

THE FEATURES OF DISTRIBUTION OF COLLAGEN TYPES I AND III AT PATIENTS WITH CHRONIC PERIODONTITIS UNDER THE INFLUENCE OF CONSERVATIVE TREATMENT

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Surgical treatment of periodontal disease remains the main method of treatment.

Improving the efficiency of the treatment of periodontal disease is still relevant because of the lack of desired results.

Even carefully conducted medical intervention does not always produce the desired effect.

This is often observed phenomenon may be due to several factors.

On the one hand, in addition to the lack of effectiveness of conducted conservative treatment, surgery, against the background of incomplete elimination of the phenomena of inflammation are additional injury, which in turn worsens and exacerbates the treatment of periodontitis.

After therapeutic interventions on periodontium reparative process goes through the formation of immature and then mature connective tissue, the main component of which is collagen (C). The effect of treatment and saving its stability is determined by the volume of newly formed mature dense C type I and immature C type III. Therefore, the study of this process based on qualitative and quantitative determination of markers of C maturity has not only theoretical, but also practical importance to determine the effectiveness of treatment.

In the 1-st group of the study were included 25 patients with severe chronic periodontitis in the acute phase, and in the 2-d control group - 10 persons with intact periodontium. Clinically healthy gingival tissues were obtained during extraction of intact teeth during orthodontic treatment. Tissue samples were cutted out from periodontal pockets in the acute phase and after local anti-inflammatory therapy (LAIT). Comparative analysis of the distribution C types I and III in the connective tissue of the gingiva was carried out by means of polarizing microscopy. Sections of 5 μ m were stained with Sirius Red dye (Picro Sirius Red Stain Kit, connective tissue stain), and subsequently analyzed in polarized light with magnification lens 40. For a quantitative evaluation of the results morphometric analysis by the use of the program ImageJ 1.46 (Wayne Rasband, National Institute of Health, USA) was carried out. Studying color histograms calculated the ratio of red and green pixels, which corresponded to the distribution of C types I (red) and III (green). ANOVA was used for statistical analysis.

The analysis of the inflamed tissue samples revealed a ratio of C types I/III of $1,52 \pm 0,04$ while the corresponding ratio of C types I/III in inflamed tissues after therapy (i.e.LAIT) and in the control group was $1,69 \pm 0,07$ ($p \leq 0,001$) and $1,97 \pm 0,27$ ($p \leq 0,001$) respectively. These indicators are not only objective criterion of the condition of periodontal tissue at the time of the survey, but can serve to assess the effectiveness of LAIT before surgery, as well as for comparative assessment of different types of conservative and surgical treatments.

At patients with chronic periodontitis it revealed significantly ($p \leq 0,001$) lower ratio of C types I/III compared with the control. Increase this index after LAIT testifies to the inflammatory process subsided and the maturation of connective tissue. The use of polarized light microscopy allows to trace the dynamics of maturation of the connective tissue of the gingiva and to assess the effectiveness of LAIT. According to our data, the ratio of C types I/III equal $1,69 \pm 0,07$ is a criterion for sufficient maturity of the connective tissue and allows to start complex surgical procedures in periodontium.

FORMULATION OF A NEW CONTROLLED-RELEASE MATERIAL CONTAINING METRONIDAZOLE AND DOXYCYCLINE FOR THE TREATMENT OF PERIODONTAL DISEASES: IN VITRO EVALUATION

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Background

Several locally-administered antimicrobials have been studied in the literature as adjunctive or primary treatments for periodontitis with conflicting results.

Objective: The aim of this study was two-fold: 1) The formulation of a controlled-release material containing metronidazole and doxycycline (MET/DOX gel); 2) An *in vitro* evaluation of its antibacterial properties against planktonic and biofilm species.

Methods

Doxycycline (10mg/ml) and metronidazole (20mg/ml) were incorporated into a hydroxyethylcellulose-polyvinylpyrrolidone-calcium polycarbophil gel. Three ml of gel were dialyzed against Dulbecco's Phosphate Buffered Saline (DPBS) for 13 days. Antibiotics release at 3, 7, 10 and 13 days was determined spectroscopically.

The inhibitory activity of the experimental MET/DOX gel was tested against *A. actinomycetemcomitans*, *S. sanguinis*, *P. micra*, *E. corrodens* with an agar diffusion test, an inactivation biofilm test and a confocal laser scanning microscope study (CLSMS) for *S. sanguinis* up to 20 days.

Results

After 13 days, the released doxycycline was 9.7% (at 3 days = 1.2mg; 7 days = 0.67mg; 10 days = 0.76mg; 13 days = 0.29mg) while metronidazole was 67% (30mg, 6.8mg, 2.5mg, 0.9mg at the same intervals). The agar diffusion test highlights that the MET/DOX gel was active up to 312h.

Quantitative analysis of biofilm formation for all strains and CLSMS for *S. sanguinis* showed a high growth reduction up to 13 days.

Conclusions

The *in vitro* efficacy of MET/DOX gel was confirmed both on planktonic species and on bacterial biofilm over a period of 13 days.

