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REVIEW OF COMMON DENTAL PROBLEMS AND USE OF DIFFERENT HERBAL FORMULATIONS

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Abstract:

The oral cavity is part of the digestive system, which is composed of many important anatomical structures, including teeth, periodontal tissues, oral mucosa, maxillary and mandibular bones, as well as other soft and hard tissues. It is also a complex ecological niche as more than 700 microorganism species colonize the oral cavity, which is closely associated with oral health . The oral microbiota could help prevent pathogenic microorganisms from growing and help to maintain the stability and balance of oral microecology. However, the composition of oral microbiota could alter due to the change of diet, poor oral hygiene, systemic diseases, etc., which might lead to the dysbiosis of oral microecology, and thus many oral microbiota related diseases, i.e., oral infectious diseases. It has been widely considered that oral infectious diseases such as dental caries, periodontitis, peri-implantitis, and oral candidiasis are caused by microbial dysbiosis instead of specific kinds of bacteria. Furthermore, it has been gradually recognized that oral health is closely related to systemic health. Therefore, great effort has been made for the treatment and prevention of oral infectious diseases. Drug therapy plays an important role in the inhibition of bacterial growth and inflammatory response, and thus the promotion of tissue regeneration. Systemic administration and local drug delivery are both important ways for drug administration. However, systemic administration could cause many other problems.

Keywords: *Dental Caries, Oral Lesion, Gingivitis, Chewing Tablets.*

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INTRODUCTION:

Dental caries:

Dental caries is one of the most common preventable diseases which is recognized as the primary cause of oral pain and tooth loss. It is a major public health oral disease which hinders the acheivement and maintenance of oral health in all age groups. WHO pointed that the global problem of oral disease still persists despite great improvements in the oral health of population in several countries. WHO claimed that poor oral health may have a profound effect on general health as well as quality of life, and several oral diseases are related to chronic diseases.

Breakdown of teeth due to activities of bacteria also known as Dental caries is tooth decay, cavities, or caries means number of different colors from yellow to black. Symptoms may include pain and difficulty with eating. Complications may include inflammation of the tissue around the tooth, infection, tooth loss or abscess formation.

What is dental caries?

Dental caries refers to the localized destruction of susceptible dental hard tissues by acidic by-products from the bacterial fermentation of dietary carbohydrates. It is a chronic disease that progresses slowly in most of the people which results from an ecological imbalance in the equilibrium between tooth minerals and oral biofilms.

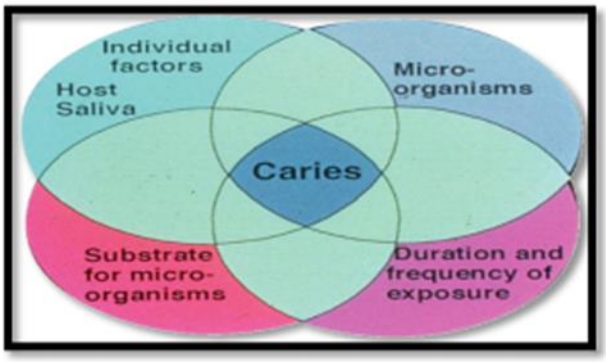


FIG.1: DENTAL CARIES

History of Dental Caries:

According to the archaeological evidence it shows that tooth decay is an ancient disease. Skulls dating from a million years ago through the Neolithic period show signs of caries, including those from the Paleolithic and Mesolithic ages . In 1850, another sharp increase in the prevalence of caries occurred and is believed to be a result of widespread diet changes. It is increased availability of sugar cane, bread, refined flour, and sweetened tea corresponded with a greater number of pit and fissure caries. In 1924 in London, Killian Clarke described a spherical bacterium in chains isolated from various lesions which he called Streptococcus mutants. Later, in the 1950s in the USA, Keyes and Fitzgerald working with hamsters showed that caries was transmissible and caused by an acidproducing Streptococcus. In 1960s that it became generally accepted that the Streptococcus isolated from hamster caries was the same as S. mutans described by Clarke. The diet of the “newly industrialized English working class” then became centered on bread, jam, and sweetened tea, greatly increasing both sugar consumption and caries.

Pathophysiology:

Enamel:

Enamel is stronger than bone. Enamel is the most highly mineralized tissue in the body It consists of microscopic crystals of hydroxapatite arranged in structural layers or rods, also known as prisms and sourended by water.

Demineralization of enamel by caries follows the direction of the enamel rods, the different triangular patterns between pit and fissure and smooth-surface caries develop in the enamel . As the enamel loses minerals, the enamel develops several distinct zones are: translucent zone, dark zones, body of the lesion, and surface zone. The translucent zone coincides with 1/2% loss of minerals. Dark zone is slight remineralization of enamel. The greatest demineralization and destruction is in the body of the lesion. The surface zone remains relatively mineralized until the loss of tooth structure results in a cavitation .

Dentine:

In dentine from the deepest layer to the enamel, the distinct areas affected by caries are the advancing front, the zone of bacterial penetration, and the zone of destruction. The advancing front represents a zone of demineralised dentine due to acid and has no bacteria present. The zones of bacterial penetration and destruction are the locations of invading bacteria and ultimately the decomposition of dentin. The zone of destruction has a more mixed bacterial population where proteolytic enzymes have destroyed the organic matrix.

Cementum:
The incidence of cemental caries increases in older adults as gingival slump occurs from either trauma or periodontal disease. It is a chronic condition that forms a large, shallow lesion and slowly invades first the root's cementum and then dentin to cause a chronic infection of the pulp.

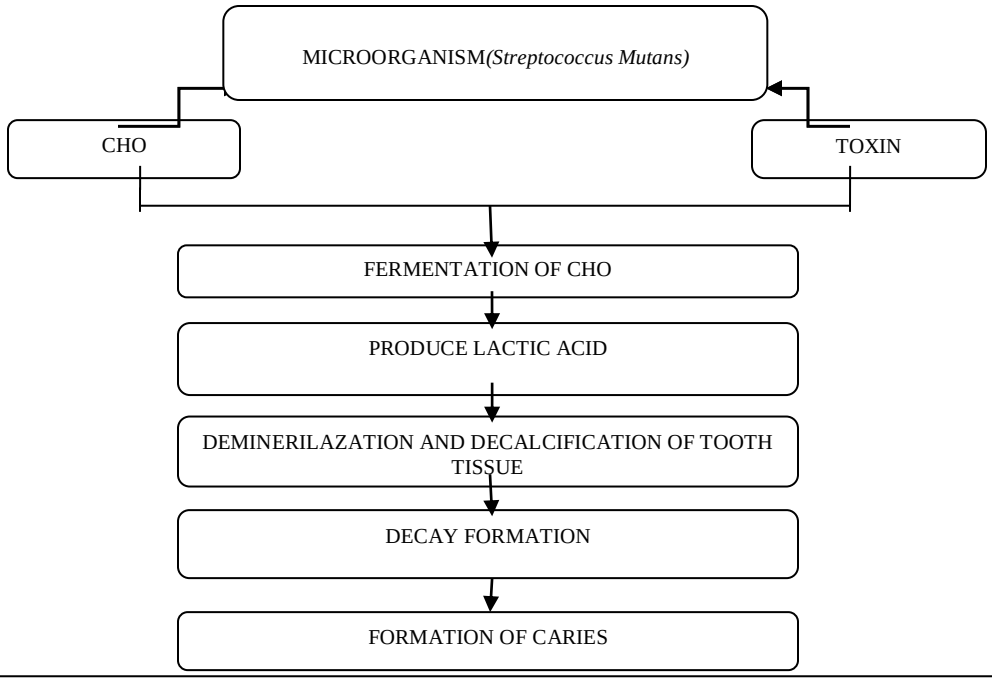
Cariesetiology:
Historically, researchers have focused on biological and dietary effects on children's oral health to explain caries development. In recent years, children's oral health outcomes using a broader framework, which incorporates psychosocial and environmental predictors as well as the biological and dietary effects. These frameworks generally classify conditions associated with disease into five broad domains: genetics and biology, social environment, physical environment, health influencing behaviors and medical care. These relevant variables explain why some children, despite use of fluoride and abundant information about caries prevention, develop carious lesions. The caries model by Fisher-Owens and co-workers includes different levels of the environment that can affect caries development: child-level; family-level; and community-level.

