2019 Oregon Dental Conference®
Course Handout

Jo-Anne Jones, RDH

Thursday, April 4
1:30 - 4:30 pm
THE SILENT KILLER:
Understanding and Addressing the Missing Link in Today's Periodontal Therapy Program

Elevate Understanding and Treatment of Periodontal Disease as an Inflammatory Disease

Just the Facts!

FACT: The information has been redefining our understanding of how inflammation is at the very core of today's complex, prevalent and deadly diseases.

FACT: Moderate to severe chronic periodontitis has significant systemic implications.

FACT: The AAP has redefined periodontal disease as an inflammatory disease with far reaching effects.

FACT: We need to reconsider our therapeutic endpoints to ensure that the impact of oral disease does not continue to threaten overall health

FACT: We need to meet the needs of today’s population.

FACT: We are in the era of dental medicine.

We've Lost the Battle

When we focus on reducing the bacterial component only, we do not achieve the reduction of the host response. Inflammation and destruction continues placing healing, repair and systemic health in jeopardy.

Aha moment!

To continue to ignore the inflammatory aspect of periodontal disease is inadvertently setting up our patient for risk of systemic disease

Also our tx outcomes will continue to be at a standstill

Today's Periodontal Therapy Program Objective

Traditional clinical periodontal examination includes assessment of already existing damage to periodontal tissues

Focus should be on oral inflammation rather than solely focused on pocket depths

However, in diminishing future periodontal breakdown due to chronic inflammation, our current methods are far from effective

Aha moment!

Debridement at regular intervals will never gain momentum against host response

Gram negative bacteria will begin forming 4 – 7 days after full mouth debridement and the immune cascade begins again

“If we, in dentistry, are indeed healers, it is imperative for us to take a different approach... the goal is to help patients become and remain inflammation-free.” Dr. Tim Donley
Defining of a healthcare professional: “An occupation whose core element is work based upon the mastery of a complex body of knowledge and skills...to be used in the service of others. Professions and their members are accountable to those served and to society. Society rewards health professionals...this status, however, comes with professional obligations.”

**FACT: The Common Link — Inflammation**
Today’s diseases of influence are linked by the inflammatory pathway
Periodontal disease is the most common chronic inflammatory disease known to mankind
Living longer, consequences of Western lifestyle adding to today’s inflamed body
We have a responsibility as a dental professional to minimize risk of systemic disease by treating oral inflammation

**FACT: American Academy of Periodontology Statement:**
« Research has shown that periodontal disease is associated with several other diseases. For a long time it was thought that bacteria was the factor that linked periodontal disease to other disease in the body; however, more recent research demonstrates that inflammation may be responsible for the association. Therefore, treating inflammation may not only help manage periodontal diseases but may also help with the management of other chronic inflammatory conditions.

**Aha moment!**
Bacteria initiates the localized infection
Bacteria are essential but insufficient. Bacteria are incapable of breaking down collagen. What is required is a susceptible host.

**Host Modulation: Low-dose doxycycline (LDD)**
Medical and Dental Benefits
About 30 years ago, Golub et al discovered that low dose doxycycline had the unexpected ability to inhibit host-derived tissue-destructive enzymes known as MMPs by mechanisms unrelated to the antibacterial/antibiotic properties of these drugs
These enzymes when present in pathologically-excessive levels are largely responsible for degrading collagen fibers and mediating bone resorption related to various medical and dental diseases
Over the past decade this novel non-antimicrobial LDD has been tested in patients with medical disorders which excessive MMPs and inflammatory mediators play a role

And why is collagen breakdown so imperative to periodontitis?
Periodontium is primarily made up of collagen;
- gingival tissues – 60% collagen
- periodontal ligament – 70-80% collagen
- alveolar bone matrix – 90% collagen

References & Resources:
[www.perio.org/consumer/other-diseases](http://www.perio.org/consumer/other-diseases)
[https://www.cdha.ca/pdfs/Profession/Resources/Disease_Link_Article.pdf](https://www.cdha.ca/pdfs/Profession/Resources/Disease_Link_Article.pdf)
[www.heartandstroke.com](http://www.heartandstroke.com)
**TIME Magazine article:**
Systemic Outcome of Collagen Breakdown
Breakdown of collagen in diseased joint (synovial) tissues increasing severity of symptoms in ARTHRITIS
Breakdown of collagen in connective tissues around CANCER cells increasing ability for invasiveness and metastasis
Breakdown of collagen rich protective ‘cap’ which is the only stabilizing force preventing cholesterol-rich arterial plaques from rupturing increasing risk for or MYOCARDIAL INFARCTION & STROKE