INFLUENCE OF PORPHYROMONAS GINGIVALIS ON CLINIMETRIC AND THERAPEUTIC ASPECTS OF RHEUMATOID ARTHRITIS PATIENTS: A GLIMPSE INTO THE TONGUE MICROBIOME

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Objective

Periodontitis can impact on a wide range of pathological conditions, including Rheumatoid Arthritis (RA). Porphyromonas gingivalis is the major bacterium responsible in periodontitis and it may even be involved in RA initiation and progression. In the present case-control study, we first aimed at assessing the prevalence of P. gingivalis in a cohort of patients with RA, by analyzing tongue biofilm, and then relating the presence and the quantification of the bacterium with disease activity (DAS28) and frequency of anti-rheumatic drugs.

Methods

We enrolled 143 RA patients (M/F 32/111) and 36 periodontal patients (M/F 11/25) as controls. All subjects underwent a standard cytologic swab to identify the presence of P. gingivalis by using real-time PCR.

Results

The prevalence of P. gingivalis in RA group overlapped with that one observed in periodontal patients. The presence of the bacterium in the tongue biofilm was associated with the severe class of DAS28 and a higher frequency of anti-rheumatic drugs. Furthermore, the percentage of P. gingivalis on the total tongue biofilm positively correlated with DAS28 values ($r=0.4$, $P=0.01$).

Conclusions

We demonstrated a significant association between P. gingivalis and RA, both as regards the disease activity grade (DAS28) and the use of anti-rheumatic drugs, suggesting that P. gingivalis could play a role in the pathogenic mechanisms of RA.

PERIODONTITIS IS INDEPENDENTLY ASSOCIATED WITH AN INCREASE IN PLATELET COUNT: A NEW POTENTIAL LINK WITH CARDIOVASCULAR DISEASES.

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Blood platelets have an important role in atherosclerosis and in the formation of thrombi. Basing on this rationale, many epidemiological prospective studies have shown how an increase in platelet count (thrombocytosis), as well as in volume and in activation, is associated with a subsequent development of fatal coronary heart disease (CHD).

At the same time, it is well know how inflammatory and infective processes can results in an increase in the number of platelets, a phenomenon called "reactive thrombocytosis". This phenomenon is probably related to the role of platelets in inflammation and immune response. So that, it is reasonable to hypothesize that also periodontitis, an infection-based inflammatory disease, could lead to an increase in circulating platelets.

Our hypothesis is that periodontitis could cause a reactive thrombocytosis and this increase in number of platelets could potentially mediate the well documented association between periodontitis and cardiovascular diseases. However, to the best of our knowledge, no epidemiological nationally representative studies have examined the association between platelet count and periodontitis.

The aim of this cross-sectional study is to evaluate, using KNHANES data, if there was in 2012 an association between periodontitis and platelet count in a representative sample of the South Korean population.

The platelet count was measured by the DC detection method (XE-2100D - Sysmex/Japan) in the participants blood samples collected after a 12-hour fasting period.

The periodontal status was assessed by dentists using the Community Periodontal Index (CPI). For the present study, the periodontal status at participant level was dichotomized into periodontitis (CPI \geq 3 in at least one sextant) and no periodontitis (CPI \leq 2 in all sextants).

All the statistical analyses were carried out considering the complex sampling design. A student t-test was initially used to compare platelet count values of periodontitis patients with the non-periodontitis ones.

In order to examine the association between periodontitis and platelet count allowing for potential confounders, a multivariate linear regression analysis was applied controlling for age, sex, smoking status, hypertension status, LDL and triglyceride blood levels, consumption frequency of coffee and red wine, educational level and body mass index (dependent variable: platelet count as a continuous variable).

A further analysis was finally performed categorizing the platelet count in quartiles, and carrying out a multivariate logistic regression analysis with the same covariates.

A total of 5732 subjects over 19 years of age were examined, representative of 38,8 millions of adults. The participants affected by periodontitis were 1327 (20.2% weighted of the total).

A statistically significant lower mean platelet count was found in subjects with periodontitis (251.05 Thous/ μ L) compared to the non-periodontitis ones (256.10 Thous/ μ L) (MD: -5.046; 95% CI: -9.23 to -0.86; P=0.018).

However, after controlling for confounders, the relationship was inverted. In fact, in the multivariate analysis, the periodontitis subjects showed to have a higher platelet count (MD: 7.77 95% CI: 1.14 to 14.40; P=0.022).

Moreover, the odds ratio for the subjects affected by periodontitis to be in the highest platelet count quartile was 1.41 (95% CI: 1.014 to 1.969) when compared to the non-periodontitis ones.

Within the limitations of this study, in this national representative sample, periodontitis prevalence was independently associated with an increase in platelet count. Moreover, the presence of periodontitis increased the estimated odds to be in the highest quartile of platelet count of 41%. Further studies are necessary to verify if this increase in thrombocytes could represent a relevant mechanism linking periodontitis and cardiovascular diseases.

