

LONG TERM VALIDATION OF “PERIODONTAL RISK ASSESSMENT UNITS”

Castronovo G., Gronelli G., Frattini C., Nicolin V., Zanon G.

Università di Trieste ~ Trieste ~ Italy

The risk assessment in a subject estimates the risk of predisposition to the progression of the periodontal disease. It consists of an evaluation of editable parameters, such as the state of gum health or the prevalence of periodontal pockets, environmental factors like smoking habits and others not editable such as individual predisposition. Individual risk factors have not been able to predict the progression of the periodontal disease, therefore it has been proposed to evaluate them all together.

In 2009, at the “Clinica Stomatologica dell’Università di Trieste” [Stomatology Clinic of the University of Trieste], with the aim of predicting the degree of risk of a single subject of evolving in a case of periodontal disease, a model of “Periodontal Risk Assessment” has been designed, based on the use of 6 parameters and inspired by the one used by Lang & Tonetti in 2003. The “genetic predisposition” factor has been changed to “local dento-specific factors”. We’ve considered for example the furcation impairment, a malposition or a context of crowding, II degree mobility, incongruous and protruding restorations. These parameters are dose-dependent, which means that the higher the quantity, the wider the area of risk that is going to be calculated in order to define the individual risk of the patient.

The objective of this research is to understand if the “Periodontal Risk Assessment UniTs” can be seen as an effective methodology for predicting the risk of progression of a periodontal disease in patients analysed for a period of about 8 years. Finally the population of individuals has been split into 2 subgroups according to the permanence or not of the patient in Supportive Periodontal Therapy (SPT), in order to evaluate the influence of compliances on the results.

The individuals have been divided into 3 classes according to the initial assessed risk (low, medium or high). For each individual at the baseline and after 8 years (from 2009 to 2016), a complete periodontal file was made, where, for the creation of the initial risk area, we took in consideration the Bleeding on Probing (BoP %), Pocket Depth \geq 5mm (PD \geq 5mm); the number of lost teeth (out of 28). During the anamnesis the potential smoking habit has been considered, taking into account the number of cigarettes smoked per day and an intraoral radiography of the tooth which from the periodontal file seemed to be the most damaged was taken, in order to calculate the bone loss compared to age. During the same session an objective examination was performed where “local factors” were referred too. The collected data were inserted in a risk diagram later compared to the diagram of the same patient from 8 years before.

We were able to reassess 140 of the 199 initial patients, 81 of which throughout the years were regularly maintained in Supportive Periodontal Therapy, whereas 59 weren’t. 53 were at high initial risk; 24 at medium initial risk, and only 4 at low risk. This last category, being small, wasn’t taken into consideration during this research.

In high risk patients there was an average of 2.45 lost teeth per patient, while among those at medium risk it was 1.22. If we compare this data in the 2 subcategories: those at high risk NOT in SPT had an average of 3.05 lost teeth compared to those in SPT with an average of 2 lost teeth per patient. In those at medium risk the average is 1.75 teeth per patient NOT in SPT, while it is 1 tooth per patient in SPT. Regarding the supporting bone of the most compromised tooth, high risk patients lost an average of 0.65mm and those at medium risk 0.49mm. Data in the 2 subgroups are as follows: in high risk the loss is averagely 0.76mm for NOT in SPT and 0.57mm for those in SPT. For the medium risk the subgroup NOT in SPT lost averagely 0.49mm and those in SPT 0.48mm. Considering vitiated habit of smoking: 12.34% of patients in SPT increased the number of smoked cigarettes while 23.46% smoked less or stopped. In patients NOT in SPT the percentage is 16.07% for those who increased the number of smoked cigarettes and 16.95% for those who smoked less or stopped.

According to data obtained with “Periodontal Risk Assessment UniTs”, patients considered at high risk had an higher loss of dental elements and alveolar bone compared to those at medium risk. SPT led to a lower progression of the periodontal disease both in “high risk” and “medium risk” groups. The data we obtained allow us to come to the conclusion that the “Periodontal Risk Assessment UniTs” has some usefulness in preventing the progression of the periodontal disease. Regarding smoking habit disposal it is clear that there has been a higher percentage of patients who smoked less or stopped for patients regularly followed during SPT sessions, compared to those not regularly followed.

PREGNANCY AND ORAL HEALTH: INTRODUCING AN INFORMATORY TOOL FOR THE PRIMARY PREVENTION OF A PREGNANT PATIENT

Di Piazza A.*, Conte M., Costantinides F., Frattini C., Nicolin V., Di Lenarda R.