The Game Changers!
2015 JADA Guidelines for Non-surgical Treatment of Chronic Periodontitis
Followed by:
AAP January 2017 newsletter (included in handout)
New gingivitis code for 2017
New periodontal classifications 2017 World Workshop
Resulting in:
Medical vs. mechanical approach to treatment of periodontal disease
Therapeutic options to address the bacterial (chairside/self care) and host response component of periodontal disease

Recognize the role of ongoing chronic inflammation in initiating disease states within the body

Cardiovascular Disease: Understanding the Oral-Systemic Link – 2 Pathways

References & Resources:
www.heartandstroke.com
The Facts on Diabetes:
FACT: Nearly 30 million Americans have diabetes and face its devastating consequences—nearly 1 in 10
FACT: 84.1 million American adults—approximately 1 in 3—have prediabetes. Over half of new diagnosed diabetes cases were in adults 45-64 years old.
FACT: Periodontal disease is listed as the 6th complication
FACT: 82% of diabetic patients with severe periodontitis experienced the onset of one or more major cardiovascular, cerebrovascular or peripheral vascular events compared to only 21% of diabetics without periodontitis.

Understanding the Oral-Systemic Link: Diabetes
Research supports that infectious and inflammatory processes increase insulin resistance resulting in hyperglycemia.

Hyperglycemia (elevated blood glucose) diminishes the ability of WBC, neutrophils in particular to track, adhere and kill bacteria

Diabetes increases risk through an amplified inflammatory response and depressed wound healing; elevated blood glucose leads to elevated glucose levels in GCF hindering wound healing capacity of fibroblasts.

GCF contains elevated concentrations of cytokines producing higher levels of MMPs that promote tissue destruction and disease severity

Understanding the Oral-Systemic Link between Obesity and Periodontal Disease:
A pro-inflammatory state exists in obesity as a result of the release of several cytokines and hormones from adipose tissue into systemic circulation; similar cytokines are released into circulation in periodontal disease

Obesity is a major risk factor for a number of chronic diseases including type 2 diabetes, hypertension, cardiovascular disease, metabolic syndrome, liver disease, musculoskeletal disease, reproductive abnormalities and cancer. Recent studies have reported an association between obesity and periodontitis.

Studies prove that a high prevalence of PD can be expected among obese adults

Rheumatoid Arthritis (RA)
Understanding the Oral-Systemic Link with Rheumatoid Arthritis:
• Periodontal disease (PD) is an infection characterized by chronic inflammation, and may ultimately lead to tooth loss
• Rheumatoid arthritis (RA) is a chronic disease, characterized by inflammation of the synovium of the joints, and may ultimately lead to destruction of the joint
  o RA begins with inflammation of the synovial membrane...lymphocytes, neutrophils and other inflammatory cells migrate into the joint and release inflammatory chemicals that destroy body tissues
• Chronic inflammatory mediators are shared by both these diseases, and this has prompted researchers to investigate the possibility of a relationship between RA and PD

References & Resources:
Yoshihiro Iwamoto, Fusanori Nishimura et al. The Effect of Antimicrobial Periodontal Treatment on Circulating Tumor Necrosis Factor-Alpha and Glycated Hemoglobin Level in Patients with Type 2 Diabetes. J Periodontol.72:774-778, 2001
Arthritis Prevalence in U.S.
>50 million adults have doctor-diagnosed arthritis; 1 in 5 over age 18
>300,000 babies and children have arthritis or a rheumatic condition; 1 in 250 children
Most common form is osteoarthritis (OA) which affects an estimated 31 million Americans
More than 78 million people expected to have doctor-diagnosed arthritis by the year 2040
Arthritis is the nation’s No. 1 cause of disability

Pregnancy (PLBW)
Understanding the Oral Systemic Link with Pregnancy (PLBW):
1 in 10 infants born are considered to be preterm; improvements in neonatal intensive care medicine have improved the survival rate however rate of premature delivery has steadily climbed since the 1950’s
Other risk factors include race, smoking, alcohol and drug use, lower socioeconomic status and lower education; more than ¼ of all complicated pregnancies occur for no apparent reason
Periodontal disease may contribute by presenting an infectious, inflammatory ongoing challenge to the fetus

February 2015 Statement:
During normal pregnancy, the placenta invades the surrounding uterine tissue and provides an exchange of nutrients and waste between mother and fetus via the umbilical cord. As pregnancy progresses, amniotic fluid levels containing prostaglandin E2 (PGE2) and inflammatory cytokines—tumor necrosis factor (TNF-α) and interleukin 1 (IL-1β)—steadily rise to reach the threshold that induces labor. Thus, normal labor and delivery are induced by inflammatory signaling. One theory for the association between periodontal diseases and preterm birth is that women with periodontitis, a bacterial infection, exhibit an increase in fluid mediator levels and inflammatory cytokines, which can trigger labor prematurely. Furthermore, an increase in other markers of inflammation such as C-reactive protein (CRP) has been associated with an elevated risk for preeclampsia and intrauterine growth restriction.