EVALUATING DENTINE HYPERSENSITIVITY SEVERITY IN NIGERIANS USING CUMULATIVE HYPERSENSITIVITY INDEX

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Dentine hypersensitivity (DH) has initial symptoms of sharp pain of rapid onset that disappears once the stimulus is removed. The initiation and progression of dentine hypersensitivity are reported to be influenced by the characteristics of the teeth and periodontium with the oral environment and external influences. The aggravating stimuli are tactile, thermal and chemical or osmotic. The pain of DH although uncomfortable, it is most often a temporary and sustainable problem and occasionally the pain may become chronic persisting for months or years. The Cumulative Hypersensitivity Index (CHI) for denture hypersensitivity severity was validated by Olley et al. (year of publication) to indicate DH severity per subject which may help to investigate the prevalence, aetiology and management of this condition. Olley et al. (year) used the existing diagnostic criteria of Schiff index by combining the results from the teeth into an overall subject sextant score. The CHI was used in this study to investigate the severity of DH in Nigerian subjects with a view of proposing the need for its prevention and or management.

This national survey is aimed to evaluate the cumulative severity of dentine hypersensitivity (DH) in Nigerians.

One thousand three hundred and forty-nine urban and rural Nigerian dwellers aged 18-35 years were studied within a six-month period after obtaining institutional ethics approval. The subjects were recruited from dental hospitals in eight states that were randomly selected from the thirty-six states in Nigeria. Self-administered questionnaire evaluated subject's demography, settlement and brushing technique. Schiff index Scores were collected and percentages calculated. Gingival recession (GR) was measured with CPITN probe. Cumulative Hypersensitivity Index (CHI) Score and the highest Schiff Index Score were recorded per subject. Spearman correlation Coefficients (P-value) were used to assess the relationship between CHI Scores, Schiff Index percentages and Schiff Index highest per subject.

There was statistical significance (correlation?) between CHI, gender, tooth brushing technique and GR ($P < 0.001$) but there was no statistical significance (correlation?) between CHI, age, settlement and type of hand used in brushing ($p > 0.001$). Percentage highest CHI was 18.8% and Schiff score was 35.4%. 26.5% of the respondents had GR greater than 1mm and the overall mean GR was 1.00 ± 1.32 . The percentage of urban dwellers was 54.2% while 51.3% were rural dwellers. The overall mean Schiff score was 0.54 ± 0.88 while the overall mean CHI was 1.51 ± 2.95 .

DH is severe in Nigerians and the relationship between this severity, gender and tooth brushing technique is strong. There is a need for the prevention and management of DH in Nigeria.

PREVALENCE OF ALVEOLAR ATROPHY IN RELATION TO IMPLANT PLACEMENT IN EDENTULOUS ELDERLY PATIENTS: A RADIOLOGICAL STUDY

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Treatment of the elderly edentulous patient is becoming a very important aspect of oral care in western countries due to the increase of life expectancy and improvement in perception of oral health needs. Implant supported restorations play a major role in improving patient quality of life in this clinical situation.

The present study aims at describing the residual alveolar bone anatomy in a large group of elderly individuals (age 65 or more) either edentulous or with a seriously mutilated dentition. Focus is placed in describing the anatomy in relation to the possibility to insert implants with or without a bone reconstruction.

228 CBCT scans of edentulous arches (max. 4 teeth) were included in this study. They were chosen among the ones present in the ASL RM/A database in Rome, by listing the patients in age order (age interval 65-100). Arches that presented bone loss caused by major pathological problems (i.e. malignancies, major osteolytic lesions and/or resective surgeries) were excluded from this study. The same CT scanner was used for all examinations that were analysed using the same software (GE corp.). The software was used to reconstruct cross sectional images every 1,5 mm perpendicular to the occlusal plane. Both in the mandible and in the maxillary arches it was decided to analyse the sites in the area of the lateral incisor, the first premolar and the first molar. Anterior areas would include incisor and premolar, while posterior areas includes the molar sites. The height and the width of the crest were measured at each site. The height was measured from the most coronal point of the crest, following the main axis of the bone section. The most apical point was set at the apical limit of the bone or of any essential anatomical structure. The width of the bone at the site was measured perpendicularly to the main axis. As a reference point on the main axis, it was chosen the most coronal level exploitable for implant placement. A second measurement of the crest width was taken at the middle portion, in terms of implant length, of the planned implant. After the dimensional measurements, the sites were classified following both anatomical and clinical parameters.

Among 228 scanned arches 101 scans were of maxillary and 127 were of mandibular arches. Only 27 were classified as "no need for augmentation" (22 (17.3%) mandibles and 5 (4.9%) maxillas). In these arches all the sites were adequate for implant placement without the use of any bone augmentation or other advanced techniques. Analysing the anterior maxillary areas, the 90,09% of the arches needed bone augmentation, in at least one site. Furthermore the 81,32% of these bone augmentations were found to be complex (needing a staged surgical augmentation procedure). When a posterior augmentation was needed also necessary. Considering the posterior areas, 91 of the 101 analysed maxillary arches needed a bone augmentation procedure; of which 88 needed a sinus lift procedure on at least one side. 66 arches needed a bilateral sinus lift procedure. In the mandibular anterior areas, 92 arches presented no need of bone augmentation in any site. Of the 35 arches that presented at least one site needing a hard tissue augmentation procedure, the 45,71% needed a complex one. In the posterior area, the 76,38% of the arches need a bone augmentation procedure. Of these, the 80,41% present at least one site that needs a complex procedure. Of the mandibular arches needing a posterior regeneration, the 27,83% will need an anterior regenerative therapy as well.

