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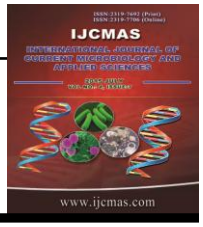

Review Article

Microbiota around Root-Formed Endosseus Implant

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A B S T R A C T

Dental implant have high success rate and are commonly used for replacement of missing teeth, however failure occasionally occur. The long term success of a dental implant strongly depends on good adhesion of the surrounding tissue to the biomaterial. The interaction between bacteria and oral implants material s show microbial adhesion and aggregation colonization of oral cavity by bacteria in humans start at birth and remains constant throughout life. Large quantities of *Lactobacillus* spp. are responsible for biofilm adhesion, and *Streptococcus* spp. Like *S. sanguinis S. oralis*, *S. mitis*, etc. which promote biofilm growth are initial colonizers *Actinmyces* spp. And gram-negative species are found in low proportion at his phase. However, variety of bacterial species is transitory in the oral cavity. The present article reviews the microflora associated with dental implants and how periimplantitis can be avoided by implanting sterile implants.

Introduction

Dental implants (artificial root) are defined as "an artificial material or tissue that shows biocompatibility upon its surgical implantation (Allenc, 1687) or implants are inert alloplastic material embedded in the maxilla or mandible. Now a days implants are becoming more common in the clinical setting for replacement of missing teeth, repair of damage to the jaw, dentition or to replace teeth lost through decay, trauma, neoplasia and congenital defects (Lamont and Jenkinson, 2010), Hence dental implant became long lasting treatment modality. However, 7–10% of the treatment failures has been suggested due to result of Periimplantitis (Esposito *et al.*, 1998) Implant failure has been defined as the inadequacy of the host tissue to establish or to maintain osseo-integrated implant in function, resulting in loss of supporting bone (Heydenrijk *et al.*, 2002). Longitudinal studies have shown that successful implant are colonized by a predominantly gram positive facultative flora which is established shortly after implantation (Grovers and Sagrika Shukla, 2011). Microbial adhesion and aggregation have been studied on different *in vivo* and *in vitro* by Mergenhagen and Rosan (1985). Few studies by Nakazato *et al.* (1986), Fujioka-Hirai *et al.* (1987), Joshi and Eley (1988) and Walinsky *et al.* (1989) have proved the interaction between bacteria and oral implant material such as Titanium Mombelli

et al. (1988, 1990) have shown the development of plaque on newly inserted implants.

Microbiota around teeth and implant

When an implant is exposed to oral cavity its surface gets colonized by micro organisms. The microbiology parameter in sulci around the teeth crowns supported in a study by Shahabouee *et al.* (2012) which has shown six types of anaerobic bacteria in teeth and implants sulci such as gram positive cocci, gram negative cocci, *Prevatella, Parphyromonas ginginalis, Bacteroides fragilis* and *Fusobacterium,* gram positive cocci had maximum and minimum percentage frequency in the two groups respectively. It is indicative that microflora in implant sulci is similar to the tooth sulci when the depth of the sulci is normal (<4mm) which implicates that implants susceptibility to inflammation the same as teeth. A healthy gingivalisis sulcus contains predominantly gram positive cocci and rods commonly *Actinomyces naeslundii* (14%) *Actinomyces grenoseriae* (11%) *Streptococcus oralis* (14%) and *Peptostreptococcus microbe* (5%) gram negative anaerobic rods account for 13% of the total cultivable organisms on an average (Mahesh *et al.,* 2011). Due to the development of periodontitis, microflora shifts, containing higher number of gram-negative rods and decrease in gram-positive species in a periodontal lesion, low numbers of cocci and higher number of motile rods and spirochaete are seen (Geetha Priya *et al.,* 2014) whereas Danser *et al.* (1991) noted that when all teeth are extracted in patients with peridontitis, Actinomycetes comitans and porphyromonas gingivalis are no longer detectable in a month after full mouth tooth extraction, but bacteria like *P. gingivalis, T. forsynthesis* and other pathogenic bacteria that were present before the teeth were extracted re-emerge after 6 months of implant placement. These studies indicate that bacteria that cause peridontitis also cause periimplantitis.

Dental implant plaque

Peri-implant microbiota is soon established after implant placement and is largely influnced and depends upon the presence of teeth. In edentulous patients, the subgingival area around implants *S. sanguis* and *Streptococcus mitis* are most predominant organisms. Whereas motile rods, *Spirochaetes fusiforms* are infrequently found (Mombelli and Long, 2000).

Biofilm and dental implant

The term biofilm (Socransky and Haffajee, 2000) describes relatively indefinable community associated with a tooth surface or any other hard non-shedding material randomly distributed in a shaped matrix or glycocalyx. Biofilm formation around natural teeth occurs in minutes and the specific species start colonizing within 2–6 hrs. This is due to the clean tooth surfaces are likely to have remnants of unattached microbiota that can immediately multiply & provide a favourable surface for the attachment of the late colonizers (Tanner *et al.,* 1997). The pristine surfaces of the implants lack the desire indigenous microbiota and demand the early colonizers to set the state for the complex communities to develop (Li *et al.,* 2004).

Asepsis and treatment

Dental implants are becoming increasingly important in prosthodontic rehabilition, Bacterial infections however, can induce bone loss and jeopardize clinical success, one area of concern is that the implants should be properly sterile before insertion,

recently it has been demonstrated that infra-red co2 laser light is suitable for decontamination of exposed implant surfaces. Another treatment regimen, photodynamic therapy involves the use of a nontoxic dye i.e. photosynthesizer and low intensity laser light. These combine to create singlet oxygen molecule that are lethal to certain bacteria. Photodynamic therapy can be used successfully to decontaminate the implant surface (Lauront and Jenkinson, 2010).

Conclusion

As dental implants are inevitable forms of prosthetic device implanted into patients. The high success rate for the placement of endosseous dental implants can be achieved by implanting sterile implants under restricted sterile environment and aseptic surgical conditions.

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