

Marunick M, Gordon S. Prosthodontic treatment during active osteonecrosis related to radiation and bisphosphonate therapy: a clinical report. J Prosthet Dent 2006;96:7-12.
(29 refs.)

Purpose: To present prosthodontic management of a patient with osteonecrosis of the mandible and a history of oral bisphosphonate use, as well as irradiation of the mandible for cancer therapy.

Materials and Methods: Author's opinion with case report.

Findings: A 64 year old black women with type II diabetes, hypertension, complete hysterectomy, and history of breast cancer presented for evaluation for maxillary and mandibular complete dentures. Patient medications included insulin, anastrozole, amlodipine, enalapril, ranitide, and alendronate (for last 9 years). The patient was diagnosed with a stage IV squamous cell carcinoma of the right floor of mouth and tongue 22 months prior. Treatment consisted of surgical resection of the right floor of mouth including partial glossectomy, right modified neck dissection, and left supraomohyoid neck dissection. The mandible was not involved in the surgery. Reconstruction was completed with a split-thickness skin graft. Following head and neck surgery, the patients 30 remaining teeth were extracted in preparation for radiation therapy. All radiation and chemotherapy was completed 17 months prior to pros evaluation. During pros exam, an asymptomatic 4-5mm area of exposed bone with irregular, inflamed soft tissue margins was noted in the posterior lingual mandible in attached mucosa. The area was biopsied and was negative for recurrent cancer. Initial diagnosis was spontaneous osteoradionecrosis involving the right lingual mandible. Treatment consisted of strict oral hygiene along with irrigation with warm dilute saline for 2 months. At 2 month re-eval, area of exposed bone had increased. Hyperbaric oxygen treatment was then prescribed per the Robert Marx protocol. After the first 30 hyperbaric treatments, local debridement of the exposed bone was completed with no attempt at flap closure. Ten additional hyperbaric treatments were then completed. At six week follow up, the area of exposed bone had decreased in size with near total soft tissue coverage. At 10 week follow up, the area had increased to approximately its original size. A new diagnosis of osteonecrosis related in part to bisphosphonate toxicity was made. The pros treatment plan was as follows: no mandibular denture, an unconventional maxillary denture that would not engage the undercuts in the areas of the exostoses with little or no contact with the palatal torus. The patient was informed that the purpose of the maxillary denture was to improve dental facial appearance and speech, but to provide no masticatory function. At the time of this report, the patient had been followed for 2 months and was pleased with the outcome. The area of exposed bone still remains in the mandible.

Conclusions: In patients with osteonecrosis related to bisphosphonate use, pros treatment should be based on clinical judgment obtained from the medical profile, presenting conditions, and patient needs. Any pros treatment provided should be conservative in nature.

Bobetsis YA, Barros SP, Offenbacher S. Exploring the relationship between periodontal disease and pregnancy complications. JADA 2006;137(10 supplement):7S-13S. (49 refs.)

Purpose: To explore the relationship between periodontal disease and pregnancy complications.

Materials and Methods: Literature review with author's opinions.

Findings: Periodontal disease affects more than 23% of women between 30 and 54 years of age. It has been hypothesized that the bacteria associated with periodontal disease may enter the bloodstream causing a systemic inflammatory response and/or ectopic infections. This idea was first reported in 1891 by Miller and in 1991 by Collins et al. where he postulated that these bacteria and inflammatory mediators could reach the fetus thereby inducing pregnancy complications. In his studies, pregnant hamsters were injected with *Porphyromonas gingivalis* which caused an increase in inflammatory mediators in the amniotic fluid and an approximate 20% reduction in weight of the fetus. A series of case control and cohort studies have been done to try to link the association between periodontal disease and pregnancy complications. Thirteen case control studies have been completed with 6 finding an association, 4 demonstrating no association, and 3 finding that an association may be present. The varying results have been attributed to different populations studied, varying criteria for the presence of periodontal disease, and varying outcomes being studied (ex. Low birth weight, pre-eclampsia, etc). When a positive association was found in the above mentioned studies, it was demonstrated that pregnant women with periodontal disease were 7.5X more likely to have a pregnancy complication when compared to the disease free group. Ten cohort studies were completed with 6 finding an association, 3 demonstrating no association, and 1 finding that an association may be present. In these studies, it was found that pregnant women with periodontal disease were up to 20X more likely to have a complication with pregnancy than the controls. Three randomized intervention studies have been published with the pointing to the fact that periodontal treatment resulted in a significant reduction in the rate of pre-term delivery and an increase in birth weight. In these studies, treatment consisted of scaling and root planing with or without the use of chlorohexidine mouthrinse or metronidazole. Another set of experiments to find an association between periodontal disease and pregnancy complications involved the testing of periodontal bacteria along with the maternal and fetal antibody response against those organisms. These studies found that mothers without a protective IgG response against bacteria in the red and orange clusters were more likely to experience preterm labor. It has also been demonstrated that an increase of CRP, IL-1 β , IL-6, TNF- α , PGE, and 8-isoprostane in cord serum levels increases the risk of pre-term birth. Other studies have shown that certain bacteria, especially *P. gingivalis* and *C. rectus*, are capable of disseminating from the subcutaneous chamber towards both the maternal liver and uterus, but also to placental and fetal tissue. This infection induces a significant shift in the architecture of the placenta, especially in areas critical for nutrient exchange between mother and fetus. These results suggest that infections caused by periodontal pathogens not only affect growth during gestation, but may also affect perinatal neurological growth and development.

