

Introduction

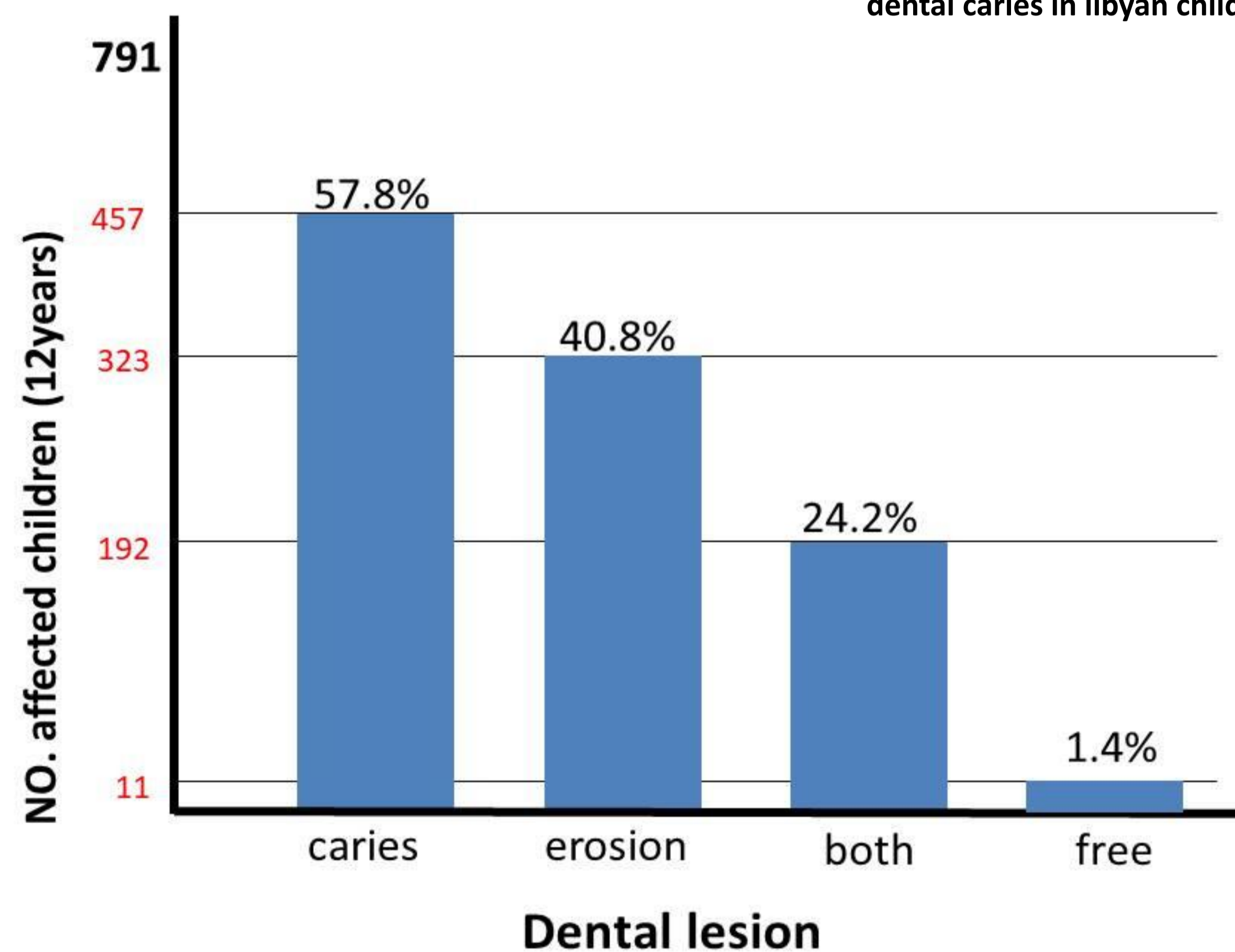
Dental caries or decay can be defined as a progressive, microbial, irreversible damage of calcified dental structures (enamel, dentine, and cementum), due to demineralization of calcium and destructive effect of acids produced by fermentation of dietary carbohydrates .^{1,2}

