words : *Dental Caries, Cavernous Sinus Thrombosis, Plaque, Oral Biofilm, Tooth Decay.*

INTRODUCTION:

The mouth contains 16+16-32 teeth, which are situated within the alveoli or sockets of the alveolar ridges of both the maxilla and mandible. The sequence of teeth from front to rear is Incisors, Canines, Pre-Molars, Molars.

The **Incisors** are the central four teeth found in both the upper and lower jaws. They serve to cut, tear, and grasp food. The cutting part of an incisor is broad and slender, forming a chisel-like sharp edge.

The **Canines** (or cuspids, referring to a tooth with one point) are located beside the incisors. They are used for grasping and ripping food.

The **Premolars** (bicuspid) and **Molars** possess a set of raised areas (points or 'cusps') that serve to crush food particles. Typically, each premolar possesses two cusps, which is why it is called bicuspid. They are used for crushing.

The **Molars** are the flat teeth located at the back of the mouth. Each molar usually possesses four or five cusps. They are exclusively used for crushing and grinding.

Wisdom Teeth are commonly referred to as third molars. They emerge starting at 18 years old, yet are frequently extracted through surgery. A tooth can be categorized into three main sections:

Crown: The crown refers to the section above the gum line and is coated with enamel, the toughest substance in the body that safeguards the tooth against acids.

Neck: The neck or cervix is the narrowed connection between the crown and the root.

Root: The root may comprise one, two, or three ledge fitted into a socket. Bigger teeth such as molars possess multiple roots.

Dentine: It constitutes a significant portion of the tooth and possesses a bone-like composition. Dentine differs from enamel in that it is a living tissue and can react to caries attacks.

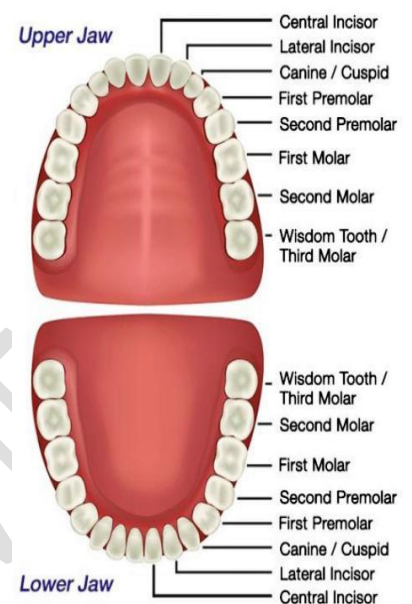


Fig-1 Anatomy Of Tooth

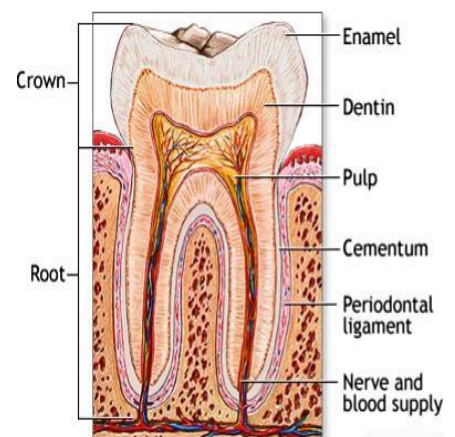


Fig-2 Structure of Tooth

Enamel: It is the outermost layer that encases the crown of the tooth and is more durable than bone. The initial formed lesion (white spot) in smooth surface enamel caries has a conical shape with the tip directed towards the amelodentinal junction. It comprises a series of zones based on the extent of demineralization.

Cementum: It is a hard tissue. The gums, or gingivae, cover the alveolar processes and extend a bit into each socket. The pulp cavity, which houses blood vessels, is located in the centre of the tooth. Lymphatic vessels and nerves that are encased in dentine.

DENTAL CARIES

It is one of the Prevailing diseases identified as the leading reason for oral discomfort and loss of teeth. It is a significant public oral health issue that obstructs the attainment and preservation of oral health across all age demographics. Caries can be characterized by the sensation of pain, difficulty with eating, chewing, smiling, and speaking because of absent, discolored, or damaged teeth. The primary bacteria that cause the onset of caries are the Streptococcus mutans group. The caries microbial community is varied and includes numerous facultative and obligate anaerobic bacteria from the genera Actinomyces, Bifidobacterium, Eubacterium, Lactobacillus, Parvimonas, and Rothia. (Zhang Y, et al., 2018).

