

## COMPARISON OF PERI-IMPLANT MICROBIOTA BETWEEN HEALTHY AND DISEASED IMPLANTS

Ali M. Al-Dahbi<sup>1</sup>, Intesar N. Khelkal<sup>2\*</sup> and Eman N. Naji<sup>2</sup>

<sup>1</sup>Department of Dentistry, Dijlah University, Baghdad, Iraq.

<sup>2</sup>Department of Biology, College of Science, Mustansiriyah University, Baghdad, Iraq.

\*e-mail : [intesarnkshaibani@uomustansiriyah.edu.iq](mailto:intesarnkshaibani@uomustansiriyah.edu.iq)

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**ABSTRACT :** Recently, dental implants have experienced increasing demand as one of the most effective, permanent and stable ways for replacing missing teeth. However, peri-implant diseases that are multispecies plaque-based infections may ultimately lead to implant failure (*i.e.*, late peri-implantitis). Therefore, the present study aims to detect the microbial diversity of subgingival plaque in peri-implantitis cases (N = 30) by comparing with healthy implants (N = 34) using culture-based identification methods, including VITEK 2 system. An increase in microbial diversity (29 species along with 1 and 7 isolates, which were classified as a genus and unidentified species, respectively) were observed in subgingival sites of diseased implants dominated by Gram negative enteric bacilli compared with healthy implants (21 species with 2 at genus level) with the majority of Gram-positive lactic acids species. Our results showed significant differences in the mean age between healthy (53.14±11.34) and diseased implants (61.9±9.71).

**Key words :** Peri-implantitis, microbiota, dental implant.

### INTRODUCTION

The dental implant is an artificial device usually made of titanium, inserted into the bone for replacing one or more missing teeth (Branemark, 1985). Peri-implantitis is a destructive pathological inflammatory process affecting the soft and hard tissues surrounding dental implants. The soft tissues become inflamed whereas the alveolar bone, which surrounds the implant for the purposes of retention, is lost over time. Peri-implantitis is similar to periodontitis as infectious diseases (Lindhe and Meyle, 2008).

Microbial infections with bacteria, possibly viruses and yeasts play an important role in the disease progression (Verdugo *et al*, 2015). Quirynen and Van Assche (2011) detected high levels of bacteria related with periodontitis and peri-implantitis, in totally edentulous patients, agreeing with other similar studies of Quirynen *et al* (2005), Devides and de Mattias Franco (2006) and Sachdeo *et al* (2008).

Slots *et al* (1991) also reported that in implants with peri-implantitis, it is possible to detect big quantities of Gram-negative anaerobic bacteria, including Fusobacteria, spirochetes, *B. forsythus*, *P. intermedia*, *P. nigrescens* and *P. gingivalis*. *Aggregatibacter*

*actinomycetemcomitans* was also isolated in this type of lesion.

*A. actinomycetemcomitans* and *P. gingivalis* were found in large quantities in peri-implant lesions. These two pathogens can be considered the predominant microorganisms, being responsible for destructive infection in peri-implantitis (Heydenrijk *et al*, 2002; Botero *et al*, 2005). Also, Van de Velde *et al* (2009) have demonstrated the presence of *A. actinomycetemcomitans*, *Fusobacterium* sp., *P. gingivalis*, *P. aeruginosa* and *T. forsythia*, in implants diagnosed with peri-implantitis. Symbiosis between *Bacteroides* sp. and *P. aeruginosa* seems to favor the persistence of *P. aeruginosa* in inflamed regions around implants.

For several years, there may be a balance between the challenged bacteria and host peri-implant tissues, the formed biofilm is in a symbiotic state and this homeostatic state indicates the state of health around the implant (Marsh, 1994 and 2003).

In peri-implantitis cases, biofilm has high amounts of Gram-negative bacteria, as well as Gram positive cocci (*Parvimonas* sp. and *Peptostreptococcus* sp.) (Koyanagi *et al*, 2013).