University of Trieste ~ Trieste ~ Italy

Pregnancy has been defined by the World Health Organization (WHO) as a physiological condition (whose beginning and ending are well-defined), which presents biochemical and metabolic alterations. These alterations can lead to several diseases even at an oral level, such as gingivitis gravidarum, periodontitis, dental erosion, caries and epulis gravidarum.

Periodontal diseases have often been linked to certain negative outcomes of pregnancy, therefore it is considered very important to protect the health of the oral cavity.

The aim of this study is to promote oral health in pregnant women and prevent oral pathologies with newborns, by means of the distribution of an informatory leaflet combined with a satisfaction survey.

An informatory leaflet and an anonymous satisfaction survey have been submitted to the 50 voluntary pregnant participants that have been recruited.

Patients who had recently given birth or with mental disorders have been ruled out of the study.

The submitted leaflet included information regarding the oral hygiene of the pregnant mother and the one of the newborn baby, whereas the anonymous survey asked 8 questions in terms of the level of satisfaction on this informatory initiative and required an initial completion by the patient with its age, gestation period and number of pregnancies.

The patients who have been examined were on average 30 years old (□ 6,7). At t
administration of both leaflet and survey, more than 74% of the patients was experiencing pregnancy for the first time, while the remaining 26% was at its second pregnancy or more. When considering instead the gestation period, 10% of the patients was at its first trimester, 32% at its second and 48% at its third.

The answers to the survey have revealed that the patients considered the proposed leaflet as useful (for the 76.0% of them), whereas the remaining 24.0% considered it quite useful. 74.0% of the patients admitted not to be aware of at least one of the topics proposed in the leaflet, among which: the 48.0% was not aware of the eventual correlation between oral health and pregnancy; the 8.0% did not have knowledge of plaque causing dental and periodontal issues; another 8.0% was not informed on the fact that during pregnancy eventual erosions could occur due to emesis; the 40.0% was not aware of the fact that dental checkups during pregnancy are safe; the 44.0% did not know how and according to which dosage to administer fluorine to the newborn baby; the 34.0% did not know how to perform a proper oral hygiene to the newborn baby.

46.0% of the patients suggested that these information had not been provided by any healthcare professional, whereas the 12.0% of them suggested that they had been only partially provided, and finally only the 24.0% of them had received these information.

42.0% of the patients said that the leaflet has had an impact on the everyday measures of oral hygiene, whereas the 46.0% admitted to a partial impact, and finally the 12.0% has not noticed any influence on the methods of domestic oral hygiene.

100% of the patients declared to consider the leaflet as a good preventive methodology, while at the same time the 84.0% of them had never experienced a similar informatory methodology.

22.0% of the patients declared that it would have preferred to receive these information by the means of a different methodology.

By analyzing the data collected with this study, it is possible to assert that both general knowledge in terms of oral health and level of information, within this group of patients, could be considered at a low-medium degree; a lack of primary prevention during the entire gestation period could also be identified; the circulation of information regarding the importance of the maintenance of oral health during pregnancy seems to be left at the discretion of each healthcare professional.

Patients seemed to appreciate the leaflet, by considering it as a good methodology for circulation of information regarding the primary prevention.

ORAL HEALTH IN DIABETIC PATIENTS: CLINICAL REPORT FROM A DENTAL UNIT WITHIN A PUBLIC ITALIAN UNIVERSITY HOSPITAL

Gioppo Boggio C.¹, Vecchiatini R.^{1,2}, Mobilio N.², Guarnelli M.E.^{1,2}, Trombelli L.^{1,2}

¹ Dental Unit, University Hospital, Ferrara, Italy

² Research Centre for the Study of Periodontal and Peri-implant Diseases, University of Ferrara, Italy

BACKGROUND: Nowadays the bi-directional relationship between diabetes and periodontitis has been well recognized by several studies. Despite the growing evidence that periodontitis negatively affects glycaemic control, frequently subjects with diabetes have been proven to underestimate the importance of oral-care and oral health for themselves. This is further reinforced by interventional studies, where successful periodontal therapy can lead to improvements in glycaemic control in these patients.

AIM: To characterize a specific population of type I and II diabetes patients referred to Dental Unit, University Hospital, Ferrara, Italy.