It may also result from different types of bacteria, such as members of the mitis, anginosus, and salivarius groups of streptococci, along with Propionibacterium, Enterococcus faecalis, Scardovia, Pseudomonas, Fusobacterium, Pseudoranibacter, Veillonella, Atopobium, Granulicatella, Prevotella, Dialister, Leptotrichia, and Thiomonas. Bacteroides, Prevotella, and Porphyromonas species are commonly found on mucosal surfaces and achieve significant concentrations in dental plaque, gingival crevices, and tonsillar crypts. (Marsch PD. Et al., 2009)..

PERIODONTAL DISEASE

Periodontitis is an infection of the periodontium. The term ‘Perion’ signifies around the enamel tissues, ‘odont’ refers to teeth, and ‘itis’ denotes infection, thus the full term “Periodontitis” indicates ongoing inflammation of the gums. Periodontal ligaments, alveolar bone, and dental cement. (Nyvad B. Et al., 2008). As per the World Health Organization (WHO), it is a highly transmissible chronic illness around the



Fig-3 Periodontitis Tooth

world. It begins with the build-up of plaque around the teeth, which forms microbial biofilms containing microorganisms detected through methods of localized causing an irritation of gingiva.(Petersen et al., 2005)

Global Scenario of Dental Caries.

Dental caries are the most prevalent oral health issues worldwide, although other conditions like oral and pharyngeal cancers, as well as oral tissue lesions, are also important health concerns. Globally, around 2.43 billion individuals (36% of the population) suffer from dental caries in their adult teeth. In primary teeth, it impacts approximately 620 million individuals, or 9% of the population. The illness is most common in Latin American nations, nations in the Middle East, and South Asia, and least common in China. (Tanzer et al., 2001). In the United States, dental caries is the prevalent chronic disease among children, occurring at least five times more frequently than asthma. It is the main pathological reason for tooth loss in children. Between 29% and 59% of adults aged fifty and older suffer from caries.

TABLE:1 Prevalence Of Dental Caries In Global Scenario. (Becker et al., 2002).

S.NO	AGE GROUP	PREVALENCE (%)	SAMPLE SIZE	COUNTRY	YEAR
1	5-9	50	1,598	USA	2004
2	17	78	3249	USA	2004
3	6	97.1	4050	Philippines	2006
4	6-12	92.3	1200	Philippines	2005
5	2-6	59-92	993	Philippines	2003
6	3-5	55	2014	China	2007
7	5-74	100	350000	China	2008
8	5	76	140712	China	2002
9	5-6	84	1587	China	2001
10	6	89.4	178	Taiwan	2006
11	1-6	52.9	981	Taiwan	2006
12	0-5	40	1487	Brazil	2007
13	1-2.5	20	186	Brazil	2007

14	12	53.6	1151	Brazil	2004
15	7-9	78.5	121	Argentina	2006

TABLE-2 Prevalence Of Dental Caries On National Scenario. (Aas JA. et al., 2008).

S.NO	AGE GROUP	PREVALENCE	SAMPLE SIZE	YEAR
1	5-6	23.23	638	2007-2008
	12-13	50.00		
2.	5-7	20.7	376	2012
	8-10	48.2	1174	
	11-14	52.46	1624	
3.	5-6	52	361	2013
4.	1-6	85.2	392	2013

TYPES OF DENTAL CARIES

Early Childhood Caries

Early childhood caries (ECC) is a type of decay observed in young children affecting their primary teeth. The teeth that are probably impacted are the maxillary anterior teeth, though all



teeth may be involved. This form of caries occurs when children are permitted to sleep with sugary liquids in their bottles or are given sweetened drinks several times throughout the day. The likelihood of ECC may also be influenced by existing enamel developmental issues known as hypoplasia.

Fig-4 Classification of Caries on different basis

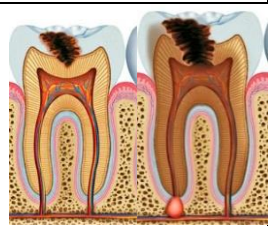

Rampant Caries


Widespread caries are severe deterioration on various surfaces of several teeth. It can be observed in people with inadequate oral hygiene, dry mouth caused by medications, or high sugar consumption. (Ling et al., 2010).

CLASSIFICATION OF DENTAL CARIES.

Caries may be categorized based on the speed of development, impacted hard tissues, and their location. These types of classification can be utilized to identify a specific instance of tooth decay to more precisely convey the condition to others and also show the extent of tooth damage.

TABLE-3 DENTAL CARIES CLASSIFICATION (Yucel et al., 2013).

