

From Plaque to Heart Attack

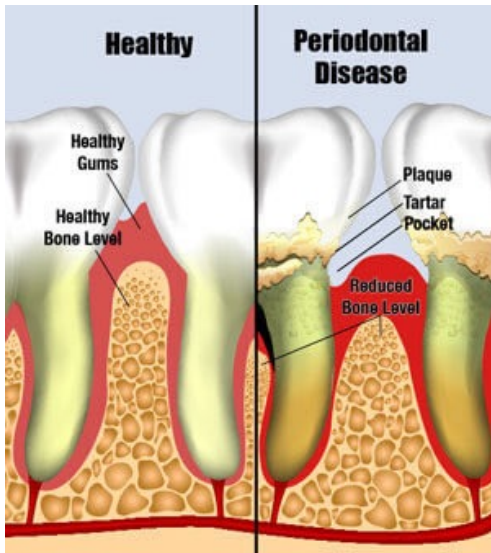
Poor oral hygiene is the main cause of plaque accumulation around teeth, leading to gum disease such as, gingivitis and chronic periodontitis.

From gingivitis to periodontitis:

Gingivitis is a common gum disease that causes inflammation and swelling of the gingiva. This happens because of poor oral hygiene; when we are not cleaning our teeth bacteria stay there and accumulate all over our mouth; this is what leads to gingivitis. The good news is that at this stage, gingivitis can be reversible. However, if not, it can lead to periodontitis.

What is Periodontitis?

Periodontal disease is a progressive inflammation, leading to damage surrounding dental tissue due to bacteria infections that release toxins and cause inflammatory reactions. Scientist think that chronic periodontitis can be considered as a cardiovascular disease risk factor, which is independent of other well-known risk factors,



<http://www.thepremiersmile.com/blog/>

Connection Between Periodontitis and Myocardial Infarction: Bacteriological Analysis

What is *Porphyromonas gingivalis*?



<https://www.dentistrytoday.com/news/industrynews/item/2083-oral-bacteria-may-interfere-with-conception>

Facts of *P. gingivalis* :

P.gingivalis is a non-motile, gram-negative, rod-shaped anaerobic bacteria that results in oral bone destruction.

Many studies showed that connection between two diseases is due to same bacteria known as *Porphyromonas gingivalis*. **It is the most pathogenic and etiologic bacteria for chronic periodontitis.** Antibodies against *P. gingivalis* have been found in human arteriosclerotic plaque, in heart valves. Therefore, bacteria found in infected periodontal tissue around teeth can enter the bloodstream and move through the circulatory system, contributing to the development of heart disease such as life threatening Myocardial Infarction.

Clinical Studies Findings

“Every year about 735,000 American have a heart attack” (Centers for Disease Control and Prevention).

This number does not only include people that have a heart attack for the first time, but people who already had a heart attack. Heart disease has contributed to many deaths and this is partly due to it being difficult to detect, but what if there was a way to reduce the risk of having a heart attack.

For quite some time, it has been debated that a relationship exists between periodontitis and the development of a first myocardial infarction. This relationship came about because periodontitis was and is still commonly found in people who have had a heart attack. To determine the possibility of a relationship a large study was carried out with 1,610 people. 805 of those people were patients with a first myocardial infarction and the other half were people that never had a heart attack.

By comparing the findings between the experimental and the control group and reviewing the radiographs of the patients for bone loss the researchers found that periodontitis does increase the risk of a first myocardial Infarction strengthening the relationship.

The authors state that:

- “Mild to moderate or severe periodontitis was present in 43% of the patients and 33% of the controls”.
- The risk for myocardial infarction was, “significantly increased among subjects with periodontitis”.
- The risk to develop a heart attack was, “significantly higher the presence of moderate to severe periodontal disease even after adjustment for potential cofounders [such as smoking]”.

Role of the Dental Hygienist

Many studies establish that poor oral hygiene and dental plaque leading periodontal disease are causal risk factors for heart disease (MI). Role of the dental hygienist is to:

- To provide periodontal maintenance through scaling and biofilm removal.
- Educate patients about importance of oral health and how it is connected with overall health
- Teach patients about home care, prevention of periodontal disease and proper treatment can reduce the risk of developing the heart attack or other CVD

This will provide significant and positive effects for dental hygienists and for patient motivation and awareness.



<https://www.dentalwellness4u.com/hygienist/hygienist.htm>

References

Cotti E, Dessì C, Piras A, et al. Can a chronic dental infection be considered a cause of cardiovascular disease? A review of the literature. *Int. J. Cardiol.* 2011; 148(1): 4–10.

Fagundes JA, Monoo LD, Euzébio Alves VT, et al. *Porphyromonas gingivalis* is associated with protease-activated receptor-2 upregulation in chronic periodontitis. *J. Periodontol.* 2011; 82(11): 1596–1601.

Heart Attack | National Heart, Lung, and Blood Institute. www.nhlbi.nih.gov/health-topics/heart-attack.

“Heart Disease Facts & Statistics.” Centers for Disease Control and Prevention, Centers for Disease Control and Prevention, www.cdc.gov/heartdisease/facts.htm

Lysek P, Szafraniec Krystyna., et al. “Relationship between past myocardial infarction, Periodontal disease and *Porphyromonas gongivalis* serum antibodies: A case-control study.” *Cardiology Journal*, 2018, vol.25, no. 3, 386-392 doi: 10.5603/CJ. a 2017 15.

Ryden, L., et al. “Periodontitis Increases the Risk of a First Myocardial Infraction: A Report From the PARKRANK Study.” *Journal of Vascular Surgery*, vol. 64, no. 3, 2016, pp. 827-828., doi: 10.1016/j.jvs. 2016.07.056.

Tam V, O'Brien-Simpson NM, Chen YY, et al. The RgpA-Kgp proteinase-adhesin complexes of *Porphyromonas gingivalis* Inactivate the Th2 cytokines interleukin-4 and interleukin-5. *Infect. Immun.* 2009; 77(4): 1451–1458.

Teeuw WJ, Slot DE, Susanto H, et al. Treatment of periodontitis improves the atherosclerotic profile: a systematic review and meta-analysis. *J. Clin. Periodontol.* 2014; 41(1): 70–79.

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