Conclusion: Current and past studies seem to present evidence that suggests periodontal disease may have a negative impact pregnancy. The association seems to be linked in the following manner: periodontal bacteria induce a local response, if the immune response cannot keep the infection localized then the bacteria and inflammatory cytokines may enter the blood circulation, these bacteria in the blood will produce a systemic inflammatory response causing an increase in inflammatory cytokines and acute phase reactants such as C-reactive protein, these bacteria and inflammatory cytokines may reach the placenta which may cause another site of infection and bacterial challenge, cytokines will again be produced which may lead to placental tissue destruction contributing to impaired fetal growth and development, lastly periodontal bacteria may pass through the placenta and enter the fetal circulation possibly causing further tissue and organ damage.

Lee HJ, Garcia RI, Janket SJ, et al. The association between cumulative periodontal disease and stroke history in older adults. J Periodontol 2006;77:1744-54. (37 refs.)

Purpose: To examine the association between cumulative periodontal disease and stroke history in the elderly.

Materials and Methods: Data from NHANES III, a large population based cross-sectional survey was used for this study. A new index called the periodontal health status (PHS) was devised to account for the cumulative tooth loss at the time of examination. PHS combined CAL with dentate status of the elderly. PHS I was based on sites with ≥ 2 mm CAL and PHS II based on median CAL ≥ 3 mm. The outcome variable for this study was self-reported history of stroke (Yes/No). Bivariate and logistic regression analysis was carried out to determine the relationship between history of stroke and periodontal health status.

Findings: No significant differences were found in stroke history between males and females. A positive association was found between stroke history and higher radial pulse rate, higher systolic blood pressure, higher BMI, plasma fibrinogen, serum CRP, serum glucose, serum creatinine, and serum triglyceride, lower HDL levels, diabetes, hypertension. Both PHS I and PHS II were significantly associated with a prevalence of stroke history. Elderly adults with "high" levels of CRP were almost twice as likely to have a positive stroke history compared to elderly adults with "low" levels of CRP. Completely edentulous elderly adults and partially edentulous elderly adults with PHS classification 4 were more likely to report of a history of stroke compared to dentate adults without appreciable clinical attachment loss (PHS Class I) when adjusted for age and tobacco. When adjusted for all confounders, there was no statistically significant association between PHS and stroke.

Conclusions: Evidence of association was found between periodontal disease and stroke. Based on this study it is difficult to determine if the association is due to the presence of similar risk factors for both or due to a cause and effect relationship.

Faria-Almeida R, Navarro A, Bascones A. Clinical and metabolic changes after conventional treatment of type 2 diabetic patients with chronic periodontics. J Periodontol 2006;77:591-8. (46 refs.)

Purpose: To perform a clinical and metabolic comparison of the response to non-surgical periodontal treatment between non-diabetic patients and type 2 diabetic patients.

Materials and Methods: This study represented a parallel, prospective, comparative longitudinal study on 2 patient populations with moderate generalized chronic periodontitis. The duration of the study was 6 months. Two groups of 10 patients were utilized according to the author's inclusion criteria. The 2 groups were classified as the following: 1) patients diagnosed as type 2 diabetics (experimental group) and 2) non-diabetic patients (control group). All diabetic patients received oral antidiabetics at the same dosing regimen in order to control their glycemia. The initial examination including the following: comprehensive medical history; complete periapical radiographic series; determinations of both blood glucose levels in mg/dl and Hemoglobin A1c (HbA1c) values; periodontal examination of 6 sites in all teeth except for the 3rd molars (probing depth, plaque index, bleeding on probing index, gingival recession, and clinical attachment levels); oral hygiene instructions; and supragingival prophylaxis. Subsequent examinations included 4 sessions of scaling and root planing. After the treatment sessions, follow-up examinations were performed at 3 and 6 months. At the 3 and 6 month exams, most of the measurements obtained at the initial examination were repeated including determinations of HbA1c and the blood glucose levels, comprehensive periodontal evaluations, oral hygiene instructions, and supragingival prophylaxis. The data were then subjected to statistical analysis using the Fisher exact test (comparisons between gender), the Student t test (comparisons based on age and the number of teeth) and the multivariate analysis of variance (ANOVA) (comparisons of HbA1c/blood glucose and periodontal indices between the groups).

