

Found 20 Records

CONTROL ID: 3223537

FINAL ID: 0467

CURRENT SCIENTIFIC GROUPS & NETWORKS: Stem Cell Biology Research

PRESENTER: Chloé Le Fournis

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TITLE: Complement C5a and Mesenchymal Stem Cell Recruitment

ABSTRACT BODY:

Objectives: Recruitment of bone marrow mesenchymal stem cells (MSC) into bone filling materials is a prerequisite for successful periodontal bone regeneration. Complement C5a fragment has been shown to be involved in pulp mesenchymal stem cell recruitment. The aim of this work was to investigate the effect of xenogenic bone grafting materials on modulating C5a secretion by injured periodontal ligament (PDL) cells and its possible influence on MSC recruitment to the bone filling material application site.

Methods: Material extracts were prepared from 3 bone grafting materials: Gen-Os[®] of equine and porcine origins, and anorganic Bio-Oss[®]. Injured PDL cells were cultured with these extracts to investigate C5a secretion using RT-PCR and enzyme-linked immunosorbent assay (ELISA). C5a fixation on MSC C5a receptor (C5aR) and its activation was evaluated by ELISA. Migration of MSC was studied in Boyden chambers.

Results: PDL cells production of C5a significantly increased when the cells were incubated with equine and porcine Gen-Os[®] materials. The activation of MSC C5aR and their recruitment significantly increased with these conditioned media. The specific involvement of C5a in MSC recruitment was demonstrated using a C5a receptor-specific antagonist (W54011).

Conclusions: Taken together, these findings indicate an enhanced MSCs recruitment potential of both Gen-Os[®] bone grafting materials when applied on PDL cells by inducing C5a secretion.

Country - Travel Award: France

CONTROL ID: 3223837

FINAL ID: 0485

CURRENT SCIENTIFIC GROUPS & NETWORKS: Dental Materials 5: Biocompatibility, Bioengineering and Biologic Effects of Materials

PRESENTER: Thomas Giraud

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TITLE: BioRoot™ RCS Modulates the Regeneration Mechanisms Initiated by Periodontal Ligament Fibroblasts.

ABSTRACT BODY:

Objectives: Endodontic treatment is required to prevent root canal infection. After removal of necrotic/infected tissues, regeneration is required to promote the periapical healing to achieve the endodontic treatment success. This in vitro study was designed to investigate the effect of silicate-based root canal sealer BioRoot™ RCS (BRCS) on modulating the early steps of regeneration initiated by human periodontal ligament (PDL) fibroblasts.

Methods: Human PDL cells were obtained by the explant outgrowth method and were sorted and characterized by immunofluorescence and RT-PCR as PDL fibroblasts and PDL stem cells. Samples of BRCS and Pulp Canal Sealer (PCS), a zinc oxide root canal sealer were incubated in culture medium to obtain material extracts. To simulate bacterial infection and endodontic sealer use, human PDL fibroblasts were stimulated with lipopolysaccharides (LPS) and cultured with material extracts. Expression of Transforming Growth Factor- β 1 (TGF- β 1) by PDL fibroblasts was evaluated by immunofluorescence and its secretion was quantified by ELISA. PDL fibroblast proliferation was quantified by MTT while PDL stem cell migration was investigated using Boyden Chambers.

Results: Isolated PDL stem cells expressed mesenchymal stem cell markers such as STRO-1, CD44, CD90, CD105, CD106 and CD166 and characteristic transcription factors genes KLF4, NANOG, OCT3/4 and SOX2. These were not expressed in the sorted PDL fibroblasts which expressed Fibroblast Surface Protein (FSP). TGF- β 1 expression and secretion increased when PDL fibroblasts were incubated with BRCS as compared to PCS. PDL fibroblast proliferation increased with BRCS without affecting PDL stem cell migration. By contrast, PCS decreased PDL fibroblast proliferation and PDL stem cell migration.

Conclusions: This work shows that the endodontic sealers modulate the PDL regeneration potentials in vitro. It demonstrates that, BRCS has the capacity to promote tissue regeneration. This could enhance the endodontic treatment outcome.

Country - Travel Award: France

CONTROL ID: 3223172

FINAL ID: 0059

CURRENT SCIENTIFIC GROUPS & NETWORKS: Orthodontics Research

PRESENTER: Mila Janjic Rankovic

AUTHORS (FIRST NAME, LAST NAME): Mila Janjic Rankovic¹, Andrea Wichelhaus¹, Uwe Baumert¹

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TITLE: Comparison of Two Controls Used in WAB In-vitro Experiments

ABSTRACT BODY:

Objectives: In vitro weight approach based (WAB) loading models have been used for years to elucidate molecular mechanisms of bone remodelling during orthodontic tooth movement. In this model, static compression (CF) is applied by loading cells with a cylinder filled with lead granules placed on a glass-coverslip to assure even force distribution. Two different types of the negative controls have been described in the studies: conventional controls with unloaded cells (CC) and controls with cells covered with a glass-coverslip (GC). Aim of this study was to investigate potential differences between both negative controls concerning cell viability, cell proliferation and gene expression.

Methods: Human primary periodontal ligament fibroblasts were cultured unloaded (CC) or covered with a glass-coverslip only (GC) for 1-6 days. On each day gene expression of cFOS, IL6, and COX2, was examined by qPCR and PGE2 concentrations were measured using ELISA (n=6). The independent-samples Mann-Whitney U test was applied to test significant differences between CC and GC. Cell growth and cell viability were monitored daily.

