The microbiology of peri-implantitis: Similar or distinct to periodontitis?

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**Background**

- Peri-implantitis is an inflammatory disease of bacterial aetiology, with a 20% prevalence in individuals after 5-10 years of placement.¹
- Bacterial complexes associated with chronic periodontitis (Figures 1, 2) have traditionally been linked to peri-implantitis.
- Recent studies suggest differences between the microbial profiles of peri-implantitis and periodontitis.

**Question**

What is the microbiology of peri-implantitis, and is it similar or distinct to chronic periodontitis?

**Aims and Methods**

- Literature review to investigate the microbiology of peri-implantitis, the role of periodontal pathogens, and how advances in microbe detection have shaped our understanding.
- Electronic search of MEDLINE, Web of Science, PubMed databases using keyword searches for clinical studies detecting microbes in peri-implantitis. Selected studies reviewed and quality assessed.

**Results**

- 25 clinical studies obtained with 1,392 participants (1987 to 2015).
- Large variety in study designs and microbe detection techniques, including: Culture, DNA-DNA hybridisation, 16S rRNA sequencing, 16S pyrosequencing (Table 1). This limits the degree of cross-comparison between studies.
- Red and orange complex periodontal pathogens commonly detected in peri-implantitis (Table 2). Many studies also reported the presence of non-periodontal opportunistic pathogens i.e. Staphylococcus spp., Candida spp., and Pseudomonas aeruginosa. Still not clear whether these are aetiological or incidental findings.

**Conclusions**

- Red and orange complex periodontal pathogens are strongly associated with peri-implantitis.
- Simultaneously, there is growing evidence using the latest advances in technology that peri-implantitis has a unique microbial signature that is distinct to chronic periodontitis.

**Clinical application**

- Antimicrobial therapies, where used, must be fine-tuned to ensure they are effective in complementing manual debridement.
- Future management may involve acquiring plaque samples from failing sites to conduct molecular analyses and thus enable precise antimicrobial intervention.

**References**