Child-level:
Visible plaque, early colonisation by caries-related bacteria, the presence of mutans streptococci, frequent intake of sweetened drinks, infrequent tooth brushing, illness and use of antibiotics have all been associated with caries developments in preschool children.

Family-level:
Family level characteristics associated with caries risk in children included are demographic factors of the family, parental oral health behaviors and attitudes, dental anxiety and dental attendance, maternal health and lifestyle in pregnancy and early childhood.

Community-level:
Children's oral health is likely to be better in a community that values good oral health. Cultural aspects and the neighbourhood may have implications for caries development. The dental care system and amount of dental care available may affect oral health and the development of caries in preschool children.

Pathogenesis of dental caries:
The classic description of the cause of dental caries includes three factors: host, bacteria and diet. Dental caries occurs when a susceptible tooth surface is colonized with cariogenic bacteria and dietary source of sucrose or refined sugar is present. Bacterial pathogen produced lactic acid from fermentation of carbohydrates and this acid dissolves the hydroxyapatite crystal stucture of the tooth which causes caries.



The sucrose connection related to caries:
Sucrose is a major environmental contributor to dental caries because of the many oral streptococci possess extracellular enzyme capable of cleaving the α-1 and α-2 glycosidic bond of sucrose and harnessing the energy to yield glucose polymer (glucans and mutans) and fructose. This group of enzymes called the glucosyltransferases (GTFs), accounts for this special relationship between sucrose and caries. Formation of glucan-mutan polymer allows the cariogenic bacteria to accumulate into biofilm to form a critical mass. Without formation of critical mass cariogenic bacteria would colonize the oral cavity but not be massed so as to cause the destruction of the enamel surface. Accordingly the formation of critical mass that is uniquely associated with glucosyltransferases and sucrose is a biological reason for man's recent affliction with caries.

Saliva and its importance:
1. Physical protection provides a cleansing effect. Thick, or viscous, saliva is less effective than more watery saliva in clearing carbohydrates.
2. Chemical protection contains calcium, phosphate, and fluoride. It keeps calcium there ready to be used during remineralization. It includes buffers, bicarbonate, phosphate, and small proteins that neutralize the acids after we ingest fermentable carbohydrates.
3. Antibacterial substances in saliva work against the bacteria.
4. If salivary function is reduced for any reason, such as from illness or medications or due to radiation therapy, the teeth are at increased risk for decay.

Signs and Symptoms:
- It is dark brown and shiny suggests dental caries were once present but the demineralization process has stopped.
- The earliest sign of a new carious lesion is the appearance of a chalky white spot on the surface of the tooth, indicating an area of demineralization of enamel. This is referred to as a white spot lesion, an incipient carious lesion or a "microcavity".
- Once the decay passes through enamel, the dentinal tubules, which have passages to the nerve of the tooth, become exposed, resulting in pain that can be transient, temporarily worsening with exposure to heat, cold, or sweet foods and drinks.
- Dental caries can also cause bad breath and foul tastes.

Complications:
- Cavernous sinus thrombosis and Ludwig angina can be life-threatening
- Toothache, pulpitis, tooth loss and dental discoloration (www.rightdiagnosis.com)

FIG.2: AFFECTED TEETH

Classification of Dental Carries:
Classification of dental carries as per the symptoms are as follows.
Class I - Buccal or lingual pits on molars, Occlusal surfaces of posterior teeth, lingual pit near cingulum of maxillary incisors.
Class II - proximal surfaces of posterior teeth.
Class III - Interproximal surfaces of anterior teeth without incisal edge involvement.
Class IV - Interproximal surfaces of anterior teeth with incisal edge involvement.
Class V - Cervical third of facial or lingual surface of tooth.
Class VI - Incisal or occlusal edge worn away due to abrasion.

Early childhood caries:
Early childhood caries (ECC) is a pattern of decay found in young children with their deciduous teeth. The teeth most likely affected are the maxillary anterior teeth, but all teeth can be affected. This type of caries comes as a result of allowing children to fall asleep with sweetened liquids in their bottles or feeding children sweetened liquids multiple times during the day. The risk for ECC also may be determined by pre-existing developmental defects of the enamel called hypoplasia. Hypoplasia predisposes teeth to early colonization by Streptococcus mutans and malnutrition. ECC exhibits a characteristic pattern related to the emergence sequence of the teeth and the tongue position during feeding. The lower teeth are protected from exposure to ingested liquids by the tongue during feeding and by the pooling of saliva and so usually are not affected. The incisors are the first upper teeth to emerge and are most affected by ECC. Depending on how long the caries process is active, the upper first primary molars are often involved, followed by the upper second molars and canines, and in severe cases, the lower teeth.

Rampant caries:
"Baby bottle caries," or "Bottle Rot" is a pattern of decay found in young children with their deciduous teeth. The teeth most likely affected are the maxillary anterior teeth, but all teeth can be affected. The name for this type of caries comes from the fact that the decay usually is a result of allowing children to fall asleep with sweetened liquids in their bottles or feeding children sweetened liquids multiple times during the day. It is due to large sugar intake which result problems can also be caused by the selfdestruction of roots and whole tooth resorption when new teeth erupt or later from unknown causes shown in figure.

FIG.3: EARLY CHILDHOOD CARIES

Root Caries:
1. Root caries is becoming more prevalent and is a concern for the elderly population who often has gingival recession exposing the root surfaces.
2. People are living longer and keeping their teeth longer. Older people are often taking medications known to reduce salivary flow.
3. Carious lesions form more quickly on root surfaces than coronal caries because the cementum on the root surface is softer than enamel and dentin.
4. Like coronal caries, root caries has periods of demineralization and demineralization.