METHODS: In collaboration with the Diabetology Unit of the University Hospital of Ferrara, Dental Unit developed a clinical program focused on diabetic patients oral health, called “Dolce Sorriso”. All participants underwent a comprehensive oral examination and clinical parameters record (i.e. PII, PD, BoP, n. of sites with probing depth > 4 mm, DMFT, Periodontal Risk Score). All dentate patients underwent to specific non surgical periodontal treatment. Considering periodontitis severity, each patient was evaluated after 4, 6, or 12 months. All data recorded were compared to those recorded from a population of healthy subjects, matching diabetes patients for sex, age and habits (nondiabetic, systemically and periodontally healthy non-smokers).

RESULTS: During 18 months observation time, 56 diabetic patients underwent to clinical oral examination. Excluding edentulous patients, 37 patients, received complete dental preventive treatments, including non surgical periodontal treatment and/or dental extraction and caries treatments. 100% of patients came to Dental Unit for 4 or 6 months recall-visit (compared to 55% of healthy patients), and 48% of patients came to Dental Unit for 12 months recall-visit (compared to 21% of healthy patients).

In unadjusted analyses, baseline and 4 or 6 months data differed in terms of average PII, BoP, % of sites with probing depth > 4 mm. DMFT did not differ, while BoP score was significantly reduced (Friedman test $p < 0,05$).

CONCLUSIONS: As reported in literature, short- term effect of periodontal therapy among patients with diabetes is similar to healthy subjects. The clinical effectiveness of nonsurgical periodontal therapy is shown in this report through the significant improvement of all periodontal parameters after 6 months in diabetic patients. Research findings concerning long-term effect of periodontal therapy among patients with diabetes are scarce. We found that non surgical periodontal therapy can positively affects periodontal health of all diabetics only focusing on the needing of improved compliance for diabetes patients, obtained in Dental Unit with a strict program such as “Dolce Sorriso”. motivation, counselling and psychological approach may have a positive effect on oral health, self-care and oral-care of diabetic patients. Dental hygienists’ role for these patients management could be crucial and needs to be investigated in further studies.

STRATEGIES FOR COMPLIANCE IMPROVEMENT IN DIABETIC PATIENTS

Rizzato S.¹, Vecchiatini R.^{1,2}, Trombelli L.^{1,2,3}

¹ *Department of Biomedical and Specialty Surgical Sciences, University of Ferrara, Italy*

² *Dental Unit, University Hospital, Ferrara, Italy*

³ *Research Centre for the Study of Periodontal and Peri-implant Diseases, University of Ferrara, Italy*

BACKGROUND: Diabetes is an increasing public health concern, affecting 415 million people worldwide and projecting to rise to 642 million by 2040. Health literacy (HL) represents not only the skills needed by an individual to process health-related information, but also the demands of the health system in terms of delivery of information or instructions. With the rising prevalence and severity of diabetes mellitus and its complications, such as periodontitis, the incorporation of tailored cultural strategies into diabetes management by health providers is important to promote the equity of the demands of the health system together with the individual's ability to effectively use oral-care information. Although importance of supportive periodontal therapy has been well documented for diabetic patients, many studies have shown patient compliance to be poor.

AIM: This report reviews some of the extensive literature in HL, focusing on the need of improved compliance for diabetes patients.

Materials and Methods: Articles and other documents for this review were selected:

- by searching MEDLINE and related databases, such as Web of Science, CINAHL, ERIC;
- by consulting existing bibliographies;
- by using both forward and backward reference chaining techniques;
- by tracking recent international activities in HL;
- by reading contents in scientific society websites (for oral care and diabetes control and management).

RESULTS: According to HL suggestion, specific leaflet addressed to diabetic patients was written, focusing on compliance during periodontal therapy and long term benefits after high adherence to therapy. Focusing on the problem of the basic literacy level of the patient, the readability of the health-related materials that the patient is expected to read was analyzed. As suggested by literature, reading material was at the fifth- or sixth- grade reading level, rather than the 10th- or 11th-grade level at which many patient materials are written. It is suggested to choose simple, common words and short sentences and writing in the active voice and in a conversational and personalized style. Culturally appropriate relevant content focused on actions and behaviors rather than underlying principles is preferred. The purpose of the communication has to be clear, and essential information are presented in a direct and specific way. Aspects of layout, such as large mixed-case font, question-answer format, bulleted lists, and illustrations were preferred over other presentation formats.