Results: Increased expression of cFOS ($p \leq 0.016$) and COX2 ($p \leq 0.026$) was observed in GC group during whole experiment when compared to CC. IL6 in GC showed increased expression on the days 1-3 and 5 ($p \leq 0.010$). PGE2 was found at higher concentrations in GC than in CC in all timepoints. Cells viability maintained throughout the experiment in both groups. However, proliferation rate in GC was significantly lower.

Conclusions: Our results show an increased expression of the genes and metabolites related to the mechanosensing (cFOS) and bone remodelling (IL6, COX2, PGE2) in the GC group. We suppose, that the observed differences in gene expression between GC and CC, as well as the differences in the cell proliferation might be related to mechanical stimuli originating from the glass-coverslip. The exact origin and magnitude of this stimuli remains unclear, therefore further examination is required.

Country - Travel Award: Germany

CONTROL ID: 3214973

FINAL ID: 0393

CURRENT SCIENTIFIC GROUPS & NETWORKS: Periodontal Research-Diagnosis/Epidemiology

PRESENTER: Vinay Pitchika

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TITLE: Long-term Impact of Powered Toothbrush on Oral Health: 11-year Cohort Study

ABSTRACT BODY:

Objectives: This study aims to assess 11-year longitudinal effects of powered toothbrush on periodontal health, caries and tooth loss in an adult population.

Methods: Participants of Study of Health in Pomerania (SHIP) cohort with dental examinations and interview data at SHIP-1, SHIP-2 or SHIP-3 examinations were included. Mixed-effects linear regression models were constructed between the exposure (manual versus powered toothbrush) and outcome variables (periodontal status using mean probing depth (PD) and mean clinical attachment loss (CAL), caries status using DMFS and DFS scores, and tooth loss); adjusting for potential baseline covariates.

Results: Final baseline (SHIP-1) study sample comprised of 2819 participants. Powered toothbrush users increased from 18.3% (SHIP-1) to 36.9% (SHIP-3); were younger; had significantly less mean PD [β :-0.09 (95% CI: -0.16; -0.02)] and mean CAL [β :-0.19 (95% CI: -0.32; -0.07)] progressions; 17.7% less DMFS progression and 19.5% more teeth retained than the manual tooth brushers'.

Conclusions: In the long-term, powered toothbrush seems to be effective in reducing mean PD and mean CAL progressions, besides increasing the number of teeth retained. Short-term interventional studies have proved their effectiveness, and the findings from this long-term cohort study attest this association. Therefore widespread usage of powered toothbrushes can be recommended.

Country - Travel Award: Germany

CONTROL ID: 3221278

FINAL ID: 0079

CURRENT SCIENTIFIC GROUPS & NETWORKS: Dental Materials 5: Biocompatibility, Bioengineering and Biologic Effects of Materials

PRESENTER: Maria Paschalidou

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TITLE: Biological Effect of Full-length Amelogenin Protein: Events Leading to De Novo Formation of Periodontal Tissues.

ABSTRACT BODY:

Objectives: To investigate the biological effect of full-length recombinant amelogenin protein (rh191), a component of enamel matrix derivatives (EMDs), on Human Oral Keratinocytes (iHOKs).

Methods: Immortalized Human Oral Keratinocytes (iHOKs) were expanded in Keratinocyte Growth Medium-2 (KGM-2) and later treated with different rh191 eluates. Full-length recombinant amelogenin protein (rh191) was diluted in KGM-2, in five different concentrations (10 ng/ml, 100 ng/ml, 1.000 ng/ml, 5.000 ng/ml and 10.000 ng/ml). Samples that were not treated with rh191 dilutions served as control. Cell viability was examined by WST-1 and cell proliferation by cell doubling in three time points (Day7, Day14, Day21). Wound healing was evaluated using scratch assay. The two-dimension scratched area was digitally quantified in three time points (Day0, Day1, Day3).KRT14, KRT18, KRT19 (Keratinocyte genes) and ODAM (Odontogenic ameloblast-associated protein) gene expression was examined by RT-PCR analysis in four timepoints (Day0, Day3, Day7, Day14). Statistical analysis, with Games-Howell test was performed, and p-values < 0.05 were considered statistically significant.

Results: The stimulation of iHOKs with rh191 led to dose-dependent inhibitory results, which were statistically significant in almost all experimental processes.

The inhibitory effect, present also after one week, is more evident after 14 and 21 days.

Conclusions: rh191 has a significant biological impact on iHOKs. A dose dependent inhibitory effect of rh191 has been showed on iHOKs, which suggests the complexity of amelogenin proteins therapeutic mechanisms that may affect the periodontal tissues.

Country - Travel Award: Germany

CONTROL ID: 3223385

FINAL ID: 0597

CURRENT SCIENTIFIC GROUPS & NETWORKS: Pulp Biology & Regeneration Research

PRESENTER: Wuttapon Sadaeng

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TITLE: Influence of Sensory and Autonomic Denervation on Pulp CGRP Level

ABSTRACT BODY:

Objectives: Sensory and sympathetic nerves both control neurogenic inflammation by releasing calcitonin gene-related peptide (CGRP) and other neuropeptides from axon terminals. However, the overlap and interplay of these nerve activities in pulp inflammation remains obscure. We aimed to evaluate the influence of somatosensory and sympathetic innervation on CGRP level following electrical stimulation evoked inflammation.

Methods: Eighteen Wistar rats were randomly divided into sensory axotomy and sympathectomy groups. Inferior alveolar axotomy was performed intraorally and sympathectomy was done by removing superior cervical ganglion. The left side of each animal was used as a control. After three days of postsurgical recovery, all animals were subjected to electrical stimulation of the molar teeth. Three animals from each group were randomly sacrificed on the first, second and third week after stimulation. Histological slides of tooth were prepared and CGRP was visualized by immunohistochemical technique. The amount of CGRP boutons were determined using the Fiji® software. The Mann-Whitney U test, Kruskal-Wallis test and pairwise comparison were used for statistical analysis.