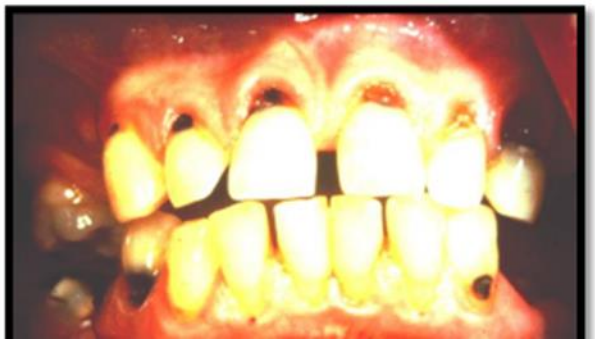


FIG.4: ROOT CARIES

Secondary, or Recurrent, Caries:

1. Bacteria are able to thrive in these areas.
2. When dental restorations need to be replaced, it is because there is recurrent caries under the existing restoration. New restorative materials that are bonded to the tooth structure eliminate the gap between tooth and filling where micro leakage can occur. Restorative materials that slowly release fluoride help to prevent secondary caries.

FIG.5 AMALGAM RESTORATION

Prevention and Control:

Oral hygiene

It consists of proper brushing and flossing daily. The purpose of oral hygiene is to minimize any etiologic agents of disease in the mouth.

the mouth.

FIG.6: DENTAL TOOTH BRUSH

Dietary modification

Chewy, substances sticky foods tend to adhere to teeth longer, and, as a consequence, are best eaten as part of a meal. Chewing and stimulation of flavor receptors on the tongue are also known to increase the production and release of saliva.

Dental sealants

The use of dental sealants is a means of prevention. A sealant is a thin plasticlike coating applied to the chewing surfaces of the molars to prevent food from being trapped inside pits and fissures. Fluoride helps prevent decay of a tooth by binding to the hydroxyapatite crystals in enamel. The incorporated calcium makes enamel more resistant to demineralization and, thus, resistant to decay. Calcium, as found in food such as milk and green vegetables, is often recommended to protect against dental caries.

Diagnosis of Dental Caries:

1. Detectable explorer “stick”
2. Radiographs
3. Visual
4. Laser caries detector

Primary diagnosis:

Initially it may appear as a small chalky area (smooth surface caries) which may eventually develop into a large cavitation. Inspection of all visible tooth surfaces using a good light source, dental mirror and explorer. Dental radiographs (X-rays) are used for

less visible areas of teeth in particular caries between the teeth. Lasers without ionizing radiation also now used for detection of interproximal decay (between the teeth). Visual and tactile inspection along with radiographs are employed frequently among dentists, in particular to diagnose pit and fissure caries. Early, uncavitated caries is often diagnosed by blowing air across the suspect surface, which removes moisture and changes the optical properties of the unmineralized enamel.

Laser Caries Detector:
1. The laser caries detector is used to diagnose caries and reveal bacterial activity under the enamel surface.
2. Carious tooth structure is less dense and gives off a higher reading than non- carious tooth structure.

Differential diagnosis:
Dental fluorosis and developmental defects of the tooth including hypomineralization of the tooth and hypoplasia of the tooth are used for dental caries.

FIG.7: CROSS SECTION OF MOLAR SHOWING DECAY

Methods of Caries Intervention:
1. Fluoride: A variety of types are available to strengthen the tooth against solubility to acid.
2. Antibacterial therapy: Products such as chlorhexidine rinses are effective.
3. Fermentable carbohydrates: Reduce the amount and frequency of ingestion.
4. Salivary flow can be increased by chewing sugarless gum, for example, those with a non-sugar sweetener such as xylitol

Treatment:
In early stages of tooth decay (when white or brown spots appear on the teeth) it might be enough just to brush your teeth regularly with fluoride toothpaste and have a fluoride treatment at the dentist's.

The goal of treatment is to preserve tooth structures and prevent further destruction of the tooth. Most importantly, whether the carious lesion is cavitated or noncavitated dictates the management.

If you have a hole in your tooth, known as a cavity, you will be given a filling. Here the dentist will use a drill to remove decayed material, and then fill the cavity with synthetic resins (composite resins), amalgam, ceramic material or a precious metal. If the tooth damage is more severe, a partial or full crown may be needed for the tooth. If nerves are also affected, root canal treatment is usually recommended. Sometimes the tooth may need to be pulled (extracted). It can then be replaced by a bridge or fixed dentures supported by an implant.
Besides the conventional ways of treating tooth decay, there are a number of newer procedures, some of which no longer use a drill. These include a technique called "caries infiltration" to treat tooth decay in its early stages, which involves using plastic to harden the tooth.

Noncavitatedlesions can be arrested and remineralization can occur with extensive changes to the diet i.e, reduction in frequency of refined sugars. It can be treated with non- operative method by tooth remineralization.

Tooth remineralization:
Tooth remineralization is a process in which minerals are returned to the molecular structure of the tooth itself. Destroyed tooth structure does not fully regenerate, although remineralization of very small carious lesions may occur if dental hygiene is kept at optimal level such as toothbrushing twice per day with fluoride toothpaste and flossing, and regular application of topical fluoride. Such management of a carious lesion is termed "non-operative treatment". Cavitatedlesion, especially if dentin is involved, remineralization is much more difficult and a dental

restoration is usually indicated. Such management of a carious lesion is termed "operative treatment".

Dental restoration:
A dental restoration or dental filling is a process in which dental restorative material (including dental amalgam, composite resin, porcelain, and gold) is used to restore the function, integrity and morphology of missing tooth structure. Composite resin and porcelain can be made to match the color of a patient's natural teeth and are more frequently used. Local anesthetics, nitrous oxide ("laughing gas"), or other prescription medications may be required in some cases to relieve pain during or following treatment or to relieve anxiety during treatment.

Tooth extraction:
The removal of the decayed tooth is performed if the tooth is too far destroyed from the decay process to effectively restore the tooth.

Others measures:
Dental sealants:
A sealant is a thin plastic-like coating applied to the chewing surfaces of the molars to prevent food from being trapped inside pits and fissures.

Calcium and fluoride:
Calcium is found in food such as milk and green vegetables, is often recommended to protect against dental caries. Fluoride helps prevent decay of a tooth by binding to the hydroxyapatite crystals in enamel. The incorporated calcium makes enamel more resistant to demineralization and, thus, resistant to decay. Topical fluoride include a fluoride toothpaste or mouthwash or varnish is now more highly recommended than systemic intake such as by tablets or drops to protect the surface of the teeth. After brushing with fluoride toothpaste, rinsing should be avoided. Fouride have pre-erruptive and post-erruptive effects on caries prevention.

Oral lesion:
An oral lesion (which includes aphthous ulcers) is an ulcer that occurs on the mucous membrane of the oral cavity. Oral lesions are mouth ulcers or sores which may be painful They can include abnormal cell growth and rare tongue and hard palate (roof of mouth) disorders. They are very common, occurring in association with many diseases and by many different mechanisms. They can be recognized by a break in the skin or mucous membrane with loss of surface tissue and the disintegration and necrosis of epithelial tissue.

The most common causes of oral lesions are localized trauma (i.e. rubbing from a sharp edge on a broken filling), infections, systemic conditions, associated dermatological diseases and recurrent aphthous ulcers (canker sores).
Oral lesions may form individually or multiple lesions may appear at the same time. Once formed, it may be maintained by inflammation and/or secondary infection. Rarely, an oral lesion that does not heal may be a sign of oral cancer.

Symptoms:
However, symptoms accompanying red, swollen patches and open sores may include:

- Burning sensation or pain.
- Sensitivity to hot, acidic or spicy foods.
- Bleeding and irritation with tooth brushing.
- Inflammation of the gums (gingivitis)
- Painful, thickened patches on the tongue.
- Discomfort when speaking, chewing or swallowing.