CONCLUSIONS: As reported, HL involves a complex set of skills. It involves reading and writing (print literacy), listening and speaking (oral literacy), and cultural and conceptual knowledge. A good deal of the HL literature has concentrated on one aspect of print literacy, namely readability. HL can influence important health outcomes in many different ways, including the acquisition of disease knowledge (i.e. diabetes and periodontitis and their bi-directional relationship), improving self-efficacy and adherence with self-care behaviors. Health informaticians, health educators, and health care providers (i.e. dental hygienists) all need to work together to ensure that everyone has an equal opportunity to access, understand, and use health information. Self-efficacy of diabetes self-care has been significantly associated with self-care behaviors and glycemic control. This positive behaviour should be enhanced by patients' awareness of being compliant during periodontal therapy. Its importance in daily life has to be told to patients effectively, focusing on immediate and long term positive effects, that are strictly patient-related.

COMPARATIVE ANALYSIS OF SUBGINGIVAL MICROBIOTA BETWEEN INDIVIDUALS WITH CHRONIC PERIODONTITIS AFFECTED OR NOT BY TYPE 2 DIABETES MELLITUS

Valeriani L.*, Gatto M.R.A., Checchi L., Montevecchi M.

Reparto di Parodontologia ed Implantologia, Clinica Odontoiatrica, DIBINEM. Alma Mater Studiorum, Università di Bologna ~ Bologna ~ Italy

Clear evidences have shown that there exists a bidirectional relationship between diabetes mellitus and periodontal disease. The former, in fact, represents a risk factor for the onset of the latter, which is therefore called “the sixth complication” of diabetes. Conversely, periodontal disease is able to affect the diabetes regulation, conditioning its systemic impact.

Many hypothesis have been made to explain the influence of diabetes over periodontal disease. Among them, some authors have suggested that diabetes may influence the subgingival microbiota.

Even though some evidence supports this hypothesis, it still remains barely investigated. A better comprehension of this aspect could lead to more targeted therapeutic strategies.

The aim of this study was to compare the prevalence and bacterial load of six main periodontal pathogens among chronic periodontitis patients with or without type 2 diabetes mellitus.

After selecting 20 diabetic patients (test group), a retrospective trial has been developed with a group ratio 1:1, using as matching variable the extension and severity of periodontal damage.

Data were obtained from the Periodontal and Implantology Division database at Bologna University.

Inclusion criteria were: diagnosis of chronic periodontitis, diagnosis of type 2 diabetes mellitus (only for the test group), presence of at least 12 teeth, age higher than 18 years, and caucasian race.

Patients were excluded if they were pregnant or lactating, required systemic antibiotics within 3 months prior to the microbiological testing or anti-inflammatory therapy in the month before the visit, if they were suffering from any other systemic disease except diabetes mellitus (arthritis, ulcerative colitis, Crohn's disease, osteoporosis or osteopenia, HIV infection, hematologic diseases, neoplastic diseases, cardiovascular diseases or other pathologies that could potentially interfere with the periodontitis and/or with diabetes), if they suffered from mental disorders and/or had received periodontal treatment in the 6 months before the microbial test.

The microbiological data were recorded during the first visit and obtained by means of a quantitative real-time-PCR. The bacterial load of each species, the total bacterial load of the single periodontal site, and the percentage of pathogens compared to the total load were analyzed.

The bacterial pathogens examined were: *Aggregatibacter actinomycetemcomitans*, *Porphyromonas gingivalis*, *Prevotella intermedia*, *Treponema denticola*, *Fusobacterium nucleatum* and *Tannerella forsythia*.

The study protocol was previously approved by the Ethics Committee Bologna-Imola. (Reference Number: EC 16044)

The 2 groups resulted balanced in terms of demographic and clinical parameters, except for suppuration.

The diabetic patients were 9 Female and 11 Male with a mean age of 56.5 ± 9 years while non-diabetic patients (10 female, 10 male) had a mean age of 49.5 ± 14 years.

In the microbiological test sites (4 for each patient) the mean probing pocket depth was 6.33 ± 1.62 mm in diabetic patients and 6.42 ± 1.77 in non-diabetic patients, while sites with suppuration were 5 in the test group and 25 in the other.

All diabetics were subjected to a metabolic control regime (metformin, insulin and/or diet control). The 65% of them suffered of diabetes for less than 15 years.

Results show that diabetic patients had significantly greater amount of total bacterial load, red complex (*Porphyromonas gingivalis*, *Treponema denticola* and *Tannerella forsythia*) and *Fusobacterium nucleatum* ($p < 0,05$). Comparing to the total bacterial load, only *Tannerella forsythia* maintained its prevalence in diabetic patients ($p = 0,0001$).

This retrospective study supports the hypothesis that microbiological differences exist between periodontal subjects affected and not by diabetes mellitus.

