Comparison of two different commercially available test kits to detect periodontal pathogens

Detection of periodontal pathogens

Language: English

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Date/Event/Venue:
June 4-6, 2009
6th Congress of the European Federation of Periodontology
Stockholm, Sweden

Introduction

This study compares two different test kits for detection and quantification of 4 periodontal pathogens in samples of subgingival plaque.

Material and Methods

69 Patients with aggressive or severe chronic periodontitis participated in this study. Microbiological analysis of pooled samples from subgingival plaque was performed with two different gene probe-tests [IAI Pado Test 4.5, Institut für Angewandte Immunologie, Zuchwill, Switzerland (PADO), and the Meridol Periodiagnostics, GABA, Lörrach, Germany (MERI)]. Agreement between the two protocols was calculated with kappa statistics for a categorical dichotomous diagnosis (positive/negative test result) and with a passing bablok regression (x= PADO, y=MERI) for the continuous data of bacterial counts in mio units.

Fig 1: Inserting sterile paperpoints in the periodontal pocket
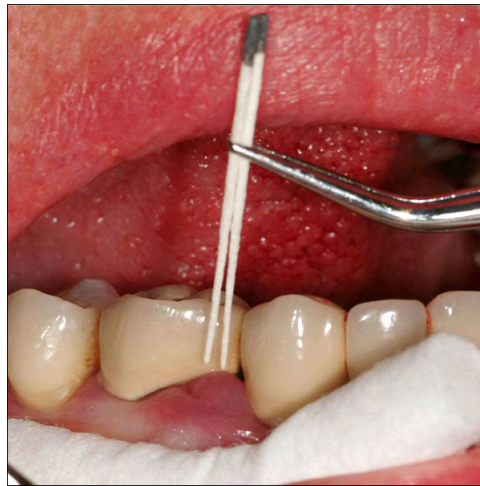
Fig 2: Taking plaque samples from the periodontal pockets

Fig 3: Collection of the plaque samples in transportation vials

Fig 4: Pooled plaque samples

Results

Aggregatibacter actinomycetemcomitans (A.a.), Tannerella forsythia (T.f.), Porphyromonas gingivalis (P.g.) and Treponema denticola (T.d.) were identified with both PADO and MERI. For all 4 periodontal pathogens under examination, MERI tended to identify more patients with a positive diagnosis than PADO. Thus, the passing bablok regression equation revealed positive slopes for all 4 pathogens between 2.974 and 8.250. Kappa-statistics exhibited fair agreement for A.a (0.295), moderate agreement for T.f. and T.d. (0.509 and 0.576) and a good agreement for P.g. (0.689).
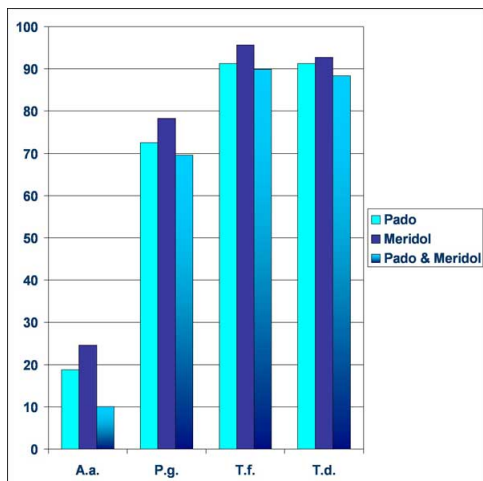

Fig 5: Detected percentual counts for 4 periopathogens with Pado and Meridol Test

	A.a.		P.g.	
	Pado	Meridol	Pado	Meridol
Patients tested positive [n]	13	17	50	54
Arithmetic mean [10^6]	0.09	0.37	3.75	14.18
Standard deviation [10^6]	0.13	0.87	3.29	16.18
Median [10^6]	0.02	0.07	3.47	9.90
Wilkoxon Test	p > 0.05		p < 0.0001*	

Tab 1: Difference in bacterial counts between Pado and Meridol

	T.f.		T.d.	
	Pado	Meridol	Pado	Meridol
Patients tested positive [n]	63	66	63	64
Arithmetic mean [10^6]	2.98	6.91	1.27	7.30
Standard deviation [10^6]	2.42	10.42	1.19	4.60
Median [10^6]	2.30	3.80	1.11	4.60
Wilkoxon Test	$p < 0.0001$*		$p < 0.0001$*	

Tab 2: Difference in bacterial counts between Pado and Meridol

Conclusions

Identification of periodontal pathogens may be inconsistent if different commercially available test kits are used.