When to see a dentist..???
Follow your dentists recommended schedule for regular checkups. If you notice any symptoms of oral lesions, make an appointment with your dentist
As soon as possible. The sooner you seek care, the better your chances of reversing oral lesions.

Causes:

- Sores on the tongue or inside the mouth may also be caused or exacerbated by other infections, inflammation, stress, or, very rarely, cancer. If the sore is deep, or if it gets irritated or infected, it may also bleed.
- Some mouth sores and lesions may have more obvious causes, such as sharp or broken teeth or braces with protruding wires.
- Gritting or gnashing your teeth, especially while sleeping, can cause tiny bites on the inside of your cheeks. Gum disease and inflammation can also cause bleeding in and around the gumline.
- Biting your tongue or chewing your lips can cause pain, swelling, and even small cuts. Drinking hot liquids, smoking cigarettes and cigars, and consuming alcoholic beverages can also lead to mouth lesions, as can brushing or flossing too vigorously or using a hard toothbrush.
- Cold sores, because they're a form of herpes, are transmitted by oral-to-oral contact and through saliva, which means you can develop them through kissing or by sharing utensils with someone who has a cold sore. This type of herpes virus can also be transmitted to the genitals

through oral-genital contact and cause genital herpes. (Herpes simplex virus 1 causes oral herpes and a different form of the virus — herpes simplex virus 2 — causes genital herpes.)

- While cold sores are caused by a virus, the exact cause of canker sores is unknown. But there are several things than can trigger an outbreak. These include food allergies, stress, hormonal changes, vitamin deficiencies, or even spicy foods. Acidic fruits and vegetables may also trigger canker sores.
- Often, people with recurrent canker sores have a family history of the disorder. They are also linked to rheumatologic conditions like lupus.

Risk Factors :

- Factors that can increase risk of oral lesions are :
- Tobacco and alcohol use
- Poor nutrition
- Excess body weight
- Genetic syndromes

Complications:

The most common complications in oral lesions include the following:

- Oral mucositis (inflamed mucous membranes in the mouth).
- Infection.
- Salivary gland problems.
- Change in taste.
- Pain.

How oral lesion can be diagnosed?

The most typical sites include buccal mucosa, dorsal tongue, and palate. Diagnosis is usually based on the clinical appearance, with or without confirmation by smear or culture of Candida, because no chairside test (in the office, not sent to the laboratory) exists for oral candidiasis.

Treatment:

Oral lesions afflict children and adults, and the pharmacist may be the first point of contact regarding treatment. The prevalence of many oral lesions depends significantly on individual characteristics. Prevalence rates should be based on studies of general populations and be stratified by risk factors for the specific lesion. These factors include sex, age, race/ethnicity, tobacco use, and use of removable dentures. According to the most current data available, the National Health and Nutrition Examination Survey (NHANES) about 28.24% of an adult group present with oral lesions.

Pharmacists should be cognizant of common oral lesions and the various medications used for their management (see Table 1). Oral lesions may present as a multitude of different diagnoses, ranging from benign to malignant. This article reviews several oral lesions and conditions, including traumatic/irritational lesions, candidiasis, primary and recurrent herpes infection, recurrent aphthous ulcers, lichen planus, leukoplakia, erythroplakia, mucocele, and xerostomia.

Managing pain:

Painful oral vesiculoerosive diseases (OVD) include lichen planus, pemphigus vulgaris, mucous membrane pemphigoid, erythema multiforme, and recurrent aphthous stomatitis. OVD lesions have an immunopathic cause. Treatment is aimed at reducing the immunologic and the following inflammatory response. The mainstay of OVD management is topical or systemic corticosteroids to include topical triamcinolone, fluocinonide, and clobetasol, whereas systemic medications used in practice can include dexamethasone, prednisone, and prednisolone. Oral herpetic lesions can be primary or recurrent. If management is desired, they can be treated by topical or systemic antiviral drugs. Topical antiviral creams include prescription acyclovir, penciclovir and over-the-counter docosanol.

Bad breath:

Bad breath, also called halitosis, can be embarrassing and in some cases may even cause anxiety. It's no wonder that store shelves are overflowing with gum, mints, mouthwashes and other products designed to fight bad breath. But many of these products are only temporary measures because they don't address the cause of the problem.

Certain foods, health conditions and habits are among the causes of bad breath. In many cases, you can improve bad breath with consistent proper dental hygiene. If simple self-care techniques don't solve the problem, see your dentist or physician to be sure a more serious condition isn't causing your bad breath.

Symptoms:

Bad breath odors vary, depending on the source or the underlying cause. Some people worry too much about their breath even though they have little or no mouth odor, while others have bad breath and don't know it. Because it's difficult to assess how your own breath smells, ask a close friend or relative to confirm your bad-breath questions.

When to see a doctor..???

If you have bad breath, review your oral hygiene habits. Try making lifestyle changes, such as brushing

your teeth and tongue after eating, using dental floss, and drinking plenty of water.

If your bad breath persists after making such changes, see your dentist. If your dentist suspects a more serious condition is causing your bad breath, he or she may refer you to a physician to find the cause of the odor.

Causes:
Most bad breath starts in your mouth, and there are many possible causes. They include:

- Food. The breakdown of food particles in and around your teeth can increase bacteria and cause a foul odor. Eating certain foods, such as onions, garlic and spices, also can cause bad breath. After you digest these foods, they enter your bloodstream, are carried to your lungs and affect your breath.
- Tobacco products. Smoking causes its own unpleasant mouth odor. Smokers and oral tobacco users are also more likely to have gum disease, another source of bad breath.
- Poor dental hygiene. If you don't brush and floss daily, food particles remain in your mouth, causing bad breath. A colorless, sticky film of bacteria (plaque) forms on your teeth. If not brushed away, plaque can irritate your gums and eventually form plaque-filled pockets between your teeth and gums (periodontitis). Your tongue also can trap bacteria that produce odors. Dentures that aren't cleaned regularly or don't fit properly can harbor odor-causing bacteria and food particles.
- Dry mouth. Saliva helps cleanse your mouth, removing particles that cause bad odors. A condition called dry mouth or xerostomia (zeer–o-STOE-me-uh) can contribute to bad breath because production of saliva is decreased. Dry mouth naturally occurs during sleep, leading to "morning breath," and it worsens if you sleep with your mouth open. Chronic dry mouth can be caused by a problem with your salivary glands and some diseases.
- Medications. Some medications can indirectly produce bad breath by contributing to dry mouth. Others can be broken down in the body to release chemicals that can be carried on your breath.
- Infections in your mouth. Bad breath can be caused by surgical wounds after oral surgery, such as tooth removal, or as a result of tooth decay, gum disease or mouth sores.
- Other mouth, nose and throat conditions. Bad breath can occasionally stem from small stones that form in the tonsils and are covered with bacteria that produce odor. Infections or chronic inflammation in the nose, sinuses or throat, which can contribute to postnasal drip, also can cause bad breath.
- Other causes. Diseases, such as some cancers, and conditions such as metabolic disorders, can cause a distinctive breath odor as a result of chemicals they produce. Chronic reflux of stomach acids (gastroesophageal reflux disease, or GERD) can be associated with bad breath. Bad breath in young children can be caused by a foreign body, such as a piece of food, lodged in a nostril.