Understanding the Oral-Systemic Link with Osteoporosis:
In periodontal disease, chronic oral inflammation results in destruction of oral bone and periodontal ligament

References & Resources:
Notes:

Increased production of cytokines, IL-6 stimulate osteoclast activity and promote bone resorption

Similar mechanism may contribute to osteoporosis

Evidence indicates there is an association between the two diseases

Common risk factors; age, genetics, estrogen deficiency, calcium and Vitamin D deficiency, alcohol intake and smoking

**Understanding the Oral-Systemic Link with Alzheimer’s disease**

Alzheimer’s disease (AD) is a degenerative disease of the brain characterized by neurofibrillary tangles and the accumulation of beta amyloid plaques

A strong positive correlation was found between mid life C-reactive protein levels, a marker of inflammation and the risk of developing AD. The chronic nature of oral infections, such as periodontitis, may further amplify the mechanisms that lead to the onset or progression of AD.

For the first time we are at a ‘tipping point’ in establishing a molecular link between blood glucose levels and Alzheimer’s.

Studies prove excess glucose damages a vital enzyme creating an abnormal build up of beta amyloid proteins accumulating to form hard, insoluble plaques (Diabetes 3)

**Understand and Apply the 2015 JADA Guidelines into Clinical Practice and Treatment Delivery**

**Study:**

Conduct a systematic review and meta-analysis on nonsurgical treatment of patients with chronic periodontitis by means of scaling and root planing (SRP) with or without adjuncts.

**Methods:**

A panel of experts convened by the American Dental Association Council on Scientific Affairs conducted a search of PubMed (MEDLINE) and Embase for randomized controlled trials of SRP with or without the use of adjuncts with clinical attachment level (CAL) outcomes in trials at least 6 months in duration

The panel included articles on the effectiveness of SRP with or without the following: systemic antimicrobials, a systemic host modulator (subantimicrobial-dose doxycycline), locally delivered antimicrobials and a variety of nonsurgical lasers

**Study Limitations**

Inconsistency among studies regarding the number of tooth sites and teeth assessed; whole-mouth vs. periodontal sites

“Whole-mouth measurements may lead to underestimation of the treatment effect by including healthy sites in the computation of teeth or mouth averages or of changes over time. The estimates in the meta-analyses include studies in which the investigators reported at these different levels of assessment.”

Studies did not include the reduction of CRP levels or other inflammatory mediators

References & Resources:


Determining Results and Clinical Recommendations

### Balancing level of certainty and net benefit rating to arrive at clinical recommendation strength.

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<thead>
<tr>
<th>LEVEL OF CERTAINTY</th>
<th>NET BENEFIT RATING</th>
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<tbody>
<tr>
<td></td>
<td>Benefits outweigh potential harms</td>
</tr>
<tr>
<td>High</td>
<td>Strong: In favor</td>
</tr>
<tr>
<td>Moderate</td>
<td>In favor</td>
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<tr>
<td>Low</td>
<td>Expert opinion for</td>
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</tbody>
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### Definitions for the strength and direction of recommendations.

<table>
<thead>
<tr>
<th>RECOMMENDATION STRENGTH</th>
<th>DEFINITION</th>
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<tbody>
<tr>
<td>Strong</td>
<td>Evidence strongly supports providing this intervention. There is a high level of certainty of benefits, and the benefits outweigh the potential harms.</td>
</tr>
<tr>
<td>In Favor</td>
<td>Evidence favors providing this intervention. Either there is a high level of certainty of benefits, but the benefits are balanced with the potential harms, or there is a moderate level of certainty of benefits, and the benefits outweigh the potential for harms.</td>
</tr>
<tr>
<td>Weak</td>
<td>Evidence suggests implementing this intervention after alternatives have been considered. There is a moderate level of certainty of benefits, and either the benefits are balanced with potential harms or there is uncertainty about the magnitude of the benefit.</td>
</tr>
<tr>
<td>Expert Opinion For</td>
<td>Expert opinion suggests this intervention can be implemented, but there is a low level of certainty of benefits, and there is uncertainty in the benefit-to-harm balance.</td>
</tr>
<tr>
<td>Expert Opinion Against</td>
<td>Expert opinion suggests this intervention not be implemented because there is a low level of certainty that there is no benefit or the potential harms outweigh benefits.</td>
</tr>
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### What’s the Fine Print?