As a matter of fact, dental caries is one of the most prevalent chronic diseases worldwide ; affects both sexes, all races, all social classes, and all age groups .^{1,2}

In Libya, the change toward more westernised diet and habits May increase the risk of dental caries and erosion in children.³

Incidence

Diagram showing incidence of dental caries in libyan children (3)



Healthy tooth structure

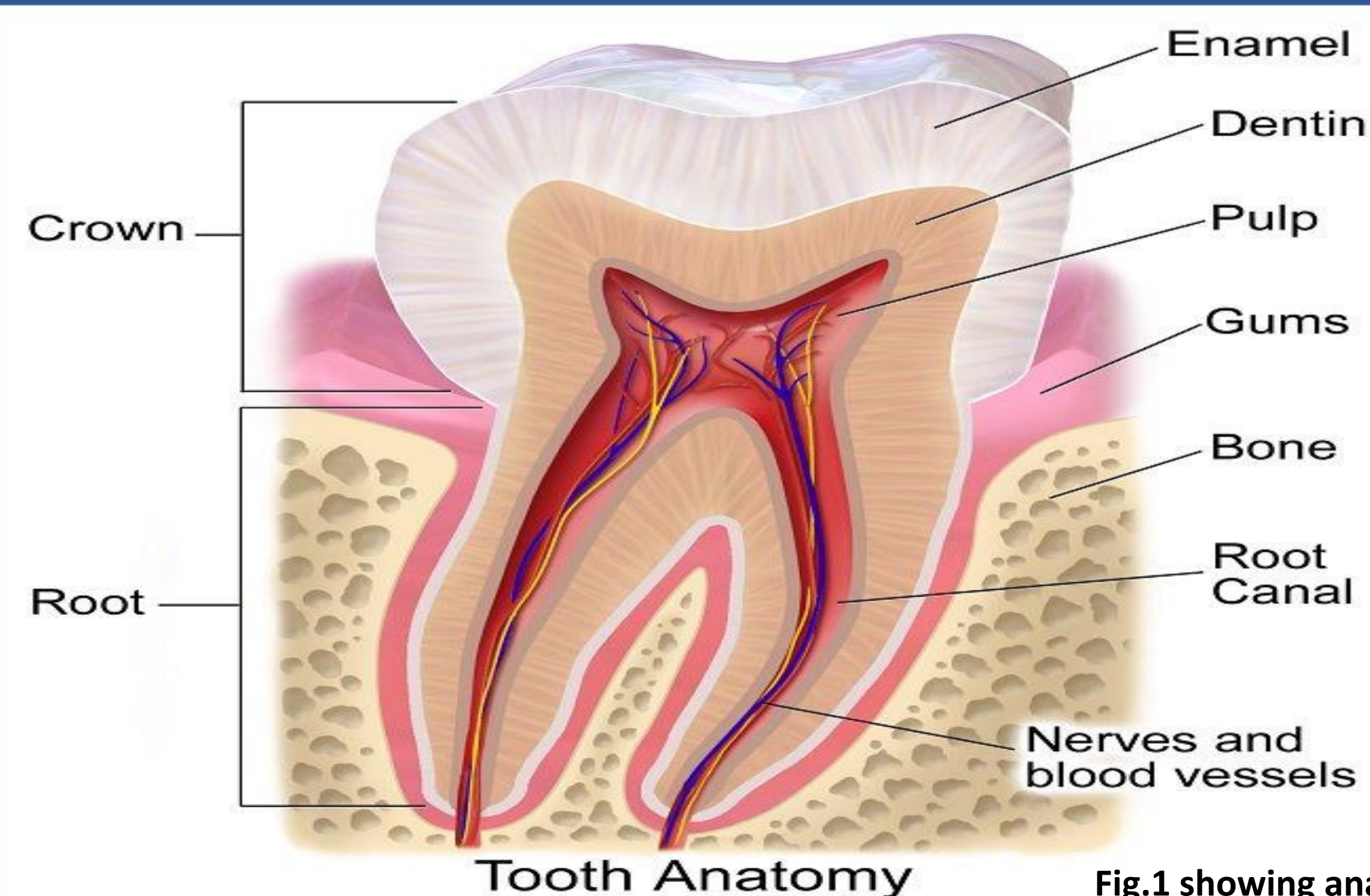


Fig.1 showing anatomy of tooth.

