Scientific Highlights

SHORT OVERVIEWS ON RECENTLY PUBLISHED SCIENTIFIC EVIDENCE.

Issue 2/2020

Edited by Dr Pooja Nair

in this issue

EDITOR'S CHOICE

The effect of systemic antibiotics on clinical and patient reported outcome measures of oral implant therapy with simultaneous guided bone regeneration
(Payer M et al. 2020)

and

Transmission routes of 2019-nCoV and controls in dental practice
(Peng X et al. 2020)

Clinical and esthetic outcomes of two different prosthetic workflows for implant-supported all-ceramic single crowns - 3year results of a randomized multicenter clinical trial
(Wittneben, J. G et al. 2020)

The impact of the ITI International Team for Implantology on implant dentistry: a retrospective and descriptive analysis of 30 years of research support
(Lazarin, R et al. 2020)

Editor's choice

Clin Oral Implants Res. 2020 Jan 19

The effect of systemic antibiotics on clinical and patient reported outcome measures of oral implant therapy with simultaneous guided bone regeneration

Payer M, Tan W C, Han J, Ivanovski S, Mattheos N, Pjetursson B E, Zhuang L, Fokas G, Wong M C. M, Acham S, Lang N P.

FREE FULL TEXT

Study objectives and methods

The aim of the present superiority study was to determine the effect of systemic antibiotics primarily on patient reported outcome measures (PROMs) and post-surgical complications in patients undergoing oral implant therapy with simultaneous guided bone regeneration (GBR).

236 medically and periodontally healthy patients received oral implants with simultaneous GBR at 7 centers. Pre-operative antibiotics of 2 g amoxicillin were prescribed to the test group 1 hour prior to surgery and 500 mg thrice daily on days 1 to 3 after surgery. The control group was given a placebo. Group allocation was performed randomly.

Primary outcome variables were PROMs recorded as Visual Analogue Scale (VAS) scores assessed on days 1-7 & 14 on pain, swelling, hematoma and bleeding. Postoperative complications as secondary outcome variables were examined at 1, 2, 4 and 12 weeks from surgery. Chi-square tests and repeated measures of analysis of variance (ANOVA) were performed for statistical evaluation.

Results

- No statistically significant differences ($p>0.05$) between the two groups were detected for the evaluated PROMs. The same was noted with respect to post-surgical complications.
- Four implants were lost - three in the test group and one in the control group

Conclusions

In this trial, systemic antibiotics did not provide additional benefits to (PROMs), nor the prevention of post-surgical complications in medically and periodontally healthy patients undergoing oral implant therapy with simultaneous GBR.

Adapted from Payer M et al.,Clin Oral Implants Res. 2020 Jan 19, for more info about this publication click HERE

Int J Oral Sci. 2020;12(1):9

Transmission routes of 2019-nCoV and controls in dental practice

Peng X, Xu X, Li Y, Cheng L, Zhou X, Ren B

Abstract

A novel β-coronavirus (2019-nCoV) caused severe and even fetal pneumonia explored in a seafood market of Wuhan city, Hubei province, China, and rapidly spread to other provinces of China and other countries.

The 2019-nCoV was different from SARS-CoV, but shared the same host receptor the human angiotensin-converting enzyme 2 (ACE2). The natural host of 2019-nCoV may be the bat Rhinolophus affinis as 2019-nCoV showed 96.2% of whole-genome identity to BatCoV RaTG13.

The person-to-person transmission routes of 2019-nCoV included direct transmission, such as cough, sneeze, droplet inhalation transmission, and contact transmission, such as the contact with oral, nasal, and eye mucous membranes. 2019-nCoV can also be transmitted through the saliva, and the fetal-oral routes may also be a potential person-to-person transmission route.

The participants in dental practice expose to tremendous risk of 2019-nCoV infection due to the face-to-face communication and the exposure to saliva, blood, and other body fluids, and the handling of sharp instruments. Dental professionals play great roles in preventing the transmission of 2019-nCoV.

Here we recommend the infection control measures during dental practice to block the person-to-person transmission routes in dental clinics and hospitals.

