

The Brown

PerioDontaLetter



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From Our Office to Yours...

A large body of evidence exists that suggests periodontal disease may increase the the risk of cardiovascular disease. Recently there has been growing evidence that periodontal disease may also increase the risk of a host of other chronic systemic diseases and conditions. Studies suggest that periodontitis may be a risk factor for 21 other diseases including stroke, diabetes, cancer and Alzheimer's disease, likely because of the common inflammatory pathway.

*In this current issue of **The PerioDontaLetter**, we address the scientific evidence for the potential role and impact of periodontal disease on a wider range of systemic diseases in addition to heart disease.*

As always, we welcome your comments and suggestions on this new approach to determining prognosis.

The Association of Periodontal Disease With Other Life-Threatening Systemic Diseases

While clinical proof of causality is elusive, three basic mechanisms have been identified as having a potential role in the associations between periodontitis and systemic diseases: metastatic infections, inflammation and inflammatory injury, and adaptive immunity.

Loe et al established that periodontal infections develop through inflammatory processes induced by

a microbial biofilm. Left untreated, periodontal inflammation becomes chronic periodontal pathology with systemic impact.

The chronic periodontal infection is metastatic, that is, it is not limited to the gingiva or oral cavity. Tooth brushing, flossing, eating and dental treatment may disturb the ulcerated periodontal tissues sending bacteria and inflammatory mediators into the blood. Because of the ulceration, the

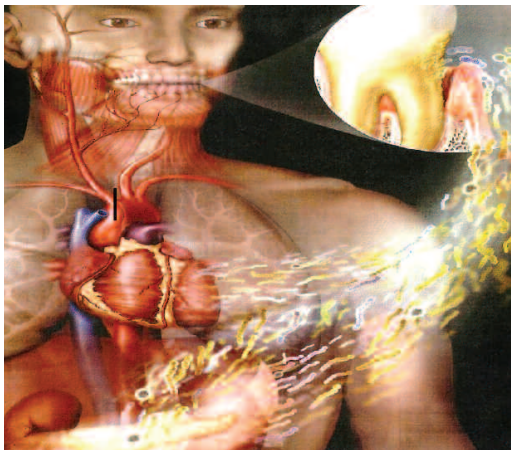


Figure 1. We are the gatekeepers -- saving lives by saving smiles.



Figure 2. This patient had uncontrolled diabetes and severe dental neglect.



Figure 3. Following medical treatment for diabetes, along with scaling, root planing and plaque control, the periodontal status significantly improved.

bacteria, their products and toxins are disseminated systemically and may adhere at non-oral body sites causing tissue damage and inflammation.

The inflammatory process protects the body by attracting immune cells and molecules to the site and in later stages promoting the healing of affected tissues.

Chronic inflammation on the other hand can seriously damage healthy tissues. Periodontal bacteria possess a plethora of virulence factors that induce cells to produce inflammatory mediators. Leucocytes, endothelial cells and hepatocytes respond to bacteria by inducing pro-inflammatory immune mediators -- cytokines, chemokines and C-reactive protein (CRP).

Severe periodontal disease has been linked to 22 different systemic diseases. These include:

1. Heart disease
2. Infectious endocarditis
3. Carotid artery stenosis
4. Stroke
5. Diabetes

6. Rheumatoid arthritis
7. Mouth and throat cancer
8. Pancreatic cancer
9. Colon cancer
10. Kidney infection
11. Lung infection / COPD
12. Low fertility in men
13. Erectile dysfunction
14. Brain abscesses
15. Cognitive dysfunction / Alzheimer's
16. Infectious mononucleosis
17. Pre-term babies
18. Yeast infections
19. Multiple sclerosis
20. Osteoporosis
21. Pre-eclampsia
22. Congestive heart failure in dogs

Stroke

Four studies have found periodontal disease a significant risk factor for stroke.

One study found that individuals with periodontal disease had twice the risk of stroke than individuals with healthy gum and bone tissue. In

another study, stroke patients had almost twice as much periodontal disease as did patients who had not experienced a cerebral vascular accident.

Diabetes

Patients with diabetes who have periodontal disease have two chronic conditions, each of which may affect the other. Evidence in the medical literature supports the role of inflammation as a major component in the pathogenesis of diabetes and diabetic complications.

As an infectious process with a prominent inflammatory component, periodontal disease can adversely affect the metabolic control of diabetes. Periodontal disease can place individuals with diabetes at greater risk for diabetic complications, including mortality from cardiovascular disease and kidney disease.

Conversely, susceptibility to periodontal disease is one of the most common sequelae of diabetes. A large evidence base suggests that diabetes is



Figure 4. Local irritation and systemic disease??



Figure 5. Following medical evaluation, no systemic condition was diagnosed. Although further periodontal treatment is necessary, local debridement significantly reduced inflammation and pocket depth.

associated with increased gingivitis and periodontitis. The National Institute of Dental and Craniofacial Research has reported that people with noninsulin dependent diabetes mellitus (type 2) are three times more likely to develop periodontal disease than nondiabetic individuals.

Rheumatoid Arthritis

Six studies have shown that the greater the extent of periodontal disease and tooth loss, the greater the risk of rheumatoid arthritis.

Pancreatic Cancer

A Harvard Medical School study provides the first strong evidence that gum disease may increase the risk of pancreatic cancer. The study of more than 51,000 men found those with periodontal disease had a 64 percent higher risk of pancreatic cancer com-

pared to those who didn't have periodontal disease.

Colorectal Cancer

A Swedish study found periodontal disease was associated with a 15 percent increased risk of all cancers -- particularly increased risk of digestive tract, colorectal, pancreatic and prostate cancers in men and an increased risk of uterine cancer in women.