This study confirms that in elderly patients alveolar atrophy in edentulous arches or in arches with a mutilated dentition is very frequent and in most of the cases there is the need of an augmentation in combination or before implant placement. The need for major augmentation is more frequent in the maxilla than in the mandible where the interforaminal region often shows enough bone to safely insert implants for prosthesis anchorage or retention.

A METAGENOMIC APPROACH TO IDENTIFY BACTERIAL STRAINS ASSOCIATED WITH PERI-IMPLANT DISEASES

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Background: Bacterial colonization plays a major role in the etiology of peri-implant diseases but it is still unclear whether this is primarily related to a host susceptibility issue, to implant surface phenomena, or both. The recent metagenomics revolution that enables profiling the composition and structure of microbial communities without cultivation opened new lines of investigation also for dental diseases. By directly sequencing the genetic material present in a sample from the subgingival plaque, it is possible to uncover the ecosystem of bacterial, viral, micro-eukaryotic, and archaeal organisms - the microbiome - present in the dental environment. Metagenomics can thus unravel ecological dynamics of tooth-associated microbial diversity including organisms refractory to cultivation. **Aim:** We are performing a longitudinal observational study that aims at understanding which is the role of microbial organisms in the etiology of peri-implant diseases and at identifying which are the specific microbiome features (strains, genes, pathways) associated with this disease for the development of new diagnostic and therapeutic approaches. **Materials and Methods:** The study is targeting 75 patients identified and selected on the basis of specific inclusion and exclusion criteria in six different private practices and equally divided in one of three study groups (healthy, mucositis, peri-implantitis) according to the state of health of their dental implants. Extensive clinical/metadata information is collected, and samples are collected with technical replicates from a single implant and from the contralateral tooth for each patient at three different timepoints: at baseline before treatment; 1-month follow-up after standard treatment; 7-month follow-up. Submucosal and subgingival plaque samples are taken with individual sterile Gracey curettes and immediately placed in separate 1.5-mL microcentrifuge tubes and frozen at -80° . Total genomic DNA is extracted using the QIAamp DNA Mini kit with an additional mechanical disruption step for complete lysis of gram-positive and gram-negative species. Samples are processed following the updated Human Microbiome Project procedures, and are shotgun sequenced on the Illumina HiSeq (~4Gb/sample, 100bp PE reads). **Results:** We first performed preliminary tests to identify the buffer solution and DNA extraction kit that were able to maximize the amount of DNA that is possible to extract from plaque microbiome samples. To this end, a total of 8 subgingival plaque samples were obtained from three different patients (8 samples/ patient) and 4 different buffer solution (PBS, MoBio, sterile water, and SCF-1b) were used to preserve them in 1.5-mL Eppendorf tubes. We also shortlisted two different DNA extraction kits (QIAamp vs MoBio Powersoil) for this evaluation. Sufficient amounts of total genomic DNA was retrieved for all combination of storage buffer and extraction kit but the best results were obtained when SCF-1b and QIAamp were employed together. The six samples processed with this protocol were sequenced on the Illumina HiSeq producing >50 million reads with an acceptable amount of contaminant human DNA ranging from 33.57 % to 70.03%. **Conclusion:** We developed and validated a metagenomics protocol that proved successful in profiling the microbiome of subgingival and submucosal plaque samples. Such protocol, combined with novel advanced computational tools, is now being applied on the full set of samples for our peri-implantitis project that thus have a high chance to identify members of the plaque microbiome associated with peri-implant diseases.

MEDICATION-RELATED OSTEONECROSIS OF THE JAW (MRONJ): ORAL CONDITION OF ONCOLOGIC AND HEMATOLOGIC PATIENTS UNDERGOING DENTAL PREVENTIVE PROGRAM

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Antiresorptive agents such as biphosphonate (BPs) effectively reduce skeletal-related events incidence in patients with metastatic bone cancer and multiple myeloma, thereby placing them at potential risk for developing medication-related osteonecrosis of the jaw (MRONJ). Prevention and treatment of MRONJ is a challenge for medical team, considering Dentist, Dental Hygienists and Physician's involved in antiresorptive agents prescriptions.

MRONJ onset and progression is due to drugs, systemic and local risk factors, including oral conditions. Presently, few reports addressed periodontal conditions of MRONJ patients.

To evaluate MRONJ patients oral conditions, association between periodontal disease and MRONJ onset and to assess the impact of non surgical periodontal treatment on oral health in a population at risk for MRONJ onset. This report focuses on both medical and dental databases at a single-center.