Findings: No statistically significant differences were found between the 2 groups when comparing age and gender. The groups did not significantly differ in plaque index, gingival recession, bleeding on probing index or clinical attachment level at any of the examination time periods. Also in both groups, there were statistically significant improvements in the plaque index, clinical attachment levels, and gingival recession from the baseline examination to the 3 month exam and from the 3 month exam to the 6 month exam. Statistically significant differences in mean probing depth were noted between the 2 groups at all the examination periods. Both groups demonstrated significant improvements at each follow-up examination; however, significant better outcomes in probing depths were found in the control group. There was a positive metabolic response to periodontal treatment as demonstrated by a lowering of HbA1c values from the baseline examination to the 3 month exam and from the baseline exam to the 6 month exam. Lower blood glucose levels were observed at each follow-up examination; however, they did not reach statistical significance.

Conclusions: Both groups demonstrated clinical improvements after employment of non-surgical therapy. There was a statistically significant difference between the groups in probing depth after the scaling and root planing was performed. The non-diabetic group demonstrated a greater reduction in probing depth as a result of the treatment utilized in the study. An improvement in all the other clinical variables was noted among the 2 groups between baseline and the 3 and 6 month examinations. The diabetic patient group demonstrated a significant improvement in their metabolic control (blood glucose levels /HbA1c levels) as a result of the periodontal treatment. This improvement in metabolic control was statistically significant between baseline and 6 months.

Radnai M, Gorzo I, Urban E, et al. Possible association between mother's periodontal status and preterm delivery. J Clin Periodontol 2006; 33: 791-6. (50 refs.)

Purpose: To investigate the relationship between initial chronic localized periodontitis and pre-term birth (PB) or the birth weight of the newborn.

Materials and Methods: The subjects of this study were 161 systemically healthy Caucasian women. Personal data and general medical history were recorded for demographic and socioeconomic data. The periodontal examinations were completed within 3 days post-partum. A detailed periodontal status was determined, which evaluated plaque, calculus, recession, tooth mobility, probing depth (PD), and BOP.

The definition of pre-term birth was the case group if the newborn's weight was < 2500g, or the mother had spontaneous pre-term labor, with pre-term premature rupture of membranes before the 37th gestational week. Women who had threatening pre-term labor were treated in order to maintain their pregnancy as long as possible. Even if they were delayed until week 37, they were counted as the PB group. Mothers whose delivery occurred after week 37 without any previous problem, and had a newborn with a weight ≥ 2500g were included in the normal group.

A woman had periodontitis if she had ≥ 4mm PD at least one site and BOP at ≥ 50% of teeth. Subjects having no ≥ 4mm PD, or BOP occurring at < 50% of teeth were regarded as periodontally healthy.

Results:

- (1) Mean age of mothers – no significant difference
- (2) Educational level and occupation of mothers and fathers – no significant difference
- (3) Means of PII, frequency of calculus, PD, and BOP – no significant difference
- (4) The analyses between the different signs of periodontitis and PB

	Case (N=77)	Control (N=84)	p-value	Odds ratio
PD 4 mm + BOP 50%			0.0001	3.76
No	38	66		
Yes	39	18		

- (5) Mean weight of newborns of mothers with and without periodontitis

	With periodontitis (N=57)	Without periodontitis (N=104)	p-value
Weight (g)	2834.5	3180.3	0.0002

- (6) The adjusted odds ratio
 - PD 4 mm + BOP 50% : 3.32
 - Smoking : 4.55

Conclusions: Pre-term birth and low weight of newborn are influenced by initial chronic periodontitis of pregnant women.

Mombelli A, Cionca N. Systemic diseases affecting osseointegration therapy. Clin Oral Imp Res. 2006;17:97-103. (70 Refs)

Purpose: To evaluate the impact of systemic disease and their treatment on the success of osseointegration therapy.

Materials and Methods: Literature review using Endnote. 11 Medline searches up to and including October 2005 using implant, dental and 11 diseases name which had a negative impact on the success of osseointegration, includes cardiovascular, diabetes, osteoporosis etc.

