

A HEALTHY MOUTH IS A HEALTHY BODY

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Possible Health Challenges Associated with Periodontal Infection

The National Institute of Dental Research states that 75% of the adult population has moderate to advanced periodontal infection, 90% has some form of gingivitis, and 30% of children have pathogenic microorganisms. According to the National Institute of Health, "the incidence of PI exceeds 70% in the 30 – 44 age groups and 90% in the 55 – 64 age group... the prevalence and severity of PI will increase as the life expectancy of the population and retention of teeth increase."

Why treat the first few inches of the digestive tract, which begins at your mouth, differently from the rest of your body? A physician would consider the presence of a few bugs (e.g. protozoa, amoebae or spirochetes) anywhere in the body as a serious health threat. However, some dental professionals consider having these organisms in the mouth only a minor localized problem.

Present research overwhelmingly supports the assertion that PI affects the rest of the body in dramatic ways. Germs enter the bloodstream from infected gum tissue, sometimes just by chewing. Routine oral-health practices such as flossing, using a toothpick, or even brushing can open pathways for bugs. I am not recommending abandoning these good oral-hygiene practices; rather, I am illustrating how easy it is for bacteria to enter the blood stream.

If you have an unhealthy mouth, you have an unhealthy body!

The Surgeon General's Report on Oral Health: Implications on Research and Education stresses the seriousness of the connection between PI and many systemic diseases. Furthermore, the report emphasizes that problems generated from the mouth must be considered by all members of the medical profession. Other research associates PI with over forty diseases, including heart disease, stroke and diabetes. The sheer number of studies that directly or indirectly examine the oral-systemic link is substantial.

A study from the Michigan School of Dentistry goes even further, associating poor dental health with "early death from any cause." Parade Magazine, March 26, 2000 has an article entitled "Keep Your Gums Healthy—And Your Heart Will Benefit." The word is definitely getting out.

A Dental Products Report Survey from April 1999 stated that 86% of the dentists questioned believed that their patients have an increased awareness of PI, but of this 86%, only 4% were using effective techniques to evaluate this major health concern.

Heart Disease

There is increasing awareness in medical literature that coronary heart disease is linked not only to hereditary and nutritional factors, but that it also has an infectious origin.

Heart attacks and strokes are often associated with fatty deposits called arthromeres. Outstanding research done at the Department of Oral Biology, School of Dental Medicine, State University of NY at Buffalo (SUNYAB) discovered that fatty deposits contain DNA remnants from a variety of periodontal microorganisms. The study concluded that periodontal microorganisms were present in the plaque inside arteries, where they might play a role in the development and progression of certain kinds of heart disease.

A second study of 10,000 adults ages seventeen and over, found that persons with PI have increased levels

of the blood-clotting factor fibrinogen. (An elevated fibrinogen level is known to be an independent risk factor for cardiovascular disease.) The research team at SUNYAB said bacteria from PI appeared to have entered the blood, possibly spurring the body to produce such factors as fibrinogen, which can cause blocked arteries.

At the University of Michigan (UM), Dr. Walter Loesche reported that patients with periodontitis were much more likely to have cardiovascular disease, even after accounting for all other causes, such as smoking, cholesterol, triglycerides and obesity. Total mortality was two and one-half times greater in patients with PI. In a six-year study, a sample of 44,119 male health professionals with no major pre-existing conditions reported significant correlation between PI and coronary heart disease.

Another study reported that patients between the ages of 30 – 40 who showed evidence of bone loss around teeth were 50% more likely to have a coronary heart problem. Furthermore, fatal heart disease was twice as common in those with PI.

UNC also added that heart-attack survivors who have advanced PI are more likely to have elevated blood levels of C-reactive-factor protein (CRP), an inflammatory protein associated with heart disease. Further research noted that CRP levels were directly related to the severity of the PI.

Obviously, not all individuals have a heart attack every time their gums bleed. Under ideal circumstances, the bacteria that enter the bloodstream are removed quickly by the immune system. But for people who already have serious heart disease or a compromised immune system, the risk is much greater.

The Department of Oral Biology, University of Florida at Gainesville, tested in vitro the ability of three periodontal pathogens to invade the cells that coat the inside of the artery (endothelial cells) and the smooth muscle cells of the coronary artery. The study demonstrated that specific species and strains of bacteria do invade coronary artery cells at significant levels. This was the first documented study of its kind to establish how oral microorganisms invade human primary cell cultures of the circulatory system.

At the Helsinki University Central Hospital, Finland, doctors followed the medical history of 9,760 patients for fourteen years. They confirmed that those with the most severe dental infections at the beginning of the study had a 25% increased risk of developing coronary heart disease, especially men under 50 years of age.

Heart disease is not the only serious systemic illness that research has correlated with gum disease. A diverse list of adverse health conditions have also been linked to the presence of PI, including stroke, diabetes, ulcers, obesity, respiratory illnesses, osteoporosis and complications in pregnancy.

Stroke

The First National Health and Nutrition Examination Survey and its follow-up represent the first major study correlating cerebrovascular accidents (strokes) with PI. The study comprised 9,962 adults, ages 25 to 74, categorized from no PI to significant PI. The results were astounding: having PI represented more than a 200% greater risk for total strokes and, in particular, non-bleeding strokes. The risk was the same for African-Americans and Caucasians.

Arnin Grau, M.D., of the Department of Neurology at the University of Heidelberg, Germany discovered that poor dental status resulting from chronic dental and bone infection was associated with a stroke increase of two and one-half times over non-PI patients. In fact, stroke patients are three times more likely to have PI. "In stroke cases, only the dental factor is causative and significant."

