



ORAL HEALTH AND DENTAL CARIES

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Article history:	Abstract:
Received: July 14 th 2022 Accepted: August 14 th 2022 Published: September 28 th 2022	Dental disease is widespread among various groups, as tooth decay ranks second after the common cold, as it is widespread and as soon as the child reaches the age of five. Among the most important causes of tooth decay are carbohydrates, bacteria, susceptibility to caries, and the time factor, it divides tooth decay into the type of chronic caries and acute decay. The type of bacteria associated with decay is <i>Staphylococcus Spp.</i> , <i>Streptococcus pyogenes</i> , <i>Bacillus cereus</i> , <i>Escherichia coli</i> and <i>Proteus Spp.</i>

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INTRODUCTION:

Dental caries is one of the most frequent oral and dental disorders across all age groups; by the time a child reaches the age of five, about (4) teeth have been impacted by caries, and by puberty, more than (10) teeth have been affected by caries (Dias *et al.*, 2019).

Tooth decay is a deterioration of the tooth's structure, if left untreated, can lead to painful and destructive stages. Unless the initiative is rapidly established to increase caries in the early stages, the tooth is weakened. (Jabuk *et al.*, 2015).

An early sign of the onset of caries; The appearance of white (chalky) spots on the surface of the teeth; Referring to a region of mineral dissolution caused by the formation of acids in this area, and as the dissolution of minerals continues, these white spots turn brown. In the absence of a medical examination, Brown spots turn into decay, and holes occur in the teeth, and if these spots remain in their bright brown color; This means that the metal dissolution process stops, and this color is only a stain, but if it turns dark brown; This indicates that caries is in an active state (Boehlke *et al.*, 2020).

• Causes of Tooth Decay

Many people believe that caries develops solely as a result of neglecting teeth and failing to keep them clean, yet caries develops when the following variables are present:

1-Carbohydrates: Foods that contain high carbohydrates, such as sugars, starches, ice cream, sweets, fruits, and juice, are among essential substances that help the occurrence of decay if they remain on the surface of the tooth for a long time (Inquimbert *et al.*, 2019).

2- Bacteria: Sugars alone cannot cause decay without the presence of bacteria, and certain types of bacteria

help in the occurrence of decay, including spherical bacteria and rod-shaped bacteria (Hussein,2020).

3- The susceptibility of teeth to decay: This is due to poor nutrition in periods of tooth formation, as the proportion of minerals in the teeth such as calcium and phosphates is reduced which leads to brittle teeth.

4- The time: if the teeth are not cleaned regularly and adequately; The (bacterial plaque) forming on the teeth becomes challenging to control and effectively remove, thus tooth decay will begin (Hussein *et al.*, 2019).

Steps of Tooth Decay:

1- The remnants of foods containing high carbohydrates left on the teeth. such as sweets, bread, fruits, and juice.

2- Then, the bacteria that are already in the mouth digest these residues, especially sugar and starch, and convert them into acids.

3- These acids and bacteria combine with food waste. It forms a sticky substance that is the germinal plaque (plaque) and this, in turn, adheres to the teeth and is visible on the back molars, but it appears on all teeth, above the gums, and at the edges of the fillings.

4- The acids in the plaque dissolve the tooth's enamel surface - which is the outer layer of the tooth that consists of a substance called hydroxyapatite - creating cavities that are initially small and painless, and are an ideal place for germs to multiply, and grow inside the tooth to reach the dentin (the middle layer of A tooth crown) causing pain when cold and hot, then to the pulp of the tooth (blood vessels and nerves), where it becomes painful, especially at night (Durand *et al.*, 2019; Al-Shami *et al.*, 2019)



Types of Tooth Decay

There are two types of caries, considering the time and speed of its occurrence:

1- Chronic caries: it occurs over a long time and in several stages; Starting with enamel, then ivory, and finally, the pulp.

2- Acute caries: it occurs very quickly; It reaches the pulp of the tooth without the tooth's tissues being able to protect it, and this type of decay occurs frequently in children (Hussian *et al.*, 2016).