Findings and Conclusions: for the following diseases the evidence to recommend implant therapy was low:

1. Scleroderma
2. Parkinson's
3. Sjogren's syndrome
4. HIV infection
5. Pemphigus
6. Ectodermal dysplasia

Successful implant maintenance under long term immunosuppression after organ transplantation was demonstrated in one case. With regards to Chron's, one center reported that out of three treated cases two experienced early implant failure. Implant therapy is not generally considered an absolute contraindication in diabetes mellitus and osteoporosis.

Diabetes: Within the limitations of the collected material the following trend were recognized 1- more failure in diabetic patient occurred early 2- the percentage of diabetic patients experiencing failure seemed to be relatively high, but the percentage of failing implants appeared to lie within the normal range. A retrospective Cohort analysis by Moy et al 2005 includes 48 diabetic and 1092 non-diabetic patients, treated by one surgeon over a period of 21 yrs. This study indicates that there was a statistically significant risk of implant failure with diabetes. Accursi 2000 study shows that diabetic patients had no increased risk of implant failure and a similar number compared with matched non diabetic control.

Osteoporosis: Starck and Epker 1995 reported a case of implant failure after bisphosphinate therapy for osteoporosis. Mason et al 1990 reported three cases of mandibular fractures following implant placement, two of which were in elderly women with advance mandibular atrophy. One retrospective study by Friberg et al in which implant was placed in 16 women with osteoporosis, they report over all success rates was 97% for maxillary and 97.3% for mandibular implants. Cases have been shown that implants were placed in pt. using corticosteroid or other endocrinopathies can cause osteoporosis. Minsk and Polson 1998 study found no difference in failure rates between women receiving, not receiving hormone replacement therapy. In August et al 2001 study post menopausal women without Hormone replacement therapy had the highest maxillary failure rate 13.6 %, which was significantly greater than for pre-menopausal women. Implant placed in the mandible did not show statistically significant difference of failure. Established risk factor for osteoporosis includes advance age, smoking and alcohol consumption, steroid therapy, inadequate calcium intake, genetics predisposition and menopause. In conclusion the Level of evidence indicating absolute and relative contraindications for implant therapy due to systemic disease is low.

Mealey BL, Oates TW. Diabetes Mellitus and Periodontal diseases. J Periodontol 2006;77;1289-303. (146 Refs.)

Purpose: To review the relationship between diabetes mellitus and periodontal disease.

Materials and Methods: Findings and research published over the past 20 yrs and certain "classic" literatures published before the 1980's. The literature search was done using the PubMed search engine.

Findings:

Diabetes Epidemiology and Classification: Type I diabetes constitutes 5-10% of the total diabetes cases. It results from cellular mediated autoimmune destruction of pancreatic β cells leading to total loss of insulin secretion. It is usually present in children and adolescents but some studies show that cases are being diagnosed after the age of 30 yrs.

Type II diabetes constitutes 85-90% of diabetic cases. It results from insulin resistance that alters the use of endogenous insulin at the target cells. They have altered insulin production, but there is no autoimmune destruction of β -cells. Most patients with Type II diabetes are obese with body fat distributed predominantly in the abdominal region. Women with Gestational diabetes return to normoglycemic state after giving birth. But it increases significantly the risk of developing type II diabetes.

Diagnostic Criteria and Evaluation of Glycemic Control: A normal fasting glucose level is < 100 mg/dl. In diabetes it is ≥ 126 mg/dl. In diabetes, casual plasma glucose values are ≥ 200 . Glucose tolerance tests (GTT) are performed to diagnose impaired glucose tolerance. A normal 2-hour postload plasma glucose level is < 140 mg/dl. In impaired glucose tolerance it is 140-199 mg/dl and in diabetes it is ≥ 200 mg/dl. Glycosylated hemoglobin (HbA1c) test is used on diagnosed patients to check on their diabetes control. It provides an estimate of the average blood glucose level over the previous 30-90 days. The fructose amine test which measures glycosylated albumin is used to test shorter interval (weeks) than the HbA1c test (months).

Effects of Diabetes on the Periodontium: Examination of the available data shows strong evidence indicating that diabetes is a risk factor for gingivitis and periodontitis. The investigator found in one of the studies that children with Type I diabetes had a prevalence of gingivitis greater than non-diabetic children with similar plaque values. Greater gingival bleeding is seen in poorly controlled diabetic patients than either well controlled diabetic subjects or non diabetic controls. Various studies indicate a more severe periodontal condition in diabetic adults than in adults without diabetes. Studies show that in type II diabetes there is a four-fold increased risk of progressive alveolar bone loss compared to non-diabetic patients.

