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<td><strong>Author(s)</strong></td>
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**Preferential Colonization Patterns of Periodontopathogens in Subgingival Niches of Periodontitis Patients**

W.K. Leung*, L.J. Jin, P. - O. Soder, E.F. Corbet. The University of Hong Kong, Hong Kong SAR, China and *Karolinska Institute, Huddinge, Sweden.

**Introduction**

Chronic periodontitis is an infectious disease resulting from intricate host-pathogen interactions at the subgingival border of the tooth supporting apparatus (Connerman Report 1996). The role of specific periodontopathogens in this disease process was being investigated dating back to the late 70's (Socransky & Haffajee 1994). At least a dozen putative periodontopathogens were identified (Zambon 1996) while more were being put onto the list when research ability in bacterial identification was pushed beyond the limits of traditional culture techniques (Paster et al 2001). Realizing the possible immense complexity of the microbial etiology of periodontal disease, attention was also being put towards studying the interactions between members of the subgingival microbial biofilm (Socransky et al 1988, Simonsson et al 1992). Evidence accumulated in recent years pointed towards certain periodontopathic organisms tending to co-exist in subgingival niches of subjects with various clinical conditions (Socransky et al 1998, Jin et al 1999, 2002, 2003). Various statistical analyses have been applied to the subgingival microbial data processing (Simonsson et al 1992, Cohen 1993, Ali et al 1995, Simonsson et al 1998). Many studies employed statistical protocols focusing on two-way contingency, correlation or cluster analysis of target species. Configural frequency analysis (CFA) was recommended by Cohen (1993) as the statistical test when configurations of the target microorganisms, present or not, were studied. The aim of the current study is therefore to attempt to utilize CFA in studying the possibility of co-colonization patterns among five periodontopathogens namely, Actinobacillus actinomycetemcomitans (Aa), Bacteroides forsythus (Bf), Porphyromonas gingivalis (Pg), Prevotella intermedia (Pi), and Tanneraella denticola (Td) in subgingival niches of untreated periodontitis patients.

**Material and Methods**

Patients management, site selection and sampling

Microbiological samples from 85 subgingival sites of 16 untreated Chinese patients management, site selection and sampling were collected using paper points and analyzed for Aa, Bf, Pg, Pi and Td using species specific DNA probes (Jin et al. 1999).

**Results**

Samples were collected using paper points and analyzed for Aa, Bf, Pg, Pi and Td using species specific DNA probes (Jin et al. 1999).

Following sampling, each patient received a course of non-surgical periodontal therapy within a 4-week period. Subgingival plaque samples were collected from the areas of 85 sites one month after the non-surgical periodontal therapy.

**Statistical analysis**

The prevalence of Aa at baseline and 1-month post-therapy was low (5% and 3.5% respectively) and hence not included in the study. Stuart-Maxwell Chi-squared test (Fleiss & Everitt 1997) was used to analyze the change of microbial profile, i.e. presence or absence, of the four target species Bf, Pg, Pi and Td alone and in all possible combinations (n=16, see Table 2) at baseline and one-month post non-surgical therapy. Post hoc analysis based on McNemar’s statistic with Bonferroni adjustment was carried out. The level of significance chosen was 0.05.

CFA was then applied to the data set (Cohen 1993). The protocol described by Etyen (2002) was followed. In brief, a global K-th order log-linear analysis was performed in order to search for the appropriate statistical types. The first set of marginal fit described the model for initial independence among all variables (the first-order model). The second, third, and fourth models tested, respectively, models based on two-, three- and four-way interactions among the variables (Cohen 1993). The statistical types were selected based on the component of Chi-square (p-value) and the corresponding analysis configuration where types and/or antitypes were identified.

**References**


**Conclusions**

Within the limitations of this study:

- Bf, Pg, Pi Td colonized periodontal sites in a cluster or not
- while proportion of sites with none of these pathogens had markedly increased one month after non-surgical periodontal therapy, this cluster-type typing of Bf, Pg, Pi and Td persisted.

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