Further investigations on broader samples and larger bacterial range are recommended.

SUBGINGIVAL MICROBIOTA IN DESQUAMATIVE VERSUS PLAQUE-INDUCED GINGIVITIS: A CROSS-SECTIONAL STUDY IN A CAUCASIAN POPULATION

Bianco L.*, Romano F., Cricenti L., Arduino P.G., Broccoletti R., Aimetti M.

Department of Surgical Sciences, CIR Dental School, University of Turin ~ Turin ~ Italy

The presence of epithelial desquamation, erythema, and erosions on the gingival tissue is usually described in literature as desquamative gingivitis (DG). A wide range of autoimmune/dermatological disorders can manifest as DG, although the two more common are oral lichen planus (OLP) and mucous membrane pemphigoid (MMP). It has been reported that DG could play a role in increasing the long-term risk for periodontal tissue breakdown at specific sites, however there is scarce evidence to support this. In addition, no information is available on the association between the main periodontal pathogens in subgingival plaque samples of patients with DG and plaque-induced gingivitis (GI).

The aim of the present cross-sectional study was to investigate the prevalence of 11 periodontal-pathogenic microorganisms in DG cases and to compare it with microbiologic status of individuals affected by GI.

Clinical and microbiologic data were obtained from a total of 66 subjects (33 in each group) who were recruited consecutively among Caucasian patients attending the Oral Medicine Section and the Periodontology Section of the C.I.R. Dental School, University of Turin (Italy). The study protocol was approved by the Institutional Ethical Committee (protocol n° 1015/2016).

The DG group comprised 19 patients with OLP and 14 patients with MMP. Histological diagnosis of OLP and MMP was made on the basis of WHO criteria and confirmed by direct immunofluorescence analysis. To be included in the study, the GI subjects had to be systemically healthy, have no probing depth (PD) and clinical attachment level >3 mm, and bleeding on probing (BoP) at sites ≥20%.

All the study participants received an oral examination performed by two calibrated and experienced clinicians, together with a full-mouth periodontal examination. Subgingival plaque samples were taken from 4 periodontally affected sites, one in each quadrant, with signs of gingival inflammation (BoP positive) and a PD of ≤ 3 mm, in both groups. The deepest site in each quadrant was selected. In patients with DG, sampled sites must also present clinical evidence of DG lesions. Pooled subgingival plaque samples were analysed with a semi-quantitative polymerase chain reaction (PCR) analysis by a blinded microbiologist.

Odds ratios (OR) and 95% confidence intervals were obtained from univariate and multivariate logistic regression analyses [adjusted for age, FMPS, FMBS, number of missing teeth and PD] to model the relationship between DG and bacterial exposure.

DG patients presented with significantly higher mean FMPS (73.35% versus 53.58%, $P < 0.001$), FMBS (70.61% versus 58.51%, $P < 0.001$), and PD values (2.73 mm versus 2.14 mm, $P < 0.001$) compared with the control group. However, these differences, probably due to the worse compliance of DG patients in daily oral hygiene, had little clinical significance.

The PCR results showed that at least one species of periodontal pathogens was found in each patient. *Fusobacterium nucleatum/periodonticum* was found in statistically higher levels in subgingival samples from DG than GI patients, followed by *Eikenella corrodens* and *Aggregatibacter actinomycetemcomitans* which displayed also higher detection frequency in the DG cases (66.7% versus 24.2%). In spite of the high detection rate and counts for the other tested bacteria in DG lesions, except for *Parvimonas micras*, no statistically significant differences could be observed when compared with healthy GI patients. After adjustment for age, FMPS, FMBS, PD and number of missing teeth the subgingival colonization of *Aggregatibacter actinomycetemcomitans* and *Fusobacterium nucleatum/periodonticum* was not yet significantly associated with DG, whereas high levels of *Eikenella corrodens* were associated with a 13-fold increased odds for DG. No statistical difference in the microbiologic profile was detected between OLP and MMP patients.

There is a considerable deficiency in present knowledge of the pathogenesis and risk factors of DG. To the best of the authors' knowledge, this is the first controlled study comparing microbiologic profile in DG and GI patients. Microbiologic differences were found in subgingival plaque between autoimmune and plaque-induced gingivitis. This may suggest a possible association between periodontal pathogens and DG, as well as provide new knowledge to the field of oral manifestations of autoimmune systemic diseases. For this reason, affected patients should be advised regarding the possible risk of periodontal complications and should be informed to have routinely dental check-ups to avoid a deterioration of the condition. Future larger prospective studies could possibly give more valuable information.