This retrospective study included MRONJ patients referred to Dental Clinic, University Hospital, with a history of antiresorptive agents therapy among those treated at Hematology and Oncology Unit of different Hospital of Ferrara Area (Ferrara, Cento and Lajosanto), focusing on both medical and dental databases at single-center. All participants underwent complete oral and radiographical examination and clinical parameters records (PPD, BoP, PII, mobile dentures examination). Then all parameters were merged to assign each patient a comprehensive risk evaluation score for MRONJ.

During 36 months observation time 183 patients, eligible for antiresorptive agents therapy, mean age of 67 years (range 33-92), received complete dental examination and treatments, including dental extraction and prosthetic rehabilitation. Individual risk for MRONJ was checked for each patients during first visit and after 3 months at least.

Twenty-nine patients developed MRONJ (mean drug treatment cycles: 11 [range 4–38]). For those patients developing MRONJ clinical parameters records showed higher percentage when compared to overall population (2 times higher). It was observed a correlation between HIGH risk evaluation score, according to Dental Clinic Method, and established MRONJ, with high sensibility (96%).

According to literature periodontal, dental and oral disease are main risk factor for MRONJ onset. MRONJ is a clinically significant adverse effect of antiresorptive agents. A mandatory preventive program for oral health, involving a multidisciplinary team should be developed for all patients eligible for antiresorptive agents.

CORRELATION BETWEEN PERIODONTITIS AND MEDICAL OSTEONECROSIS OF THE JAW

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Bisphosphonates (BPs) are drugs used in the treatment of various metabolic and malignant bone diseases. They inhibit the resorption and renewal of bone by suppressing the activity of osteoclasts. However, BPs are strongly associated with the development of a form of osteonecrosis of the jaws: the Medical Osteonecrosis Of the Jaw (MRONJ).

To evaluate the prevalence and severity of periodontitis (P) in a cohort of patients affected by MRONJ.

All patients affected by MRONJ and referring to the Unit of Dentistry and Oral Surgery of the University Hospital of Pisa from January 2004 to December 2016 were invited to participate and sign the informed consent. MRONJ diagnosis was made according to the criteria proposed by the American Association of Oral and Maxillofacial Surgeons. Included subjects had a full-mouth periodontal examination including probing depth, gingival recession, plaque index and bleeding on probing.

Two hundred and twenty-four patients with MRONJ were included and accepted to sign the informed consent; 162 females and 62 males, mean age 68.9 years, SD 10,42, range 32-93. Sixty patients were receiving oral BPs for the treatment of osteoporosis, while the remaining 164 were under treatment with intravenous BPS for oncological diseases. 66% of the MRONJ lesions were located in the mandible; in 14 cases patients presented a lesion both in the maxilla and in the mandible. Among the included subjects 52 were edentulous whereas the remaining 144 had P (66%), distributed as 3.5%, 5.6% and 90.9% of mild, moderate and severe P, respectively.

The prevalence of P in patients affected by MRONJ is higher than literature data referring to MRONJ free populations.

ALVEOLAR RIDGE DIMENSIONS IN MANDIBULAR POSTERIOR REGIONS: A RETROSPECTIVE COMPARATIVE STUDY OF DENTATE AND EDENTULOUS SITES USING COMPUTERIZED TOMOGRAPHY DATA

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Sufficient alveolar bone volume and favorable architecture of the alveolar ridge are essential to obtain ideal functional and esthetic prosthetic reconstruction following implant therapy. Following tooth extraction the alveolar socket undergoes to a modeling process. This modeling process results in a narrower and shorter ridge [Pinho et al. 2006, Bressan et al. 2016] and the effect of this resorptive pattern is the relocation of the ridge to a more palatal/lingual position. In the mandible, the alveolar ridge resorption is usually more rapid in the premolar and molar region than in the anterior region, because of the lower position of the reversal line.

to comparatively evaluate ridge dimensions at edentulous and dentate mandibular posterior sites.

Computerized tomography scans of 45 patients (22 males; mean age: 54.5 ± 10.9 years, range: 24–71 years) with one edentulous lacuna (including at least two adjacent teeth among second premolar, first molar and second molar) and the contralateral dentate sites were analyzed. On the panoramic slice of each CT scan, a digital line parallel to the CT scan plane was traced passing through the CEJ of the homolateral canine or first premolar. This digital line was visualized on the section of interest (SOI) of dentate and edentulous sites as a reference point (P) to perform vertical linear measurements. On the SOI of edentulous and contralateral dentate sites, the following recordings were performed: relative ridge position (rRP), measured as the distance (in mm) from P to the most coronal point of the alveolar crest (in dentate sextants) or the ridge (in edentulous sextants) (hcrest); bone height (BH), measured as the distance (in mm) from hcrest to the most coronal point of the inferior alveolar canal; bone width (BW), measured as the width (in mm) of the alveolar crest recorded 1 mm (BW1mm), 3 mm (BW3mm) and 5 mm (BW5mm) apically to hcrest; alveolar canal height (ACH), measured as the distance (in mm) from the most coronal point and the most apical point of the inferior alveolar canal; basal bone height (BBH), measured as the distance (in mm) from the most apical point of the inferior alveolar canal to the inferior border of the mandible.

