BAOJ Biotechnology

Valia Uria Ovando, BAOJ Biotech 2015, 1: 1
1: 004

Editorial Article

Molecular Diagnosis in Peri-Implantitis

Valia Uria Ovando*

Biotechnology, Autonomous University of Madrid, Spain

Implantology today is one of the disciplines that arouse greater interest among professionals of Odontology and Stomatology due to the great benefits to the patient.

The dental implants improve significantly the quality of life of partially or fully edentulous patients, both in terms of aesthetics and mastication.

In 2009 The Spanish Society of implants (SEI) points out that in Spain has been exceeded the 500,000 implants placed per year. The implant placements have a high forecast growth, given that more than half of the population has lost teeth or pathology that will lead them to this over time.

There is no doubt that the implantology should be deemed a successful therapy. In the literature, figures show an average of 95% of favorable results, with ranges between 85% and 97%. Thus, there is a reasonable margin of error in implantology. The professionals must admit that there are risks when performing prosthetic implants and the peri-implantitis frequently compromise the future of implants.

Peri-implantitis is defined as an inflammatory process that will affect the surrounding tissue to an implant loading producing a loss of bone support, generally as a result of an imbalance between bacterial load and host defence.

If the clinical manifestation of peri-implantitis are characterized by the appearance of inflammatory changes restricted to the peri-implant mucosa and without bone loss we are talking about Mucositis. If treated properly, it is a reversible process. Peri-implantitis also involves the supporting bone.

In the present traditional clinical diagnosis of peri-implant disease include bleeding on probing (BOP). Other clinical signs of disease may involve suppuration, increased probing depths relative to baseline, mucosal recession, a draining sinus (fistula) and peri-implant mucosal swelling/hyperplasia. If undiagnosed, peri-implant disease may lead to complete loss of osseointegration and implant loss [1]. Alternatives to conventional clinical methods may be used, such us the concentrations of the host responses molecules and could represent a more accurate, real-time disease activity [2].

The research for diagnostic markers and predictor of susceptibility to peri-implant diseases has mainly focused on biochemical markers in peri-implant crevicular fluid (PICF). A variety of pro-inflammatory indicators have been assessed measuring PICF volume, proteases and an array of cytokines and lipid mediators of inflammation [3].

Most analyzed peri-implantitis disease related proteins in PICF are:

- inflammatory cytokines : IL-1b, IL-6, IL-8, IL-10, IL-12, IFNg, TNFa, and CRP [4]
- matrix metalloproteinases: MMP-2 and MMP-9 MMP-7 MMP-8, MMP-9, and MMP-13 and their inhibitors (TIMPs) [5]
- Bone metabolism related cytokines: OPG, OPN, RANK, and RANKL [6];
- And enzymes: alkaline phosphatase and aspartate aminotransferase [7].

It is clear that there is increasing evidence of potential for diagnostic tests for peri-implant disease but to date prospective and longitudinal clinical human trials are required to correlate the role of these markers in disease progression.

In most of this studies are used the traditional methods as enzyme-linked immunosorbent assay (ELISA) for cytokine detection and quantification. Of course ELISA works well for a single protein but the procedure requires a lot of time and sample. This kind of testing cannot be used in the daily practice of clinical diagnosis. To overcome this disadvantage has appeared periodontal disease array kits (e.g. Human Periodontal Disease Array Q1 from Raybiotech). Using this kind of kit can make quantitative measurement of 20 human periodontal disease associated cytokines in one sample. As evidenced by a recently published work (8).

This is interesting for clinical practice because sampling is not invasive, up to 20 biomarkers can be analyzed and there are many reasons that advise to keep regular track of implants once

***Corresponding author:** Valia Uria Ovando, MSc.Biotechnology, Autonomous University of Madrid, Spain, E-mail: valia_uria@yahoo.es

Sub Date: December 21, 2015, **Acc Date:** December 28, 2015, **Pub Date:** December 30, 2015

Citation: Valia Uria Ovando (2015) Molecular Diagnosis in Peri-Implantitis. BAOJ Biotech 1: 004.

made. Perhaps one of the most important is the fact that peri-implantitis can appear with an asymptomatic picture, without obvious external signs, so it often can be a clinical situation that may go unnoticed. As indicated in the interesting reviews [7]: an increase in IL-6, IL-10 and IL-12 in peri-implant disease has been demonstrated. In patients without peri-implant disease, the proinflammatory cytokines decrease between four months after surgery, and 8 months after prosthesis placement. Therefore the detection and quantification of the levels of cytokines in programs of maintenance of patients with implants can serve as an indicator of the state of the implant. So modern oral health professionals are in the need of diagnostic and prognostic tools to obtain fast and valuable information to enhance the decision-making for both periodontal and implant therapy [9].

Finally In this way, we invite those researchers who have been investigating in the molecular markers to kindly submit your valuable work to our journals.

References

1. Heitz-Mayfield LJ (2008) Peri-implant diseases: diagnosis and risk indicators. Journal of clinical periodontology 35(s8): 292-304.
2. Syndergaard B, Al-Sabbagh M, Kryscio RJ, Xi J, Ding X, et al. (2014) Salivary biomarkers associated with gingivitis and response to therapy. Journal of periodontology 85(8): e295-e303.
3. Van Dyke TE (2012) The impact of genotypes and immune reactivity on peri-implant inflammation: identification and therapeutic use of anti-inflammatory drugs and immunomodulators. Eur J Oral Implantol 5: S51-S60.
4. Fonseca FJPO, Junior MM, Lourenço EJV, Moraes Teles D, Figueredo CM, et al. (2014) Cytokines expression in saliva and peri-implant crevicular fluid of patients with peri-implant disease. Clinical oral implants research 25(2): e68-e72.
5. Vom Orde, F., Rödiger, M., & Gersdorff, N. (2011) Comparative microarray analyses of inflamed human periimplant and periodontal tissues in vivo. Journal of Dental Implantology 01/2011: 33-46.
6. Rakic M, Lekovic V, Nikolic-Jakoba N, Vojvodic D, Petkovic-Curcin A, et al. (2013) Bone loss biomarkers associated with peri-implantitis. A cross-sectional study. Clinical oral implants research, 24(10): 1110-1116.
7. Candel-Martí ME, Flichy-Fernández AJ, Alegre-Domingo T, Ata-Ali J, Peñarrocha-Diago MA, et al. (2011) Interleukins IL-6, IL-8, IL-10, IL-12 and periimplant disease. An update. Med Oral Patol Oral Cir Bucal 16(4): e518-21.
8. Wang, H. L., Garaicoa-Pazmino, C., Collins, A., Ong, H. S., Chudri, R., & Giannobile, W. V. (2015). Protein biomarkers and microbial profiles in peri-implantitis. Clinical oral implants research 00, 2015, 1–8.
9. Agrawal P, Sanikop S, Patil S (2012) New developments in tools for periodontal diagnosis. International Dental Journal 62: 57–64.