ON THE BASIS	CLASSIFICATION	DESCRIPTION	PICTURES
Rate of progression	Acute	Represents the rapidly evolving situation	
	Chronic	Indicates the prolonged duration for development	
Affected Hard Tissue	Enamel	In the early phases of its progression, it may only affect enamel.	
	Dentinal	The extent of decay reaches into the inner layer of dentin.	
	Cementum		

		The decline at the bottom of teeth	
Location	Class I Class-II Class-III Class-IV Class V	Pit & fissure caries (anterior /posterior teeth). Adjacent surfaces of back teeth. Approximal surfaces of anterior teeth without incisal edge involvement. A Proximal surface of front teeth with involvement of the incisal edge. Gingival/cervical area on the lingual of facial surfaces [anterior/posterior].	Location 

AETIOLOGY

Historically, researchers have concentrated on the biological and nutritional impacts on children's oral health to understand the development of caries. In recent years, children's oral health outcomes have been assessed using a more comprehensive framework that includes psychosocial and environmental factors in addition to biological and dietary influences. The acids responsible for demineralization are waste products from bacteria residing in dental plaque. The microorganisms responsible for tooth decay are living entities predominantly found in dietary sugars. These consist of sucrose, glucose, fructose, lactose, and all boiled starches. These frameworks generally classify into five broad domains. The caries framework proposed by Fisher-Owens and colleagues incorporates various environmental levels that influence caries progression: child-level; family-level; and community-level.

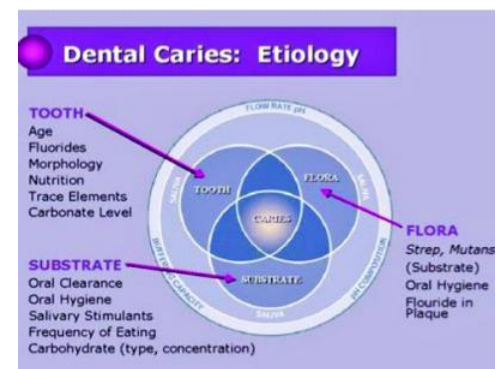


Fig-5 Aetiology of Tooth

Child-level

The presence of visible plaque, the early proliferation of bacteria linked to caries, the presence of mutans streptococci, frequent consumption of sugary beverages, rare tooth brushing habits, illness, and antibiotic usage have all been connected to the development of caries in preschool-aged children.

Family-level

Family factors linked to caries risk in children encompass demographic elements, parental oral hygiene practices and attitudes, dental anxiety and attendance, as well as maternal health and lifestyle during pregnancy and early childhood.

Community-level

Children's dental health is probably improved in a community that prioritizes excellent oral hygiene. Cultural factors and the community may influence the development of caries. The dental care system and the level of dental services accessible can influence oral health and caries development in preschool-aged children. (Abusleme et al., 2013).

PATHOGENESIS OF DENTAL CARIES.

