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Methanogenic Archaea-A Potential Periodontal Pathogen?

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Editorial Article

The microbiota of oral cavity is a complex one. More than 700 species of organisms are present in the oral cavity with every individual harbors atleast half of it. The role of red complex bacteria, Aggregatibacter actinomycetemcomitans and virus in periodontitis had been proved earlier. One more domain of organism constantly occurring in active periodontitis sites is archaea, a methanogen. It utilizes metabolic products of bacteria such as CO2, H2, acetate, formate etc and forms methane. Methanobrevibacter oralis is the common methanogenic archaea isolated from sites with chronic periodontitis, aggressive periodontitis and peri-implantitis. Its prevalence was very low in healthy sites [1-3]. Methanogenic archaea are terminal degraders in periodontal pockets by removing end products and H2, thus creating a favorable environment for anaerobes. Thus they coexist with periodontal pathogens such as Capnocytophaga species, Eubacterium nodatum, Streptococcus constellatus and proteolytic bacteria such as Porphyromonas gingivalis and Tannerella forsythia [4]. Methanogenic archaea transform metals or metalloids into more toxic volatile methylated derivatives, which causes tissue damage [5]. Yamabe K et al demonstrated humoral immune response to M. oralis [6]. de Lira EAG and Ramiro FS demonstrated reduction in aggressive and chronic periodontitis patients by six months after Scaling and root planning [7,8]. Archaea thus fulfils the first three criteria of Socransky prostulate for a periodontal pathogen. No data are available for the capability of methanogen to cause similar periodontal lesion in experimental animals. Even though there are evidence about the role of methanogen in creating a favourable environment for potential periodontal pathogen, no details are available regarding the virulence factors. Data on humoral immune response to methanogen was also inadequate. Existing data shows that methanogenic archaea play an important role in the dark side of periodontitis but are inadequate and inconclusive. Further studies with proper isolation techniques are needed to conclude its definite role in the progression of periodontitis.

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