学術情報

第 65 回国際歯科研究学会日本部会（JADR）学術大会

Correlation between oral bacterial flora analysis using DNA chip in gingival crevicular fluid and clinical findings

P-069

GC Corporation, Tokyo, Japan
○Natsuki Sasabe, Kazuto Takayama, Hijiri Masuda, Hiroki Naito, Yoko Ishihara, Hidetoshi Funabshi and Tomohiro Kumagai

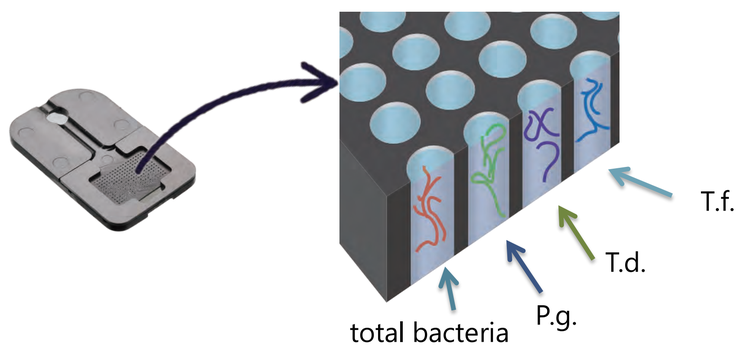
OBJECTIVES

Periodontal disease is an inflammatory condition caused by bacterial infection. Generally, periodontopathic bacteria and residental bacteria are well-balanced. But some periodontal risks cause the disruption of a balance of periodontopathic bacteria and residental bacteria, which leads to pathogenesis or progress of the periodontal disease. Since more than one bacterial species are associated with periodontal disease, it is important to evaluate the bacterial flora of the patient, in order to manage the periodontal disease. By the bacterial test using novel DNA chip (Mitsubishi Chemical, Japan), 28 species of bacteria could be detected at once, so that information of bacterial flora could be obtained. In this study, we aimed to evaluate the bacterial flora from clinical samples.

1) Park SN,et al. : Genome Announcements, 1(6): e01042-13, 2013.
2) Heller D, et al. : Applied and Environmental Microbiology, 82(6): 1881-1888, 2016.
3) Socransky SS, Haffajee AD: Periodontology 2000, 28: 12-55, 2002.

MATERIALS & METHODS

Gingival crevicular fluid (GCF) samples were collected from 15 research subjects (n=34). Values of probing pocket depth (PPD) and bleeding on probing (BOP) was recorded. DNA was extracted from GCF samples using QuickGene-800 (FUJIFILM, Japan). DNA extracted from each GCF samples was fluorescence-labeled by PCR method. Fluorescence-labeled DNA was hybridized with novel DNA chip (Mitsubishi Chemical, Japan), and fluorescence intensity was measured by Genopal Reader (Mitsubishi Chemical, Japan).



DNA array chip
developed by Mitsubishi Chemical Corp.

