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Peri-implant health in patients attending an annual implant maintenance progam

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Introduction

Peri-implant health is considered to be an important factor for long-term success of implant therapy. Findings in individuals with peri-implant mucositis or peri-implantitis are well described in the literature. Preventive and therapeutic interventions have proven to be effective in most of the cases, depending on the severity of disease an on other extrinsic and intrinsic patient and treatment variables. What, however, the general peri-implant appearance of un-selected recall hygiene patients is, needs still to be definded. Not every pocket deeper than 3 - 4 mm needs treatment and sometimes the prosthetic superstructure or the manual ability of the elderly impedes perfect oral hygiene yet does not neccessarily cause peri-implant disease in every case.

Objectives

The aim of the investigation was to describe variations and associations between findings of peri-implant health and related factors among arbitrarily recruited, presumably healthy recall patients with long-standing implant-borne restorations.

Material and Methods

74 symptom-free individuals, scheduled for their annual implant maintenance appointment at the Department for Prosthodontics of the Tübingen University Hospital, gave consent to participate in the study (Approval from the local Ethical Committee #63/2008BO2). Following an update of the patients' general medical and intra-oral clinical history investigative procedures were performed to evaluate peri-implant health (see table for details). In patients with multiple implantations only one implant was randomly chosen to avoid intra-individual dependencies on target variables. Bacterial load was measured with a commercial PCR DNA test (Hain MicroIdent, Hain Life Sciences, Nehren, Germany) and scored semi-quantitatively from 0-3 for each of the five periodonto-pathogenic species Aggregatibacter actinomycetemcomitans (Aa), Prevotella intermedia (Pi), Porphyromonas gingivalis (Pg), Tannerella forsythensis (Tf) and Treponema denticola (Td). A sum score of all 5 species was generated by adding-up the respective value of each species to a maximum possible score of 15. Statistical analyses included explorative data analysis, X^2-test, ANOVA, and logistic regression analysis. Level of significance was set at $p < 0.05$.

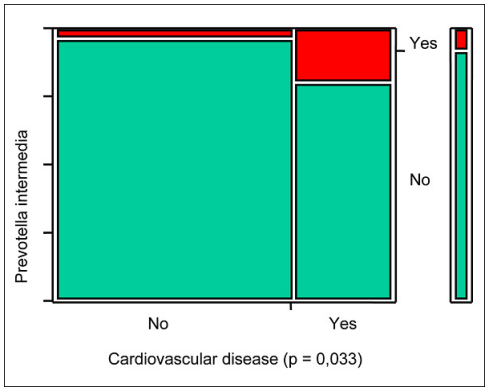
Age	69 years	Median 63 Range 23 - 94 years		
Gender	Female Male	41 33		
Medical history	Not Specified Stated in the history	31 43	Cardiovascular Diabetes Thyroid dysfunction Others (polyarthritis, allergies, gout, sklerodermia)	20 3 2 18
General oral hygiene (0-3)	1 (good) 2 (moderate) 3 (totally inadequate)	50 21 3		
Tobacco consumption	No Yes	69 5		
Restoration in function (years)	Mean 9.5 years	Median 7.8 Range 0.6 - 29.2 years		

Restoration type	Fixed	50	Single tooth crown	30
			Bridgework	20
	Removable	24	Bar attachment	17
			Ball attachment	7
Plaque (0-3)	0	30		
	1	35		
	2	8		
	3	1		
	Mean	0.7		
Pus (0-3)	0	74		
	1	0		
Bleeding probing (0-3)	0	18		
	1	50		
	2	6		
	3	0		
	Mean	0.9		
Periotest value	Mean -1.2	n=47*, Median -2 Range -6-6		
Pocket probing depth (mm)	Mean 2.9	Median 2.8 Range 1.5-5.2		
Sulcular fluid flow rate (µl/120s)	Mean 0.8	Median 0.6 Range 0-9.1		
Sum score microbiology	Mean 1.2	Median 0 Range 0-9		
Presence of any of the bacteria	No	41		
	Yes	33	Aa	14
			Pg	18
			Pi	6
			Tf	24
			Td	6

Tab. 1: * In the remaining cases the respective Implant was splinted and not accessible for Periotest measurements

Results

Smokers (n = 5) scored higher for peri-implant plaque accumulation (1.4 vs 0.7 in the remaining 69 non-smokers, p = 0.02) and had a greater subgingival bacterial sum score of the 5 periodonto-pathogenic species (3.1 vs. 1.1, p = 0.04). Individuals tested positive for the prevalence of Tannerella forsythensis (n = 24) showed decreased implant stability as shown by Periotest readings than Tf-negative individuals (0.3 vs -2.0, confidence interval 2-33, odds ratio 1.25, p = 0.03). This species was found more frequently in individuals with fixed implant-retained restorations (two thirds of 50 individuals) than in cases with removable prostheses (one fifth of 24 individuals, p = 0.046). Patients reporting cardiovascular disease were responsible for 75 per cent of the prevalence of Prevotella intermedia which was not found at all in patients without any reported unterlying medical complication.