Results: The amount of CGRP immunoreactive boutons (number/area of interest) on the side of axotomy was significantly decreased ($P < 0.05$) compared to the control side during the first (0.67 ± 1.06 vs 1.00 ± 1.01) and the second week (1.03 ± 0.98 vs 1.33 ± 1.26). Then these values significantly increased from the first week to the second week ($P < 0.05$) in control sides (1.00 ± 1.01 to 1.33 ± 1.26) and axotomized side (0.67 ± 1.06 to 1.03 ± 0.98). However, there was no significant change in the number of CGRP immunoreactive boutons between sympathectomy and control side within the time frame of the experiment. There were significant differences of CGRP count between axotomy and sympathectomy groups in the first (0.67 ± 1.06 vs 0.47 ± 0.30) and second (1.03 ± 0.98 vs 0.63 ± 0.51) weeks ($P < 0.05$).

Conclusions: Sensory nervous system may play a major role in CGRP regulation during the first two weeks after electrical stimulation evoked pulpal inflammation. Supported by EFOP-3.6.2.-16-2017-0006.

Country - Travel Award: Hungary

CONTROL ID: 3223389

FINAL ID: 0506

CURRENT SCIENTIFIC GROUPS & NETWORKS: Microbiology/Immunology

PRESENTER: Kasidid Ruksakiet

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TITLE: Antimicrobial Effectiveness of Sodium Hypochlorite and Chlorhexidine Irrigation: A Meta-Analysis

ABSTRACT BODY:

Objectives: We aimed to compare the antimicrobial efficacy of two most commonly used irrigants, sodium hypochlorite (NaOCl) and chlorhexidine (CHX) during endodontic treatment in permanent tooth by meta-analysis.

Methods: The methodology followed PRISMA guideline. Electronic databases including PubMed, EMBASE, Web of Science, and Cochrane Library were searched for randomized controlled trials (RCTs) published until November 2018 which compared the antimicrobial effectiveness of these two irrigants. Deduplicated studies were independently assessed for eligibility, extracted and performed quality assessment using the Cochrane tool by two reviewers. The incidence of positive bacterial samples after irrigation and standardized mean difference (SMD) for bacterial reduction with 95% confidence interval (CI) were compared using a random effect model. Culture and molecular methods were also used to assess the inhibition of bacterial growth.

Results: From deduplicated 1752 studies, 7 RCTs were eligible for systematic review. Two studies revealed a low risk of bias, while 3 studies revealed unclear and 2 studies revealed a high risk of bias. The meta-analysis was conducted for risk ratio (RR = 1.00, 95% CI: 0.72 – 1.37, p = 0.987) and for SMD (SMD = 0.311, 95% CI: -0.368 – 0.991, p = 0.369), indicated no differences between NaOCl and CHX for overall detection method as well as subgroup analysis for culture and molecular subgroup. Low heterogeneity was observed among studies for RR ($I^2 = 0\%$, p = 0.666) while there was considerable heterogeneity for SMD ($I^2 = 76.336\%$, p = 0.005).

Conclusions: Surprisingly, only very few RCTs were complied with the strict requirements of our statistical analysis. The evidence suggested that both NaOCl and CHX powerfully reduce endodontic infections; however, there is no significant difference between their effectiveness. Additionally, molecular methods are more reliable than cultivation methods for bacterial detection in the root canal system. Supported by Hungarian EFOP-3.6.2-16-2017-00006, KFI 16-1-2017-0409 and NKFIH K112364.

Country - Travel Award: Hungary

CONTROL ID: 3223007

FINAL ID: 0175

CURRENT SCIENTIFIC GROUPS & NETWORKS: Salivary Research

PRESENTER: Tamás Demeter

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TITLE: Effect of Smoking Intensity on Whole and Minor Saliva Secretions

ABSTRACT BODY:

Objectives: Our aim was to investigate the possible effects of smoking intensity on salivary parameters (whole saliva and minor salivary gland flow rates) among smoker and non-smoker male and female patients in different age groups in Hungary.

Methods: 901 patients (age range:18-92 years, 58.3% females) were involved in the study, and were categorized into non-smoker (NS), light smoker (LS, 1-10 cigarettes per day – CPD), and moderate or heavy smoker (MHS, more than 11 CPD) groups according to self-report. Unstimulated whole saliva flow rate (u-SFR) was measured by the spitting method, while palatal (PS) and labial (LS) minor salivary gland flow rates were measured using the Periotron method. Data were analyzed using independent samples t-test, and one-way ANOVA at a significance level of $p < 0.05$.

Results: 35.9% of our sample were smokers (43.4% of males and 30.5% of females). Regarding smoking intensity, 51.3% of females and 60.7% of males were MHS. u-SFR values of NS, LS and MHS females were 0.39 ± 0.30 ml/min, 0.4 ± 0.29 ml/min, and 0.39 ± 0.28 ml/min, respectively, while for NS, LS and MHS males were 0.52 ± 0.4 ml/min, 0.60 ± 0.36 ml/min, and 0.56 ± 0.37 ml/min, respectively. A significantly lower u-SFR was measured for MHS females (0.29 ± 0.21 ml/min) compared to NS females (0.50 ± 0.30 ml/min) in the age group of 20-29 years ($p = 0.02$). Among MHS males in the age group of 30-39 years, a significantly higher palatal secretion (3.83 ± 2.42 $\mu\text{l}/\text{cm}^2/\text{min}$) was registered compared to NS (1.42 ± 0.21 $\mu\text{l}/\text{cm}^2/\text{min}$) and LS groups (1.33 ± 0.95 $\mu\text{l}/\text{cm}^2/\text{min}$), respectively ($p = 0.03$). No other significant differences have been recorded in the salivary parameters of NS, LS and MHS males and females in other age groups.