Mechanisms by which Diabetes May Influence the Periodontium: Studies show that the microflora at the periodontal diseased sites in diabetic subjects are similar to the microflora in the diseased non-diabetic subjects. The neutrophil adherence, chemotaxis, and phagocytosis are impaired, which may inhibit bacterial killing in the periodontal pocket and increase the periodontal destruction. In hyperglycemic state there is inhibition of osteoblastic cell proliferation and collagen production that results in reduced bone formation and diminished mechanical properties of the newly formed bone. Increased glucose levels in the gingival crevicular fluid will affect the wound healing capacity of the fibroblasts in the periodontium by inhibiting attachment and spreading of the cells which are critical for wound healing and normal tissue turnover. Studies show that higher levels of periodontal advanced glycation end products (AGEs) accumulation in those with diabetes than in non diabetic subjects. Bone formation is reduced in elevated levels of AGE collagen.

Effects of Periodontal Disease on the Diabetic State: Data from several studies of type I and type 2 diabetic subjects with severe periodontitis have shown improvements in glycemic control, and decrease in HbA1c levels following scaling and root planning combined with systemic doxycycline

therapy. The investigator reports that the overall mortality rate from cardio-renal disease was 3.5 times higher in subjects with periodontitis.

Mechanisms by Which Periodontal Diseases May Influence Diabetes: Systemic inflammation is elevated in obesity, insulin resistance, hyperglycemia, and diabetes. Diabetic patients with periodontitis show a greater systemic inflammatory condition with elevated serum levels of IL-6, TNF- α , and CRP, which can worsen insulin resistance and increase the risk of poor glycemic control in type II diabetes patients. Several studies show that periodontal treatment reduces clinically evident inflammation and also results in a decrease in serum levels of IL-6 and CRP that causes insulin resistance, thereby positively affecting glycemic control.

Effects of Diabetes on the Response to Periodontal Therapy: Several studies show that in well controlled diabetic patients, in clinical and microbiologic response to scaling and root planning is similar to that in non-diabetic individuals. Patients with poor glycemic control may have a more rapid occurrence of deep pockets and a less favorable long term response.

Conclusion: Studies indicate that periodontal disease and diabetes are closely associated. Diabetes clearly increases the risk of periodontal diseases, but less clear is the impact of periodontal disease on glycemic control of diabetes. Further research is needed to clarify this aspect.

Czerniuk M, Gorske R, Filipiak K and Opolski G. C-Reactive protein in patients with coexistent periodontal disease and acute coronary syndromes. J Clin Periodontol 2006;33: 415-20.

Purpose: To evaluate periodontal disease (PD) influence on changes in high-sensitivity C-reactive protein (HsCRP) concentrations in patients with acute coronary syndromes (ACS) and coexistent periodontal disease.

Materials and Methods: A total of 50 patient of the Cardiac Care Unit at the University Hospital, Warsaw, Poland were selected for the study. Patient's mean age 51 years. All patients had chest pain for less than 12 hours and were treated according to the standard ACS therapy. During the first 24h of admission, dental examination indicating the condition and number of retained teeth and state of dental prosthesis together with treatment needs regarding prosthetic and oral surgery. All patients were diagnosed with chronic generalized periodontitis. 78% of the patients were smokers (20 cigarettes p/day). Blood samples were taken from all patients for hsCRP estimation. Examinations were divided into acute phase examination, 10-12 days of hospitalization and after months of hospitalization. Long-term observation was also carried out after 6-months in 44 patients and this represented examination 4. Samples were centrifuged and obtain serum was frozen and store at -80* until estimation. HsCRP serum levels were assessed by means of the ELISA test. A second part of the examination for verification and definitive confirmation of initial diagnosis of chronic periodontitis was performed at the Department of Oral Medicine and Periodontology at the Warsaw Medical University School. Plaque index (PI), bleeding index (BI), probing depth (PD) and clinical attachment loss (CAL) were measured and recorded. Changes in hsCRP were used as primary variable. Statistical analyses were made.

Findings and Conclusions: Examination of 50 patients with periodontal disease and coexistent ACS showed that mean values for PI and BI were very high, respectively: PI 72% in males and 42% infemales and BI 86% in females and 78% in males. Mean PD was 2.91 mm in females and 2.36 mm in males. The mean CAL ranged between 3.11 mm in females and 3.8mm in males. The study showed no significant raised mean and median hsCRP concentrations in all examinations when group with more advance periodontitis was compared with the group of less advance disease. The same observation was made when comparing the group with CAL>3mm with CAL<3mm.

