

# Group B

## Consensus Paper

# Non-surgical periodontal therapy: mechanical debridement, antimicrobial agents and other modalities

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### Introduction

Periodontal diseases are complex opportunistic infections modified by the host inflammatory response. Therefore, the current recommended treatment of periodontitis is primarily anti-infective in nature. Anti-infective approaches rely on adequate patient removal of plaque through good oral hygiene practices and mechanical debridement by an oral health professional. Scaling and root planing (SRP) is accepted to be the basis for all periodontal therapy, and any additional therapies should be considered adjunctive and supplemental.

### ***What is the current status of laser and photodynamic therapy as adjunctive measures to mechanical debridement?***

The benefits of laser and photodynamic therapy (PDT) have been proposed and documented over the past two decades. While laser therapy (Nd:YAG) used in conjunction with SRP yielded beneficial short-term clinical outcomes, especially in reducing probing depths (PD), the long-term clinical benefits of such therapy are questionable. Hence, from the current available evidence, as well as the associated high cost, laser therapy cannot be recommended for the treatment of periodontal disease.

Photodynamic therapy as an adjunct to SRP in the treatment of periodontal disease provides some additional benefits in terms of PD reductions and clinical attachment level (CAL) gains compared to SRP alone at 3 months. However, these benefits have not been observed at 6 months. For patients undergoing supportive periodontal care, the repeated use of adjunctive

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PDT with SRP has shown improved clinical outcomes with regards to reducing the number of residual pockets (PD  $\geq$  5 mm). However, the long-term benefit for applying this approach to maintenance patients needs confirmation by well-planned randomized controlled clinical trials (RCTs).

### **What is the effect of various protocols for the delivery of mechanical debridement?**

While various protocols for the delivery of mechanical subgingival debridement have been proposed, two systematic reviews have indicated slightly greater probing depth reductions in deep sites with PD  $\geq$  7 mm following full mouth disinfection (FMD) or full mouth scaling and root planing (FMSRP) compared to quadrant-wise scaling and root planing. These FMD or FMSRP protocols for the delivery of mechanical subgingival debridement may be chosen depending on patient availability and preferences, logistic settings and cost effectiveness. Irrespective of what protocol is used for subgingival debridement, it is recognized that the optimal clinical results can only be obtained if the patient is able to adequately perform oral hygiene.

### **What is the role of adjunctive antiseptics in non-surgical periodontal therapy?**

A large number of antiseptics have been proposed for chemical plaque control. However, there is limited evidence demonstrating a significant, or clinically relevant, beneficial effect of these compounds used either in active periodontal therapy or during maintenance. The use of chlorhexidine digluconate (CHX) in a concentration of 0.12% as a mouth rinse during the healing phase of periodontal interventions has shown good clinical outcomes. In two RCTs, CHX mouth rinses have been tested as an adjunct to quadrant-wise routine SRP in the management of chronic periodontitis. Improved PD reductions and CAL gains have been documented with a two-month application of CHX adjunctive to SRP compared with SRP alone. Moreover, the CHX-SRP regime yielded greater reductions in the proportions of red and orange complex pathogens. It is recognized that only CHX results in adjunctive beneficial clinical outcomes due to its high substantivity. Furthermore, the effect of CHX results from modification of the supragingival plaque ecosystems. When CHX rinses are considered, the side-effects of such therapy (e.g., tooth staining) should be taken into consideration, and the additional clinical benefits to be expected have to be weighed against such side-effects. To date, there is no evidence of clinical efficacy of non-staining antiseptics used during the healing phase of periodontal interventions. With regards to FMD, there is no RCT that has tested the presumptive additional benefits of CHX administration.

### **What is the current status of local and systemic antimicrobials as adjuncts in subgingival biofilm control?**

Local delivery antimicrobial agents may be useful as an adjunct in the treatment of periodontal disease. The release kinetics of the devices must allow for delivery of a sustained high dose of antimicrobials capable of entering the subgingival biofilm. Generally, at least 7 days of controlled release of the drugs is necessary to provide the desired clinical effects. Unfortunately, very few controlled release devices are available in the market today. Nevertheless, the concept of controlled local antimicrobial delivery deserves attention. Multiple RCTs and systematic reviews have documented significantly greater PD reductions and CAL gains in deep pockets treated with local delivery of antibiotics and SRP both for active periodontal therapy and for maintenance care of residual pockets. In the future the use of controlled release local devices for the treatment of peri-implant infections is recommended.