Diabetes (Diabetes Mellitus)

Previously, it was assumed that the association between PI and diabetes was the diabetic patient's compromised ability to respond to infectious challenges. Therefore, they were predisposed to bacterial infections such as PI.

However, now the opposite possibility should be considered. Dr. Robert Genco, chairman of Oral Biology Department at SUNYAB, said, "Diabetics are at a higher risk for periodontal disease." His studies show that treating PI may reduce a diabetic's blood sugar levels.

One study of insulin users compared diabetic adults with mild PI to those with severe PI. Periodontal examinations were performed at the beginning of the study with follow-up over eleven years. The diabetic condition remained constant. The summary over the follow-up period showed the incidence of stroke, angina and heart failure was four times higher with the severe PI group, as compared to the mild PI group.

Another study tested the hypothesis that severe PI increases the concentration of blood sugar in serum in persons with type 2 diabetes. The results of this study and others show that PI is associated with a significant worsening of the diabetic condition. Undiagnosed diabetes should be considered when a patient has advanced periodontitis in the absence of other risk factors.

Stomach Ulcers and H. Pylori

Helicobacter pylori (*H. pylori*) is a species of bacteria that is found in the stomach lining of 50% of all Americans and has been associated with stomach ulcers and stomach cancer. Dr. Barry Marshall proved, by voluntarily self-administering the bacteria into his body and then treating himself with antibiotics, that these "spiral-shaped bugs" caused ulcers. Furthermore, it was discovered that *H. pylori* was also present in infected gum tissue.

Even when *H. pylori* was eliminated from the stomach with antibiotic therapy, it was not completely eradicated from the mouth, where it continues to grow in colonies deep within periodontal pockets. These pockets could be a source of re-infection for the stomach.

Obesity and Weight Loss

Researchers from the School of Dental Medicine at SUNYAB have found that the inability to lose weight is significantly related to PI through the path of insulin resistance. (Insulin resistance is when cells do not absorb insulin from the blood stream efficiently.) Dr. Sara Grossi, clinical assistant professor of oral biology, director of the UB Periodontal Disease Research Center states, "Acute infections cause metabolic disturbances, and periodontal disease is one of humankind's most common chronic infections. In this case, we think bacteria from gum disease may interfere with fat metabolism, leading to elevated LDL cholesterol and total cholesterol."

Statistics correlate obesity and PI. Results obtained from the Third National Health and Nutrition Examination (NHANES III) show that overweight people with the highest levels of insulin resistance are 50% more likely to have severe PI compared to overweight people with low insulin resistance.

Dr. O. A'cbay and his team discovered that *H. pylori* in the stomach trigger the release of the hormone gastrin. Gastrin acts to stimulate the pancreas to release insulin, causing hyperinsulinemia, a serious condition that may not only result in diabetic complications and obesity but also put the heart at risk. Further studies are warranted to investigate whether eliminating *H. pylori* in the stomach can help in weight reduction.

Pneumonia and Respiratory Diseases

Bacterial respiratory infections may be acquired by inhaling fine droplets of oral fluids from the mouth and throat. These droplets contain germs, which can breed and multiply within the lungs. It is recognized that pneumonia and lung abscesses can result from the same bacteria that cause PI. Dental plaque would seem to be a logical source of these bacteria, especially in patients with PI.

The occurrence of advanced PI in patients with pneumonia has been estimated to be well over 50%. Parasites, viruses, fungi and bacteria cause this life threatening disease; especially susceptible are elderly and immune-compromised individuals. Pneumonia is the number one cause of death in nursing homes and the leading cause of death in those over 65.

Studies from the University of California point to the link between poor oral health and respiratory disease, especially chronic respiratory disease in non-smokers. The same research shows significant correlation between PI and risk of chronic obstructive pulmonary disease.

Pregnancy

Pre-term, low, birth weight babies (PTLBW)

Researchers at the University of North Carolina (UNC) have made an enormous contribution to understanding the correlation between PI and pre-term, low-birth-weight babies (PTLBW). Many factors, including hormones and locally acting inflammatory chemical messengers, play a key role in regulating the onset of labor, cervical opening, contractions and delivery. An infectious process appears to trigger either early labor or a premature rupture of membranes by placing undue stress on the immune system.

The study significantly correlated the presence of four organisms associated with mature dental plaque and progressing PI to the probability of having a PTLBW. The conclusion was that, after accounting for all of the normally accepted obstetric risk factors, mothers with PI have a significantly higher number of PTLBW.

Other studies support these findings. Mothers with PTLBW, who were otherwise considered low risk, were suspected to have PI as the cause of early delivery. Another study determined that a woman was seven times more likely to have a PTLBW if severe PI was present. PI may be as serious a risk to a pregnant woman's fetus as are the use of alcohol, drugs and tobacco.

Marjorie Jeffcoat, D.M.D., Department of Periodontics at the University of Alabama at Birmingham School of Dentistry stated, "...the trend for pre-term birth was observed in women with as little as two sites of infection."

Osteoporosis

Dental researchers have established a connection between PI and bone disease. A study at SUNYAB reviewed the medical records of 2,599 postmenopausal women and found that women who had osteoporosis of the hip were two times more likely to have loose teeth and PI than women with healthy hip bones.

A study conducted at the University of Toronto Department of Periodontics suggests that periodontal pathogens, such as *P. gingivalis*, might contribute to bone loss in PI not only by stimulating reabsorption but, possibly, by inhibiting bone formation directly.

Researchers are starting to use bone scans to compare the bone density of the hip to that of the bone surrounding the teeth. Preliminary results indicate that, as dental bone density decreases, so does hip bone density. Further studies are warranted.