This Poster was submitted by Dr. Raluca Cosgarea.

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Comparison of two different commercially available test kits to detect periodontal pathogens

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Objective

Microbiological identification of *Aggregatibacter actinomycetemcomitans* and other periodontal pathogens may depend on the test protocol, especially if the concentration is near the lower detection treshold. The goal of the present study was to compare the results of two different test kits for detection and quantification of 4 periodontal pathogenes in samples of subgingival plaque.

Material and Methods I

Patients

- 69 patients (45 female)
- Inclusion criterium: clinical diagnosis of either severe chronic (sCP, n=49) or aggressive periodontitis (AP, n=20)

Clinical examination

- PD and CAL-V using a rigid periodontal probe (PCPUNC 15, HuFriedy, Chicago IL, USA) at six sites per tooth (mb, b, db, mo, o, do)
- Gingival Bleeding Index, Plaque Control Record, Bleeding on Probing

Microbiological examination

IAI Pado Test:

- 4 deepest pockets in 4 different quadrants;
- after removing the supragingival plaque, drying the test site by air and cotton rolls 1 sterile paper point was inserted to the bottom of each pocket and removed after 10 seconds
- all paper points were pooled into one transportation vial (MT4)
- Analysis: RNA probe test kit (IAI Pado Test 4.5®, Institut für angewandte Immunologie, Zuchwil, Switzerland) with a detection limit of 10% for *Aggregatibacter actinomycetemcomitans* (A.a.), *Tannerella forsythia* (T.f.), *Porphyromonas gingivalis* (P.g.), *Treponema denticola* (T.d.)

Material and Methods II

Meridol Real Time PCR:

- 5 deepest pockets in 4 different quadrants
- after removing the supragingival plaque, drying the test site by air and cotton rolls, 1 sterile paper point was inserted to the bottom of each pocket and removed after 10 seconds
- all paper points were pooled into one transportation vial (MT5)
- Analysis: Real Time PCR test kit (Meridol® Real Time PCR, Gaba GmbH, Lörrach, Germany) with a detection limit of 36% for *A.a., T.f., P.g., T.d., Fusobacterium nucleatum (F.n.), Prevotella intermedia (P.i.)*.

Results I

- *A.a., T.f., P.g., T.d.* were identified with both test kits; Meridol® tended to identify more patients positive with the periopathogens compared to Pado Test.
- Passing bablok regression equation revealed positive slopes for the 4 periopathogens between 2.97 and 8.25.
- Kappa-statistics exhibited fair agreement for *A.a.* (0.29), moderate agreement for *T.f.* and *T.d.* (0.50, 0.57) and good agreement for *P.g.* (0.68).

Results II

Tab.1 Difference in bacterial counts between Pado and Meridol

	A.a.		P.g.	
	Pado	Meridol	Pado	Meridol
Patients tested positive [n]	13	17	50	54
Arithmetic mean [10^6]	0.09	0.37	3.75	14.18
Standard deviation [10^6]	0.13	0.87	3.29	16.18
Median [10^6]	0.02	0.07	3.47	9.90
Wilkoxon Test		p>0.05		P<0.0001*

*statistically significant difference

Tab. 2 Difference in bacterial counts between Pado and Meridol

	T.f.		T.d.	
	Pado	Meridol	Pado	Meridol
Patients tested positive [n]	63	66	63	64
Arithmetic mean [10^6]	2.98	6.91	1.27	7.30
Standard deviation [10^6]	2.42	10.42	1.19	4.60
Median [10^6]	2.30	3.80	1.11	4.60
Wilkoxon Test		P<0.0001*		P<0.0001*

*statistically significant difference

Results III

Detected percentual counts for 4 periopathogens with Pado and Meridol Test
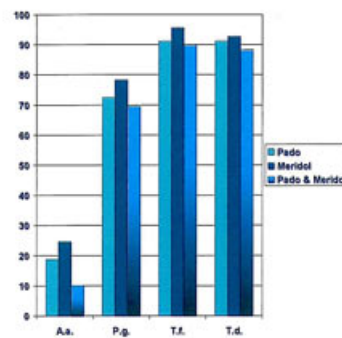
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Acknowledgement

Conclusions

Identification of periodontal pathogenes may be inconsistant if different commercially available test kits are used.