The value of systemic antibiotics in the management of periodontitis has been debated for decades. In two systematic reviews covering six and 27 studies (12 in *aggressive periodontitis*) that have investigated the administration of adjunctive systemic antibiotics for the treatment of periodontitis, additional clinical beneficial outcomes have been documented. In patients with aggressive periodontitis, the control of *Aggregatibacter actinomycetemcomitans* preferably requires the use of a combination of antibiotics such as amoxicillin (AMX) and metronidazole (MTZ). The efficacy of AMX/MTZ used as an adjunct to mechanical debridement for the treatment of aggressive periodontitis has been studied in eight RCTs lasting from 2 months to 1 year. All these studies have demonstrated significant and clinically meaningful benefits when this regime was used, compared to SRP alone. Consequently, the adjunctive use of AMX/MTZ is recommended in the treatment of *aggressive periodontitis*.

However, in the treatment of *chronic periodontitis* the use of systemic antibiotics as an adjunct to mechanical debridement is still under debate. In recent years, there have been at least 10 RCTs conducted evaluating the clinical efficacy of the adjunctive use of AMX/MTZ in the treatment of advanced chronic periodontitis. All of these studies demonstrated additional reductions in PD, gains of CAL and fewer residual pockets (PD  $\geq$  5 mm) when AMX/MTZ was used as an adjunct to therapy compared to mechanical debridement alone. In advanced periodontitis patients, as defined by a "Level 2 periodontitis case" (proximal attachment loss of  $\geq$  5 mm in  $\geq$  30% of the teeth present; Tonetti & Claffey, 2005), a benefit from additional AMX/MTZ administration has been demonstrated to various degrees depending on their risk profile (smoking, diabetes mellitus). The effect

has predominantly been documented over 3-6 months with three studies from 1 to 2 years. In all studies, the adjunctive systemic antibiotics were administered in conjunction with the initial mechanical debridement, i.e., prior to the healing of the periodontal intervention. It is unknown whether or not the additional benefits would be observed if the antibiotic regime is postponed to the healing phase, following the initial mechanical debridement. Hence, an RCT is needed to determine the proper timing for adjunctive systemic antibiotic administration. The potential additional clinical benefits obtained through other systemic antibiotics (e.g., azithromycin) has also been studied, but the results have not been as good as for AMX/MTZ. For instance, in eight RCTs of *chronic* and two RCTs of *aggressive periodontitis* the adjunctive administration of azithromycin (AZT) to SRP did not provide similar improved clinical outcomes as noted for AMX/MTZ.

As AMX/MTZ is a combination of antibiotics with high morbidity and substantial side-effects the potential benefits of this regime in the treatment of advanced periodontitis have to be weighed against such side-effects. Furthermore, the influence of additional systemic antibiotic administration on the environment should not be overlooked.

#### ***What is the current status of the effect of non-surgical periodontal treatment on glycemic control in people with diabetes?***

When considering the influence of periodontal therapy on glycemic control in periodontitis patients with type 2 diabetes mellitus, there are contradictory outcomes. While some studies have demonstrated a positive influence following effective periodontal therapy on glycosylated hemoglobin levels, other studies have failed to

demonstrate such benefits. Since the evidence available on the influence of effective periodontal therapy on glycemic control is contradictory, no specific recommendations can be made at this time. However, effective periodontal therapy is beneficial for all patients by lowering the infective burden in the tissues. It should be noted that studies testing the effect of periodontal therapy on glycemic control should be performed with a quality assurance, i.e., ensuring that the outcome of the periodontal treatment has been successful.

#### ***What are the potential benefits of immobilization of teeth with moderate to extensive periodontal damage?***

Potential benefits of immobilization of periodontally involved teeth have been suggested as part of periodontal therapy for decades. However, the evidence for this approach is completely lacking. Splinting of teeth has, at best, only a limited place in periodontal therapy that is aimed at infection control. However, there is some evidence that during regenerative procedures, immobilization of very mobile teeth may slightly improve the clinical outcome. Moreover, splinting may be performed to facilitate mechanical debridement or for improving the patient comfort.

#### **Reference**

Tonetti MS and Claffey N. Advances in the progression of periodontitis in proposal of definitions of a periodontitis case and disease progression for use in risk factor research. Group C consensus of the 5<sup>th</sup> European Workshop in Periodontology. *Journal of Clinical Periodontology* 2005; **32 Suppl 6**:210-213.