Conclusions: According to our results, higher intensity of smoking may decrease whole saliva secretion among females in younger age groups, however, we could not detect any effect of smoking intensity on minor salivary gland secretions in other age groups.

Country - Travel Award: Hungary

CONTROL ID: 3216164

FINAL ID: 0294

CURRENT SCIENTIFIC GROUPS & NETWORKS: Periodontal Research-Therapy

PRESENTER: Marina Peric

AUTHORS (FIRST NAME, LAST NAME): Marina Peric¹, Dominique Maiter², Etienne Cavalier³, Jérôme F. Lasserre², Selena Toma²

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TITLE: The Effects of a 6-month Vitamin D Supplementation During Non-surgical Treatment of Periodontitis in Vitamin D Deficient patients: a randomized double-blind placebo-controlled study

ABSTRACT BODY:

Objectives: This study aimed to assess the effects of weekly vitamin D (VD) supplementation, during 6 months (M) in VD deficient patients, on clinical and biological parameters after scaling and root planning (SRP) in the treatment of generalized chronic periodontitis (GChP). The primary outcome measure was periodontal pocket depth (PPD).

Methods: The study was designed as a monocentric, randomized, double-blind, placebo controlled clinical trial with 6 months follow-up. Otherwise healthy Caucasian patients diagnosed with GChP were included if their serum VD value was below 30 ng/ml at screening (Cobas e 602 immunoassay module, Roche, Basel, Switzerland). They were randomly allocated to one of the two treatment arms: the test group (SRP + VD 25,000 IU/week) or the control group (SRP + placebo). The supplementation (25 000 IU VD/placebo per week) started one month before SRP and continued until the 6 months visit.

Results: A total of 59 patients were screened, 27 were included and 26 completed the study. The test group (n=13) and the control group (n=14) had similar VD levels at baseline (17.6 ± 7.38 vs. 14.36 ± 5.22 , respectively). After 1M of supplementation, there was already a significant difference between groups in VD levels (32.9 ± 5.22 vs. 16.09 ± 4.74), also seen at 3M and 6M (t-test, $p<0.001$ at each time point). Periodontal treatment was successful in both groups, since it resulted in reduction of all measured clinical parameters at 3M and 6M (PPD, clinical attachment loss (CAL), full mouth bleeding and plaque scores). However, the reduction in PPD was greater in the test group.

Conclusions: In this short-term pilot study, a supplementation with vitamin D improved the treatment of chronic periodontitis in patients with initial VD deficiency. This potential advantage needs however to be confirmed in larger studies and if VD is established as risk factor for periodontitis, its serum cutoff values should be identified.

NCT03162406.

Country - Travel Award: Italy

CONTROL ID: 3223477

FINAL ID: 0296

CURRENT SCIENTIFIC GROUPS & NETWORKS: Periodontal Research-Therapy

PRESENTER: Stefano Gennai

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TITLE: Acute Phase Response After Non-Surgical and Surgical Periodontal Treatment

ABSTRACT BODY:

Objectives: The aim of the analysis was to compare the acute phase response after non-surgical (NSPT) and surgical periodontal treatment (SPT) in terms of Change in C-Reactive Protein (CRP) values 24-hours after the treatment.

Methods: Two groups of systemically healthy patients affected by periodontitis have been compared. One group consisted of 19 patients treated for NSPT whilst the other group included 19 subjects with indications for SPT (i.intrabony defects ≥ 4 mm deep; ii.no previous SPT; iii.documented radiographic bone loss). Full-mouth periodontal examination including probing pocket depth (PPD), gingival recession (REC), full-mouth plaque score (FMPS) and bleeding on probing (BOP) have been recorded at baseline and 3-months after the treatment in NSPT-group and 6-months after the treatment in SPT-group. Blood parameters were collected at baseline, 24-hours, 3-months (NSPT-group)/6-months (SPT-group) after the treatment. The following inflammatory biomarkers were analyzed: high-sensitivity C-Reactive Protein (CRP), D-Dimer and Fibrinogen.

Results: Both periodontal procedures were efficacious in terms of periodontal parameters, showing statistically significant improvements 3- and 6-months after NSPT and SPT, respectively. At 24 hours, the relative increase of CRP for the NSPT-group was of $288.52 \pm 424.79\%$ significantly superior of the $101.70 \pm 174.44\%$ in the SPT-group ($p < 0.05$). Moreover, D-Dimer resulted in a significant inter-group difference in terms of relative increase (SPT vs. NSPT: $0.21 \pm 29.39\%$ vs. $7.20 \pm 33.66\%$, $p < 0.05$).

Conclusions: Non-surgical periodontal treatment results in higher inflammatory response compared with surgical treatment in the immediate post-operative period.

Country - Travel Award: Italy

CONTROL ID: 3223725

FINAL ID: 0295

CURRENT SCIENTIFIC GROUPS & NETWORKS: Periodontal Research-Therapy

PRESENTER: Urška Marhl

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TITLE: Effects of Periodontal Treatment on Overall Well-being

ABSTRACT BODY:

Objectives: The aim of the study was to evaluate the patients' self-perception of the impact of periodontitis on the overall health, physical, psychological and social well-being before and after non-surgical periodontal treatment.

