Title: propolis as a defense against oxidative stress in periodontal disease.

Introduction and rational: an important aspect of chronic periodontitis is the alteration of the immune system in balance between antioxidants and reactive oxygen species in favor of the latter. Oxidative stress can aggravate the clinical manifestations of patients with periodontal disease and other inflammatory diseases. Oxidative stress is physiological within certain limits but under conditions of chronic inflammation the uncontrolled production of reactive oxygen species can lead to tissue damage. For example, oxidative stress could justify the particular severity of symptoms of periodontal disease that we find in patients with diabetes mellitus or autoimmune diseases such as systemic lupus erythematosus. Oxidative stress can be measured as much in blood as in the saliva, both in terms of oxidizing species that in terms of the patient's antioxidant power. The simplicity of execution of the salivary buffer justifies the widespread use of this type of test, in order to identify patients with limited antioxidant defenses and to monitor the effectiveness of periodontal therapy over time. There are today several strategies of non-surgical therapy performed to support the classic therapy with ultrasound. In patients with systemic inflammatory nature, that could compromise the oxidative balance, it makes sense to create a specific and individualized therapy. Propolis gel lends itself well to home treatment as easy to use and with good substantivity.

Objective: the objective of the study is to evaluate the possible benefit of the administration of propolis gel in the treatment of periodontal disease. This Protocol is a pilot study therefore our aim is to pave the way for laboratory and clinical investigations involving the enrollment of a substantial number of patients.

Materials and methods: this study is a prospective, randomized clinical trial, and will take place at the premises of the Tuscany Dental Institute. Afferent patients will be filtered through specific exclusion criteria:

- patients with insufficient motivation to participate in the present study;
- patients irradiated to the head or neck in the last 12 months;
- patients with diabetes or other systemic diseases are not controlled;
- pregnant women and nursing mothers;
- patients who abuse drugs and alcohol.
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Criteria for inclusion in the study will be the diagnosis of periodontal disease. Patients will be randomly assigned to two different experimental groups: a control group in which the plan of treatment of periodontal disease involves the binding of the oral hygiene of instructions home hygiene with chlorhexidine in mouthwash. The test group, by contrast, combines classic progfessional treatment with home oral hygiene use of propolis gel.

At time zero (T0 or baseline) all patients will undergo periodontal visit, dental and medical history and then to collect a saliva sample to assess local antioxidant power. After the taking of saliva, the trained operator will perform the professional oral care about each patient included. The operator actually gives the instructions for proper hygiene at home much to the test group than the control group by prescribing, in the first case, a therapy with chlorhexidine mouthwash, in the second, propolis gel therapy.

At time 1 (T1 or 1 month of professional hygiene session) all patients will undergo periodontal examination and collection of a saliva sample to assess local antioxidant power. Patients will receive a questionnaire relating to the level of satisfaction and acceptance of the therapy.

At time 2 (T2 or 3 months of professional hygiene session) all patients will undergo periodontal examination and collection of a saliva sample to assess local antioxidant power. Patients will receive a questionnaire relating to the level of satisfaction and acceptance of the therapy.

Periodontal parameters to measure are:

- clinical attachment
- probing depth
- amount of keratinized tissue
- bleeding index
- index of plaque.

Saliva samples are obtained through simulation of a chewing cycle by the patient on a small sterile gauze. Then the content collected is squeezed into a test tube and analyzed by spectral analysis. The kit contains a reagent and a chromogenic substance can detect the amount of antioxidant substances in saliva once the sample in the spectrophotometer (FRAS 4 Evolvo, H&D s.r.l.).

The data collected will be incorporated into a statistical software that will execute first a descriptive rating, then a multivariate analysis of the variables collections.

Expected results: we expect all patients (test group and control group) show an improvement of clinical variables and the salivary dosage of antioxidants. Goal of the study is to evaluate the possible benefit of the administration of propolis gel in the treatment of periodontal disease.