EVALUATION OF EFFICACY OF THREE CHLORHEXIDINE BASED MOUTHWASHES WITH DIFFERENT COMPOSITIONS. IN VIVO STUDY

Guerra F.^[3], Nardi G.M.^[2], Pasqualotto D.*^[2], Rinaldo F.^[2], Mazur M.^[2], Corridore D.^[2], Nofroni I.^[1], Ottolenghi L.^[2]

^[1]Department of Public Health and Infectious Diseases, "Sapienza" University of Rome ~ Rome ~ Italy,

^[2]Department of Oral and Maxillo-Facial Sciences, "Sapienza" University of Rome ~ Rome ~ Italy,

^[3]Department of Oral and Maxillo-Facial Sciences, "Sapienza" University of Rome ~ Roma ~ Italy

The central role of oral biofilm in caries and periodontal diseases has been demonstrated. Dentists and dental hygienists frequently recommend the use of additional aids such as an antimicrobial agent in the form of mouthwash, toothpaste, gel or spray in addition to scheduled sessions of professional oral hygiene and daily oral hygiene procedures (proper tooth brushing and flossing). For more than 30 years, the most widely used is chlorhexidine (CHX). In periodontology, chlorhexidine aids to prevent bacterial biofilm build-up, microbial re-colonization of treated sites and, therefore, to inhibit gingivitis progression.

Several molecules have been associated with chlorhexidine alone to maximize its antimicrobial efficacy or reduce side effects such as alteration of food taste, mucosal irritation, staining of composite restorations and unsightly yellow-brown pigmentation of enamel and tongue.

Cetylpyridinium chloride (CPC) is an amphiphilic quaternary compound, with a demonstrated efficacy in increasing antimicrobial activity when incorporated into oral hygiene products. CPC interaction with bacterial cell membrane results in leakage of cellular components, disruption of bacterial metabolism, inhibition of cell growth, and cell death.

ADS is an anti-discolouration system based on ascorbic acid and sodium metabisulphite. It is able to interfere with the two main processes leading to pigmentations development, respectively, the protein denaturation with metal sulphides formation and the Maillard reaction, processes of condensation and polymerization of carbohydrates, peptide and proteins, which causes development of brown staining substances, known as melanoidinis.

The main aim of this study was to compare three mouthwashes based on chlorhexidine 0.20% and 0.12% with and without no-staining system, in reducing the bacterial biofilm and gingival bleeding in association with professional oral hygiene. In particular:

- To evaluate the influence of ADS system on the effectiveness of chlorhexidine mouthwash.
- To compare 0.12% chlorhexidine + 0.05% CPC with 0.20% chlorhexidine in reducing plaque and marginal gingival bleeding.

Secondary aim was to evaluate patient perception of chlorhexidine side effects.

This study was conducted on 64 patients (aged 18-40) with Gingival Index (GI) scored between 1.1 -2.0. Patients were randomly allocated into three groups:

- Group 1: 0.20% chlorhexidine with Anti-Discoloration System (ADS)
- Group 2: 0.20% chlorhexidine
- Group 3: 0.12% chlorhexidine with 0.05% cetylpyridinium chloride (CPC)

All the patients subscribed an informed consent and underwent to the same treatment. The same operator performed all treatments.

T0 - At baseline, clinical indices Plaque control Record (O' Leary Index) and Bleeding index (GBI - Ainamo, Bay), and intraoral digital photographs were recorded.

T1 - All patients underwent professional oral hygiene and selective polish. Clinical images with camera were collected again. Each patients received motivation and instruction of oral hygiene. The instructions for use of mouthwash were as follows: oral rinse with 10 ml for 1 minute, twice a day, 30 minutes after tooth brushing, for 14 days.

T2 - At day 14, clinical indices and digital photos were taken. Patients' perception of mouthwash was evaluated with a feedback questionnaire. It contains six questions about reduction bleeding perception, alterations in food taste, alterations in perception of salt, burning sensation, dryness sensation, and mouthwash taste. Selective polishing and motivation to oral hygiene were repeated.

Statistical Analysis was conducted with descriptive statistical analysis, paired sample t-test, chi-square test, parametric Student's t test, Anova test and Tukey's post hoc multiple comparisons.