At all positions (i.e., second premolar, first molar and second molar), edentulous sites showed a significantly higher rRP, a lower BH, and a lower BW1mm compared to dentate sites. BW3mm and BW5mm were significantly lower at second premolar and first molar edentulous sites compared to their dentate counterparts. At first molar and second molar, edentulous sites showed a significantly lower ACH compared to dentate sites ($p \leq 0.001$). The mean difference in BH, rRP, BW1mm, BW3mm and BW5mm between dentate and edentulous sites was not significantly different between males and females. The proportion of patients with sufficient bone dimensions for implant placement without any bone augmentation procedure was 45.8%, 75.5% and 72.4% at second premolar, first molar and second molar edentulous site, respectively. The proportion was always lower in females than in males.

In the posterior mandible, edentulous sites showed lower bone height when compared with contralateral dentate sites. Second premolar and first molar edentulous sites exhibited lower bone width than dentate sites at all positions (i.e., 1, 3 and 5 mm apical to the bone crest), while this difference was more attenuated at second molar sites. The magnitude of the difference between edentulous and dentate sites seems not to be dependent on gender.

SURGICAL TREATMENT OF PERIIMPLANTITIS: 1 YEAR RESULTS FROM A PROSPECTIVE STUDY

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Different approaches have been developed to treat periimplantitis. They are both non-surgical and surgical: among these latter open flap debridement, resective therapy with or without implantoplasty, combined resective-regenerative and pure regenerative therapy have been described. This study describes clinical results at 1 year of a combined resective – regenerative treatment. 24 patients with 28 implants showing at least one site with probing depth of 5 mm or more and an infrabony defect detectable in periapical x-ray were treated. After decontamination/removal of the implant surface, intrabony defects were filled with a xenograft mixed with fibrin glue. Baseline parameters were: probing depth (PD) 7,9 mm \pm 1,3mm , radiographic defect depth (DD) 5.5 mm \pm 1,4 mm, bleeding on probing (BOP) 100%. 1 year after surgery clinical parameters were :PD 3,6 mm \pm 1.0 mm with a difference of 4.3 \pm 1.1mm ; DD 1.1 \pm 1.1 mm with a difference of 4.4 \pm 1.8 ; BOP 35.7 % with a difference of 64.3%. All differences were of statistical significance ($p < 0.01$). This combined regenerative-resective surgical approach demonstrated to be effective in achieving relevant clinical and radiographic outcomes.

TOPICAL DOXYCYCLINE AFTER NON SURGICAL INSTRUMENTATION OF DEEP POCKETS: 12 MONTHS RESULTS FROM A PROSPECTIVE STUDY

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Topical application of doxycycline may be an additional option in periodontal non-surgical therapy.

To evaluate the clinical results at 12 months of a topical application of doxycycline after non surgical instrumentation of deep periodontal pockets.

40 patients in healthy conditions previously treated for periodontal disease, with one or more residual periodontal pockets of at least 6mm of depth on non-molar teeth, were enrolled. After registration of pocket depth (PD), attachment loss (AL) and bleeding on probing (BOP), the pockets were non-surgically treated with hand and ultrasonic instruments then a 14% doxycycline hyclate gel (Ligosan, Heraeus-Kulzer, Hanau, Germany) single topical application was performed. 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).

Of the 40 enrolled patients, 35 (14 males and 21 females; mean age 59.9 years) came for the 12 months clinical re-evaluation. The analysis was therefore based on the data from 87 pockets. Initial values were: PD = 7.28 ± 1.69 mm, AL = 9 ± 2.4 mm, BOP = 78.16 %. 12 months values were: PD = 4.62 ± 1.77 mm, AL = 6.75 ± 2.54 mm, BOP = 22.99%. The difference was of high statistical significance ($p < 0.001$) for all clinical parameters.

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

APPLICATION OF BACTERIOPHAGES IN THE TREATMENT OF PERIODONTAL DISEASE. CLINICAL TRIALS

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High frequency and the crescent of resistance of microorganisms to antibiotics and multiple complications in their use dictate the necessity of searching for alternative tools against periodontal infection.

The aim of this research was to evaluate the antimicrobial effectiveness bacteriophages in periodontology

Hundred and ten patients (59 women, 51 men) having inflammatory periodontal disease were recruited (Please describe briefly the type of periodontal disease that affected patients and if you use any criteria to select the type of patients according to the disease entity). Patients were divided in 3 groups: a test group, a positive control group and a negative control group. In the test group (number of patients), Phagodent was used as an additional therapeutic medication; in the positive control group (number of patients), Metrogyl Denta (metronidazole + Chlorexidine) was used; in the negative control group (number of patients) no additional therapeutic medication were applied. The following clinical parameters were recorded to compare the 3 groups : (please describe briefly the parameters and the purpose of using them) Index Silness-Loe, PMA by C.Parma, index by H.R. Muhlemann&Cowell were used.

