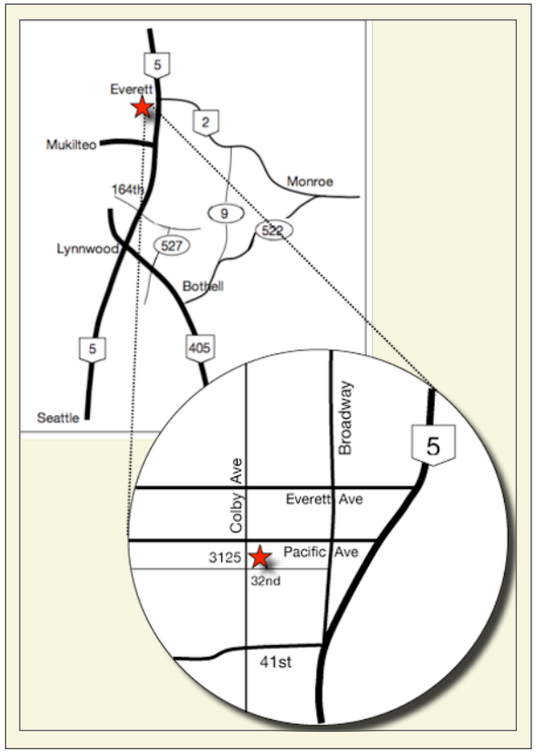
Pamela A Nicoara DDS MSD PLLC

PERIODONTOLOGY IMPLANTOLOGY ORAL MEDICINE



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The Systemic Connection

As long ago as 1683, when the first microscope was created, it was discovered that bacteria are in dental plaque. There are over 300 different bacteria which inhabit the mouth, some more virulent than others. Periodontitis is a bacterial infection, which requires the presence of bacteria to cause disease. However, it takes more than a great deal of plaque to cause bone loss or tooth loss, and this is evident in your daily practice. So why is it that in the presence of even only a little plaque that some people have periodontitis with associated bone loss, while others with loads of plaque have only gingivitis without any detriment to the bone? The answer is in the systemic response of the host to those bacteria: an autoimmune inflammatory reaction, akin to an allergy, to the oral bacteria. Of particular importance has been the inflammatory component of periodontitis, which is shared by other systemic diseases. Inflammation in the mouth can exacerbate inflammatory diseases in other parts of the body, and vice versa.

This issue of Probe Tips will focus on the relationship between periodontitis and systemic diseases.

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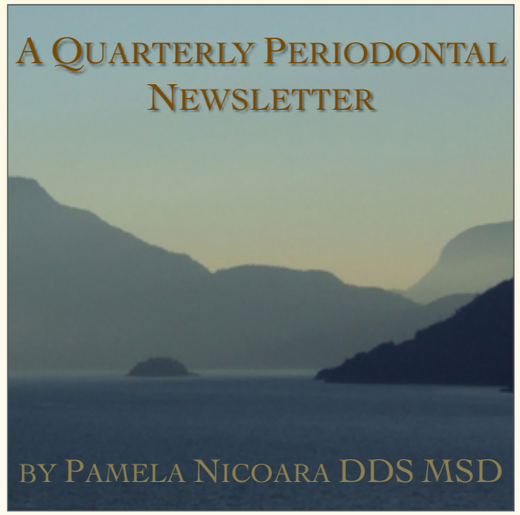
Probe Tips

A Quarterly Periodontal Newsletter



by Pamela Nicoara DDS MSD

The Link between Periodontitis and Systemic Disease

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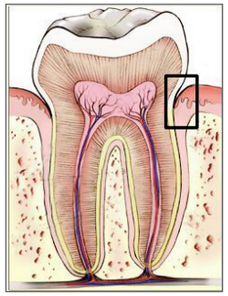
General Considerations

The teeth make up a very special environment in the body. Where else do you find a situation where bone is protruding through the epithelium? A tooth in the bony socket is surrounded by blood vessels and nerves, which need to be kept separated from the bath of bacteria a few millimeters away. The gingival sulcus is a battle ground where oral bacteria fight to get into the connective tissue, while the gingival crevicular fluid is constantly pushing them out. If the bacteria do manage to invade, then the blood vessels release a barrage of inflammatory mediators: Tumor Necrosis Factors, Prostaglandins, Collagenases, Interleukins, and C-Reactive Proteins among others, to stop the advancing bacteria. These markers of inflammation flow through the blood stream which pulses through the entire body. Is it any wonder, then, that infection and inflammation in the mouth would have effects on the rest of the body and require us to provide antibiotic prophylaxis for certain heart conditions and joint replacement patients? There are a few diseases or conditions in particular that also have an inflammatory component and which seem to have the closest relationship to periodontitis:



1. Diabetes
2. Cardiovascular Disease
3. Rheumatoid Arthritis
4. Obesity
5. Pregnancy

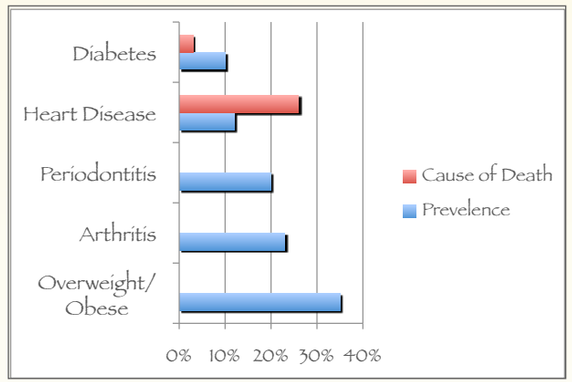
Knowing these relationships can help you manage not only your patients oral disease, but also improve their general health.

Periodontitis and Systemic Disease

Prevalence of Disease

The Centers for Disease Control recently released research findings indicating the top ten causes of death in the United States in 2007. Heart Disease was the number one cause at 26%. Stroke and Diabetes also topped the list and are among the conditions listed with an inflammatory component.

The prevalence of these diseases are provided and are compared in the graph below to death rates from the CDC. It is unknown the number of deaths related to periodontitis, arthritis, or obesity.



Although heart disease is the number one cause of death, it only affects about 12% of the population, which is less than the approximate 20% which are infected with periodontitis. You can begin to see the significant percentage of the population that you can influence when you know periodontitis impacts the management of other inflammatory processes.

Research is still being conducted to verify the exact relationship between periodontitis and each of the conditions listed, however, a relationship definitely exists and is briefly identified through systematic reviews of the literature which come not just from the dental literature, but also medical journals.

Diabetes

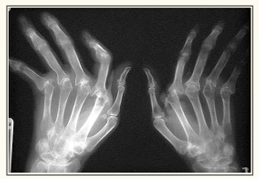
Evidence supports the concept of up to 3x increased severity of periodontitis in subjects with poorly controlled diabetes. In reverse, periodontitis is associated with more difficulty in maintaining glycemic control in patients with diabetes.

Cardiovascular Disease

Periodontitis may contribute 3x the risk for cardio-vascular events such as MI and TIA in susceptible subjects.

Rheumatoid Arthritis

Periodontitis could be a causal factor in the initiation and maintenance of the autoimmune inflammatory response that occurs in Rheumatoid Arthritis. Patients with Rheumatoid Arthritis might show an increased risk of developing periodontitis and tooth loss.



Obesity

Obesity is associated with a subclinical inflammatory response, in which adipocytes secrete a series of pro-inflammatory cytokines that can interfere in immune defense and contribute to the development of periodontitis. The associated adverse metabolic effects of obesity include disrupting control of blood pressure, cholesterol, triglycerides and insulin resistance.

Pregnancy

There is a likely association between periodontal disease and an increased risk of adverse pregnancy outcomes such as pre-eclampsia, low birth weight and pre-term birth.

Affect of Periodontal Therapy

Intervention trials suggest that periodontal therapy can have a significant impact on systemic inflammatory status. However, it is inconclusive that periodontal treatment decreases the rate of adverse pregnancy outcomes.

Our primary means of controlling inflammation is currently through mechanical removal of the excess oral bacteria via scaling and root planing or surgical access. Of interest are future therapies aimed at pharmacological alteration of host response to bacteria by decreasing host production of the mediators of inflammation listed before. Periostat is the only FDA approved drug for this purpose, but still does not provide a significant benefit over traditional mechanical therapy. Others currently being researched include the use of Resolvins as well as Rouvastain (Crestor). It will be interesting to see what advances the future holds!

References

(A complete list is available upon request)

CDC 2006-2008, ***JCP*** 2008, ***Current Opin Endo, Diab & Obesity*** 2008, ***Am J Cardiology*** 2006 & 2009, ***Nat Rev Rheum*** 2009, ***Obesity Rev*** 2009, ***J Immunol*** 2007