Descriptive analysis of T0-T2 plaque and bleeding indices mean changes showed an overall reduction. The Anova analysis revealed that the three mouthwashes have significantly different efficacy in reducing plaque in upper and lower jaw ($p = 0.007$ and $p = 0.013$) and bleeding in the upper and lower jaw ($p = 0.017$). Particularly, according to the Tukey's post hoc multiple comparisons:

- mouthwash in group 3 was significantly more effective than the mouthwash in group 1 in reducing plaque and bleeding in upper and in lower jaw;
- mouthwashes of group 1 and 2 showed significant differences only in reducing plaque in upper jaw and bleeding in lower jaw, in both cases mouthwash 2 showed more effectiveness;
- no statistically significant differences were found in this analysis between mouthwashes of groups 2 and 3 in reduction of plaque and bleeding.

The results obtained show that the group 3 mouthwash performs the same efficacy in plaque and gingival bleeding reduction of CHX 0.20% alone, while showing less side effects. In fact, from the general point of view, 100% of patients who used CHX 0.12 % + CPC has enjoyed the pleasantness of the product versus 24% of patients that used CHX 0.20% mouth rinses. This is an important finding for patient compliance to therapeutic guidelines.

Both group 2 and 3 mouthwashes were greater than group 1 mouthwash in reducing plaque and gingival bleeding. It seems to be proper related to the addition of the ADS in mouthwash formulation.

As regards mouthwash effectiveness, each group showed improvements after treatment according to clinical parameters. When comparing the three mouthwashes, the one with addition of ADS showed a limited ability to reduce bacterial plaque and gingival bleeding. Overall, taking into consideration the plaque build-up and bleeding decrease, the better perception results collected from patient's perception questionnaire and the lowest CHX rate, group 3 mouthwash performed better than groups 1 and 2.

TOPICAL DOXYCYCLINE AFTER NON SURGICAL INSTRUMENTATION OF DEEP POCKETS TREATED AT FIRST OCCURRENCE OR RECURRENT DURING MANTAINANCE THERAPY: 12 MONTHS RESULTS

Camilo S.^{*[1]}, Orlando E.^[1], Briganti M.^[1], Centracchio M.^[1], Bertinetto M.M.^[1], Abundo R.^[2], Zambelli M.^[3], Corrente G.^[2]

^[1]DH ~ Turin ~ Italy, ^[2]MD,DDS ~ Turin ~ Italy, ^[3]MD ~ Turin ~ Italy

Topical application of doxycycline may be an additional option in periodontal therapy after non surgical instrumentation. Usually such approach was used to treat recurrent pockets during maintenance therapy.

To compare the 12 months clinical results after a topical application of doxycycline following non surgical instrumentation of deep periodontal pockets (≥ 6 mm) treated at their first occurrence or recurrent during maintenance therapy in patients already successfully treated for periodontal disease.

26 patients in healthy conditions affected by periodontal disease, with one or more periodontal pockets of at least 6 mm depth on non molar teeth, were enrolled.

After registration of pocket depth (PD), attachment loss (AL) and bleeding on probing (BOP), 22 periodontal pockets of 12 patients were non surgically treated for the first time after diagnosis of periodontal disease, one month after a scaling session with instruction to proper oral hygiene maneuvers, with hand and ultrasonic instruments (Group A).

The same therapy was performed on 22 periodontal pockets of 14 patients affected by previously treated periodontal disease and included in a recall program (Group B).

Then a 14% doxycycline hyclate (Ligosan®, Heraeus Kulzer, Hanau, Germany) single topical application was performed in both groups. All patients followed supportive periodontal therapy every 4 months.

At 12 months measurement of PD, AL and BOP were repeated.

The differences between baseline and 12 months measurements for all clinical parameters of each group underwent statistical analysis by means of Student's t test for paired data (PD and AL) and Chi-square test (BOP) and by means of Student's t test for independent samples (PD and AL) and Chi-square test (BOP) in the comparison between the 2 groups.

The analysis was based on data from 44 pockets. Initial values were: PD = 6.91 ± 0.97 mm, AL = 8.95 ± 1.49 mm, BOP = 95,45 % (Group A); PD = 7.45 ± 1.71 mm, AL = 8.91 ± 1.87 mm, BOP = 90.91 % (Group B).

12 months values were: PD = 4.27 ± 1.32 mm, AL = 6.54 ± 1.47 mm, BOP = 18,18 % (Group A); PD = 4.23 ± 1.74 mm, AL = 6.27 ± 1.98 mm, BOP = 36,36% (Group B).

The difference between baseline and 12 months values was statistically significant ($p < 0.01$) for all parameters in both groups.

There were no significant differences in the results between Group A and Group B.