The study shows the reduction of intensity of disease symptoms, elimination of inflammation and intensive bleeding when using Phagodent for 3 to 8 days compared to comparison group and 3 to 16 days compared to control group. (Please describe the main results according with the parameters used to evaluate the comparison between groups.)

No side effects have so far been detected (please report how long patients have been followed in terms of weeks, months or years). (Please define clearly the main conclusion of the study).

TREATMENT OF INTRABONY DEFECTS WITH DENTAL PULP STEM CELLS\COLLAGEN SPONGE VERSUS COLLAGEN SPONGE ALONE: A RANDOMIZED CLINICAL TRIAL

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Aim

This RCT has the aim to evaluate clinical and radiographic benefits of the use of Dental Pulp Stem Cells (DPSCs) versus papilla preservation flap alone in the regenerative treatment of infrabony defects.

Material and Methods

27 periodontal patients showing vertical defects and requiring vital tooth extraction were enrolled. Patients were randomly assigned to test (14) and control group (13). Both groups were treated using Minimally Invasive Surgical Technique (MIST). The pulp of extracted teeth was used to obtain a cellular suspension enriched in autologous stem cells.

Each defect was filled with DPSCs and collagen sponge (Test) or collagen sponge (Control).

A blinded, calibrated measurer at baseline, 6, 12 months collected: full mouth plaque/bleeding score (FMPS/FMBS), probing pocket depth (PPD), clinical attachment level (CAL) and radiographic intrabony defect (INFRA-rx).

Results

At 12 months a significant difference ($p < 0.01$) was found in favour of test group for CAL gain ($4,4 \pm 1,8$ mm VS $2,6 \pm 1,7$ mm), PPD reduction ($4,7 \pm 1,30$ mm VS $3 \pm 1,4$ mm) and INFRA-rx reduction ($3,4 \pm 1,6$ mm VS $1,7 \pm 1,2$ mm).

Conclusions

Within the limits of this study, the clinical and radiographic findings suggest that the application of autologous DPSCs may be a clinically relevant procedure in treating deep and non-containing infrabony defects.

PHOTODYNAMIC THERAPY, AS AN ANTIBACTERIAL PART OF THE COMPLEX THERAPY OF INFLAMMATORY PERIODONTAL DISEASES AND ITS EFFECTS ON THE MICROCIRCULATION OF PERIODONTAL TISSUES.

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The high prevalence of periodontal disease in our country and abroad determines the need for new methods of treatment. One such method is photodynamic therapy.

The aim of this study was to evaluate the clinical and microbiological results of treatment with photodynamic therapy, as adjuncts to initial therapy of inflammatory periodontal diseases.

Forty patients with chronic inflammatory periodontal disease were randomly divided into two equal groups. Groups of patients received: (1) Scaling and root planning (SRP) alone; (2) SRP + photodynamic therapy. We studied condition of periodontal indexes (HI, PMA, PI, CPITN, BOP), orthopantomography (assessment of severity of alveolar bone resorption (SR)), microbiological research and microcirculation of periodontal tissues at all stages of treatment. The microbiological and clinical parameters were monitored at day 0 and day 90.

At the end of the observation period, statistically significant improvements in clinical parameters were observed within each group. Parallel to the clinical changes, both treatments reduced the number of total bacteria and the proportion of obligately anaerobic microorganisms. Although intergroup comparisons of microbiological parameters showed significant differences, clinical findings, including attachment gain and PD reduction, were found to be statistically significant in favor of the SRP + photodynamic therapy. In the test group (2) was observed reduction of index PMA on 18-20% higher than in the control group (1) ($p < 0,05$). Ultrasound Doppler flowmetry showed significant increase of the leaner and volume velocity values of periodontal blood flow in the test group (2).

Our studies about the influence of the use of photodynamic therapy not only in antibacterial stage of treatment but also for improving the microcirculation of periodontal tissues demonstrated high efficiency, which enables us to suggest it for use in the complex therapy of inflammatory periodontal diseases.

COMPARISON OF GINGIVAL RECESSION TREATMENT WITH CORONALLY ADVANCED FLAP AND THE CONNECTIVE TISSUE GRAFT TO CORONALLY ADVANCED FLAP AND THE XENOGENEIC COLLAGEN MATRIX: A RANDOMIZED, SINGLE-MASKED CLINICAL TRIAL

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Gingival recession (GR) with exposure of the root surface can be found in more than 50% of adult population. Root coverage therapy is indicated in patients, who find GR aesthetically problematic, and if they are involved in pathologies, like inflammation of gingival tissue, root caries or hypersensitivity, and if they have progressive nature. The connective tissue graft (CTG) in conjunction with a coronally advanced flap (CAF) has been shown to be a highly successful method of gaining root coverage and augmenting the gingival thickness. The CTG harvesting at palatal donor site is frequently associated with patient discomfort, limited supply of donor tissue and it is time consuming. Several alternatives are available to avoid this problems and one of them is xenogeneic collagen matrix (CM).

To compare the clinical outcomes of the use of the xenogeneic CM (Derma[®]) in combination with coronally advanced flap to coronally advanced flap with CTG in treatment of localized gingival recession defects.