Diagnosis:
Your dentist will likely smell both the breath from your mouth and the breath from your nose and rate the odor on a scale. Because the back of the tongue is most often the source of the smell, your dentist may also scrape it and rate its odor.

There are sophisticated detectors that can identify the chemicals responsible for bad breath, though these aren't always available.

Treatment:
To reduce bad breath, help avoid cavities and lower your risk of gum disease, consistently practice good oral hygiene. Further treatment for bad breath can vary, depending on the cause. If your bad breath is thought to be caused by an underlying health condition, your dentist will likely refer you to your primary care provider.

For causes related to oral health, your dentist will work with you to help you better control that condition. Dental measures may include:

- Mouth rinses and toothpastes. If your bad breath is due to a buildup of bacteria (plaque) on your teeth, your dentist may recommend a mouth rinse that kills the bacteria. Your dentist may also recommend a toothpaste that contains an antibacterial agent to kill the bacteria that cause plaque buildup.
- Treatment of dental disease. If you have gum disease, you may be referred to a gum specialist (periodontist). Gum disease can cause gums to pull away from your teeth, leaving deep pockets that fill with odor-causing bacteria. Sometimes only professional cleaning removes these bacteria. Your dentist might also recommend replacing faulty tooth restorations, a breeding ground for bacteria.

Lifestyle and home remedies:
To reduce or prevent bad breath:

- Brush your teeth after you eat. Keep a toothbrush at work to use after eating. Brush using fluoride-containing toothpaste at least twice a day, especially after meals. Toothpaste with antibacterial properties has been shown to reduce bad breath odors.
- Floss at least once a day. Proper flossing removes food particles and plaque from between your teeth, helping to control bad breath.
- Brush your tongue. Your tongue harbors bacteria, so carefully brushing it may reduce odors. People who have a coated tongue from a significant overgrowth of bacteria (from smoking or dry mouth, for example) may benefit from using a tongue scraper. Or use a toothbrush that has a built-in tongue cleaner.
- Clean dentures or dental appliances. If you wear a bridge or a denture, clean it thoroughly at least once a day or as directed by your dentist. If you have a dental retainer or mouth guard, clean it each time before you put it in your mouth. Your dentist can recommend the best cleaning product.
- Avoid dry mouth. To keep your mouth moist, avoid tobacco and drink plenty of water — not coffee, soft drinks or alcohol, which can lead to a drier mouth. Chew gum or suck on candy (preferably sugarless) to stimulate saliva. For chronic dry mouth, your dentist or physician may prescribe an artificial saliva preparation or an oral medication that stimulates the flow of saliva.
- Adjust your diet. Avoid foods such as onions and garlic that can cause bad breath. Eating a lot of sugary foods is also linked with bad breath.
- Regularly get a new toothbrush. Change your toothbrush when it becomes frayed, about every three to four months, and choose a soft-bristled toothbrush.
- Schedule regular dental checkups. See your dentist on a regular basis — generally twice a year — to have your teeth or dentures examined and cleaned.

Gingivitis:

Gingivitis is a common and mild form of gum disease (periodontal disease) that causes irritation, redness and swelling (inflammation) of your gingiva, the part of your gum around the base of your teeth. It's important to take gingivitis seriously and treat it promptly. Gingivitis can lead to much more serious gum disease called periodontitis and tooth loss.

The most common cause of gingivitis is poor oral hygiene. Good oral health habits, such as brushing at least twice a day, flossing daily and getting regular dental checkups, can help prevent and reverse gingivitis.

FIG.8: GINGIVITIS.

Symptoms:

Healthy gums are firm and pale pink and fitted tightly around the teeth. Signs and symptoms of gingivitis include:

- Swollen or puffy gums
- Dusky red or dark red gums
- Gums that bleed easily when you brush or floss
- Bad breath
- Receding gums
- Tender gums

When to see a dentist

If you notice any signs and symptoms of gingivitis, schedule an appointment with your dentist. The sooner you seek care, the better your chances of reversing damage from gingivitis and preventing its progression to periodontitis.

Types:
There are two main categories of gingival diseases:
Dental plaque-induced gingival disease: This can be caused by plaque, systemic factors, medications, or malnutrition.
Non-plaque induced gingival lesions: This can be caused by a specific bacterium, virus, or fungus. It might also be caused by genetic factors, systemic conditions (including allergic reactions and certain illnesses), wounds, or reactions to foreign bodiesTrusted Source, such as dentures. Sometimes, there is no specific cause.

Causes:
The most common cause of gingivitis is poor oral hygiene that encourages plaque to form on teeth, causing inflammation of the surrounding gum tissues. Here's how plaque can lead to gingivitis:

- Plaque forms on your teeth. Plaque is an invisible, sticky film composed mainly of bacteria that forms on your teeth when starches and sugars in food interact with bacteria normally found in your mouth. Plaque requires daily removal because it re-forms quickly.
- Plaque turns into tartar. Plaque that stays on your teeth can harden under your gumline into tartar (calculus), which collects bacteria. Tartar makes plaque more difficult to remove, creates a protective shield for bacteria and causes irritation along the gumline. You need professional dental cleaning to remove tartar.
- Gingiva become inflamed (gingivitis). The longer that plaque and tartar remain on your teeth, the more they irritate the gingiva, the part of your gum around the base of your teeth, causing inflammation. In time, your gums become swollen and bleed easily. Tooth decay (dental caries) also may result. If not treated, gingivitis can advance to periodontitis and eventual tooth loss.

Risk factors:
Gingivitis is common, and anyone can develop it. Factors that can increase your risk of gingivitis include:

- Poor oral care habits
- Smoking or chewing tobacco
- Older age
- Dry mouth
- Poor nutrition, including vitamin C deficiency
- Dental restorations that don't fit properly or crooked teeth that are difficult to clean
- Conditions that decrease immunity such as leukemia, HIV/AIDS or cancer treatment
- Certain drugs, such as phenytoin (Dilantin, Phenytek) for epileptic seizures, and some calcium channel blockers, used for angina, high blood pressure and other conditions
- Hormonal changes, such as those related to pregnancy, menstrual cycle or use of birth control pills
- Genetics
- Medical conditions such as certain viral and fungal infections

Prevention:

- Good oral hygiene. That means brushing your teeth for two minutes at least twice daily in the morning and before going to bed — and flossing at least once a day. Better yet, brush after every meal or snack or as your dentist recommends. Flossing before you brush allows you to clean away the loosened food particles and bacteria.
- Regular dental visits. See your dentist or dental hygienist regularly for cleanings, usually every six to 12 months. If you have risk factors that increase your chance of developing periodontitis such as having dry mouth, taking certain medications or smoking you may need professional cleaning more often. Annual dental X-rays can help identify diseases that are not seen by a visual dental examination and monitor for changes in your dental health.