Methods: This was a prospective clinical study. Patients diagnosed with periodontitis from 18 to 70 years were included. Full-mouth periodontal clinical examination was performed prior (M0) and at 3-month after the treatment (M3). Following clinical parameters were collected by a calibrated examiner: periodontal pocket depth (PPD), clinical attachment level (CAL), recession (REC), full-mouth bleeding score (FMBS), full-mouth plaque score (FMPS). Patients completed a questionnaire of 88 items, divided into seven areas: Oral health Impacts Profile (OHIP-14), Pittsburgh Sleep Quality Index (PSQI), Memory Assessment Clinic-Q (MACQ), International Index of Erectile Function (IIEF-5), Fagerstrom-nicotine dependence test, Perio-symptoms, Perio-perception at M0 and M3. Clinical variables were analyzed with ANOVA test for repeated measures and categorical ones with Chi-square test.

Results: A total number of 403 patients was included, 58.3% of them were female. Non-surgical Periodontal treatment was successful, as at M3 all measured clinical parameters improved (Table1). The psychometric tests showed statistically significant improvement at M3 ($p < 0.05$), except for IIEF-5. When compared to baseline, at M3 mean OHIP-14 scores lowered from 31.30 ± 14.07 to 12.49 ± 11.87 , MACQ scores from 7.18 ± 3.03 to 3.62 ± 1.51 , and Fagerstrom scores from 8.08 ± 1.63 to 7.33 ± 1.75 . The PSQI scores also improved, showing a significant improvement in patients diagnosed with severe periodontitis. At baseline, 55.3% of patients with mild, 68.2% with moderate and 62% with severe periodontitis thought that periodontitis could increase their stress. At M3, those percentages decreased to 24.4%, 30.8%, and 20.3% for mild, moderate and severe periodontitis, respectively.

Conclusions: Patients perceived that non-surgical periodontal treatment exhibited positive effects on their overall well-being.

Country - Travel Award: Italy

CONTROL ID: 3222621

FINAL ID: 0204

CURRENT SCIENTIFIC GROUPS & NETWORKS: Implantology Research

PRESENTER: Angeliki Polymeri

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TITLE: Surgical Treatment of Peri-Implantitis with Two Different Types of Xenograft

ABSTRACT BODY:

Objectives: To compare the efficacy of two different bovine bone substitutes in the regeneration of peri-implant intra-osseous defects.

Methods: Thirty nine patients diagnosed with peri-implantitis (i.e. marginal bone loss ≥ 3 mm diagnosed on a periapical radiograph and probing pocket depth (PPD) ≥ 5 mm with presence of bleeding and/or suppuration on probing (BoP/SoP)) were screened for eligibility for this randomized controlled trial. Further, all patients needed to have one 3 or 4 wall intra-osseous defect deeper than 3 mm, defect angle $\leq 35^\circ$ calculated from the axis of the implant. Patients were randomized to receive surgical debridement and defect fill with either Endobon® or Bio-Oss®. Radiographic defect fill was the primary outcome and secondary outcomes were PPD and BoP/SoP.

Results: Ultimately, 30 patients qualified and 29 patients (n=15 Endobon, n=14 Bio-Oss) completed the 12-month follow-up. The bone defects reduced on average by 3.0 ± 1.1 mm for Endobon and 3.1 ± 1.3 mm for Bio-Oss ($p=0.856$). The Endobon group showed a PPD reduction of 3.7 ± 1.6 mm compared with 3.3 ± 1.7 mm in the BioOss group ($p=0.515$). BoP was reduced from 100% to 50% and from 98% to 40% for Endobon and BioOss, respectively ($p=0.185$). The improvements in bone levels, PPD, and BoP between the baseline and the 12-month examinations were statistically significant for both grafting materials ($p<0.001$). Successful treatment outcome (i.e. no further bone loss, mean PPD <5 mm and no SoP, regardless of BoP) was identified in 10/15 (66.6%) and 9/14 (64.3%) individuals who were treated with Endobon and BioOss respectively ($F = 0.018$, $p=0.893$).

Conclusions: Both bone substitutes showed similar effectiveness in terms of radiographic defect fill and PPD reduction after 12 months, and represent a viable treatment option for peri-implantitis bone defects.

Country - Travel Award: Netherlands

CONTROL ID: 3223601

FINAL ID: 0576

CURRENT SCIENTIFIC GROUPS & NETWORKS: e-Oral Health Network

PRESENTER: Janneke Scheerman

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TITLE: The Effect Evaluation of an Online Cognitive Behavioral Therapy Program for Children's Dental Anxiety

ABSTRACT BODY:

Objectives: Recently, Gomes et al. (2018) performed a systematic review and concluded that cognitive behaviour therapy (CBT) produces better anxiety reduction than diverse behavioural management techniques, but the evidence was of low quality and further studies in children are needed. The aim of this study was to evaluate the effects of an online CBT program on improving children's dental anxiety and Quality of Life (QoL).

Methods: Three hundred children (aged 12-18) were recruited from pediatric dental clinics in Qazvin. This study adopted a three-arm randomized-controlled trial design, consisting of a children only online CBT group, children plus involvement of parents and dental professionals online CBT group, and waiting-list control group. The online CBT comprised text, videos, exercises and online guidance from a psychologist. A combination of cognitive and behavioral techniques was used to reduce dental anxiety. Children completed questionnaires, which assessed dental anxiety (MCDAS) and Self-Efficacy regarding Specific Phobias, QoL at baseline (T0), three month post-intervention (T1) and six-months post-intervention (T2). Data were analyzed with mixed models.