Non surgical treatment by means of hand and ultrasonic instruments plus a single topical doxycycline application showed efficacy in deep periodontal pockets (6 mm or more) both for pockets treated at their first occurrence and for recurrent pockets during maintenance therapy.

TOPICAL DOXYCYCLINE AFTER NON SURGICAL INSTRUMENTATION OF DEEP POCKETS: 12 MONTHS RESULTS IN SMOKERS AND NON-SMOKERS

Centracchio M.*^[1], Orlando E.^[1], Briganti M.^[1], Camiolo S.^[1], Bertinetto M.M.^[1], Abundo R.^[2], Zambelli M.^[3], Corrente G.^[2]

^[1]DH ~ TORINO ~ Italy, ^[2]MD, DDS ~ TORINO ~ Italy, ^[3]MD ~ TORINO ~ Italy

Topical application of doxycycline may be an additional option in periodontal therapy after non surgical instrumentation. Smoking of 10 or more cigarettes usually impairs healing after periodontal therapy.

To compare 12 months clinical results of a topical application of doxycycline after non surgical instrumentation of deep periodontal pockets (≥ 6 mm) in smoking and non-smoking patients in maintenance care and previously treated for periodontal disease.

35 patients in healthy conditions, previously treated for periodontal disease and included in a recall program, with one or more periodontal pockets of at least 6 mm of depth on non molar teeth, were enrolled.

After registration of pocket depth (PD), attachment loss (AL) and bleeding on probing (BOP), 43 pockets in 16 smokers and 44 pockets in 19 non-smokers were non surgically treated with hand and ultrasonic instruments, then a 14% doxycycline hyclate (Ligosan®, Heraeus Kulzer, Hanau, Germany) single topical application was performed in both groups. Patients followed supportive periodontal therapy every 4 months.

At 12 months measurement of PD, AL and BOP were repeated.

The results underwent statistical analysis by means of Student's t test for paired data (PD and AL) and Chi-square test (BOP).

The analysis was based on data from 87 pockets. Initial values were: PD = 7.58 ± 2.1 mm, AL = 9.12 ± 2.47 mm, BOP = 72.09 % (Smokers); PD = 6.98 ± 1.11 mm, AL = 8.95 ± 2.45 mm, BOP = 86,05 % (Non Smokers).

12 months values were: PD = 4.74 ± 1.76 mm, AL = 6.67 ± 2.19 mm, BOP = 9.30% (Smokers Group); PD = 4.5 ± 1.78 mm, AL = 6.77 ± 2.83 mm, BOP = 34.88% (Non smokers Group).

The mean differences for all clinical parameters were statistically significant ($p < 0.01$) both in smokers and non-smokers.

Non surgical treatment by means of hand and ultrasonic instruments plus a single topical doxycycline application showed efficacy in deep periodontal pockets (6 mm or more) both in smokers and in non-smokers.

FACTORS PREDICTING PERI-IMPLANT MUCOSAL RECESSON IN PATIENTS ENROLLED IN A SUPPORTIVE PERIODONTAL CARE PROGRAM

Lenzi E.* , Lenzi D*, Cairo F.°

**Dental Hygienist Private Practice Florence I~ °Department of Periodontology University of Florence, I*

Emerging evidence suggests that the amount of peri-implant keratinized tissue (KT) is associated with stability of the gingival margin and the risk of inflammation in the long term.

The aim of the present study is to assess possible factors predicting peri-implant mucosal recession 3 years after prosthetic treatment.

Patient treated with implant-supported prosthetic restorations were selected in a private periodontal office. Patients were enrolled in at least 3 year-supportive periodontal care (SPC) program and annually revalued by an expert periodontist. Clinical parameters were collected using a NCP 15 probe. Data at patient (age, gender, smoking, habits and history of treated periodontitis) and implant (implant dimensions, amount of KT at the time of prosthetic delivery, implant position, probing depth at the time of implant delivery, bleeding on probing at the last follow-up) levels were collected and assessed using a multi-level model. Primary outcome variable was the presence of mucosal recession at the last follow-up.

A total of 27 patients (mean age 49.4 ± 6.3 years) with a total of 41 dental implants were selected. Patients had a mean duration of SPC of 4.3 years. Among assessed factors, $KT < 2\text{mm}$ at the time of prosthetic delivery ($P < 0.0001$) and BoP ($P < 0.0001$) at the last follow-up were associated with increased risk of recession at the last follow-up.

Data from the present study support that amount of KT at the time of prosthetic delivery was associated with increased risk of peri-implant recession and inflammation in compliant patients and rolled in SPC.