This was single blinded, randomized, controlled, split-mouth study of Miller class I. and II. GR in contralateral canines of upper jaw. A total of 10 patients were evaluated for 6 months. The coronally advanced procedure was used in this investigation for both sites: test site with xenogeneic CM– Derma and control site with CTG. The free gingival graft was harvested on palate at the first molar area, which was deepithelialized extraorally. The primary outcome was percentage of root coverage at 6 months. Secondary outcomes included width of keratinized tissue, thickness of gingival tissue, and percentage of complete root coverage, patient's pain perception on donor site, subjective and objective (RES-Root coverage Esthetic Score) aesthetic evaluation and surgery time.

At 6 months complete root coverage for the test site was 80 % and 90 % for the control site. At 6 months, percentage of root coverage on test sites was $92.7\% \pm 15.5\%$ and on control sites $97.5\% \pm 7.9\%$ ($p = 0.115$). There was 0.1 mm loss of keratinized tissue width on the test sites, in contrast, there was 0.2 mm extension on control sites. On the control sites noticeable thickening of the gingival thickness was observed (0.63mm) compared to test sites (0.3mm) ($p < 0.05$). RES value for test site was 8.5 and for control site was 7 ($p = 0.191$). Subjective evaluation from patients themselves was better on test site in 70 %.

After 6 months the mean percentage of root coverage, the percentage of complete root coverage and the width of keratinized tissue were not statistically significant between both sites, and only the gingival thickness was statistically significant in favour of the control sites. Collagen xenogeneic matrix presents a viable alternative to connective tissue graft.

EVALUATION OF EFFICACY OF THREE CHLORHEXIDINE BASED MOUTHWASHES WITH DIFFERENT COMPOSITIONS

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Bacterial biofilm capacity to create cavities and periodontal disease in a susceptible host is well known. Steadily removing bacterial biofilm it is possible to maintain oral health. For more than 30 years, chlorhexidine (CHX), in the form of mouthwashes spray or gel, helps dentists and dental hygienists in this direction. Over the years, several agents have been associated with pure chlorhexidine; they maximize CHX effectiveness or reduce its side effects that can undermine patient compliance to treatment. In our study, we considered CHX associated with cetylpyridinium chloride (CPC), quaternary ammonium compound capable of binding to the bacterial membrane, thus causing the death of the bacterial cell; and CHX associated with Anti-Discoloration System (ADS), a system designed to reduce tooth surface yellow brown pigmentation.

- 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.
- 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)

The same operator followed enrolled patients in three steps.

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.

All mouthwashes showed a statistically significant improvement of clinical signs of inflammation. 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;
- despite the lowest CHX rate of Group 3 mouthwash, no statistically significant differences were found in this analysis between mouthwashes of groups 2 and 3 in reduction of plaque and bleeding.

For all subjective patient's perception variables, except for dryness sensation, there is an association, in the three Groups, between type of mouthwash, and patient's perception. The two mouthwashes of Group 1 and 3 have never expressed alterations in salt perception while in Group 2 almost a quarter of subjects experienced it. Mouthwash with CHX 0.12 % + CPC had fewer side effects than CHX 0.20% alone, 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. Comparing the subjective perceptions of patients treated with chlorhexidine 0.20 % and chlorhexidine 0.20% + ADS, the latter was more tolerable, especially as regards taste alteration, which occurred in only 5% of cases compared with 57% of Group 2. Therefore, data collected from patient's perception questionnaire, show less side effects of CHX 0.12%+CPC, maybe due to CHX lower concentration.

ADS limits CHX ability in reducing the clinical signs of inflammation, CHX 0.20% + ADS is less able to decrease the de novo plaque build-up and to reduce bleeding than CHX 0.20% and CHX 0.12%+ CPC.

CHX 0.20% and CHX 0.12%+ CPC show equally efficacy, with a major advantage: CHX 0.12%+ CPC, despite having a lower dosage, reaches the same efficiency of CHX 0.20% alone with a considerable decrease of side effects.

ERGONOMIC ONE STEP FULL MOUTH APPROACH IN PERIODONTAL PATIENTS MAINTENANCE

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Aim

The present study aims at evaluating the ergonomics of a one-step oral hygiene procedure in patients under hygienic maintenance, comparing two machineries that include the airpolishing unit and the ultrasonic one in the same body.

Materials and Methods

Sixty patients under periodontal maintenance were selected for this study. The patients were randomly divided in Group 1 and Group 2. FMPS was collected at baseline and at the end of the treatment. Both groups received a one step full mouth procedure, using airpolishing and ultrasonics. Group 1 was treated with the new ergonomic technology Mectron COMBI Touch R and Group 2 with Mectron COMBI R. The time taken for the procedures was clocked. Subjective appreciation of the treatment was asked to all patients and to the operator who performed it.

Results

The average time spent for the procedure was lower in Group 1, and the difference with Group 2 was statistically significant with t Student test ($p < 0.05$).

Discussion

The test approach tends to be less time consuming than a traditional instrumentation method and, generally, more ergonomic.