



Research Article

SHORT COMMUNICATION ROLE OF GRAM POSITIVE BACTERIA EUBACTERIUM NODATUM IN SMOKERS AND NON-SMOKERS WITH PERIODONTITIS

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ABSTRACT

The study of the microbiota associated with periodontal diseases has been impacted by changes in paradigms regarding the etiology and pathogenesis of periodontal diseases over the years. Contrary to the ‘dogma’ of gram-negative bacterial dominance in periodontitis, gram-positive anaerobic species exhibit a significant increase in deep diseased sites relative to healthy sites, and can be detected in greater abundance than gram-negative species in some studies. Many of these species are as yet to be cultivated. These organisms exhibit polymicrobial synergy. The *Eubacterium* recolonize in smokers than in non-smokers counterparts, with chronic periodontitis.

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INTRODUCTION

Periodontitis is a chronic inflammatory bacterial infection leading to destruction of periodontal ligament and supporting bone of the tooth. It is well known that destructive periodontal diseases are infections caused by bacteria that colonize the tooth surface, gingival margin and sub-gingival environment. Number of studies in the last decades illustrate the unique infectious nature of the chronic periodontitis and aggressive periodontal diseases. It has been demonstrated, however, that the initiation and progression of the inflammatory and destructive periodontal lesion is related not only to the presence of bacterial strains pathogenic for the periodontium, but also to the lack or minimal proportions of the beneficial microorganisms in a susceptible host.

Periodontal diseases are polymicrobial, multifactorial diseases, and there are many host factors involved in determining the individual susceptibility to disease.¹Periodontal disease has been traditionally associated with an anaerobic gram-negative microbiota. , There was improvements in sampling ,handling and the culture media have that reported gram-positive anaerobes belonging to the genus *Eubacterium* the important surrounding around half of the microbiota in advanced disease.²

There have been a number of reports of the isolation of *Eubacterium* species in oral infections but because, in general, they are slow-growing and have fastidious nutritional

requirements, they have not been widely studied.² Indeed, in a number of studies of the microbiota associated with periodontal disease, *Eubacterium* species are not mentioned at all while in others where they have been isolated, no attempt has been made at speciation. Nevertheless Moore *et al* that *E.brachy*, *E. nodatum*, *E. timidum*, *E. alactolyticum*, *E. saharum* and 17 un-named taxa made up a significant proportion of the subgingival microbiota in chronic and severe advanced periodontitis. Wade *et al* found asaccharolytic *Eubacterium* species to comprise 10.8 per cent of the subgingival microbiota in advanced periodontitis.²

Smoking is considered a risk factor for periodontitis. It is associated with pathogen enrichment in periodontal disease and that smokers acquire these pathogens within 24 h of biofilm formation⁽³⁾. Recently a meta-transcriptomics study suggest that smoke-induced transcriptional shifts in commensal biofilms triggers a florid proinflammatory response, leading to early commensal death, which may preclude niche saturation by these beneficial organisms⁴

Uematsu and Hoshino,” who found the genus to make up 54 per cent of the anaerobic microbiota of periodontal pockets. *Eubacterium* spp. have also been isolated in numbers from affected sites in juvenile periodontitis where, when present, they were found to comprise 10.2 per cent of isolate. In addition, *Eubacterium* species are regularly isolated from carious dentine, endodontic infections and peri-apical infections. as yet unnamed taxon, *Eubacterium* C., has been shown to be strongly associated with dento-

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alveolar abscesses.²³ In studies where healthy sites have been investigated, *Eubacterium* species have rarely². RT-PCR is a very sensitive and specific molecular method, and it permits not only qualitative, but also quantitatively analyses the microbiota.

DISCUSSION

For decayed, efforts and studies been made to identify the potential pathogens and explain their functions in growth of periodontitis. The given complexity of the oral microbiota, there is still no conclusive evidence to demonstrating how many different pathogens are involved in the polymicrobial disease and how these co-infecting species interact with each other in triggering the disease and contributing to its progression. This advancement in our understanding has made been possible, due to open-ended molecular techniques such as DNA-DNA checkerboard hybridization techniques and 16S rRNA cloning and the absolute oral microbiome study in 2010. Newer microorganisms which were previously associated with periodontal health have now been found to be contributing to the periodontal disease process³. Of these, Gram-positive anaerobes such as *Eubacterium nodatum*, *Peptostreptococcus micros* and *filifactoralocis* which have been recently isolated from patients with periodontitis, are emerging to be considered as important contributors to the bacterial etiology of periodontitis³. The literature evidences is contentious and the inconsistent across a different and various studies.

CONCLUSION

Tobacco smoking is a significant risk factor for periodontal disease affecting the prevalence, extent & severity of the disease. Retrospective and prospective studies correlate with the cross-sectional studies in that the rates and/or risks of periodontal disease progression and tooth loss are greater in current smokers as compared to non-smokers. Smokers were five times more likely to have periodontitis than non-smokers. Smoking creates an environment that favours colonization of pathogens even in shallow sites of pocket depth ≤ 4 mm (26). *E. nodatum* has been found to be increased in smokers with chronic periodontitis. It was also found that smokers with periodontal health also harboured *E. nodatum*.

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