Systemic SDD and SRP. For patients with moderate to severe chronic periodontitis, clinicians may consider systemic SDD (20 milligrams twice a day) for 3 to 9 months as an adjunct to SRP, with a small net benefit expected (In favor, Box 2).

#### AE assessment.

Investigators in the studies reported that SDD was well tolerated, with no participants reporting AEs. 1 study, AEs were reported only in the placebo group. The package insert lists the most frequent adverse reactions that occurred during clinical trials as headache, common cold, flu symptoms, and toothache.

We judged that antimicrobial resistance should not be a factor at subantimicrobial doses. Overall, we judged the potential for AEs from SDD was negligible.

### Conclusions

For patients with chronic periodontitis, SRP showed a moderate benefit, and benefits were judged to outweigh potential adverse effects.

Authors voted in favour of SRP as the initial nonsurgical treatment for chronic periodontitis.

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### References & Resources:

- Oral Science Video Series: Dr. Lorne Golub and Host Modulation.
- Sub-antimicrobial Dose Doxycycline (SDD) Study Listing at end of handout.
Primary etiologic basis for periodontal disease is bacterial however the excessive host inflammatory response or inadequate resolution of inflammation is critical to the pathogenesis of periodontitis

Adequate Bacterial Reduction:
- Biofilm leads to bacteremia
- Onset of bacteremia initiates inflammatory response
- Systemic involvement

Solutions for Effective Patient Self-Care
www.curaprox.com – Curaprox

Host Modulation

Periodontal Inflammation and Destruction:
Cytokines are an intermediate mechanism between bacterial stimulation and tissue destruction; may also be produced by fibroblasts and osteoblasts

The host response is the major contributing factor for chronic maladaptive periodontal disease. A deficient host response initiates the chronic condition and response that leads to further tissue breakdown

Primary etiologic basis for periodontal disease is bacterial however the excessive host inflammatory response or inadequate resolution of inflammation is critical to the pathogenesis of periodontitis

References & Resources:
T Van Dyke, C Serhan, A Novel Approach to Resolving Inflammation, Oral and the Whole Body Health; 2006:42-45
D Graves, Cytokines That Promote Periodontal Tissue Destruction, J Periodontol (Suppl.), 2008; 1585-1591

Authors voted in favour for systemic subantimicrobial-dose doxycycline and ‘weak’ for systemic antimicrobials because of the higher potential for adverse effects with higher doses of antimicrobials.
The strengths of 2 other recommendations were ‘weak’ for CHX chips and photodynamic therapy with a diode laser.

‘Expert opinion for’* doxycycline hyclate gel and minocycline microspheres however evidence is lacking and uncertainty of adverse effects

**Note that expert opinion for does not imply endorsement but instead signifies that evidence is lacking and the level of certainty in the evidence is low."
Bacteria initiate periodontitis. They are essential but insufficient. What is required is a susceptible host.

Therapeutic Benefit of Inhibiting Collagen Breakdown:

- Inhibit breakdown of collagen in diseased joint (synovial) tissues reducing severity of symptoms in ARTHRITIS
- Inhibit breakdown of collagen in connective tissues around CANCER cells: reduced local invasiveness and metastasis
- Protect collagen “cap” stabilizing cholesterol-rich arterial plaques: reduced risk for MYOCARDIAL INFACTION & STROKE
- Reduce diagnostic biomarkers of skeletal bone resorption for POST MENOPAUSAL OSTEOPOROSIS with no effect on biomarkers of bone formation
- Reduce blood levels of Hemoglobin A1C after SDD + SRP for DIABETICS

Mechanism of Action

Non-antibiotic doxycycline will help to reduce the over-production of collagenase (enzymes responsible for the destruction of collagen) and osteoclasts (bone cell responsible for the resorption of bone) that are present in overabundance during a chronic, prolonged & destructive inflammatory response. This exaggerated inflammatory response is common among inflammatory diseases such as periodontitis, cardiovascular disease and rheumatoid arthritis. Therefore, when used (BID) for 6 to 9 months, low dose doxycycline will help to modulate the chronic, prolonged & destructive inflammatory response into a normal & healthy inflammatory response process.