Diagnosis:
Dentists usually diagnose gingivitis based on:

- Review of your dental and medical history and conditions that may contribute to your symptoms.
- Examination of your teeth, gums, mouth and tongue for signs of plaque and inflammation.
- Measuring the pocket depth of the groove between your gums and your teeth by inserting a dental probe beside your tooth beneath your gum line, usually at several sites throughout your mouth. In a healthy mouth, the pocket depth is usually between 1 and 3 millimeters (mm). Pockets deeper than 4 mm may indicate gum disease.
- Dental X-rays to check for bone loss in areas where your dentist sees deeper pockets.

Treatment:
Prompt treatment usually reverses symptoms of gingivitis and prevents its progression to more serious

gum disease and tooth loss. You have the best chance for successful treatment when you also adopt a daily routine of good oral care and stop tobacco use.

Herbal formulations for treatment of dental diseases:

Different herbal formulations:

Different herbal formulations are alternative options for prevention and treatment of dental diseases because the product formulations prepared from the herbal sources are safe, effective and economically available as compared to other choices

Herbal chewing tablets:

Herbal chewable tablets are an important alternative and convenient to conventional tablets in dental diseases. Such tablets have great and potential merits because of no need of water. It implies that the tablets can be given to the patient at any place in any time. Chewable tablets provide additional advantages for patients to ensure better compliance, to improve the experience and to overcome swallowing difficulties.

The increasing prevalence of multi drug resistant strains of bacteria and the recent manifestation of strains with abridged susceptibility to antibiotics increases the prevalence of untreatable bacterial infections and poses necessity for searching new infection combating strategies in dental diseases. Many popular herbal products are known to control dental plaques and gingivitis. However, they have been used for a limited period of time and used only as an adjunct to other oral hygiene measures such as brushing and flossing. Chewable tablets are one of the best remedies available against cariogenic microorganisms.

The anti-cariogenic activity of chewable tablets of guava extract against Strep. mutans has been reported by Saraya et al.. Rationale for the selection of guava extract was that its aqueous extracts have in vitro anti-bacterial effect on the growth of plaque bacteria and it may have potential use as anti-plaque agents. The guava extract chewable tablets were formulated using the classical wet granulation method. The tablets (1 g each) were prepared using crude extract, PVP (polyvinyl pyrrolidone) K30 (as 10% solution), mannitol, aerosil, magnesium stearate, peppermint and menthol as excipients. Results of the study revealed that 32 mg/g of the guava extract in chewable tablets exhibited best bacteriostatic activity after 15 minutes but no bactericidal activity. On the other hand, Thombre et al. attempted formulation of chewable tablet using polyherbals viz. bark of Azadirachta indica (neem), fruit of Caryophyllus aromaticus, bark of Cinnamomum zeylanicum, fruit of Emblica officinalis, fruit of Mangifera indica, fruit of Quercus infectoria, fruit of Terminalia belerica and bark of T. chebula. The polyherbals chewable tablets were prepared by direct compression method using 20 mg powder of each herb per each tablet and was mixed properly with 5%w/v of PVP in alcohol as binder, 5% starch powder was added as disintegrating agent. The tablet showed good anti-bacterial activity with greater zone diameter than individual extracts tested. These studies led to the conclusion that instead of using individual extract, mixture of extracts was more effective. The tablets showed the synergistic effect on plaque formation.

Herbal gels:

Herbal gels are defined as semi rigid systems in which movement of the dispersing medium is restricted by an interlacing three-dimensional network of particles from different herbs or solvated macromolecules of the dispersed phase. Herbal gels have better potential as a vehicle to administer drug topically in comparison to ointment, because they are non-sticky, require low energy during formulation, are stable and have aesthetic value. Herbal gels have several advantages over conventional gels in minimizing side effects and increasing the therapeutic efficacy. Herbal gels with suitable rheological properties can facilitate the absorption of poorly absorbed drug by increasing the contact time of the drug with the skin.

Muco-adhesive dosage forms have been used to target local disorders at the mucosal surface to reduce the overall dosage required and to minimize the side effects that may be caused by the systemic administration of the drugs. In these formulations, polymers were used as the adhesive component. These polymers are often water-soluble and when used in a dry form, they attract water from the mucosal surface and this water transfer leads to a strong interaction. These polymers also form viscous layers when hydrated with water, which increases the retention time over the mucosal surfaces and leads to adhesive interactions. Herbal gels have also been reported in literature for the treatment of various dental disorders.

The anti-microbial potential of Spilanthes acmella (Akkalkara plant) gel against the different microorganisms (Bacillus cereus, Escherichia coli, Lactobacillus and Streptococcus), which are responsible for causing tooth decay, was reported by Gupta et al. The gel from Akkalkara was prepared using carbopol 934 and sodium carboxy methyl cellulose (SCMC) as a gelling agent. Carbopol 934 was dispersed in preserved water (sodium metabisulphate 0.05%) and glycerin overnight. The extract was dissolved in above solution and stirred for

10 minutes and neutralized by triethanolamine to pH 6.4 and then mixed at 300 rpm for 10 minutes. Formulated gel was evaluated for spreadability, pH, homogeneity, viscosity, in-vitro diffusion study, muco-adhesion measurement and stability. The values of surface pH within the range of neutral or slightly acidic indicated that such formulations could be used without any irritation in the oral cavity. Spreadability of gel formulations was found to be in the acceptance range. Results of anti-microbial study revealed that 5% concentration of extract of S. acmella showed pronounced anti-microbial action, comparable to the standard drug moxifloxacin.

A clinical study on the pomegranate (Punica granatum) extract gel was studied by Somu et al. against gingivitis. Fresh extract was obtained from pomegranate seeds and then it was dissolved in 5 g of CMC in 100 ml of distilled water and stirred gently for 15 minutes until the gel attained a consistency (0.05%) convenient for usage. A very small amount of methyl paraben (2 mg) was added as a preservative. The control gel was also prepared, which had the same formulation except the extract of Pun. granatum. The results of Somu et al. were conclusive of the fact that the gel containing Pun. granatum extract was effective in treatment of gingivitis when used along with mechanical cleaning in controlling plaque and gingivitis.

Alternatively, Makarem et al. reported efficacy of aqueous extract gel of barberry (Berberis vulgaris) for the control of plaque and gingivitis. A dental gel was prepared with the help of soxhlet method using alkaloid extract of roots and barks of Ber. vulgaris plant as the test material. The gel containing 1% berberine was formulated at pH 5, a placebo gel (the dental gel without Ber. vulgaris extract) was also prepared. In this study it was reported that the Ber. vulgaris dental gel was effective in controlling microbial plaque and gingivitis in school aged children; considering the fact that no side effects were observed with the dental gel with Ber. vulgaris during the study period. This gel could be recommended to be used as a dentifrice.

Fani et al. reported inhibitory activity in the gel of Aloe vera on some clinically isolated cariogenic and periodontopathic bacteria. In this study, the inhibitory activities were observed in the gel of Aloe vera on some cariogenic (Strep. mutans), periodontopathic (Aggregatibacter actino mycetemcomitans, Porphyromonas gingivalis) and an opportunistic periodonto pathogen (Bacteroides fragilis) isolated from patients with dental caries and periodontal diseases. Salient findings of the studies were: Strep. mutans was most sensitive to Aloevera gel with a MIC of 12.5 µg/ ml, while Aggre. actinomycetemcomitans, Bact. fragilis and Porph. gingivalis were less sensitive, with a MIC of 25–50 µg/ml ($p < 0.01$). Therefore, it was concluded that Aloe vera gel at optimum concentration could be used as an antiseptic for prevention of dental caries and periodontal diseases.