Results: Decreases in children's dental anxiety and increases in self-efficacy and QoL at 3-months and 6-months follow-up in both intervention groups compared to the control group were observed. For the children only CBT group, the mean MCDAS score at baseline was 28.2 (SD, 6.2) and at follow up (T2) 16.81 (SD, 5.9). For the online CBT group plus involvement of parents and dental professionals, the mean MCDAS score for the CBT+ group was 27.4 (SD, 6.6) at baseline and 15.11 (SD, 5.7) at follow up. The control group showed no significant changes. Children in CBT group that involved significant others showed significant greater decreases in their dental anxiety, self-efficacy and QoL than the children in the CBT group ($p < .001$).

Conclusions: This online CBT program led to decreased dental anxiety, higher self-efficacy with regards to phobias and better QoL of children. Involving parents and dental professionals can confer additional benefit for children's dental fear.

Country - Travel Award: Netherlands

CONTROL ID: 3217383

FINAL ID: 0213

CURRENT SCIENTIFIC GROUPS & NETWORKS: Cariology Research-Microbiological Studies/Biofilm

PRESENTER: CAN WANG

AUTHORS (FIRST NAME, LAST NAME): CAN WANG¹, Jiapeng Hou², Henny C. Van der Mei², Henk Busscher², Yijin Ren³

AUTHORS/INSTITUTIONS: C. WANG, Department of Orthodontics, University Medical Center Groningen, Groningen, Groningen, NETHERLANDS|J. Hou, H.C. Van der Mei, H. Busscher, Biomedical Engineering, University Medical Center Groningen, Groningen, NETHERLANDS|Y. Ren, Department of Orthodontics, University Medical Centre Groningen, Groningen, NETHERLANDS|

TITLE: Identification of Adhesion-force Induced Gene Expression, Its Force Sensitivity and Height Distribution in Streptococcus Mutans Biofilms

ABSTRACT BODY:

Objectives: luxS quorum sensing system which coordinates communication in Streptococcus mutans biofilm was hypothesized to impact the extension of adhesion-force sensitive genetic programming into a mature biofilm. Therefore, this study aims to investigate how adhesion-force induced gene expression spread in a mature biofilm and to what extent quorum-sensing controls it in later biofilm inhabitants, residing further away from the substratum surface.

Methods: S. mutans UA 159 (wild type) and S. mutans UA 159 Δ luxS (quorum-sensing deficient mutant) were used in this study. Adhesion forces between bacterial strains and four different solid surfaces were tested by using atomic force microscope. Biofilm thickness and structure on all surfaces were analyzed using optical coherence tomography (OCT) after 5 h and 24 h of growth. Biofilms were then collected and sliced. Gene expressions in whole biofilms and biofilm slices were determined using RT-qPCR.

Results: The gene expression of brpA, comDE and gbpB in 5 h old biofilms were up-regulated with increasing adhesion forces sensed by the bacteria. In 24 h old biofilms, adhesion-force induced gene expression and emergent extracellular polymeric substances production was stronger for the parent strain than for the quorum-sensing deficient mutant, but only up to a height of around 30-40 μ m above the substratum surfaces.

Conclusions: Initial colonizers of a substratum surface sense adhesion forces directly, which triggers the gene expression and quorum-sensing system. Bacteria in a biofilm 40 μ m away from the surface still show adhesion-force induced gene expression.

Country - Travel Award: Netherlands

CONTROL ID: 3223562

FINAL ID: 0437

CURRENT SCIENTIFIC GROUPS & NETWORKS: Periodontal Research-Diagnosis/Epidemiology

PRESENTER: Alexander R.E. Verhelst

AUTHORS (FIRST NAME, LAST NAME): Alexander R. Verhelst¹, Madeline X. Kosho¹, Ghizlane Aarab², Bruno G. Loos¹

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TITLE: Periodontitis is a Risk Indicator for Obstructive Sleep Apnea

ABSTRACT BODY:

Objectives: Periodontitis (PD) is a complex, highly prevalent chronic inflammatory disease of the tooth-supporting structures. Obstructive Sleep Apnea (OSA) is a condition characterized by recurrent obstructions of the upper airway, often resulting in oxygen desaturations and arousals from sleep. Since PD and OSA share several risk factors, the aim of the current study was to investigate the associations between PD and OSA in a dental setting.

Methods: For this cross-sectional, case-control study, we recruited PD patients and non-PD controls. PD patients and non-PD controls filled out a validated screening questionnaire on the risk of OSA. Based on this questionnaire, an OSA risk score was calculated and low (<35%), intermediate (35%-55%) or high-risk categories (>55%) were also determined. Independent T-tests, Chi-square tests and Odds Ratio's (OR) were calculated for the total risk of OSA as well as for the severe OSA risk category in both groups.

Results: Seventy PD patients (60% male, mean age 54 years, mean BMI = 26 kg/m²) and 77 controls (49% male, mean age 54 years, mean BMI = 27 kg/m²) were included for analysis. The risk of OSA for the PD patients was 38.6% ± 29.7% and for the controls 34.2% ± 23.3% (NS, P =0.31), with an OR of 1.0 (95% CI 0.9 – 1.1). After subgrouping individuals in the low/intermediate or high OSA risk categories, we observed significant more PD patients than controls in the severe risk category for OSA (21% vs 9%, P =0.036), with OR 2.7 (95% CI =1.0 – 7.2).

Conclusions: Having periodontitis is more often associated with a severe risk for OSA. These findings suggest that screening for OSA in a PD population may help in early diagnosis and possibly early treatment, to prevent severe morbidities like cardiovascular diseases and diabetes, which are related with OSA.