Over the last two years, a series of genetic studies on human colon biopsies revealed that one family of microbes — Fusobacteria, a strain of bacteria which causes gum disease — is also abundant in tissues from colorectal cancer patients.

Now two new independent studies, one from Harvard, the other from Case Western Reserve University, indicate that Fusobacteria may indeed cause colorectal cancer by stimulating bad immune responses and turning on cancer growth genes to generate colorectal tumors.

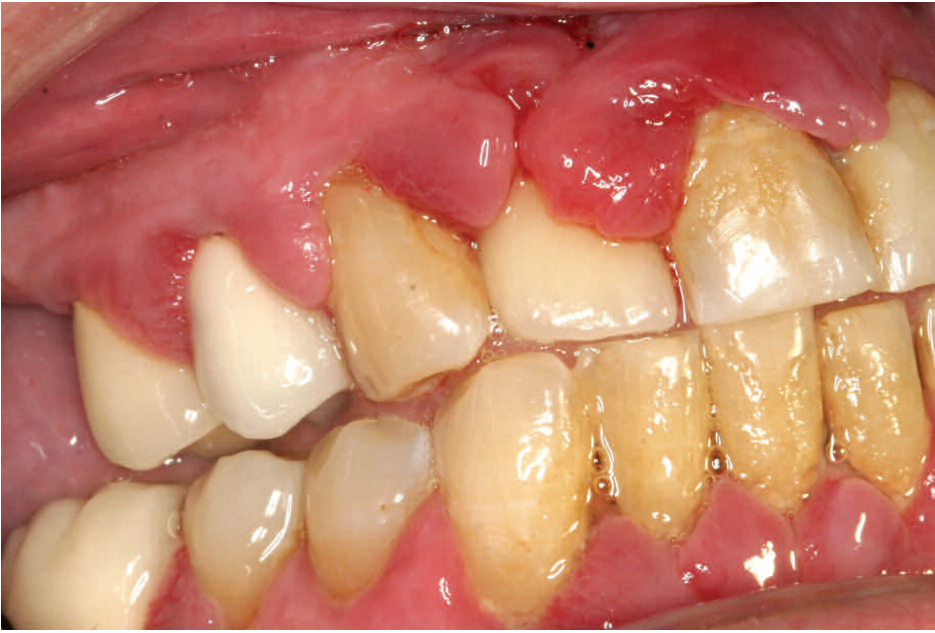
Although Fusobacteria start off in the mouth, they can migrate through blood vessels to far reaches of the intestinal tract, including the colon.

The Harvard study discovered that Fusobacteria species are enriched in biopsy samples of colonic adenomas. These start off as benign tumors of the intestinal lining, but can become malignant and are the leading precursor of colorectal cancer.

Kidney Infection

Recent data suggest periodontal infection contributes to chronic kidney disease.

A study of 4,053 adults older than 40 investigated the association between chronic kidney disease and clinical measures and serologic markers of periodontal infection. In those individuals with chronic kidney disease, 22% had high A. actinomycetemcomitans antibody titer, 24% had high Porphyromonas gingivalis antibody titer, 9% had periodontal disease, and 17% were edentulous.



ted with cognitive impairment among older adults. Noble found that those with high antibodies to a common periodontal pathogen had a 200 percent increase in their incidence of Alzheimer's Disease.

A new study published recently in the *Journal of Alzheimer's Disease* found the *P. gingivalis* bacteria associated with periodontal disease in brain samples from four of ten Alzheimer's patients.

Multiple Sclerosis

Shapira et al found evidence that infection with a periodontal pathogen, such as *P. gingivalis*, may play a role in the pathogenesis of central nervous system inflammatory disorders such as multiple sclerosis.

Figure 6. This patient had type 1 diabetes and severe periodontitis.

COPD and Pneumonia

Aspiration of common periodontal pathogens has been associated with severe respiratory problems such as chronic obstructive pulmonary disease (COPD) and pneumonia.

Studies by Scannapieco et al show that periodontal disease may increase a person's risk for Chronic Obstructive Pulmonary Disease (COPD) and promote the progression of the disease. Scannapieco found a correlation between the amount of periodontal disease and lung capacity and that patients with periodontal disease experience twice as many respiratory infections as healthy patients.

Scannapieco also found that respiratory pathogens found in the oral flora of patients in intensive care units and nursing homes were rare in normal oral flora. It appears that aspiration of oral pharyngeal flora brings respiratory

pathogens into the tracheobronchial tract allowing the respiratory pathogens to colonize the oral pharyngeal tissues and in turn cause pneumonia. Periodontal treatment and oral hygiene reduced pneumonia and death two to five fold.

Alzheimer's Disease

In 2011, Koch and Hill observed various types of spirochetes, including six periodontal spirochetes in the Treponemas family, were detected in the brains of more than 90 percent of Alzheimer's patients. It is established that chronic spirochetal infection can cause slowly progressive dementia, brain atrophy and amyloid deposition in late neurosyphilis.

In a 2009 report published in the *Journal of Neurology, Neurosurgery and Psychiatry*, J.M. Noble, M.D., found periodontitis is associa-

Conclusion

All of these studies found strong evidence that the prevention and the treatment of periodontal disease to reduce oral inflammation may reduce the risk and slow the progression of several systemic diseases.

Realizing that saving teeth saves lives, dentists are changing the way they practice to emphasize with their patients the connection between periodontal disease and other life-threatening diseases.

Increasingly physicians are also acknowledging the link between periodontal disease and systemic diseases and are collaborating with dentists and their mutual patients to jointly prevent and address these vexing clinical conditions.