Vasconcelos et al. conducted experiment on anti-microbial effect of a Pun. granatum Linn. (pomegranate) phytotherapic gel against three standard Streptococci strains viz. Strep. mutans ATCC 25175, Strep. sanguis ATCC 10577 and Strep. mitis ATCC 9811. Strep. mutans (clinically isolated) and C. albicans (either alone or associated with other microorganisms). The gel of Pun. granatum had better efficiency as compared to miconazole. The gel of Pun. granatum was also reported to be effective in inhibiting the adherence of the C. albicans, Strep. mitis, Strep. mutans and Strep. sanguis. The findings of Vasconcelos et al. suggested the possibility that the gel of Pun. granatum might be useful in controlling bacteria and yeasts that cause various oral infections namely caries, periodontal disease and stomatitis.

Polyherbal formulations:

Polyherbal formulations refer to formulations in which two or more than two herbs are involved to develop a product to reduce adverse events by enhancing the therapeutic action and reducing the single herbs concentrations. Sometimes, these herbs are combined with mineral preparations . The concept of polyhedral formulation is well-established and documented in the literature of ancient history . Today, a challengeable task is subjected to concern on the development of a stable polyherbal formulation because of the wide diversity of chemical compounds in different medicinal plants. They are compilation of therapeutic entities that are formulated and prepared on the basis of the healing properties of individual ingredients with respect to the condition of sickness. Such herbal constituents with diverse pharmacological activities principally work together in a dynamic way to produce maximum therapeutic benefits with minimum side effects. Different polyherbal formulations are available in today's market .

A polyherbal formulation was used by Sharma et al. to prepare toothpaste and evaluate its anti-microbial activity. In the composition of toothpaste formulation, the plant parts of various polyherbals viz. bark of Acacia arabica, A. indica, Mimusops elengi, Salvadora persica; fruit of E. officinalis, fruit of Piper longum, Terminalia belirica, T. chebula, Q. infectoria;

leaves of Ocimum sanctum or Ocimum tenuiflorum, Stevia rebaudiana; rhizome of Curcuma longa; root of Glycyrrhiza glabra were used. The study showed significant anti-microbial activity against all selected human oral pathogens viz. Strep. mutans and Candida albicans. The findings of Sharma et al. supported and suggested that medicinal herbs and plants possess anti-microbial properties, are traditionally applied and can be employed in polyherbal formulation to prevent various dental diseases.

Pathak et al. had mentioned anti-microbial activity of a polyherbal extract against dental micro flora. Total 20 g of poly-herbal powder of leaves of A. indica, dried pulp or fruit of Emblica officinales, leaves of M. indica, bark of T. arjuna, whole fruit of T. belerica and T. chebula in the proportion of 1:0.25:0.25:1.5:1:1, respectively was cold macerated using 100 mL mixture of ethanol and water (in proportion of 70:30). The filtrate was concentrated to yield 20 mL of a semisolid extract. The A. indica was reported to be used widely in oral care formulations. E. officinales, T. belerica and T. chebula, were used because they appear to be synergistic to the anti-microbial activity of A. indica in maintenance of oral hygiene. M. indica and T. arjuna were selected because of their astringent and antioxidant properties in addition to anti-microbial activity. The polyherbal extract of 10% w/v concentration was found to be an effective anti-microbial formulation which was quite safe in animal toxicity studies. Therefore, formulation could also be routinely used for improving oral hygiene of healthy children and adults as well as in patients with dental caries and gingivitis.

The polyherbal formulation of hydro-alcoholic extracts of A. indica, Accacia nilotica, Achyranthes aspera, Curcuma longa, Mim. elengi, Pip. nigrum (Black pepper), Sal. persica, Sapindus mucorosai, Syzygium aromaticum, Zanthzylum armatum and Zingiber officinale have also been tried. The observations of this study clearly suggest the suitability of polyherbal formulation as herbal remedy for maintaining oral hygiene, since it possesses potent anti-microbial activity against bacterial (B. subtilis, E. coli, Micrococcus luteus, Pseudomonas aeruginosa, Staph. aureus, Strep. mutans) and yeast (C. albicans) strains.

Herbal lollypop:

Herbal lollipops are sugar-free products made up of licorice extracts using a standard sugar-free candy formula suggested by Dr. John's Candy. The main ingredients of formulations were: hydrogenated starch hydrolysate (HSH) (solidifying agent), citric acid and mint (flavoring agents), FD & C blue #1,2; Red 3, 40; Yellow 5, 6 (coloring agents), and acesulfame potassium (non-caloric sweetener). Licorice extracts (about 7–15 mg) were added to each lollipop to make the uniformity of Glycyrrhizol A concentration. The amounts of licorice extracts are always dependent upon the Glycyrrhizol A concentration in a batch. The lollipop manufacturing comprises various temperatures ranges from maximum 135°C to minimum 65°C for cooking syrup and on the cooling table, respectively. At various temperatures, the thermal stability of Glycyrrhizol A was tested.

Then, the extracts of the herbal are added at the particular and appropriate temperatures at which their bioactivities could not be affected. The studies showed that the sugar-free lollipops were safe and their anti-microbial activities against cavity causing bacteria were stable in the formulations intended for delivery. It was also revealed from pilot human studies that a brief application of these lollipops (twice a day for 10 days) led to marked reduction of cavity-causing bacteria in oral cavity among most of the human subjects under study. Therefore, lollipops turn out to be a useful delivery system well accepted by different populations with problems in oral cavity.

Herbal mouthwashes:

Mouthwashes are concentrated aqueous solutions of anti-microbial preparations, routinely used in the oral cavity after dilution to counter infections, for cleansing and anti-sepsis as well as refreshing the oral cavity. The health benefits of herbal mouthwashes include: relieving symptoms of gingivitis, canker sores, inflamed gums, sore mouth, inflamed or ulcerated throat, mouth infections, bleeding gums and teeth sensitivity. Mouthwashes are commonly for oral hygiene and in the delivery of active agents to the teeth and gums. The potency of these rinses to influence the plaque formation and to alter the course of gingival inflammation has been reviewed extensively by many researchers. A decoction of the root-bark was suggested as a mouthwash for swollen gums and decoction of the leaves makes an efficacious gargle for swollen gum and ulceration of the mouth and also for bleeding gums.

A mouthwash was prepared from alcoholic extraction of Sal. persica chewing sticks (10 mg/ml) and was tested against dental plaque formation. The 200 g of Sal. persica chewing sticks were cut using a sharp knife, then grounded to powder using a food blender. The powder was extracted with 60% ethanol; the mixture was left for 24 hours, then filtered through Whatman No.1 filter paper and was autoclaved at 40°C until it was dry. The in-vitro activity of Sal. persica, revealed that its anti-bacterial action was

concentration dependent; where 10 mg/ml solution produced the greatest zone of inhibition around each paper disc in the agar diffusion assay. Literature revealed that the herbal mouthwash can be effectively used as an alternative to chlorhexidine and other synthetic drug containing mouthwash owing to their reported side effects.