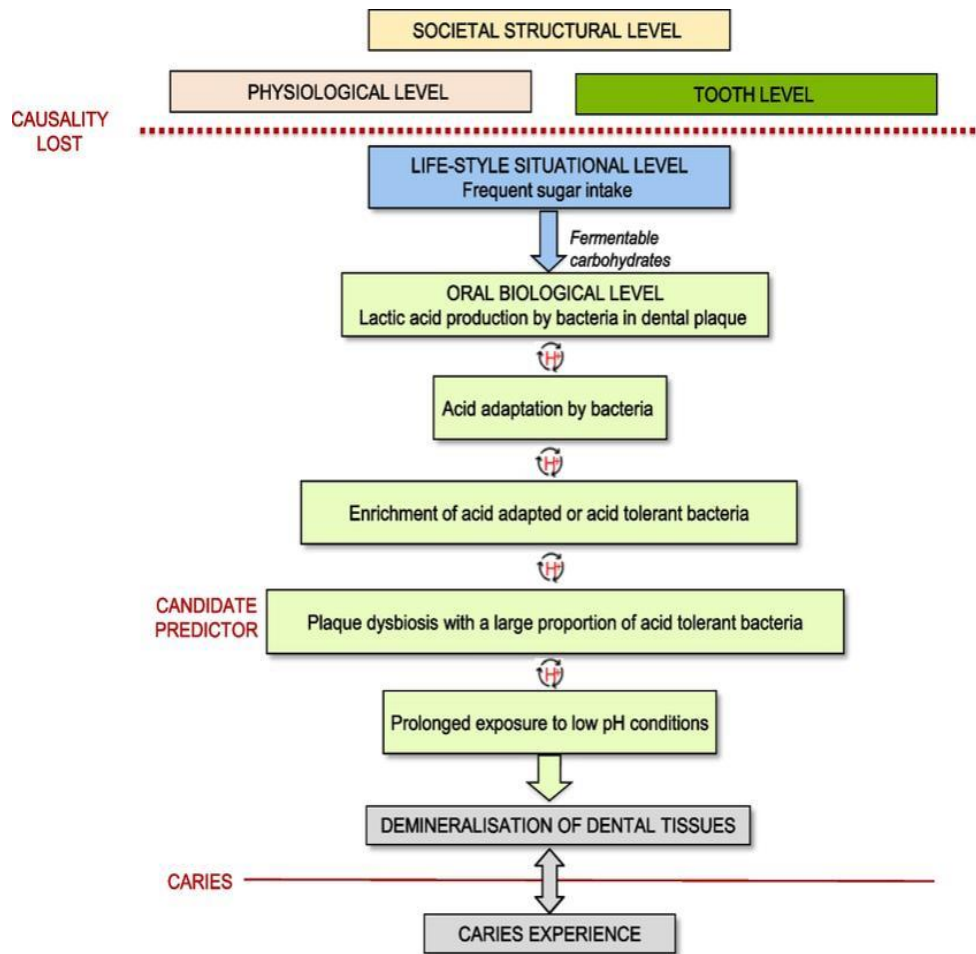


Fig-6: Pathogenesis

Carbohydrates and this acid break down the hydroxyapatite crystal structure of the tooth, leading to cavities. The explanation for the development of dental caries consists of three components: host, bacteria, and diet. Dental cavities develop when a vulnerable tooth surface is exposed to cariogenic bacteria and a source of sucrose or refined sugar is available. The bacterial pathogen generated lactic acid through fermentation. (Nelson et al., 1990).

SIGN & SYMPTOMS

Toothache can present with a range of signs and symptoms, varying in intensity and duration. The most common indication of toothache include:

Pain: The main indication of toothache is discomfort, which may be intense, pulsating, or persistent. The severity of the pain ranges from slight unease to intense suffering, based on the root issue.

Sensitivity: Tooth sensitivity is the most common indication of tooth pain. The impacted tooth might develop sensitivity to hot or cold temperatures, causing discomfort when eating or drinking specific foods and beverages.

Discomfort when chewing: Toothache may result in discomfort or pain when chewing or biting into food. This may result in challenges while eating and could influence an individual's food selections.

Swelling and redness: In certain instances, the nearby gum tissue might become inflamed or sensitive. There may be swelling or redness near the impacted tooth, suggesting a potential dental problem.

Bad breath or foul taste: Continuous tooth pain can result in foul breath and a distasteful flavour in the mouth caused by bacterial accumulation and infection.

Fever and headache: If the tooth pain is caused by an abscess or serious infection, it may result in systemic symptoms such as fever and headache

Radiating pain: The discomfort from a toothache can spread to the jaw, ear, or various areas of the head and neck. It is important to note that toothaches can arise from multiple reasons, such as dental cavities, gum issues, dental injuries, tooth sensitivity, or dental abscesses; the symptoms felt may differ according to the root cause. (Herrera et al., 2018).

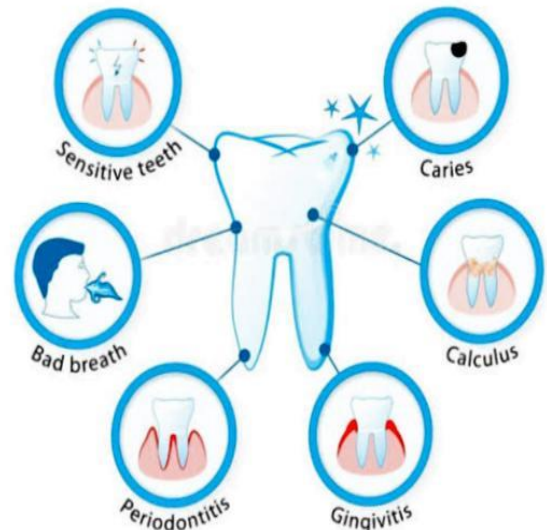


Fig-7 Symptoms of Tooth Decay

COMPLICATIONS

- Cavernous sinus thrombosis and Ludwig angina can be life-threatening.
- Dental pain, pulp inflammation, tooth extraction and tooth staining
- Apical periodontitis
- Periapical infection
- Granuloma periapical
- Cyst at the apex
- Skin infection
- Inflammation of the periosteum

- Bone infection (Gher et al., 1990).

CAUSES

1. **Tooth Decay:** A prevalent reason for toothache is dental caries (cavities). Mouth bacteria generate acids that wear away tooth enamel, resulting in the development of cavities. When these cavities reveal the delicate inner layers of the tooth, it may lead to discomfort and sensitivity.

2. **Gum Disease:** Gum infections like gingivitis and periodontitis can lead to tooth pain. When the gum tissues get inflamed and pull back, the roots of the teeth can be exposed, resulting in pain and discomfort.