Conclusions

In almost half of all cases one or more periodonto-pathogenic bacteria species could be found in the presented implant patient group with predominantly healthy oral conditions. Even though clinical conclusions are limited due to the small number of individuals in some of the analyses' subgroups statistically significant trends could be observed within the study population. Patients with a smoking habit have been reported to be more prone to peri-implant complications. This fact is reflected by the results of the present investigation with regard to plaque status and total bacteria load. Beyond that fixed restorations and a history of cardiovascular disease seem to be associated with a an increase in periodonto-pathogenic bacteria, showing statistically significant differences for some of the species in such patients.

This Poster was submitted by Dr. med. dent. Stefan Lachmann.

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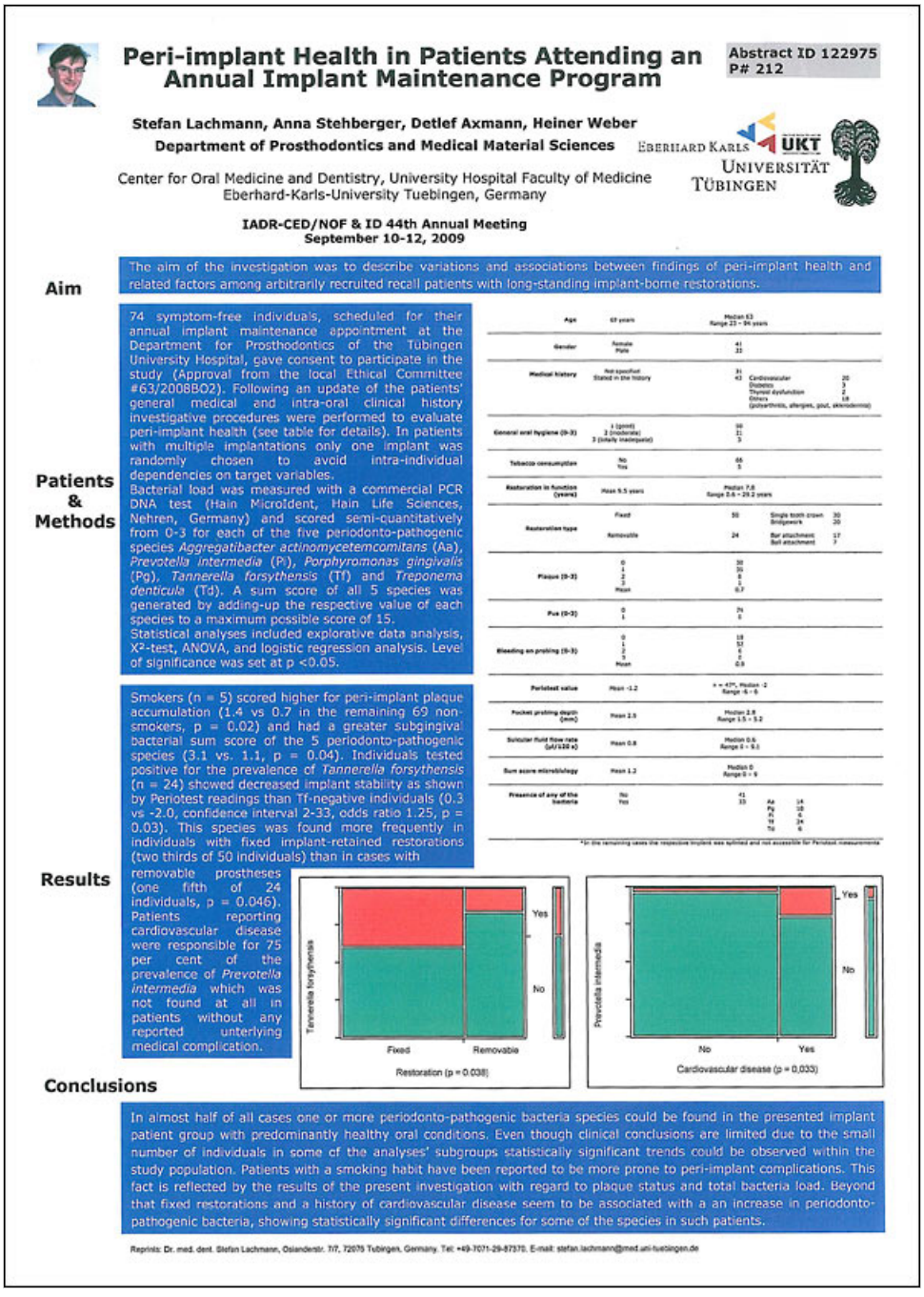

Peri-implant Health in Patients Attending an Annual Implant Maintenance Program

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IADR-CED/NOF & ID 44th Annual Meeting
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Aim

The aim of the investigation was to describe variations and associations between findings of peri-implant health and related factors among arbitrarily recruited recall patients with long-standing implant-borne restorations.