The anti-bacterial effect of Neem (A. indica) mouthwash was against salivary levels of Strep. mutans and Lactobacillus, when tested along with its effect in reversing incipient carious lesions. The growth of Strep. mutans was inhibited by neem mouthwashes. In some other study reported on the same plant, the purpose was to compare the shortterm efficacy and safety of the A. indica mouth rinse on gingival inflammation and microbial plaque. A double masked, randomized, parallel armed study was carried out to assess the efficacy of an oral mouth rinse based on leaves of the neem tree to reduce gingivitis. The ethanolic extract of neem was used for preparation of mouthwash. Final formulation was achieved using 25% of A. indica extract, 20.0% of saccharine, peppermint oil (<0.1%)as flavor and amaranth red color. Results of the study revealed that a mouth rinse based on the neem tree was equally effective in reducing periodontal indices, gingival plaque and bleeding indexes. Additionally, the count of cariogenic bacteria in the saliva was reduced drastically. Moghbel et al. reported a nontoxic, safe and stable mouthwash formulation of water extract of green tea (Camellia sinensis). It had high tannin content with antioxidants and anti-microbial potential.

A mouth rinse containing propolis was evaluated against dental plaque accumulation. Results of this study revealed that mouth rinse containing propolis was thus efficient in reducing supragingival plaque formation and plaque index formation under conditions of high plaque accumulation. Al-Saffar et al. reported anti-plaque activity of mouthwash of nutmeg (Myristica fragrans) extract. Results showed significant anti-plaque and anti-inflammatory effects (tested by reduction in bleeding index) in comparison with the conventional chlorhexidine mouth rinse which encouraged its use in the treatment of gingival inflammation because it was a natural plant devoid from any chemical agent.
Effectiveness of mouthwash formulated from fruits of T. chebula was evaluated on a salivary Strep. mutans. Mouthwash was formulated by adding 2.5% of ethanolic extract to distilled water, sodium CMC was added to provide viscosity, mannitol was added to mask the astringent effect of extract and methyl paraben was used as preservative. It was observed that there was 44.42% reduction of salivary Strep. mutans colony forming units in 5 minutes after rinsing.

Charles et al.formulated Psidium guajava mouthwash and screened for anti-microbial activity against cultures of C. albicans, E. coli and Staph. aureus. Mouthwash was prepared using aqueous extract of Ps. guajava with sodium lauryl sulphate, peppermint emulsion; double strength chloroform water. The formulation with aqueous extract of Ps. guajava showed the highest anti-microbial activities due to presence of bioactive compounds in extract. Potencies of some formulations were enhanced by the addition of sodium lauryl sulphate and its absence responsible for the reduced potency irrespective of the strength of the chloroform water used as preservative. The Ps. guajava mouthwashes were effective at all tested concentrations against of Staph. aureus than E. coli.

Herbal toothpaste and toothpowder:
Herbal toothpaste consists of a formulation of well-constituted herbs that ensure anti-bacterial and gum tightening properties and provide absolute dental care. It contains natural taste of several ingredients like elaichi (Elettaria cardamomum), lavang (Syzygium aromaticum, also known as cloves), etc. and helps users in maintaining a fresh mouth for the whole day and also provides ideal protection against dental issues like gum bleeding and sensitivity. Further, the toothpaste is made of uncommon herbs that are safe to use and have great effect on oral hygiene and health.

The herbal toothpaste is based on ancient and well documented Ayurvedic medical formulation and gives high protection against cavities in addition to other dental and gum related issues. Herbal toothpaste not only protects from germs producing dental plaque, but it also has antioxidant properties owing to mixture of extracts which could not be found in conventional toothpaste. A tooth paste containing Gymnema sylvestre was evaluated against C. albicans, Strep. aureus, Strep. mitis and Strep. mutans. Toothpaste was formulated using 1.5 grams of gum tragacanth in water in one container. The 56 grams of calcium carbonate, 2%w/w of G. sylvestre hydro alcoholic extract, 1.0 g of sodium lauryl sulphate were further added in another container and dry mixed. The 22 g of glycerin was added and mixed well until the mass became slightly wet. Then gum tragacanth was added to it and wetted completely followed by thorough mixing. The masses clumps were mixed well with water followed by addition of 0.1 g of saccharine sodium and preservative like sodium benzoate in sufficient quantity and mixing to get thick paste. Finally the peppermint oil was added in sufficient quantity as a flavoring agent. Devi et al. had also

formulated tooth powder containing G. sylvestre. It was formulated using 92.8 g of calcium carbonate and G. sylvestre (2%w/w) and mixed thoroughly. To the above mixed dry powder 6.0 g of sodium lauryl sulphate was added and mixed evenly. Around 0.2 g of powdered saccharine sodium, peppermint flavor was added in sufficient quantity and mixed completely and packed in well closed tight container.

Herbal tooth powder is a tooth-cleaning agent that is almost entirely made from all-natural ingredients to refresh breath, help heal gums, rid teeth of bacteria and reduce the amount of inflammation in the mouth. Herbal tooth powder has been around for centuries. The constituents of tooth powder and tooth pastes were same except that tooth powders do not contain humectants, water and binding agents. The primary function of tooth powder was the cleaning of the accessible surfaces of the teeth. Vohra et al. reported efficacy of a herbal toothpowder consisting of bark of C. zeylanicum, roots and rhizome of Glycyrhhiza glabra, root of Moringa oleifera (Moringa or Drumstick tree), oil of S. aromaticum (clove), fruit of T. chebula and leaves of Thea sinensis against microbial flora of oral cavity and its comparison with marketed toothpastes. The root and rhizome of Gly. glabra, root of Mor. leifera, T. chebula were finely powdered into uniform size taking care that no separation occurred on shaking. Clove oil (1 g) was added to the powder followed by proper mixing. The formulation was stored in an airtight wide mouth container for future use. The constituents present in toothpowder were well known for their activity against the microorganisms found in oral cavity. They have been found effective against the dental pathogens such as Lactobacillus acidophilus, Streptococci salivarius, Streptococci sanguis, Strep. aureus and Strep. mutans. The herbal tooth powder showed a reduction in oral bacterial count which may be due to the presence of active ingredients, natural extracts and blends of natural oil ingredients which may have anti-bacterial effects. Pawar et al. prepared herbal toothpowder using bark of acacia (Acacia senegal), ajowan (Trachyspermum ammi), alum, amla (E. officinalis or Phyllanthus emblica), asafetida (Ferula asafoetida), clove (C. aromaticus), ginger, leaf of menthe (Mentha arvensis), mustard oil, neem bark and pepper and evaluated for anti-microbial activity against C. albicans, E. coli, P. aeruginosa and Staph. aureus .

SUMMARY AND CONCLUSION:

It is important to have proper oral hygiene because there are many things that can harm our teeth. If we don't counteract these harmful agents our teeth will decay and cause a lot of problems.

From the things we have no control over like the DNA makeup of our saliva, to the things we choose to eat and drink have an affect on our teeth. These can be either positive or negative. A healthy mouth is an important part of life. It keeps bacteria from spreading and infecting the rest of our body and allows us to be able to eat and speak properly. The best way to keep out teeth and mouth healthy is by brushing, flossing and using a mouth rinse twice a day. It is also important to see our dentist or hygienist at least twice a year for a good cleaning and make sure there are no problems that need to be addressed

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