Fig-8 Inflamed Gums

3. **Dental Abscess:** An abscess is a pocket of pus. That forms at the root of a tooth or between the tooth and gum. It is often caused by major tooth decay, trauma, or a bacterial infection. Abscesses can be extremely painful and require immediate dental attention.

4. **Tooth Fracture or Cracks:** Injury to a tooth, chewing on hard items, or excessive teeth grinding (bruxism) can lead to fractures or fissures in the tooth. These breaks can reveal the delicate inner layers of the tooth, resulting in pain.

5. **Dental Sensitivity:** Tooth sensitivity may arise when the protective enamel on a tooth's surface wears down, revealing the dentin underneath. This may result in discomfort and pain, particularly when eating hot, cold, sweet, or acidic foods and drinks. (Tonetti et al., 2019).

6. **Impacted Wisdom Teeth:** When third molars (wisdom teeth) lack adequate space to come in correctly, they can become impacted, leading to pressure and discomfort in the rear of the mouth.

7. **Dental Procedures:** Tooth pain can often be a side effect of specific dental treatments, like fillings, root canals, or tooth removals. The discomfort is typically short-lived and ought to diminish with time.

8. **Sinus Infections:** Occasionally, sinus infections can cause referred pain in the upper back teeth, creating the feeling of a toothache. (Petersen et al., 2003).

TREATMENT AND MANAGMENT

Management:

The International Caries Classification & Management System (ICCMST™): There are five key foundation components or (key- stones) of the ICCMST™ pathway. They are

- 1) the staging of the caries process
- 2) caries risk classification
- 3) the ICCMST™ decision matrices
- 4) ICCMST™ comprehensive patient management plan,
- 5) Outcomes of caries management using ICCM

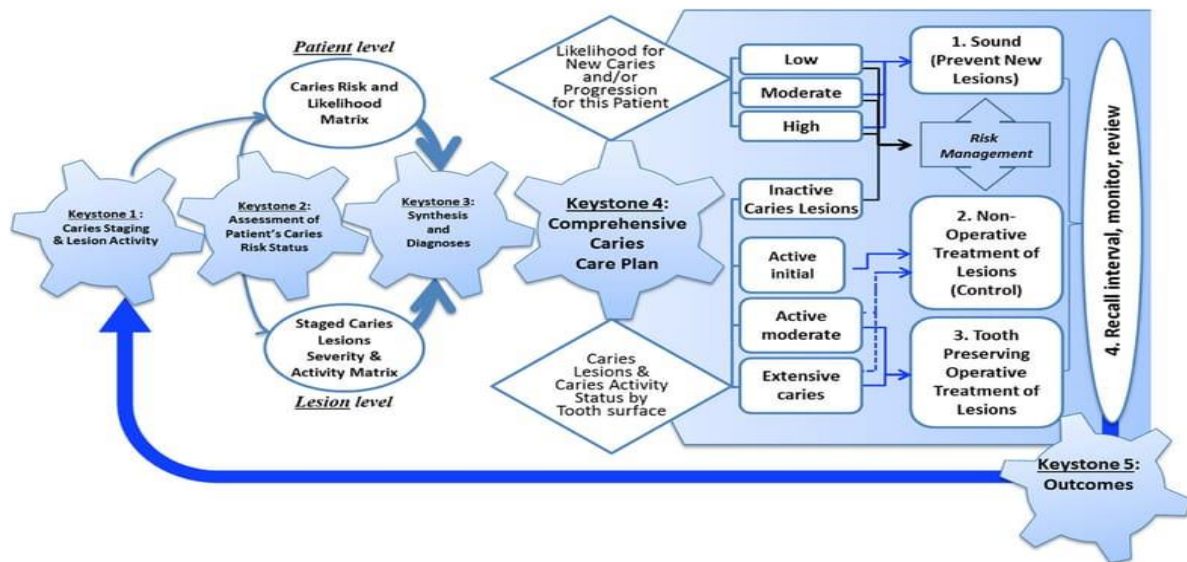


Fig.9. Keystones of ICCMST™

•Outcomes of caries management using ICCMST™

Well-rounded patient care plans, by nature, should emphasize attaining health results for patients. They must be value-oriented and not value-ignorant plans that need to be crafted and assessed to evaluate the following possible results.

1. Health promotion

- a. Number of sound teeth maintained sound
- b. Number previously treated teeth maintained free of new disease

2. Disease control

- a. Number of initial (active or arrested) caries lesions that remained unchanged or reversed.
- b. Number of radiographically detected lesions that did not progress or were treated preventively
- c. Change in number of teeth with PUFA (pulp, ulceration, fistula and abscess)
 - a. Patient-centered quality metrics
 - b. Patients' satisfaction with their dental health status
 - c. Patients' change in care pattern (from episodic to regular care based on risk status)
 - d. Patients' caries risk is reduced from high to medium or low status or stabilized if the baseline level was medium or low status.
 - e. Patients' demonstrate improvement in oral hygiene and dietary practices
 - f. Reduce cost of overall caries care

Implementation of ICCMS™.