Integration into Practice:
Assessment, Planning, Implementation & Evaluation

20 mg twice daily as an adjunct following scaling and root planing may be administered for up to 9 months.
Take 1 capsule twice daily—morning and evening Periostat™ differs from that of doxycycline used to treat infections. Exceeding the
Self-Evaluation: Rate Your Present Periodontal Therapy Program
1. How satisfied are you with your present periodontal therapy program?
2. Are you receiving predictable outcomes?
3. What do you feel would elevate your periodontal program to the next level?
4. How are you addressing the inflammatory component of periodontal disease?
5. Do you have an evidence-based risk assessment program in place?
6. Do you feel your medical history update is uncovering sufficient information to fully address the needs of your dental hygiene patient?
7. Do you have adequate resources to educate your patient about the oral-systemic link?
8. What treatment modalities have you incorporated into your periodontal therapy program in order to reduce the bacterial burden?
9. What treatment modalities have you incorporated into your periodontal therapy program in order to address the host response?
10. What are your determinants and criteria for referring to a periodontist?

Contraindications:
Pregnant or nursing women, children, Tetracycline intolerant individuals, patients with myasthenia gravis or liver disease sufferers should not take Periostat.
Concurrent use of doxycycline may render oral contraceptives less effective. Beware misrepresentation. This statement refers to antibiotic level doxy not subantimicrobial doxy!

Although most antibiotics (including doxycycline) are unlikely to affect hormonal birth control such as pills, patch, or ring, a few antibiotics (such as rifampin, rifabutin) can decrease their effectiveness. This could result in pregnancy. If you use hormonal birth control, ask your doctor or pharmacist for more details.

Incorporating Host Modulation into DHPC
Assessment:
Chronic periodontitis in a systemically healthy patient
Smokers who have chronic generalized periodontitis
Diabetics
Patients who suffer from autoimmune disorders
Cardiovascular disease etc.

Dental Hygiene Diagnosis:
Moderate, (severe) chronic generalized periodontitis

Planning:
Imperative to both eliminate the bacteria and modulate the host for the following
Concept of packaged periodontal treatment plan including 6 – 9 months of Periostat; convert Periostat into a procedure
Non-surgical approach and practice responsibility is to treat chronic periodontal disease which will impact your oral health and reduce your risk for overall disease as well.

Implementation:
Substantivity of treatment is sustainable for a minimum of 3 months for both chronic and severe periodontitis

Evaluation:
Re-evaluation performed at regular intervals i.e. at 3 month periodontal maintenance appointment assessing inflammatory resolution
If bleeding sites still prevalent, maintain patient on 3 month regimen

Aha moment!
Patients with generalized chronic periodontitis will obviously benefit from this non-antibiotic solution, however realized that just about anyone with a chronic inflammatory condition stands to benefit as well

Recognition that this is supported by evidence based peer-reviewed literature
“My patient doesn’t want to take any more medications”
KEY TALKING POINTS:

“I’m concerned with my patient experiencing side effects from taking an antibiotic for so long”
KEY TALKING POINTS:

“My patient doesn’t have any real medical concerns at this time”
KEY TALKING POINTS:

“My patient comes in regularly, has effective self-care measures. Insurance covers a 3 month maintenance interval. There is still inflammation present and I’ll refer to periodontist when we have too.”
KEY TALKING POINTS:

“The Periodontists don’t use it.”
KEY TALKING POINTS:
Non-antibacterial tetracycline formulations: clinical applications in dentistry and medicine.

Gu Y1, Walker C, Ryan ME, Parne JR, Golub LM

Author information

Abstract
In 1963, it was first reported that tetracyclines (TCs) can modulate the host response, including (but not limited to) inhibition of pathologic matrix metalloproteinase (MMP) activity, and by mechanisms unrelated to the antibacterial properties of these drugs. Soon thereafter, strategies were developed to generate non-antibacterial formulations (subantimicrobial-dose doxycycline: SDD) and compositions (chemically modified tetracyclines; CMTs) of TCs as host-modulating drugs to treat periodontal and other inflammatory diseases. This review focuses on the history and rationale for the development of (a) SDD which led to two government-approved medications, one for periodontitis and the other for acne/roacea and (b) CMTs, which led to the identification of the active site of the drugs responsible for MMP inhibition and to studies demonstrating evidence of efficacy of the most potent of these, CMT-3, as an anti-angio genesis agent in patients with the cancer. Kaposi’s sarcoma, and as a potential treatment for a fatal lung disease (acute respiratory distress syndrome, ARDS). In addition, this review discusses a number of clinical studies, some up to 2 years’ duration, demonstrating evidence of safety and efficacy of SDD formulations in humans with oral inflammatory diseases, periodontitis, pemphigoid as well as medical diseases, including rheumatoid arthritis, post-menopausal osteopenia, type II diabetes, cardiovascular diseases, and a rare and fatal lung disease, lymphangioleiomatosis.