Adapted from Peng et al., Int J Oral Sci. 2020;12(1):9, for more info about this publication click HERE

Clin Oral Implants Res 2020 Feb 3

Clinical and esthetic outcomes of two different prosthetic workflows for implant-supported all-ceramic single crowns -3year results of a randomized multicenter clinical trial

Wittneben J. G, Gavric J, Sailer I, Buser D, Wismeijer D,

Study objectives and methods

The aim of this randomized multicenter clinical trial was to evaluate and compare the performance of anterior all-ceramic implant crowns based either on prefabricated zirconia abutments veneered with pressed ceramics or on CAD/CAM zirconia abutments veneered with the hand build-up technique.
Forty implants were inserted in sites 14-24 in two centers, the Universities of Bern and Geneva, Switzerland. Twenty patients each were randomized into either Group A and restored with one-piece single crown made of a prefabricated zirconia abutment with pressed ceramic, or Group B using an individualized CAD/CAM zirconia abutment with the hand-layered technique. After 3 years, clinical, esthetic, and radiographic parameters were assessed.

Results

- Group A exhibited one dropout patient and one failure resulting in a survival rate of 89% after 3 years and two failures for Group B (90%).
- Clinical parameters presented healthy peri-implant soft tissues.
- There were no significant differences at baseline, 6 months, and 1 and 3 years for DIB values between the two groups.

Conclusions

Both implant-supported prosthetic pathways represent a valuable treatment option for the restoration of implant crowns in the anterior maxilla.

Adapted from Wittneben J.G., et al., Clin Oral Implants Res 2020 Feb 3, for more info about this publication click HERE

Int J Oral Maxillofac Implants. 2020 Jan/Feb;35(1): e1-e13

The impact of the ITI International Team for Implantology on implant dentistry: a retrospective and descriptive analysis of 30 years of research support

Lazarin R, Ebenezer S, Benthaus K, Schimmel M

Study objectives and methods

The purpose of this study was to analyze the projects submitted to the ITI International Team for Implantology for funding and the scientific publications ensuing from these projects, over a period of 30 years,

This analysis was performed based on information available in the database of the ITI. For each project, data related to institution, country of origin, and grant status (financed or rejected) were extracted.

For the financed projects, the grant amount and number of publications were recorded. Publications were searched independently by two investigators. For all publications, the study topic, study design, and citation number were recorded.

Results

- From a total of 1,372 submitted projects from 51 different countries and 308 different institutions, 514 (37.46%) were financed by the ITI.
- This amounts to more than CHF 52 million invested in favor of implant dentistry and related fields.
- A total of 552 publications (including original research and reviews) were identified related to these projects, with the majority being in vitro studies (n = 198), and
- The most common topic researched was implant surface modification (n =134).
- The United States was the country and the University of Bern was the institution with the largest number of financed projects and published papers.

Conclusions

This analysis revealed that the ITI has been actively supporting research in the field of implant dentistry and related areas globally. Several concepts in present-day implantology are based on literature from ITI-funded projects.

Adapted from Lazarin R.et al., Int J Oral Maxillofac Implants.2020 Jan/Feb;35(1):e1-e13, for more info about this publication click HERE

J Clin Exp Dent 2020 Jan 25;12(1)e79-e84

Bone loss around narrow implants versus standard diameter implants: Retrospective 2-years case-control study

Corcuera-Flores J. R, Pérez-Fierro M, Blanco-Carrión A, Torres-Lagares D, Castellanos-Cosano L, Machuca-Portillo G

FREE FULL TEXT

Study objectives and methods

The objectives were to evaluate the bone loss (BL) around narrow diameter implants (3.3 mm) 2 years after implant loading and compare with the bone loss around conventional-diameter implants (4.1 mm), as well as with clinical and anatomical variables after 2-years follow-up.

Cases: 20 patients either gender-age, narrow implants (Straumann TM-SLA, diameter 3.3 mm); Control: 20 patients matching for gender-age, conventional implants (Straumann TM-SLA, diameter 4.1). Total 82 implants (31 narrow implants and 51 conventional implants) in 40 patients. To avoid statistical bias, a cluster of one implant per patient was randomly selected (20 narrow implants and 20 conventional implants).

To evaluate changes resulting from bone loss around the implants, a total of 80 panoramic radiographs were taken of all 40 patients; the first panoramic image was taken at the time of implant loading and the second one 2 years later. Clinical and demographic variables were obtained from the patients' medical records. Statistical method: Spearman's correlation coefficient, chi-squared (Haberman's post hoc), Mann-Whitney U and Kruskal-Wallis tests. Statistical significance $p < 0.05$.

Results

- No significant differences in bone loss around were found around narrow implants versus conventional implants.
- Differences linked to tobacco use were found after studying one implant per patient ($p < 0.05$).

Conclusions

- With the limitations of the present study, no significant differences in BL were found when comparing narrow implants with conventional implants after 2 years of implant loading.
- There were also no differences found when accounting for other demographic and clinical variables, with the exception of tobacco use.