Etiology

Fig.2 showing etiology of dental caries.

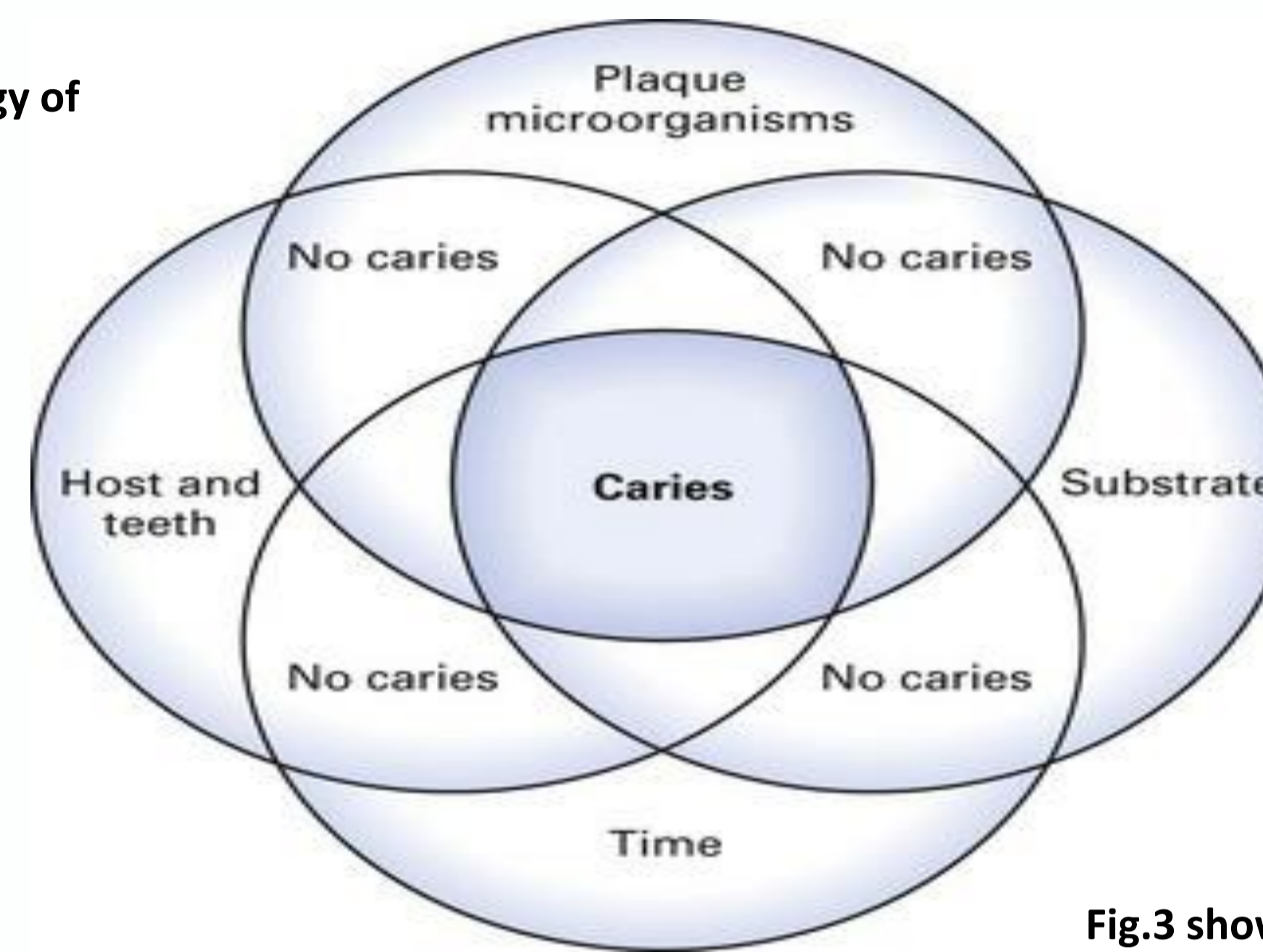


Fig.3 showing stages of dental caries progression.