Country - Travel Award: the Netherlands

CONTROL ID: 3199857

FINAL ID: 0060

CURRENT SCIENTIFIC GROUPS & NETWORKS: Orthodontics Research

PRESENTER: Brunilda Dhamo

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TITLE: Dental Development and the Occurrence of Aberrant Occlusal Dental Traits

ABSTRACT BODY:

Objectives: The aim of our study is to investigate the association between timing of dental development and aberrant dental traits such as crowding, tooth impaction, and hypodontia.

Methods: This study was performed using 4446 ten year old children from a multiethnic birth cohort, the Generation R Study. Dental development was defined using the Demirjian method. Crowding, impaction and hypodontia were ascertained from 2D and 3D pictures, and radiographs. We built three series of logistic regression models to test the associations of dental age with crowding, impaction and hypodontia. Similar models were built to investigate the associations of the developmental stages of each left mandibular tooth with crowding, impaction and hypodontia.

Results: Inverse associations were found between every one-year increase in dental age and the presence of crowding (OR=0.84, 95% CI: 0.79, 0.89), impaction of teeth (OR=0.66, 95% CI: 0.52, 0.84) and hypodontia (OR=0.52, 95% CI: 0.47, 0.56). Lower developmental stages of the second premolar were associated with the presence of crowding (OR=0.90, 95% CI: 0.83, 0.98). Lower developmental stages of the second premolar (OR=0.88, 95% CI: 0.79, 0.98), first molar (OR= 0.76, 95% CI: 0.65, 0.90) and the second molar (OR=0.83, 95% CI: 0.73, 0.94) were associated with the presence of tooth impaction. Lower developmental stages of all mandibular teeth except the central incisor were associated with hypodontia (p<0.05).

Conclusions: Accelerated dental development is associated with lower occurrence of crowding, impaction and hypodontia. Future research on factors of delayed dental development might aid to find the correct timing for orthodontic treatment and to prevent the occurrence of more severe aberrant dental traits in children.

Country - Travel Award: Netherlands

CONTROL ID: 3222912

FINAL ID: 0207

CURRENT SCIENTIFIC GROUPS & NETWORKS: Microbiology/Immunology

PRESENTER: Marije Kaan

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TITLE: Feasibility of Home Sampling by Mothers in Infants for Microbiota Analysis of Multiple Oral Niches

ABSTRACT BODY:

Objectives: Large longitudinal cohort studies in infants are needed to understand oral microbiome maturation in relation to general health. The logistics of such studies are complex and the involved costs are high. Methods like home sampling by parents would reduce these issues. This study aimed to evaluate the feasibility of home sampling by mothers and to assess which oral niche provides the most reliable sample.

Methods: A cross-sectional study was done in 29 mothers and their infants aged 2-15 months. Swabs of the tongue, buccal mucosa, and unstimulated saliva of the infant were collected by the mother after watching an instruction video. Thereafter, the trained researcher repeated the sample collection. Bacterial DNA was quantified and microbial composition was assessed using 16S rDNA amplicon sequencing. Microbiome profiles were analyzed using Principal Component Analysis, Permutational Analysis of Variance, and Bray-Curtis dissimilarity. Bacterial DNA concentration and microbiome dissimilarity indexes were compared using Kruskal-Wallis, Friedman, Wilcoxon signed-rank tests, and Spearman correlation.

Results: Bacterial DNA concentration in samples collected by the mothers versus the researcher did not differ ($p>0.05$). Irrespective of the operator, bacterial DNA concentration correlated with the age of the child ($p<0.05$). Microbial profiles of the tongue samples differed significantly from those of saliva ($p=0.02$) and buccal mucosa ($p=0.02$), but did not differ by the operator for any of the sample types ($p>0.05$). Tongue microbiome profiles showed the least interindividual differences and the lowest dissimilarity between the related samples collected by the two operators. In saliva, difference between samples collected by the two operators increased significantly with the age of the child ($p=0.049$).

Conclusions: Home sampling by mothers is a feasible method for oral sample collection in infants. Oral samples collected by mothers resemble samples collected by a trained researcher, with tongue sample being the most similar and saliva the least.

Country - Travel Award: Netherlands

CONTROL ID: 3223926

FINAL ID: 0061

CURRENT SCIENTIFIC GROUPS & NETWORKS: Orthodontics Research

PRESENTER: Nehir Canigur Bavbek

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TITLE: Understanding the Effect of Palatally Impacted Canines on Transversal Width of Dental Arch: Quadrant Analysis of Three Dimensional Data

ABSTRACT BODY:

Objectives: The aim of this study was to evaluate the transversal width of maxillary dental arch in patients with palatally impacted canines (PIC) on three dimensional images by using quadrant analysis.

Methods: The axial and coronal views of pretreatment cone beam computed tomography images of 18 patients with bilateral PIC (12 female, 6 male; mean age 23.77±2.12 years) and 31 patients with unilateral PIC (19 female, 12 male; mean age 20.54±1.41 years) were evaluated. The transversal width of maxillary arch was measured at lateral incisor, premolar and molar region together with the angulation of the canines. The results were compared with a control group (n = 60; 38 female, 22 males; mean age 21.21±3.53 years) with normally erupted canines. A further quadrant analysis was performed by comparing the quadrants with PICs and normally erupted canines with each other. Statistical analysis was performed by one-way analysis of variance followed by Tukey test with Bonferroni adjustment (p<0.05).