Adapted from Corcuera-Flores J. R et al., J Clin Exp Dent 2020 Jan 25;12(1)e79-e84, for more info about this publication click HERE

Int J Oral Maxillofac Implants 2020 Jan/Feb;35(1):39-51

Immediate dental implant stabilization in a canine model using a novel mineral-organic adhesive: 4-month results

Cochran D. L, Jones A, Sugita R, Brown M. C, Guda T, Prasad H, Ong J. L, Pollack A, Kay G. W.

Study objectives and methods

This study evaluated a novel injectable, self-setting, osteoconductive, resorbable adhesive that provides immediate implant stabilization. Twenty-six large canines had the mandibular second through fourth premolars and the first molar removed bilaterally. After 3 months, oversized osteotomies were prepared with only the apical 2 mm of the implant engaging native bone. One site had a novel resorbable, self-setting, mineral-organic adhesive (TN-SM) placed around the implant, a second site received bone graft, and a third site received only blood clot. Removal torque, standardized radiography, and histology were used to evaluate implant stability and tissue contact after 24 hours, 10 days, and 4 months.

Results

- Mean removal torque values after 24 hours were 1.4, 1.3, and 22.2 Ncm for the control, bone graft, and mineral-organic adhesive, respectively. After 10 days, these values were 5.7, 6.2, and 45.7 Ncm and at 4 months increased to 88.7, 77.8, and 104.7 Ncm, respectively.
- Clinical, radiographic, and histologic evaluations showed a lack of inflammatory reaction. Control defects were initially radiolucent in the coronal area; grafted sites revealed particles in the gap, with both conditions gradually filling with bone over time.
- At 10 days, histologic evaluation demonstrated excellent biocompatibility and intimate contact of mineral-organic adhesive to both the implant and bone, providing an osseointegration-like bond; control sites revealed no bone contact in the defect area, while the bone-grafted sites revealed unattached graft particles.
- At 4 months, much of the mineral-organic adhesive was replaced with bone; the control and grafted sites had some bone fill, and many of the defects demonstrated no bone-to-implant contact and were filled with soft tissue or isolated graft particles.

Conclusions

- The mineral-organic adhesive provides immediate (osseointegration-like) and continued implant stabilization over 4 months in sites lacking primary stability. Experimental sites demonstrated maintenance of crestal bone levels adjacent to the mineral-organic adhesive and soft tissue exclusion without the use of membranes in this canine model. These results demonstrate that this novel mineral-organic adhesive can enable implant osseointegration in a site where insufficient native bone exists to allow immediate implant placement.

Adapted from Cochran D.L et al., Int J Oral Maxillofac Implants 2020 Jan/Feb;35(1):39-51, for more info about this publication click HERE

Int J Oral Maxillofac Surg 2020 Jan 25

Oral health-related quality of life in tumour patients treated with patient-specific dental implants

Jehn P, Spalthoff S, Korn P, Stoetzer M, Gercken M, Gellrich N. C, Rahlf B.

Abstract

Dental rehabilitation after surgically acquired bone deficiency related to tumour treatment remains a challenge. The insertion of patient-specific implants geared to the contour of the remaining bone is a feasible method of supporting fixed or removable dentures.

As oral health-related quality of life (OHRQoL) is of great interest in these cases, 12 individuals treated with patient-specific implants for severe bone deficiency were surveyed and their Oral Health Impact Profile (OHIP) scores after dental rehabilitation were evaluated.

The OHIP-G53 questionnaire was used to measure overall treatment outcomes. The distribution of OHIP sum-scores for participants treated with patient-specific implants was almost homogeneous when compared to those cited in the literature for patients treated with conventional dental implants.

OHIP items related to functional impairment and physical pain showed the highest scores (occurring occasionally), and financial loss related to treatment was frequently stated. Moreover, higher scores were detected in almost all OHIP dimensions for participants with patient-specific implant-supported removable dentures. Conversely, those treated with patient-specific dental implants and fixed dentures showed lower psychosocial impact scores and equal or superior OHRQoL.

Patient-specific dental implants, especially combined with fixed dentures, can lead to a positive OHRQoL in patients with severe bone deficiencies related to tumour therapy.

Adapted from Jehn P et al., Int J Oral Maxillofac Surg 2020 Jan 25, for more info about this publication click HERE

J Dent. 2020 Mar. 94:103298.

Impact of the retention system of implant fixed dental restorations on the peri-implant health, state of the prosthesis, and patients' oral health-related quality of life

García-Minguillán G, Del Río J, Preciado A, Lynch C. D, Castillo-Oyagüe R.