The present study did not found statistical significant relationship between hsCRP and periodontal disease or viceversa.

Pititphat W, Joshipura KJ, Rish-Edwards JW, et al. Periodontitis and plasma C-reactive protein during pregnancy. J Periodontol 2006;77:821-5. (31refs)

Purpose: To examine the relationship between periodontitis and plasma CRP levels among pregnant women.

Materials and Methods: 35 subjects from Project Viva, a prospective cohort study, were included in this study. All the participants had periodontitis and provided dental radiographs which were taken within 5 years of delivery. Subjects had plasma sample taken in early pregnancy. A random sample of 66 periodontally healthy subjects matched on age and race/ethnicity. Alveolar bone loss was measured on 16 posterior teeth using a Williams probe at the mesial and distal sites of each tooth. Data regarding CRP level, age, race/ethnicity, pre-pregnancy BMI, alcohol intake, education, annual house hold income, and gestational age at blood collection were collected. Multivariate linear regression analysis was used to evaluate the association between periodontitis and CRP.

Findings: Women with periodontitis were more likely to have completed college, to have annual income more than \$70,000, to be leaner, and to exercise less than women without periodontitis. Mean alveolar bone loss (\pm SD) was higher among periodontitis cases (1.48 ± 0.50 mm) compared to controls (0.75 ± 0.34 mm). The mean CRP level was 2.23mg/l in periodontitis cases and 1.46mg/l in controls. After adjusting for all the variables, the mean CRP level was 65% higher in women with periodontitis (2.46mg/l) than those without periodontitis (1.49mg/l).

Conclusions: This study suggests that periodontitis is associated with increased plasma CRP levels in early pregnancy and raise the possibility that CRP may mediate the association of periodontitis with adverse pregnancy outcomes.

Jones JA, Miller DR, Wehler CJ, et al. Does periodontal care improve glycemic control? The Department of Veterans Affairs Dental Diabetes Study. J Clin Periodontol. 2007;34:46-52.

Purpose: to report the efficacy of periodontal care in glycemic control improvement in poorly controlled diabetic veterans.

Materials and Methods: 165 poorly controlled veterans participated in this randomized-clinical trial over 4 months. (Usual care = untreated group, no alteration in patients' medical or dental care routine.) These patients were randomly assigned to one of four groups.

1) Early treatment 4 month therapy- scr, Doxycycline 100mg daily for 14 days, CHX twice daily for 4 months, then usual care.

2) Early treatment/12 months therapy- early treatment for 12 months, no additional antimicrobial.

3) Usual care/4 month therapy- usual care, 4 months of treatment, then usual care.

4) Usual care/12 months therapy- usual care then 12 months of care as in #2

Changes in Hemoglobin A1c (HbA1c) in the Early Treatment versus Usual Care (untreated) groups and % participants with decreases in HbA1c were determined. Statistical analyses included simple/multiple variable linear/logistic regressions. Factors adjusted for baseline were HbA1c, age, and duration of diabetes.

Findings: No difference was found between groups for unadjusted mean change in HbA1C. After adjustment for baseline HbA1c, age, and diabetes duration, the mean absolute HbA1c change in the Early Treatment group was -0.65% versus -0.51% in the Usual Care group. An adjusted odd for improvement by 0.5% in the Early Treatment group was 1.67. Usual Care (untreated) subjects were 2x likely to increase insulin from baseline to 4 months (20% vs. 11%) and less likely to decrease insulin (1% vs. 6%) than Early Treatment subjects. Among insulin users at baseline, more increased insulin in the Usual Care group (40% vs. 21%).

Conclusions: No significant benefit in improvement of glycemic control was found for periodontal therapy after 4 months. There were trends in some results were in favor of periodontal treatment.

Geismar K, Stoltze K, Sigurd B, Gyntelberg F, et al. Periodontal disease and coronary heart disease. J Periodontol 2006;77:1547-54. (38 refs)

Purpose: To test the hypothesis that a high prevalence of periodontal disease among coronary heart disease (CHD) patients could be explained, at least in part, by mutual risk factors.

Materials and Methods: In this case-control study, 110 consecutive CHD patients and 140 people without CHD were recruited consecutively to match the age and gender distribution of CHD patients. All 250 participants had a medical examination involving a questionnaire concerning symptoms and diseases, familial dispositions, education and socioeconomic status, smoking and drinking habits, eating habits, physical activity, medication and previous contacts with the health care system. A resting ECG was taken and an echocardiography was performed. Arm blood pressure was measured and a blood sample was taken, and total serum cholesterol, HDL-c, LDL-c and triglyceride were measured. Oral exam consisting of PD, BOP, CAL were taken on 6 sites of all existing teeth excluding third molars. Two vertical bitewings on each side and two peri-apical radiographs of the incisors of both jaws were taken. Alveolar bone loss (ABL) as measured on radiographs were stratified into 3 groups: ABL 1 in which the means were ≤ 2 mm; ABL 2 in which the means were >2 to ≤ 4 mm; and ABL 3 in which the means were ≥ 4 mm. The same stratification was made for CAL. Statistical analysis was performed.