Results: When compared to the control group, uni- and bi-lateral PICs showed significantly more horizontal angulation in relation to maxillary midline and nasal horizontal plane. Due to the variability in location of the PICs in unilaterally affected group (right or left), the canine angulations were found to be significantly less horizontal when compared to bilaterally PIC group. Inter-group comparisons displayed no difference with regard to transversal arch widths and total arch perimeter. On the other hand, the quadrant analysis showed that in quadrants with a PIC, the transversal width of the quadrant in premolar region was significantly narrower than in quadrants with normally erupted canines. Additionally, the quadrant's arch perimeter was significantly less when a PIC was present in the quadrant.

Conclusions: PICs are more horizontally angulated when compared to normally erupted canines. The presence of a PIC on a quadrant leads to a decrease in transversal arch width in premolar region. Particularly patients with unilateral PICs are advised to be analyzed further with quadrant analysis, since the variability of the position of the PIC may affect the results of traditional intergroup comparisons.

Country - Travel Award: Turkey

CONTROL ID: 3222936

FINAL ID: 0003

CURRENT SCIENTIFIC GROUPS & NETWORKS: Cariology Research-Clinical & Epidemiological Studies

PRESENTER: Sinem OĞLAKÇIOĞLU

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AUTHORS/INSTITUTIONS: S. OĞLAKÇIOĞLU, T. Pamir, Restorative, Faculty of Dentistry, Health Sciences Institute, Izmir, TURKEY]

TITLE: 1-Year Clinical Follow-up of Selective Caries Removal in Deep Dentin Carious Lesions

ABSTRACT BODY:

Objectives: Objective: This clinical study aimed to observe the success of stepwise removal or one-step excavation techniques in deep dentin caries.

Methods: Method: Forty permanent teeth with caries lesions penetrating to 75% or more of dentin were included. For both one-step excavation and the first stage of stepwise removal, same procedure was applied, in which peripheral dentin was prepared to hard dentin by high-speed diamond and low-speed steel bur. Then, selective removal to soft dentin was carried out using a hand instrument over the pulp. Pure calcium hydroxide followed by zinc-oxide eugenol cement (Alganol, Kemdent®) was placed on pulpal walls of the cavities. Conventional glass-ionomer cement (Ketac™ Molar Quik Applicap, 3M ESPE) was used for temporary filling.

Evaluations were performed at the sixth-month according to clinical symptoms and radiographic signs. At the same session, the cavities of stepwise group were re-entered and selective removal was applied to firm dentin via hand excavator. For one-step group, glass ionomer restorations were prepared as the base for final restorations. All cavities in this study were permanently restored with resin composite (G-aenial® Posterior, GC).

Results: At the end of the one-year observation period, pulpal success of this study was 100% for one-step excavation technique while 84.21% was for the stepwise group. As a result of re-entry procedure, pulp exposure occurred on seven of teeth (37%) in the stepwise removal group, while vitally survived after one-year. Failure in this group was due to chronic inflammation of three teeth afterward they were treated with root canal therapy.

Conclusions: Within the limitation of this study, it seemed that one-step excavation technique presented better performance compared to stepwise removal. Additionally, stepwise removal led to pulp exposure more than expected and it maybe better to reconsider re-entry.

Country - Travel Award: Turkey

CONTROL ID: 3223391

FINAL ID: 0093

CURRENT SCIENTIFIC GROUPS & NETWORKS: Dental Materials 4: Adhesion

PRESENTER: RUHSAN MUDUROGLU

AUTHORS (FIRST NAME, LAST NAME): RUHSAN MUDUROGLU³, Andrei C. Ionescu¹, Massimo del Fabbro¹, Salvatore Scolavino², Eugenio Brambilla¹

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TITLE: Adhesive Application in Class II Composite Restorations Before/After Matrix Positioning

ABSTRACT BODY:

Objectives: Resin-based composite (RBC) restorations are characterized by excellent performances, yet their application is critical at the cervical margin of class II restorations. A clinical protocol suggests applying the adhesive system before positioning of interproximal matrices, to achieve better control.

This study aimed to morphologically investigate the effect of adhesive placement prior, or subsequent, to matrix positioning in direct-bonded Class II RBC restorations. Additional aim was to evaluate possible differences when using a two-step (CSE, Clearfil SE Bond2) or a one-step adhesive system (CU, Clearfil Universal Bond Quick).

Methods: Standardized mesio-occlusal and disto-occlusal cavities were prepared on twenty human molars. Teeth were randomly assigned to two groups according to (n=10) contoured sectional metal matrices positioned before adhesive application (M->A), or (n=10) after adhesive application (A->M). Both adhesive systems were additioned with crystal violet dye (CV, 10 vol%). Specimen sections (0.5 mm thickness) were prepared and assessed with optical and scanning electron microscopy (SEM). Bond strength of the CV-additioned adhesives was tested by microshear bond test on enamel and dentin of 12 additional molars.

Results: M->A produced a layer of adhesive both on tooth surfaces inside the restoration box and on external restoration surfaces in contact with the matrix. A->M produced a thin layer of adhesive on external tooth surfaces, well beyond cavity margins and end of RBC restoration. In all restorations, excess RBC material with uneven margins was observed over cervical margin (Figure 1). Shear bond strengths: CV addition significantly reduced adhesion forces on dentine (p=0.0015). When CU+CV was used on dentine, adhesion forces showed a 10-fold reduction.

Conclusions: Both M->A and A->M protocols showed pros and cons, expressing adhesive layers in a hard to reach area, with the risk of being poorly polymerized. To improve longevity, all cervical margins of RBC restorations should be carefully finished, no matter the clinical protocol adopted.

Country - Travel Award: Turkey