Dental Caries Complications

The substance in decay does not depend on the unpleasant look of the tooth, nor does it stop at the boundaries of the tooth or the mouth, but rather develops into a number of health difficulties, some of which damage the teeth themselves, and some of which extend beyond that. Among the complications are:

- 1- Extraction of the teeth.
- 2- Dental erosion.
- 3- Bad breath.
- 4 -Abscess beneath the root of the teeth: This occurs when the advancement of caries continues to destroy the pulp, resulting in an abscess under the root that causes significant infections. Such as lymph node inflammation, osteitis, and sinusitis (Kazemtabrizi *et al.*, 2020).
- 5- Furthermore, rotting teeth can serve as an entrance point for serious infections that damage other regions of the body, such as the heart in those with birth abnormalities or rheumatic heart disease.
- 6- Gingivitis is caused by tooth decay, which manifests as ulcers that can migrate to the inner parts of the gums, causing bleeding, redness, and swelling (Jafarzade *et al.*, 2021).

The type of bacteria that cause tooth decay:

1- *Staphylococcus Spp.*

Gram-positive cocci are usually clustered in grape clusters, which is why they are called staphylococcus. It grows aerobically and is also selective anaerobic, except for *S. saccharolyticus*, which grows anaerobically. Non-motile, non-spore-forming, and secretes the enzyme catalase. It should be noted here that *S. aureus* is considered a normal flora that is carried by a large number of people in different areas of the body (Damtie *et al.*, 2020).

2-*Streptococcus pyogenes:*

It is a spherical bacteria whose cells accumulate in the form of chains, so it is called by that name. It is gram-positive facultative anaerobic that grows well on the blood agar in the form of small to medium-sized colonies lead in color and it completely dissolves the red blood cells (the Beta-haemolysis), negative to catalase,

which causes tonsillitis, otitis media, which is one of the causes of joint infection (Wilson & Wilson 2021).

3-*Bacillus cereus*

It is widespread in the environment and can be easily isolated from soil and various foods such as dairy products, meat, spices, and grains. They are large straight bacilli, positive for the gram stain, forming spores, and their cells are usually arranged in pairs or chains with round or square ends. They are moved by circumferential flagella (peritrichous flagella), *B. cereus* cells are 1 - 1.2 μm in width. The length ranges from 3to 5 Micrometres. Aerobic and facultative anaerobes The optimum growth temperature for most isolates are between 35 – and 40 ° C (Horst *et al.*, 2018).

4-*Escherichia coli*

Belongs to the Enterobacteriaceae family, which is derived from the fact that members of this family live in the human gastrointestinal tract and from the Greek word Enteron, meaning intestine. It is also called Coliform, which are gram-negative bacilli producing gas and acid from the fermentation of lactose, positive for indole and methyl red, moving with a peripheral flagellum, growing at a pH between 2 7.6-7. Also called fecal coli, which is found naturally in the intestine, where one gram of feces contains about 107 colony-forming units of them (Colombo & Tanner, 2019).

5- *Proteus Spp.*

Members of the genus are distinguished by being straight bacilli, 0.8-0.4 μm in diameter and 3-1 μm in length, gram-stain negative, motile with circumferential flagella, non-capsular, non-spores forming. It is difficult to obtain separate colonies from them when planted in the center of the blood dens, and the medium of the nutrients; as well as the bacterium is characterized by its distinctive active movement, which is known as the phenomenon of creeping proliferation or swarming phenomena, where the surface of the blood cells is covered with a thin transparent layer forming concentric circular lines Sehdev *et al.*, 2020).

Kinds of Toothpaste

It is preferred when choosing a toothpaste, regardless of its type or the type of problem, that it has the following ingredients:

1- Fluoride: It is classified as one of the natural minerals and fluoride is considered the first and most crucial component in most toothpaste because of its significant role in protecting teeth from decay, and some countries add it to drinking water because of its many benefits in fighting bacteria and strengthening teeth (Jabuk *et al.*, 2020).



2- Antibacterial: They aim to eliminate harmful bacteria that multiply in the mouth and around the teeth and to prevent their negative effect on weakening and eroding teeth, as well as weakening the gums and bad breath, and among the most important of these antibiotics and the most used in toothpaste is triclosan (Thornton-Evans et al., 2019)

3-Alkaline substances: These materials help in the formation of thick toothpaste foam and get rid of food debris stuck between the teeth, but they are used in minimal quantities due to the great controversy surrounding them as being harmful to the body and causing cancer.

4- Anti-tartar materials: These materials prevent plaque from forming on the outer layers of the teeth, and also help break up the previously formed tartar (Amaechi *et al.*, 2019).

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