Patients & Methods

74 symptom-free individuals, scheduled for their annual implant maintenance appointment at the Department for Prosthodontics of the Tübingen University Hospital, gave consent to participate in the study (Approval from the local Ethical Committee #63/2008BO2). Following an update of the patients' general medical and intra-oral clinical history investigative procedures were performed to evaluate peri-implant health (see table for details). In patients with multiple implantations only one implant was randomly chosen to avoid intra-individual dependencies on target variables.
Bacterial load was measured with a commercial PCR DNA test (Hain MicroIdent, Hain Life Sciences, Nehren, Germany) and scored semi-quantitatively from 0-3 for each of the five periodonto-pathogenic species *Aggregatibacter actinomycetemcomitans* (Aa), *Prevotella intermedia* (Pi), *Porphyromonas gingivalis* (Pg), *Tannerella forsythensis* (Tf) and *Treponema denticula* (Td). A sum score of all 5 species was generated by adding-up the respective value of each species to a maximum possible score of 15.
Statistical analyses included explorative data analysis, X^2-test, ANOVA, and logistic regression analysis. Level of significance was set at $p < 0.05$.

Age	67 years	Median 63 Range 23 – 94 years
Gender	Female Male	41 33
Medical history	Not specified Stated in the history	31 43 Cardiovascular 20 Diabetes 3 Thyroid dysfunction 2 Others 18 (polyarthritis, allergies, gout, skindermitis)
General oral hygiene (0-3)	1 (good) 2 (moderate) 3 (totally inadequate)	50 21 3
Tobacco consumption	No Yes	66 5
Restoration in function (years)	Mean 5.5 years	Median 7.0 Range 0.6 – 20.2 years
Restoration type	Fixed	50 Single tooth crown 30 Bridgework 20
	Removable	24 Bar attachment 17 Ball attachment 7
Plaque (0-3)	0 1 2 3 Mean	30 35 8 1 0.7
Pus (0-3)	0 1	74 0
Bleeding on probing (0-3)	0 1 2 3 Mean	18 52 4 0 0.9
Periotest value	Mean -1.2	x = 47*, Median -2 Range -6 – 9
Pocket probing depth (mm)	Mean 2.5	Median 2.8 Range 1.5 – 5.2
Sulcular fluid flow rate (µl/120 s)	Mean 0.8	Median 0.6 Range 0 – 9.1
Sum score microbiology	Mean 1.2	Median 0 Range 0 – 9
Presence of any of the bacteria	No Yes	41 33 Aa 14 Pg 18 Pi 6 Tf 24 Td 6

*In the remaining cases the respective implant was splinted and not accessible for Periotest measurements

Results

Smokers (n = 5) scored higher for peri-implant plaque accumulation (1.4 vs 0.7 in the remaining 69 non-smokers, p = 0.02) and had a greater subgingival bacterial sum score of the 5 periodonto-pathogenic species (3.1 vs. 1.1, p = 0.04). Individuals tested positive for the prevalence of *Tannerella forsythensis* (n = 24) showed decreased implant stability as shown by Periotest readings than Tf-negative individuals (0.3 vs -2.0, confidence interval 2-33, odds ratio 1.25, p = 0.03). This species was found more frequently in individuals with fixed implant-retained restorations (two thirds of 50 individuals) than in cases with removable prostheses (one fifth of 24 individuals, p = 0.046). Patients reporting cardiovascular disease were responsible for 75 per cent of the prevalence of *Prevotella intermedia* which was not found at all in patients without any reported underlying medical complication.

Conclusions

In almost half of all cases one or more periodonto-pathogenic bacteria species could be found in the presented implant patient group with predominantly healthy oral conditions. Even though clinical conclusions are limited due to the small number of individuals in some of the analyses' subgroups statistically significant trends could be observed within the study population. Patients with a smoking habit have been reported to be more prone to peri-implant complications. This fact is reflected by the results of the present investigation with regard to plaque status and total bacteria load. Beyond that fixed restorations and a history of cardiovascular disease seem to be associated with a an increase in periodonto-pathogenic bacteria, showing statistically significant differences for some of the species in such patients.

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