Enamel caries → Dentine caries → Pulpitis → Periodontitis

Etiopathogenesis

Many theories have been proposed, however the most famous and acceptable one is the acidogenic theory; was first postulated in 1889 by W.D Miller (also called Miller's chemoparasitic theory) state that "*acids formed due to fermentation of dietary CHO by oral bacteria lead to progressive decalcification of tooth structure with subsequent disintegration of the dental organic matrix*".¹

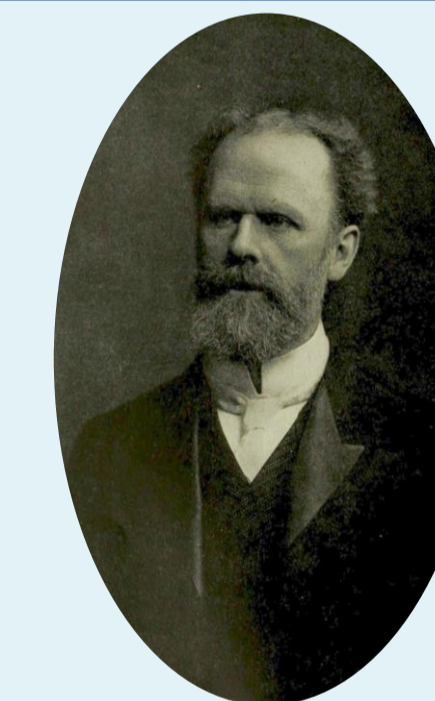


Fig.4

❖ Four factors are influencing this process:

(1) Dietary carbohydrates (CHO): numerous epidemiological studies have shown that dietary (CHO) ; especially sucrose, glucose and fructose play important role in causation of dental caries. The rate of dental caries attack is directly proportional to the consistency (sticky) and the frequency of ingested (CHO) ; because both provide constant supply of substrates used by bacteria causing prolonged acid production.^{1,2,4}

Sucrose is the most potent cariogenic sugar due to :

- (A) Sucrose and starch are the principle CHO in our diet (low cost).
- (B) Sucrose has low molecular weight so it is readily diffused and fermented by Bacterial plaque and easily converted into dextran (insoluble).^{1,2,4}