Findings: The CHD group had a significantly poorer outcome with respect to all periodontal variables except for the proportion of edentulous individuals where the difference was insignificant. A comparison of risk factors showed significant differences in self-reported diabetes, physical activity level, and years of school attendance between the CHD and non-CHD groups. The distribution of smoking in the CHD and non-CHD groups had a significant difference. The differences seen in HDL-c, LDL-c and B.P were found to be opposite to the expected values, so that the CHD group had lower values than the non-CHD group and hence were consequently left out of the logistic regression model. ABL1, ABL2 and ABL3 showed statistically significant differences in smoking defined as pack years. Socio-economic factors showed a significant difference between ABL groups. Age was not a significant variable in the group of participants <60 yrs old and was not allowed to stay in the model. After adjustment for age, diabetes, smoking, and school attendance, odds ratios for CAL3 were significant (5.1) and insignificant for CAL2 (2.1). there were no significant differences between groups of recently diagnosed CHD and the group with a longer history of CHD in the association of periodontal disease and CHD. Significantly higher OR (6.6) for individuals <60 years old of being CHD patients when having a mean ABL >4 mm based on measurements of radiographs was found. For registered CAL, the association was stronger.

Conclusions: The present study has thus shows a positive association between periodontal disease and CHD in agreement with several studies. The association was highly age dependent and could only be attributed to diabetes and smoking to some extent.

Schillinger T, Kluger W, Exner M, et al. Dental and periodontal status and risk for progression of carotid atherosclerosis. Stroke 2006; 37:2271-6.

Purpose: The purpose of the present study was to investigate the association between dental and periodontal status with the presence and future progression of carotid stenosis.

Materials and Methods: A selection of 411 of 1268 participants from the prospective Inflammation and carotid artery risk for atherosclerosis study (ICARAS). The inclusion criteria was patients who underwent duplex ultrasound investigations of the extracranial carotid arteries from March 2002 until March 2003, and who were neurologically asymptomatic of carotid obstructions defined as absence of ipsilateral cerebrovascular events at least 12 months before inclusion. The dental substudy included 271 males and 140 females with mean age of 69 years, four dentists performed all dental examinations using three standardized indices: DMFT (decayed, missing, filled teeth) which describes dental status and was used to calculate DMFT for 32 teeth, SLI (Silness-Loe Index) to evaluate oral hygiene recording teeth 12, 16, 24, 36, and 44 with scores from 0 to 3, and CPITN (community periodontal index for treatment needs) indicator of periodontal status using a lightweight probe evaluating 10 teeth and categorized from 0 (healthy) to 4 (pocket > 6mm) dentists were blind to all clinical and ultrasound data.

Results: Median DMFT index was 30 (interquartile range [IQR] = 26 to 32). Decayed teeth 0 (0 to 2), filled teeth 7 (0 to 13) and missing teeth 18 (11 to 29). Median SLI was 0.75 (IQR=0.38 to 1.21), and median CPITN was 2.5 (IQR= 2.0 to 3.0) (excluding edentulous patients). DMFT, SLI and CPITN were significantly associated with the degree of carotid stenosis. Edentulous patients had a significantly higher baseline degree of stenosis ($P=0.007$), and the number of missing CPITN was significantly associated with higher degrees of carotid stenosis ($P=0.039$). During follow up period, 48 patients (11.7%) showed progression of carotid atherosclerosis by at least one category (23 patients showed progression of the right carotid artery and 22 of the left carotid artery and 3 patients had bilateral progression). Patients with progressive disease had significantly higher DMFT and SLI indices compared with patients with stable disease, no significant difference was found for CPITN levels. Edentulous patients had higher risk for disease progression (17 of 92 19% compared with own teeth (31 of 319 10%, $P=0.021$).

Conclusion: Dental status, oral hygiene, and particularly tooth loss are associated with the degree of carotid stenosis and predict future progression of the disease.

Zaremba M, Gorska R, Suwalski P, Kowalski J. Evaluation of the incidence of periodontitis-associated bacteria in the atherosclerotic plaque of coronary blood vessels. J Periodontol 2007;78:322-27. (29 refs.)