Treatment of early seropositive rheumatoid arthritis: doxycycline plus methotrexate versus methotrexate alone.

ODell JR1, Elliott JR, Mallesk JA, Mikuls TR, Weaver CA, Glickstein S, Elkhay KM, Hausch R, Leff RD

Author information

Abstract
OBJECTIVE: To compare the efficacy of doxycycline plus methotrexate (MTX) versus MTX alone in the treatment of early seropositive rheumatoid arthritis (RA), and to attempt to differentiate the antibacterial and antimetaboloproteinase effects of doxycycline.

METHODS: Sixty-six patients with seropositive RA of ≤1 year’s duration who had not been previously treated with disease-modifying antirheumatic drugs were randomized to receive 100 mg of doxycycline twice daily with MTX (high-dose doxycycline group), 20 mg of doxycycline twice daily with MTX (low-dose doxycycline group), or placebo with MTX (placebo group). In a 2-year double-blind study. Treatment was started with an MTX dosage of 7.5 mg/week, which was titrated every 3 months until remission was reached (maximum dosage of 17.5 mg/week). The primary end point was an American College of Rheumatology 50% Improvement (ACR50) response at 2 years.

RESULTS: ACR50 responses were observed in 41.6% of patients in the high-dose doxycycline group, 38.9% of those in the low-dose doxycycline group, and 12.5% of patients in the placebo group. Results of chi-square analysis of the ACR50 response in the high-dose doxycycline group versus that in the placebo group were significantly different (P = 0.02). Trend analysis revealed that the ACR20 response and the ACR50 response were significantly different between groups (P = 0.04 and P = 0.03, respectively). MTX doses at 2 years were not different among groups. Four patients in the high-dose doxycycline group, 2 patients in the low-dose doxycycline group, and 2 patients in the placebo group were withdrawn because of toxic reactions.

CONCLUSION: In patients with early seropositive RA, initial therapy with MTX plus doxycycline was superior (based on an ACR50 response) to treatment with MTX alone. The therapeutic responses to low-dose and high-dose doxycycline were similar, suggesting that the antimetaboloproteinase effects were more important than the antibacterial effects. Further studies to evaluate the mechanism of action of tetracyclines in RA are indicated.


Engelbrecht SP1, Hey-Hadavi J

Author information

Abstract
In vitro and animal studies suggest a possible role for the tetracycline class of drugs in the inhibition of non-enzymatic protein glycation. We conducted a 3-month, randomized placebo-controlled pilot clinical trial of conventional sub-gingival debridement (periodontal therapy), combined with either a three-month regimen of sub-antimicrobial-dose doxycycline (SDD), a two week regimen of antimicrobial-dose doxycycline (ADD), or placebo in 45 patients with long-standing type 2 diabetes (mean duration 9 years) and untreated chronic periodontitis. Subjects were taking stable doses of oral hypoglycemic medications and/or insulin. Treatment response was assessed by measuring hemoglobin A1c (HbA1c), plasma glucose, and clinical periodontal disease measures. At one-month and three-month follow-up, clinical measures of periodontitis were decreased in all groups (data to be presented elsewhere). At three months, mean HbA1c levels in the SDD group were reduced 0.9% units from 7.2% units±2.2 (±SD), to 6.3% units±1.1, which represents a 12.5% improvement. In contrast, there was no significant change in HbA1c in the ADD (7.5%±2.0 to 7.8%±2.1) or placebo (8.5%±2.0 to 8.5%±2.6) groups. Mean HbA1c change from baseline was significantly greater in the SDD group compared with the ADD group (p=0.04) but not placebo (p=0.22). Moreover, a larger proportion of subjects in the SDD group experienced improvement (p<0.05) compared to the ADD or placebo groups. Mean plasma glucose levels were not significantly different between or within the groups. The results of this pilot study suggest that the treatment of periodontitis with sub-gingival debridement and 3-months of daily sub-antimicrobial-dose doxycycline may decrease HbA1c in patients with type 2 diabetes taking normally prescribed hypoglycemic agents.
The effect of nonsurgical periodontal therapy on hemoglobin A1c levels in persons with type 2 diabetes and chronic periodontitis: a randomized clinical trial.