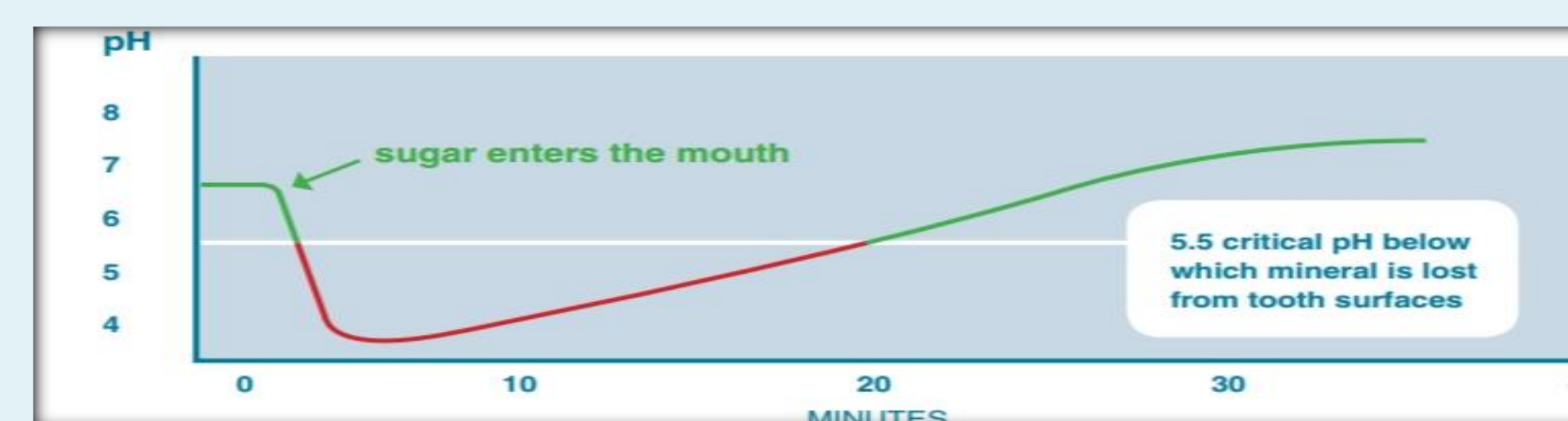


Fig.5 showing the drop of PH after sucrose rinse.

(2) Microorganisms : mainly three *a. Streptococcus mutans*; are acidogenic ,aciduric and responsible for caries initiation .
b. Lactobacilli; cause progression of deep caries lesion.¹⁻⁴
c. Actinomyces; cause root caries.

(3) Acids and (4) Dental plaque: the plaque provides adhesion and sustained effect of acids (lactic acid) on tooth surface, the plaque clinically is yellow in color and can not be removed by mouth rinsing or irrigation, because of biofilm formation.^{1,2}



Fig.6 showing dental plaque in the lower anterior teeth.

Prevention

- (1) Teeth brushing and flossing regularly with proper techniques using fluoridated toothpaste.
- (2) Sealants of susceptible fissures, mouth wash avoid snacking with regular check by your dentist.¹⁻⁴

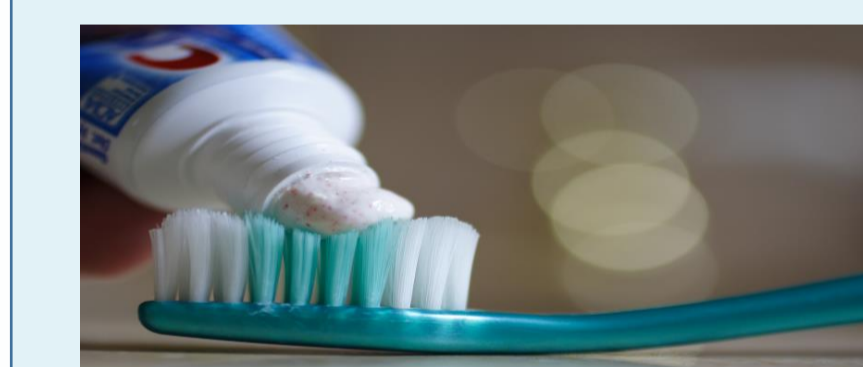


Fig.7 using of fluoridated tooth paste.



Fig.8 showing dental flossing.



Fig.9 showing examination by a dentist.

Conclusion

Dental caries is a very common endogenous chronic disease can affect almost all populations, etiology is multifactorial, the pathogenesis still not yet well understood, most importantly it can be prevented.

However, it still needs more development of preventive dentistry, awareness of people and providing skillful dental professionals.

References

- (1) Swapan, K. P. (2003). Essentials of Oral Pathology. doi:10.5005/jp/books/10291
- (2) Elsevier. Home. 10th Edition. <https://www.elsevier.com/books/essential-microbiology-for-dentistry/samaranayake/978-0-7020-3484-8>. Published September 28, 2011. Accessed December 12, 2018.
- (3) Huew R, Waterhouse P, Moynihan P, Kometa S, Maguire A. Dental caries and its association with diet and dental erosion in Libyan schoolchildren. *International Journal of Paediatric Dentistry*. 2011;22(1):68-76. doi:10.1111/j.1365-263x.2011.01170.x.
- (4) Selwitz RH, Ismail AI, Pitts NB. Dental caries. *The Lancet*. 2007;369(9555):51-59. doi:10.1016/s0140-6736(07)60031-2.