

Letter to the Editor

One stage full-mouth disinfection – Treatment of choice?

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Dear Editor,

Quirynen et al. (1995) re-introduced the one-stage full-mouth disinfection, including adjunctive use of chlorhexidine (mouth rinsing and disinfection of all intra-oral niches), and compared the clinical and microbiological effects of this treatment strategy with the more traditional treatment of quadrant scaling and root planing at 2-weekly intervals with no adjunctive use of chlorhexidine. The rationale behind full-mouth disinfection was to prevent re-infection of the treated sites from the remaining untreated pockets and from other intra-oral niches. Thereafter, the Leuven research group conducted a series of clinical trials and they consistently demonstrated a superior clinical outcome of this treatment approach (Quirynen et al. 1995, Vandekerckhove et al. 1996, Bollen et al. 1998, Mongardini et al. 1999, Quirynen et al. 2000, Quirynen et al. 2006b). However, these results are not in line with findings from other research groups (Apatzidou & Kinane 2004a; Koshy et al. 2005, Wennström et al. 2005, Jervøe-Storm et al. 2006) which generate an ongoing debate as to whether full-mouth disinfection should be the treatment of choice.

The presence of a putative pathogen subgingivally does not necessarily indicate disease initiation and progression. Several studies have demonstrated that a combination of factors such as changes in the local environment, presence of virulent strains of periodontal pathogens in sufficient numbers, absence of beneficial species and host susceptibility contribute to disease progression (Socransky & Haffajee 1992, 1993). In another study, it was shown that although patients were considered clinically

healthy, they still harboured *Actinobacillus actinomycetemcomitans* and *Porphyromonas gingivalis* post-therapy (Nieminen et al. 1995). It has been demonstrated that alterations in the local environment (temperature, osmolarity, iron concentration, pocket depth, inflammatory status) affect the expression of virulence factors and the ecology of the subgingival microbiota (Socransky & Haffajee 1991). Frequently, the suspected periodontal pathogens were present in healthy sites or in sites that responded well to treatment. This could be due to several reasons. For example, a particular species may not be pathogenic (despite its presence in diseased sites), the host may be resistant to a particular pathogen, the levels of this organism may not exceed the threshold of host susceptibility, or local environmental conditions may not favour pathogen replication and initiation of disease. Given all these variables, re-infection of the treated sites from the remaining untreated pockets, or other niches, before the active phase of treatment is completed seems to be a rather complicated process.

Quirynen et al. (2000) hypothesised that full-mouth scaling and root planing completed within 24 h caused bacteraemia and as a result an enhanced immune response. The authors speculated that this might be the beneficial aspect of this treatment strategy. One study (Apatzidou & Kinane 2004b) investigated this hypothesis and took frequent blood samples from patients (2-weekly intervals) over a longer period (overall 6 months) than had previously been performed. The data showed that although full-mouth instrumentation was completed in a shorter period (12 h rather than 24 h), no significant differences in

the IgG antibody titres against five putative periodontal pathogens were detected compared with the standard quadrant root planning at 2-weekly intervals over a period of 6 months. It may well be that, fortnightly sessions of quadrant root planing result in a similar host immune response as 12- or 24-h full-mouth treatment, even though the latter treatment approach would be expected to have a greater potential for inoculation of bacteria into the host tissues thus eliciting a stronger immune response. Although IgG antibody titres were similar for both treatment groups, a significantly greater reduction in the antibody levels to *Prevotella intermedia* and *Treponema denticola* was seen between baseline and the initial reassessment (6 weeks after the completion of the instrumentation) for the full-mouth treated group compared with the quadrant group. When the changes in the serum antibody response over the course of treatment were considered within each treatment group, significant reductions in the IgG antibody levels to *P. intermedia* and *T. denticola* were seen between baseline and the initial reassessment for the full-mouth group, but this was not found for the quadrant group. These findings imply that same-day full-mouth treatment seems to have a stronger short-term effect on the systemic antibody response compared with the classical therapy of quadrant root planing at 2-weekly intervals, which complies with more recent data by Wang et al. (2006). However, the clinical significance of this finding is difficult to assess. Our experience is that short-term perturbations of antibody responses occur during the active phase of periodontal therapy but show great

variation across subjects and are therefore, difficult to meaningfully interpret.

A more recent study by the Leuven research group (Quirynen et al. 2006b), concluded that the benefits of the full-mouth treatment protocol were partially due to the antiseptics and partially to the completion of the therapy in a shorter time period which contradicts earlier findings (Quirynen et al. 2000), that questioned the key role of the antiseptics in this treatment strategy. The most recent study demonstrated that the full-mouth treatment with chlorhexidine was superior to all other treatment strategies. Although the full-mouth group with no use of antiseptics showed greater improvements in pocket depths and attachment levels compared with the quadrant-wise treated group with no use of antiseptics, this failed to reach statistical significance at 8 months ($p \leq 0.10$). However, it should be noted that the group which received the quadrant-wise treatment in the 2006 study scored considerably better in terms of pocket depth reductions than the earlier study and this may explain the differences seen between the two studies.

Apatzidou & Kinane (2004a) randomised 40 patients into two treatment groups (1-day full-mouth root planing versus quadrant-wise root planing) and followed these subjects over 6 months. It must be stressed that although the 1-day group was mechanically treated on the same day, they were still seen every second week in order to receive the same amount of oral hygiene instruction and motivation as the quadrant-wise group. This resulted in similar plaque indices between the treatment groups throughout the study, which disagrees with the findings of Vandekerckhove et al. (1996) who showed higher plaque indices for the one-stage full-mouth disinfection group after the first month, possibly due to lack of frequent sessions of oral hygiene reinforcement. Periodontitis is a chronic multi-factorial inflammatory disease process, which requires the commitment of both the patient and the therapist in order to achieve long-term periodontal stability. We strongly believe that although the full-mouth treatment is completed within hours, the patients should be monitored by the therapist closely and frequently until the time of the initial reassessment, especially in advanced cases, in order to optimise the oral hygiene and also establish a relationship between patient and therapist and consolidate the long-term commitment.

Therefore, from this aspect, 1-day full-mouth scaling and root planing offers no additional economic advantages over the classical quadrant-wise treatment in contrast to the conclusions of the Leuven group (Quirynen et al. 2006a).

There is a lack of convincing evidence in the literature that the full-mouth disinfection approach is superior to the traditional quadrant-wise therapy based on clinical, microbiological and immunological parameters. On the other hand, recent studies point out that single-visit, full-mouth or quadrant-wise ultrasonic debridement with or without the adjunctive use of antimicrobials is a less laborious and time-consuming procedure, yet equally efficacious clinically as the standard periodontal therapy of scaling and root planing (Koshy et al. 2005, Wennström et al. 2005). These treatment regimes may constitute a significant paradigm shift in periodontal practice (Kinane 2005). In conclusion, the clinician should select the treatment modality based on practical considerations related to time availability, clinical workload and patient preference.

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