Enderbey SE1, Hyman LG2, Michalowicz BS3, Schenck Field ER2, Gelb MC4, Hou W2, Saeqilin ER4, Reddy MS5, Lewis CF6, Gates TW7, Tripathy D8, Kalazicki JA9, Orlandi PR10, Pagoule DW11, Hanson NO12, Tsai MY12.

Author information

Abstract

IMPORTANCE: Chronic periodontitis, a destructive inflammatory disorder of the supporting structures of the teeth, is prevalent in patients with diabetes. Limited evidence suggests that periodontal therapy may improve glycemic control.

OBJECTIVE: To determine if nonsurgical periodontal treatment reduces levels of glycated hemoglobin (HbA1c) in persons with type 2 diabetes and moderate to advanced chronic periodontitis.

DESIGN, SETTING, AND PARTICIPANTS: The Diabetes and Periodontal Therapy Trial (DPTT), a 6-month, single-masked, multicenter, randomized clinical trial. Participants had type 2 diabetes, were taking stable doses of medications, had HbA1c levels between 7% and less than 9%, and untreated chronic periodontitis. Five hundred fourteen patients were enrolled between November 2009 and March 2012 from diabetes and dental clinics and communities affiliated with 5 academic medical centers.

INTERVENTIONS: The treatment group (n = 257) received scaling and root planing plus chlorhexidine oral rinse at baseline and supportive periodontal therapy at 3 and 6 months. The control group (n = 257) received no treatment for 6 months.

MAIN OUTCOMES AND MEASURES: Difference in change in HbA1c level from baseline to group at 6 months. Secondary outcomes included changes in probing pocket depth, clinical attachment loss, bleeding on probing, gingival index, fasting glucose level, and Homeostasis Model Assessment (HOMA2) score.

RESULTS: Enrollment was stopped early because of futility. At 6 months, mean HbA1c levels in the periodontal therapy group increased 0.17% (SD, 1.0), compared with 0.11% (SD, 1.0) in the control group, with no significant difference between groups based on a linear regression model adjusting for clinical site (mean difference, -0.05% [95% CI, -0.23% to 0.12%]; P = .56). Periodontal measures improved in the treatment group compared with the control group at 6 months, with adjusted between-group differences of 0.28 mm (95% CI, 0.19 to 0.37) for probing depth, 0.25 mm (95% CI, 0.14 to 0.35) for clinical attachment loss, 13.1% (95% CI, 8.1% to 18.1%) for bleeding on probing, and 0.27 (95% CI, 0.17 to 0.37) for gingival index (P < .001 for all).

CONCLUSIONS AND RELEVANCE: Nonsurgical periodontal therapy did not improve glycemic control in patients with type 2 diabetes and moderate to advanced chronic periodontitis. These findings do not support the use of nonsurgical periodontal treatment in patients with diabetes for the purpose of lowering levels of HbA1c.


Clinical and biochemical results of the metalloproteinase inhibition with subantimicrobial doses of doxycycline to prevent acute coronary syndromes (MIDAS) pilot trial.

Brown DL1, Dessai KK, Vakili BA, Nouneh C, Lee HM, Golub LM.

Author information

Abstract

BACKGROUND: Vulnerable plaque demonstrates intense inflammation in which macrophages secrete matrix metalloproteinases (MMPs) that degrade the fibrous cap, ultimately leading to rupture, in situ thrombosis, and an associated clinical event. Thus, inhibition of MMP activity or more general suppression of vascular inflammation are attractive targets for interventions intended to reduce plaque rupture. We hypothesized that subantimicrobial doses of doxycycline (SDD) (20 mg twice daily) would benefit patients with coronary artery disease by reducing Inflammation and MMP activity and thus possibly prevent coronary plaque rupture events.