Purpose: To evaluate the incidence of selected anaerobic bacteria in subgingival and atherosclerotic plaques of patients treated surgically because of coronary vessel obliteration.

Material and Methods: 20 individuals with severe generalized chronic periodontitis who were also scheduled for bypass procedures were included in the study. Subgingival plaque was collected from periodontal pockets >5mm. 8 common pathogens in periodontitis were tested using DNA hybridization ("slot blot" procedure). The results were quantified as negative (<10³ pathogens), low (10³-10⁴ pathogens), moderate (10⁴-10⁵), and high (>10⁵). Atherosclerotic plaque was sampled in all 20 patients during bypass surgery, and DNA testing by the same method was performed.

Findings: In 13 of 20 patients, the pathogens most frequently found in severe chronic periodontitis were also found in coronary vessels. In 10 cases, same species of bacteria were present both in the periodontium and coronary vessels. In pockets >5mm, T.forsythensis was the most frequent, followed by E.corrodens and F.nucleatum where as, in atherosclerotic plaque, P.gingivalis and T.forsythensis were the most common. In the subgroup where pathogens were found in the vessels, plaque index was higher, preserved teeth were higher, and a higher BOP.

Conclusions: Degree of inflammation as demonstrated by BOP is associated with bacterial permeability into coronary vessels.

Padilla C, Lobos O, Hubert E, et.al. Periodontal pathogens in atheromatous plaques isolated from patients with chronic periodontitis. J Periodont Res 2006;41:350-3.

Purpose: 1) To detect the presence of periodontopathic bacterial species in the periodontal pockets of patients with periodontal disease and 2) to relate these findings with periodontal microorganisms detected in atheromatous plaques obtained from the same patients.

Methods and Materials: Twelve subjects (age range = 56 to 73 years) who were patients in a hospital were selected for this study. Subjects presented with two pathological conditions: 1) chronic periodontitis and 2) a clinical diagnosis of obliteration of inferior extremities or carotid artery stenosis-- six patients exhibited clinical, radiological, and laboratory evidence of carotid artery stenosis while the remaining patients presented with obliteration of inferior extremities. The investigators noted that subjects were not on any antibiotics for six months prior to the study.

To start, patients were given a dental examination to assess the periodontal pocket depth, plaque index, clinical attachment level, and bleeding upon probing at six sites per tooth. Clinical examination revealed pocket depths of 3.9-5.9 mm, plaque index of 1.5 to 2.5, and bleeding upon probing 27-35%. Radiographic examination revealed alveolar bone loss in all patients.

Following the clinical examination, the investigators isolated periodontal pathogens from two different sources: 1) periodontal pockets and 2) atheromatous plaques. The investigators obtained clinical samples of periodontal pockets of each tooth by inserting a sterile paper tip point for 10 seconds, placing it in a sterile tube, plating and growing under physiochemical conditions, and utilizing PCR for bacterial identification. One week after the periodontal examination, the atheromatous plaques were obtained by means of a surgical endarterectomy process, placed in a sterile tube, plated and cultured under specific physiochemical conditions, and analyzed by PCR.

Findings: Investigators observed bacterial growth with different morphologies in all 12 cultures sampled with the sterile paper tip, and were able to identify the bacteria in nine of the 12 cases. However, investigators were unable to grow bacteria in most samples from atheromatous plaques. All bacterial samples were assessed by PCR. PCR analysis revealed that *P. gingivalis* was the most common periodontal bacteria in the clinical samples. Interestingly, PCR investigation of *both* periodontal samples and their respective atheromatous plaque samples, revealed the presence of *Actinobacillus actinomycetemcomitans*, albeit in two cases.

Conclusions: Evidence derived from both bacteriological cultures and PCR identification points to the possible link between coronary heart disease and periodontal pathogens, especially *A. actinomycetemcomitans*. The investigators hypothesized that patients with chronic periodontitis often experience bacteremia, which would result in the migration of *A. actinomycetemcomitans* to the atheromatous plaque. The investigators, however, admitted to several limitations in their study: 1) the patient pool from this study may have been too small and not representative of the entire population; 2) the bacteriological medium used in the study may have been a good substrate for the growth of certain microorganisms, such as *P. gingivalis*, but was poor for *A. actinomycetemcomitans* (that would explain the high levels of *P. gingivalis* found in the clinical samples); 3) previous studies have been unable to establish strong, conclusive correlation between periodontal pathogens and coronary heart disease. Nevertheless, when observed in two different sites in the same patient, the presence of this microorganism (and possibly other gram negative bacteria) is highly suggestive of the role that periodontal pathogens play in the coronary disease process.