Although no studies have assessed the ICCMSM system to date, a Global Collaborator for Caries Management (GCCM) has been established at King's College London to commence comparative research on the suggested systems and to examine the implementation process and its results. Numerous brief and less extensive studies conducted previously on innovative management strategies for dental caries that conserve tooth structure have shown that minimally invasive removal of enamel and dentin, along with sealing caries, can protect tooth structure and yield positive results. Alongside the scientific proof backing the various interventions suggested in this paper, further evidence suggests that caries lesion remineralization can occur in enamel and dentin. A childhood caries management strategy that emphasizes home care, prevention, and restorative treatment led to favourable results; sealants and resin infiltration have demonstrated potential in slowing down or reversing the progression.




Non-cavitated carious lesions. (Paris et al., 2010) In practice, applying the ICCMST™ necessitates the introduction of decision-making tools and educational initiatives to enhance dentists' confidence that the recommended system is feasible, functional, and straightforward to adopt. ICCMST™ considers caries a disease rather than a lesion (Leo et al., 1995). It prioritizes tooth preservation, as it seeks to enhance health and evaluate health results; this approach is grounded in the best available evidence. The ICCMS model has not been entirely adopted by dentists from various nations. It signifies a shift from the standard approach to managing caries, and therefore, its adoption will necessitate considerable alterations in the behaviors of practitioners. As with all proposed new models in healthcare, the ICCMS system needs to be adjusted during the implementation phase to guarantee that an objective, straightforward, and effective caries management approach evolves to prevent, manage, and restore dental caries.

NON-OPIOID ANALGESIC

Choices consist of acetaminophen and non-steroidal anti-inflammatory medications (NSAIDs). Acetaminophen can provide short-term relief for mild to moderate pain and reduce fever. (Adhikari et al., 2012).

TABLE-4: Examples of NSAIDs a person can take for tooth pain include.

NSAIDS	DOSAGE FORM	RISKS	PICTURES
Ibuprofen	The recommended dose is 400mg every 4-6 hours. People should not exceed more than 3,200 mg daily.	Ibuprofen can affect heart function, digestive health, and kidney performance. It can also lead to skin reactions. These drugs are not advisable for pregnant people from 30 weeks	

<p>Aspirin</p>	<p>The suggested dosage is 1-2 tablets (325mg) every 4 hours, or 3 tablets every 6 hours. Individuals should not surpass 12 tablets, or 3,900 mg, per day.</p>	<p>Certain individuals might have an allergic response to aspirin, and it could lead to stomach bleeding.</p>	
<p>Naproxen</p>	<p>Physicians suggest an initial dose of 500mg, followed by 250mg every 6 to 8 hours as needed. An individual must not surpass a daily limit of 1,250 mg.</p>	<p>This medication could affect heart, gastrointestinal, kidney, and liver function and cause skin reactions. Medical professionals do not recommend these for expectant mothers.</p>	
<p>Diclofenac</p>	<p>The suggested dosage is 100mg each day. Individuals should not go beyond limits unless a physician recommends.</p>	<p>Studies indicate that using diclofenac could elevate the likelihood of heart issues. It might also affect the gastrointestinal</p>	

		tract, kidneys and liver health.	
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OPIOID ANALGESICS

Opioids are a category of analgesics that alleviate pain by attaching to opioid receptors. When this happens, opioids inhibit the body's pain signals transmitted via the spinal cord. NSAIDs are the primary choice for pain relief. Opioid analgesics are utilized solely when NSAIDs prove ineffective. (Fisher-Owens et al., 2007).

TABLE-5 Examples of Opioid Analgesic

OPIOID ANALGESIC	DOSAGE FORM	LIMIT
Codeine	It comes in tablet form and may be taken in doses of 15-60 mg every 4 hours throughout the day.	Not exceed 360 mg in 24 hours.
Oxycodone	The suggested dosage is 5-15 mg every 4-6 hours as needed for pain relief.	It is recommended to administer oxycodone at the minimum effective dose for the briefest period.
Hydrocodone	Hydrocodone This choice is also offered in a tablet form that may include acetaminophen. Based on the potency of the tablet, an individual may take 1-2 tablets every 4-6 hours as needed. They must not surpass a daily limit of 2.5-5 mg tablets or six 7.5-10 mg tablets	They must not surpass a daily dose of 2.5-5 mg tablets or six 7.5-10 mg tablets

Morphine	The suggested initial dosage for adults is 10-20 mg every four hours	Morphine in liquid form for oral use. It is frequently offered in three strengths: 2, 4, and 20 mg per millilitre.
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ANTIBIOTICS

If the cause of the tooth pain is a bacterial infection, then a person will likely receive a route of antibiotics to clear the infection.