RESULTS &DISCUSSION

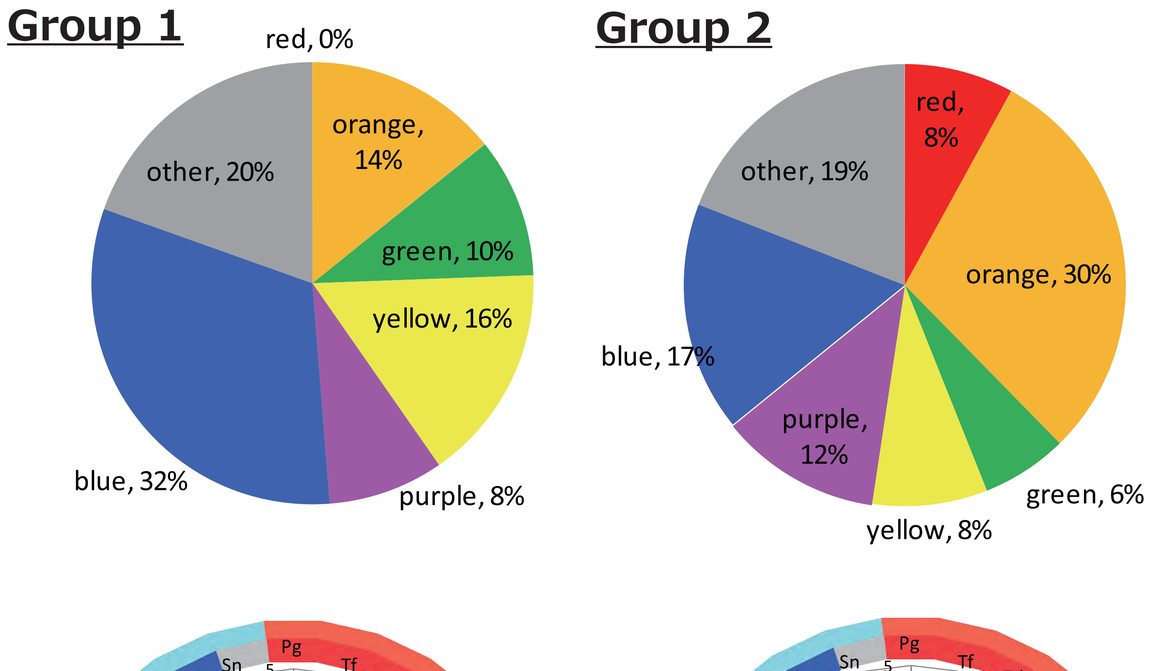
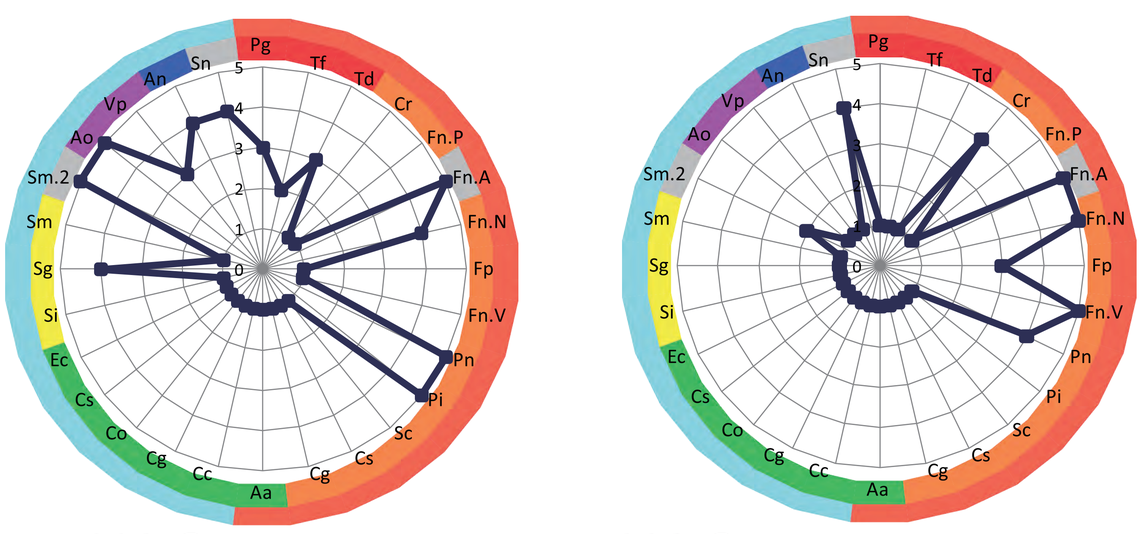


Fig. 1 Pie charts of mean percentage of microbial groups

From clinical findings, the GCF samples were divided into two groups, group1 (n=22) with PPD<4mm and group2 (n=12) with PPD≥4mm. In group2, mean percentage of red and orange complex species was higher, and Actinomyces naeslundii II (blue complex) was lower compared to group1. From these results, it was suggested that the bacterial flora would shift from healthy to periodontal disease, and it could be detect by novel DNA chip.



PPD:3mm
BOP:negative

PPD:3mm
BOP:positive

Fig.2 Influence of BOP to the bacterial flora of patients with same PPD.

Bacterial flora of the patients (PPD:3mm) with or without BOP are shown in the left. Difference in bacterial flora was observed between the patients. This result indicates that different bacterial flora could be seen with or without BOP among the patients with same PPD. Early colonizer was only present in the pocket without BOP. This result indicates that pockets with BOP may be a severe condition for early colonizer.

CONCLUSION

Different bacterial flora was observed between healthy or early periodontitis (group1) and moderate periodontitis subjects (group2). This test method using novel DNA chip may be an easy and accurate way to manage the periodontal disease of the patient.