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Guest Editorial

Antibiotics in periodontics: are we getting somewhere?

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Focused Perspective on Guerrero et al., J Clin Periodontol 2005; 32: 1096–1107

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Generalized aggressive periodontitis (GAP) is one of the most severe forms of destructive periodontal disease. It is diagnosed at relatively young age and is, from a medical point of view, a serious infection with significant damage of soft and hard tissues and, left untreated, loss of teeth early in life. The bacterial burden for the host immune system is significant and may also affect general health in different ways. It is still not clear why patients with GAP have such high susceptibility for periodontal destruction, although some putative risk factors, such as certain genetic traits or cigarette smoking, have been suggested. Also, the subgingival microbial factors seem not different from subjects with chronic periodontitis and as of yet, no specific bacterial species or complexes have been linked to GAP.

From a clinical standpoint, considerable evidence indicates that GAP patients may be particularly difficult to treat with medium- to long-term outcomes showing high rates of recurrence and tooth loss (Gunsolley et al. 1995). Patients with GAP therefore require additional attention in periodontal practice. Furthermore, GAP is a challenge for the periodontal research community to better understand the nature of this disease and to improve diagnosis and treatment.

The treatment of GAP, as with other forms of periodontitis, involves reduction of the bacterial periodontal load by mechanical and surgical measures. In the attempt to provide the best level of control of the infection practitioners tend to include systemic antimicrobial therapy in their approach and this seems justified based on the severity of the disease. The study of Guerrero et al. (2005) in this issue supports this approach. Using an excellent clinical research protocol, including non-surgical periodontal treatment delivered within 24 h, these authors clearly showed that systemic metronidazole plus amoxicillin significantly improved clinical outcomes over a period of 6 months. These data are in agreement with previous evidence that indicated added benefits of this antibiotic regimen in chronic periodontitis patients.

Should we now conclude that the job is done and is the advice to use this approach in all our GAP patients? I think several issues should still be addressed before we can reach this point.

Is GAP one disease entity or does it represent a collection of diseases with different aetiologies? Are susceptibility factors identical in all subjects with GAP or are we dealing with different pathological pathways in GAP? And how about the subgingival microflora? Are all patients subgingivally infected with the same microorganisms? If so, a standardized systemic antimicrobial therapy may be justified. If not, it is questionable if all patients with GAP would equally benefit from this therapy. From the available microbiological data it seems most likely that not all patients with GAP have identical microfloras. Major pathogens such as *Porphyromonas gingivalis* and *Actinobacillus actinomycetemcomitans* are detectable in only part of the subjects with periodontitis. Would the microbial component be a determining factor in treatment outcome with metronidazole and amoxicillin? It probably is. Winkel et al. (2001) also performed a double-blind placebo-controlled clinical trial with this combination of antibiotics and included microbial analysis of the subgingival plaque. In their study of chronic periodontitis patients, they found that the significantly better clinical outcome of the test group could be attributed to patients infected with *P. gingivalis*. Patients in the test group without this pathogen did not show an adjunctive benefit of the combined antibiotic regimen compared with patients treated with placebo. These observations indicate that not all patients benefit equally from systemic metronidazole plus amoxicillin. This may involve that microbial testing may separate patients that may benefit from adjunct antibiotic therapy from patients that do not. This would point into the direction of selective use of potent antimicrobial therapies.

Another important matter that should be kept in mind is the fact that major differences in antimicrobial susceptibility profiles of relevant periodontal pathogens occur between countries. This is explained by different use/misuse of antibiotics and has lead to different levels of microbial resistance among countries (Van Winkelhoff et al. 2000, 2005). The future challenge for diagnosis and treatment of severe forms of periodontitis such as GAP involves an individual risk assessment which could, among others, include microbial testing of the subgingival microflora as the basis for a more targeted adjunctive therapy for these patients.

Evidence-based periodontal treatment requires scientific evidence of clinical efficacy of the selected systemic antimicrobial therapy. In this respect it is important to note that in vivo potent antibiotics are not always clinically

effective as has been shown for protected amoxicillin in adult patients with undetermined periodontal disease activity (Winkel et al. 1999). Further research should elucidate the optimal sequencing of the different intervention measures. With studies such as the one presented by Guerrero et al. in this issue we are definitely on the right track, but more work has to be done before we can say *we are there*.

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