- Amoxicillin
- Clindamycin
- Azithromycin
- Doxycycline (Declerck et al., 2008).

TOPICAL ANESTHETICS

Topical anaesthetics refer to creams or gels that can alleviate pain by numbing an affected area. Individuals can use them straight on the aching tooth. Conventional topical anaesthetics frequently include lidocaine or benzocaine as their active components.

Benzocaine can assist in alleviating toothache by obstructing nerve signals in the affected region. A patient may apply benzocaine gels a maximum of 4 times each day or according to their dentist's or doctor's guidance.

Lidocaine is a regional & Local anaesthetic that is sometimes utilized in dentistry to alleviate discomfort related to toothaches or dental treatments. It functions by obstructing nerve signals in the body, which temporarily anesthetizes the regions

Local Anaesthetic Injections: In instances of intense tooth pain or during more invasive dental treatments such as root canals, dentists might provide lidocaine as a local anaesthetic via an injection. This anesthetizes a broader region and offers deeper pain alleviation. (Adair et al., 2004).

DIAGNOSIS

Primary Diagnosis

Initially, it may present as a minor chalky spot (smooth surface caries) that can later progress into a significant cavity. Examination of all accessible tooth surfaces utilizing a proper light source, dental mirror, and explorer. Dental X-rays are utilized for less visible parts of teeth, especially for detecting cavities between them. Laser radiation ionization detection of caries interproximal (entre los dientes). Dentists often use visual and tactile examinations along with radiographs, especially to identify pit and fissure caries. (Richie et al., 2011).

TREATMENT

Cavitated lesion, particularly when dentin is affected, remineralization becomes significantly harder, and a dental restoration is typically recommended. This approach to handling a carious lesion is referred to as “operative treatment.”

Non-cavitated Lesions can be halted and remineralisation may take place with significant alterations to the diet, such as a decrease in the frequency of refined sugars. It can be addressed using a non-surgical approach through tooth remineralisation. (Patel et al., 2020).

Tooth Remineralisation

Tooth remineralization is a process in which minerals are restored to the molecular framework of the tooth itself. Damaged tooth structure cannot completely regenerate, though remineralization may happen for minor carious lesions if dental hygiene is maintained optimally, including brushing twice daily with fluoride toothpaste, flossing, and regularly applying topical fluoride. The approach to managing a carious lesion is referred to as “non-operative treatment.”

Dental Restoration

A dental filling can be considered operative when dental restorative materials (such as dental amalgam, composite resin, porcelain, and gold) are employed to restore the function, integrity, and shape of lost tooth structure. Composite resin and porcelain are crafted to blend with a patient’s natural tooth colour and are commonly utilized. Local anaesthetics and nitrous oxide (“laughing gas”) are employed.

Tooth Extraction: The extraction of a decayed tooth is done if it has been excessively damaged by decay, making effective restoration impossible.