Study objectives and methods

To investigate the impact of the retention system (screwed or cemented) of implant fixed dental prostheses (i-FDPs) on the peri-implant health, prosthesis' state, patient self-evaluation of functionality and aesthetics, and oral health-related quality of life (OHRQoL).

35 participants were classified into two groups according to the retention system of their metal-ceramic i-FDPs. For the analysis of peri-implant health and prosthetic complications, the implant units were individually assessed. Group 1 (SPD; n = 22): implant units for screwed i-FDPs; and Group 2 (CPD; n = 36): implant units for cemented i-FDPs.

Data related to socio-demographics, design and installation of the superstructures, peri-implant condition, prosthetic complications, functionality, and aesthetics, were gathered. Patients answered the Oral Health Impact Profile (OHIP-14sp) questionnaire. Descriptive and parametric probes were run to evaluate the impact scores considering the study variables (alpha = 0.05).

Results

- The plaque index, gingival index, functionality, aesthetics, and global evaluation made by the patient recorded significantly better results for the SPD group.
- The most affected OHIP-14sp domain was 'Physical pain', followed by 'Psychological discomfort', and 'Functional limitation'.
- The subscales: 'Functional limitation', 'Physical disability', and 'Social disability', attributed significantly worst OHRQoL to CPD users

Conclusions

- A major presence of peri-implant disease, together with a worse functionality, aesthetics, and patient satisfaction were recorded in cemented i-FDPs with respect to the screwed ones.
- The retention system of i-FDPs can impact the peri-implant health, the subjective functional and aesthetic evaluation of the restoration, and the patients' OHRQoL; the screw retention providing superior results than the cementation.

Adapted from García-Minguillán G et al., J Dent. 2020 Mar. 94:103298, for more info about this publication click HERE

Int J Prosthodont. 2020 Jan/Feb;33(1):39-47.

A systematic review and meta-analysis of the influence of abutment material on peri-implant soft tissue color measured using spectrophotometry

Pitta J, Zarauz C, Pjetursson B, Sailer I, Liu X, Pradies G.

Study objectives and methods

To systematically review the current literature on the influence of abutment material (metal vs ceramic) and soft tissue thickness on peri-implant soft tissue discoloration in partially edentulous patients restored with implant-supported single crowns.

An electronic MEDLINE search was performed to identify randomized controlled clinical trials (RCTs) up to and including March 2017. The search was complemented by a manual search of related bibliographies. Selection of studies was made independently by two reviewers based on the inclusion criteria. Spectrophotometric data (DeltaE values) and soft tissue thickness values were extracted, and, whenever applicable, a meta-analysis using a random-effects approach was performed.

Results

- The search resulted in 208 titles and 30 abstracts. Full-text analysis was performed for 13 articles, resulting in 6 included RCTs.
- Meta-analysis of a total of 266 abutments revealed significantly lower DeltaE values for ceramic abutments when compared to the overall metal abutments (z test value = 1.99, P = .05), with a mean difference of 1.41 (95% CI 0.02, 2.80).
- Nonsignificant differences were found between titanium and zirconia (z test value = 1.59, P = .11).
- Limited information on the correlation between soft tissue thickness and DeltaE values was found. Hence, it was not possible to perform a meta-analysis of this question. 5 studies were included, reporting on 270 participants receiving 434 dental implants.

Conclusions

- The color outcome of the peri-implant soft tissue might be influenced by the abutment material. Ceramic abutments appear to provide an improved color matching between peri-implant soft tissues and soft tissues around natural teeth when compared to metallic abutments. These findings support the preference for all-ceramic or "white" abutments in esthetically demanding cases.

Adapted from Pitta J et al., Int J Prosthodont. 2020 Jan/Feb;33(1):39-47, for more info about this publication click HERE

References

Payer M et al., Clin Oral Implants Res. 2020 Jan 19 | **Peng et al.,** Int J Oral Sci. 2020;12(1):9 | **Wittneben, J.G. et al**., Clin Oral Implants Res 2020 Feb 3 | **Lazarin et al.,** Int J Oral Maxillofac Implants. 2020 Jan/Feb ;35(1): e1-e13| **Corcuera-Flores J.R. et al.,** J Clin Exp Dent 2020 Jan 25;12(1)e79-e84 | **Cochran D.L et al.,** Int J Oral Maxillofac Implants 2020 Jan/Feb;35(1):39-51 | **Jehn P et al**., *Int J Oral Maxillofac Surg 2020 Jan 25* | **García-Minguillán G et al.,** J Dent. 2020 Mar. 94:103298 | **Pitta J et al.,** Int J Prosthodont. 2020 Jan/Feb;33(1):39-47 | source: www.pubmed.gov|
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