As part of this year’s Europerio in Vienna, Heraeus held two symposiums on the latest developments in the treatment of periodontitis. The question investigated by the first session on Friday morning was how local antibiotics can assist in the treatment of periodontitis. The answer to this question by Professor Nikola P. Lang from the University of Hong Kong, China, Professor Maurizio S. Tonetti, Executive Director of the European Research Group on Periodontology (ERGO-Perio), Italy, opened the first Heraeus symposium with his presentation on current understanding of periodontitis and how it changes treatment. He began by importantly emphasising that periodontitis has become a serious health problem in Europe.

In addition to the role played by biofilm in triggering development, individual susceptibility to periodontal disease is also an increasingly important factor. This is influenced by genetic predisposition and environmental risk factors, and determines the intensity and clinical presentation of the periodontal inflammatory process.

Periodontitis is also proven to have various effects on the body as a whole. In addition to providing systemic relevance, periodontal therapy with regular follow-up for the rest of the patient’s life is therefore strongly recommended, even for additional risk factors. With professional preventive measures geared towards the patient’s individual symptoms, further progression of the condition can be prevented in the long-term.

Professor Tonetti concluded with an outlook on possible future therapies. In a dog (beagle) model of replacement therapy, “trendy” bacteria such as streptococcus anginosus, streptococcus mitis and streptococcus mutans appear to have a positive impact on inflammatory processes and sub-gingivally in addition to scaling & root planning (SRP). This is demonstrated in X-ray images by increased bone density and bone level (Nackaerts et al., 2008). Another method to look at the effect of microorganisms as a food supplement. Here, daily intake indicates a reduction in probing pocket depths (Chapple IL et al., 2012). Further clinical studies are needed in order to verify the clinical significance.

Professor Lang concentrated his presentation on the management of deep pockets. Currently considered equivalent to a probing pocket depth of ≥ 6 mm, this correlates with a higher increased risk of tooth loss. This is also the level at which the composition of biofilm and its pathogenicity changes. The local administration of adjunctive antibiotics requires the application of a significantly higher concentration of active ingredients in order to kill the periodontal pathogenic bacteria. In addition, the delivered substance must remain at the active site for a sufficient length of time in order to ensure continued release of the active ingredient.

A recently completed study by the ERGOPerio group (Tonetti et al., 2012) investigated the therapeutic effect of once-off, topical, adjunctive administration of a slow-release doxycycline gel (SRD) in patients with persistent/recurrent periodontitis during supportive periodontal therapy (SPT). Following supra-gingival debridement and sub-gingival treatment using ultrasonic/electric instrumentation, the SRD was applied in all the residual pockets ≥ 4 mm in the test group.

The result of this study supports the concept of additional local antibiotic administration, particularly SRD. In the treatment of persistent/recurrent periodontitis during SPT, this has been shown to have a positive therapeutic effect on inflammatory response as well as in the case of deep pockets (≥ 5 mm). Local antibiotics also seem to be the most effective approach for treating peri-implantitis due to the high concentration of active ingredients. The microbical flora is for the most part comparable with periodontitis, although in implant lesions may also be affected by staphylococcus aureus (typical pyogenic organism). The discharge of pus when probing a pocket is a clinical indication of infection in the diagnosis of peri-implantitis.

The greatest challenge here is the removal of biofilm, a procedure that is considerably more difficult in the case of implant surfaces than in the case of natural dentition. Currently there is no standard, evidence-based approach to therapy: local antibiotics may provide an answer for the future, however, this must first be borne out by a study. Nevertheless, Professor Lang summarises as follows: “Nothing excuses the patient from cleaning his teeth every day.

Dr Waled S. Shahal, Chief Science Officer at PoliMed Inc, USA, continued in the same vein as Professor Lang, and presented the latest biomaterials for oral and periodontal applications. He presented scientific evidence for the additional benefits of 14% SRD gel. In combination with SPT, in the case of previously untreated periodontitis, this has been proven to lead to improved at-home care as well as greater pocket reduction that is clinically more relevant than achieved by SPT alone (Eickholz et al., 2002). A comparison of sub-gingival, topical administration of antibiotics and mechanical debridement has shown comparable clinical efficiency (Eickholz et al., 2005).

The primary benefits in the case of any residual deep pockets during SPT (Tonetti et al., 2012) had already been discussed in Professor Lang’s presentation. In his conclusion, Professor Eickholz emphasised a further feature of doxycycline: not only does it have an antibacterial effect, it is also anti-inflammatory. Clinical studies have also shown that once-off application of a 14% SRD gel in patients with periodontal disease reduces the presence of certain periodontal pathogenic bacteria in the sub-gingival plaque.

Risk-based follow-up ensures long-term therapy success

The second event on Friday evening focused on current therapy options in periodontal treatment. In the first presentation, Professor Petra Ratka-Krüger from the University of Fribourg, Germany, looked at supportive periodontal therapy in daily practice, underlining the importance of SPT in long-term therapy success (Gibbons et al., 2008). She based her conclusions on a variety of studies, all of which provide scientific evidence of the positive impact when patients with periodontal disease are treated regularly and consistently using SPT techniques. Based on a risk assessment at various levels (Lang & Tonetti, 2005), an individual risk analysis can be performed, helping to prevent insufficient or excessive treatment.

Professor Ratka-Krüger continued with a description of the timeframe for a follow-up check-up, providing detailed information on the frequency and what they entail. She referred back to the positive effect discussed in the first presentation specifically that of additional topical administration of SRD gel in the case of previously untreated cases of periodontitis (Eickholz et al., 2002), and once again emphasised the advantages of local antibiotics: reliable, simple and fast application. The additional benefits of this approach combined with SPT during SPT are also scientifically proven (Tonetti et al., 2012). In this regard, she also refers to a recent study (Dannervitz et al., 2009) in which the effect of SRD administration in addition to SPT during SPT was again assessed: Once again, improvement was observed at furcation sites compared with SPT alone.

In her conclusion, Professor Ratka-Krüger described such combined therapy as periodontal therapy as the next step in periodontal therapy success. Regu- lar participation in risk-based follow-up allows recurrences to be recognised and treated at an early stage, thus preventing tooth loss. Local antibiotics can boost the effect of mechanical therapy, contributing to the success of the treatment.

In the second presentation “Telomere Length, Oxidative Stress and Chronic Periodontal Inflammation: Implications for Supportive Therapy”, Juliette Reeves, Clinical Director at Perio-Nutrition, Great Britain, looked at previously little-known links with periodontitis. Telomeres are regions at each end of a chromosome that shorten in each cell division. This process is accelerated by oxidative stress. The length of telomeres is related to aging, chronic infection, oxidative stress and systemic illness (Zanichelli et al., 2005). Over the last ten years, the effects of periodontitis on telomeres have been clearly established. Masi et al. (2011) found that shorter telomeres are linked to increased lifetime risk, and that their size correlates with oxidative stress and the gravity of living conditions. Reeves and colleagues (2008) proved that telomere degradation, the extent of chronic infection and oxidative stress can be reduced through changes in lifestyle (smoking, nutrition, obesity, stress).

In her presentation, Ms. Reeves once again demonstrated the evidence-based links between inflammatory, periodontal and general health, and defined the control of inflammation as a primary goal of treatment.