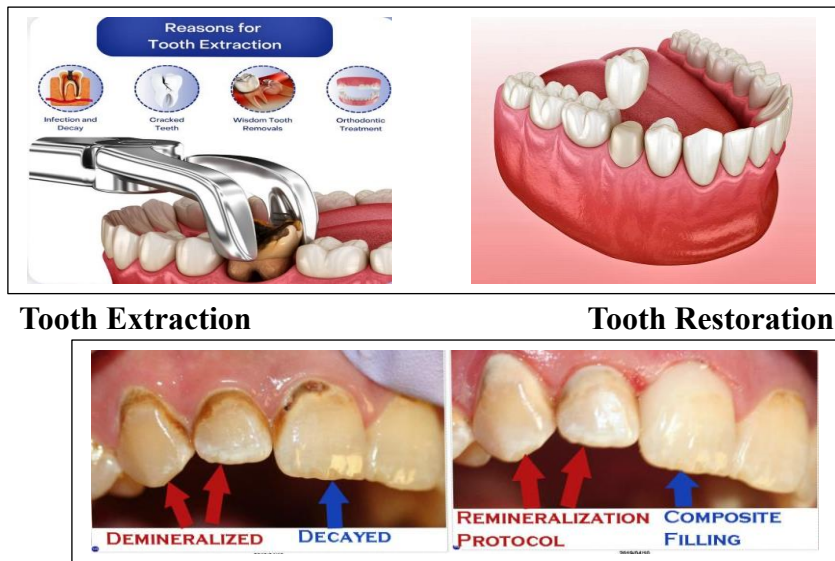


Fig-10 Treatment of Dental Caries

PREVENTION & CONTROL

Oral Hygiene

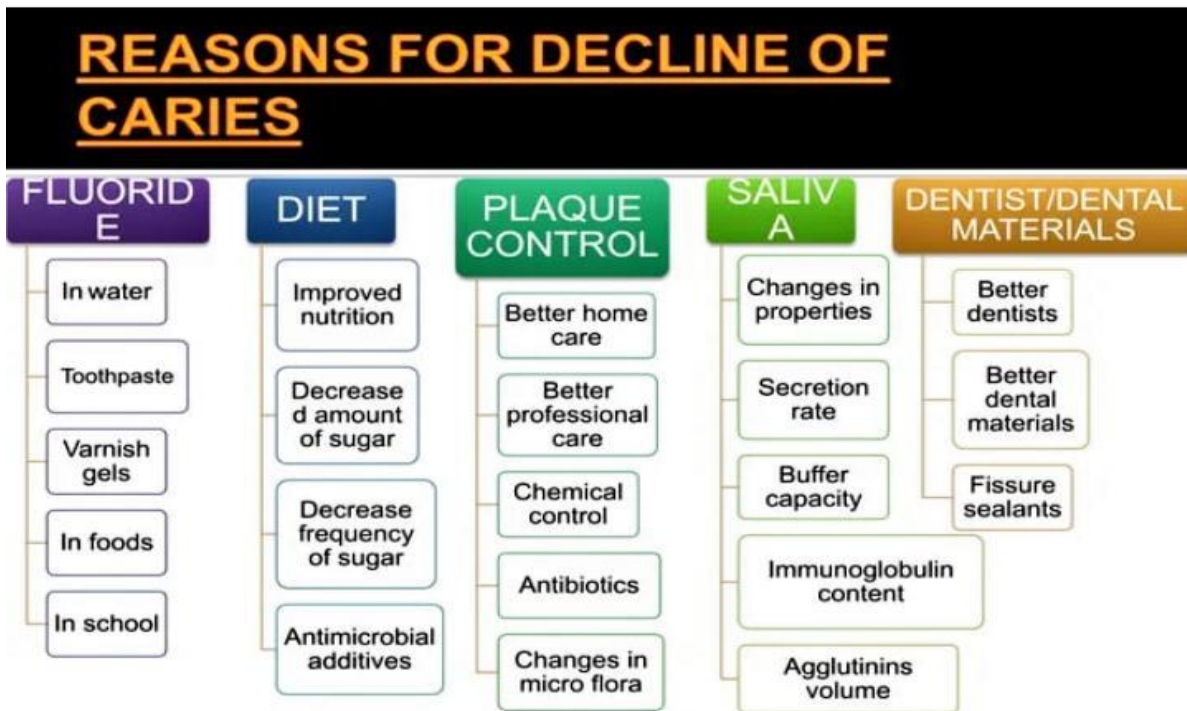
Personal hygiene maintenance includes effective brushing and flossing every day. (Youngson et al., 2019). Correct brushing and flossing aim to eliminate and avert the build-up of plaque or dental biofilm. Professional oral hygiene involves routine dental check-ups and professional cleaning (prophylaxis).

Dietary Modification

Limited and measured snacking is advised, but snacking provides a constant source of nutrition for acid-generating bacteria in the mouth. Foods that are chewy and sticky (like dried fruit or sweets) usually stick to teeth for an extended period, so it's advisable to brush your teeth after eating. Xylitol-containing chewing gum (a sugar alcohol) aids in decreasing dental biofilm. (Pergolizzi et al., 2020).

Calcium And Flouride

Calcium is present in foods like milk and leafy greens and is frequently suggested to guard against tooth decay. (Oluwatosin et al., 2022). Fluoride aids in preventing tooth decay by attaching to the hydroxyapatite crystals present in enamel. The added calcium enhances enamel's resistance to demineralization and, consequently, to decay. Topical fluoride, such as fluoride toothpaste, mouthwash, or varnish, is currently considered more preferable than



systemic options.(Sveen et al., 1982).

Fig-11 Reason for Decline of Caries

CONCLUSION

The current summary outlines various risk factors for dental caries which have undergone multiple interventions to avert decay, as significant harm from caries can result in substantial issues for individuals, impacting their quality of life in both functional and aesthetic ways. Raising awareness and understanding of dental caries overall can enhance knowledge and abilities in oral health care. Healthcare professionals can engage proactively in health assessments to identify the need for clinical preventive services and can recognize oral health issues.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

COMPETING INTERESTS:

Authors have declared that no competing interests exist.

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