METHODS AND RESULTS: We conducted a prospective, randomized, double-blind, placebo-controlled pilot study of 6 months of SDD or placebo treatment to reduce inflammation and prevent plaque rupture events. A total of 50 patients were enrolled, of whom 24 were randomized to placebo and 26 to SDD. At 6 months, there was no difference in the composite endpoint of sudden death, fatal myocardial infarction (MI), non-fatal MI, or troponin-positive unstable angina in SDD compared with placebo-treated patients (8.4% vs 0%, P = 0.491). Biochemical markers of inflammation were assessed in plasma at study entry and after 6 months of therapy in 30 patients. In SDD-treated patients, high-sensitivity C-reactive protein (CRP) was reduced by 46% from 4.84 ± 0.6 microg/mL to 2.64 ± 0.4 microg/mL (P = 0.007), whereas CRP was not significantly reduced in placebo patients. Interleukin (IL)-6 decreased from 22.1 ± 3.7 pg/mL at baseline to 14.7 ± 1.8 pg/mL at 6 months in SDD-treated patients (P = 0.025) but did not decrease significantly in placebo-treated patients. On zymography, pro-MMP-9 activity was reduced 50% by SDD therapy (P = 0.011), whereas it was unchanged by placebo treatment.

CONCLUSIONS: SDD appears to exert potentially beneficial effects on inflammation that could promote plaque stability. These findings should be investigated in a larger study.
Empower the Patient through the Provision of Resources to Understand the Oral Systemic Connection

The Least Important Thing We Did Today Was Clean Your Teeth – Dr. Tim Donley
Colgate Professional;
www.colgateprofessional.com/professional-education/oral-systemic-health
American Academy of Periodontology Consumer Site;
http://www.perio.org/consumer/other-diseases
What’s Your Real Age?
wwww.realage.com
Oral Systemic Link Professional and Public Information;
www.oralsystemiclink.pro
www.oralsystemiclink.net

Product References:
Curaprox brushes, interdental brushes, Gengigel, X-Pur, Xylimelts etc. www.oralscience.com

Thank you for your time and participation. If there is anything further that I may assist you with in regards to this presentation please do not hesitate to contact me.
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Medical History Update

Patient Name: ___________________________________________ Date: ______________________________

Recent research indicates a strong relationship between the mouth and the body. Since we now know how closely they are related, we are going to be asking you some questions about your family history and your overall health that we may not have asked you about before. This additional information will assist us in providing the best possible care to maintain your oral health and overall wellness.

1. Any changes in your health since your last dental visit?   Yes □  No □ If yes, please list: ________________________________________________________________

2. What medications are you taking? ___________________________________________________________________

3. Any changes in medication dosage or medications?   Yes □  No □ If yes, please list: ________________________________________________________________

4. What over the counter or ‘herbal/natural’ supplements are you taking on a regular basis? Please list: ________________________________________________________________

5. Do you smoke or use smokeless tobacco products?   Yes □  No □ If yes, please list: ________________________________________________________________

6. Are you taking any bisphosphonates in the past or presently?   Yes □  No □ If yes, please provide details: ________________________________________________________________

7. Do you have a persistent sore throat, hoarseness, ear ache or feeling of something being caught in your throat?   Yes □  No □ If yes, please provide details: ________________________________________________________________

8. Have you ever been diagnosed with a high-risk strain HPV infection?   Yes □  No □

9. Have you had any surgery or been hospitalized since your last visit?   Yes □  No □ If yes, please explain: ________________________________________________________________

10. Are you being treated for any medical problem presently?   Yes □  No □ If yes, please explain: ________________________________________________________________

11. Have you ever taken antibiotics prior to having your teeth cleaned or before dental work?   Yes □  No □ If yes, please explain: ________________________________________________________________

12. Any allergies to drugs, food, metal or latex? Yes □  No □ If yes, please list: ________________________________________________________________

13. History of illness or disease in family? If yes, please explain: ________________________________________________________________

14. Have you been diagnosed with osteoarthritis or rheumatoid arthritis? Yes □  No □

15. Have you experienced increased joint pain or decrease in mobility?   Yes □  No □

16. Have you been diagnosed with diabetes?   □ Type I □ Type II □ Pre-diabetes
  □ Diet-controlled □ Medication controlled □ Under control:   Yes □  No □

17. Does your mouth frequently feel dry?   Yes □  No □

18. Have you had any heart problems or a knee, hip or prosthetic joint replacement?   Yes □  No □ If yes, provide details: ________________________________________________________________

19. Have you had a bone mineral density test?   Yes □  No □ Results: ________________________________________________________________

20. Female patients; Are you pregnant?   Yes □  No □

21. On a scale of 1 to 10 (10 being highest), how would you rate your general health at this time? ________________

22. How would you rate your level of stress presently?   Low □  Moderate □  High □

23. On a scale of 1 to 10 (10 being highest), how closely related is the health of your mouth to your overall health in your opinion? ______________
References: Subantimicrobial Dose Doxycycline (SDD) *


*Note: This does not comprise a complete listing of studies related to LDD.