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# Full-mouth disinfection versus one-stage mechanical debridement in the management of Adult Periodontitis - Microbiological morphotype monitoring

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## INTRODUCTION

- Full-mouth disinfection suggested by Quirynen and co-workers[1] included a full-mouth mechanical debridement within 24 hours along with the use of topically and locally delivered Chlorhexidine (CHX).
- This approach aims to eliminate / reduce periodontopathogens colonising other intra-oral niches in addition to those in periodontal pockets. Additional benefits were noted when compared to quadrant-wise mechanical treatment.[1]

## AIM

To determine whether full-mouth disinfection has any additional microbiological benefits, as determined by microbiological morphotype monitoring, over a one-stage mechanical debridement of all teeth without adjunctive CHX.

## MATERIALS AND METHODS

### Study Design

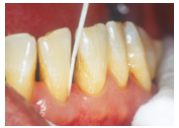
- Randomised, single-blinded, controlled, parallel clinical study
- 32 systemically healthy, non-smoking subjects aged 35-60 years old (mean 46.3 ± 7.5 yrs).
- Random allocation into test (n=16) and control groups (n=16).
- The control group received mechanical debridement in one visit which included scaling to remove detectable calculus and root planing of pocket sites of all remaining teeth. The test group underwent full-mouth disinfection (modified version of the original protocol by Quirynen *et al.*1995).

### Clinical parameters

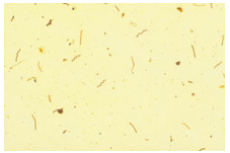
At baseline, one month, three months and six months, a blinded examiner recorded Plaque, Bleeding on probing, Probing depths and Probing attachment levels.

### Microbiological monitoring

- At baseline, one month, three months and six months, subgingival plaque samples were collected from the deepest pockets in each quadrant and pooled for each subject.
- The site was isolated with sterile cotton rolls and supragingival plaque was removed gently using sterile cotton pellets. Subgingival plaque samples were collected by means of one medium sized sterile paper point inserted into the depth of the pocket and kept in place for 10 seconds.



- The samples were transferred into a sterile screw capped vial containing 0.5 ml of sterilised phosphate buffered solution (PBS) and transported to the laboratory for processing.
- All samples were vortexed for 1 minute and a drop of suspension from the vortexed solution was smeared onto a clean microscopic slide, air dried and silver stained (Coffey *et al.* 1995)[2].



Silver stained plaque sample

- Relative proportions of each microbiological form were determined under a light microscope. At a magnification of X 1000, single cells were classified according to the morphology as coccus, straight rod, curved rod, fusiform, filament or spirochaete (Listgarten & Helldén 1978)[3].

### Statistical analysis

Comparisons within and between groups was performed at subject level by t-tests and ANOVA for repeated measures using StatView® Version 4.53 (SAS Institute, Cary, N.C.,U.S.A.)

## RESULTS

For differential counts of smears, spirochaetes and curved rods were grouped together for evaluation. The mean proportions of spirochaetes and curved rods and their reduction following treatment were compared in both groups. The change in the proportion of cocci was also noted.

### Mean proportion of spirochaetes and curved rods ( SpCR%)

Following treatment, there was a marked drop from baseline in the mean proportions of the spirochaetes and curved rods (*paired t-test, p<0.001*) to levels within the healthy limits in both groups which were maintained until 6 months (Figure 1).

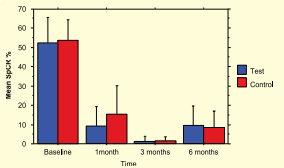



Figure 1

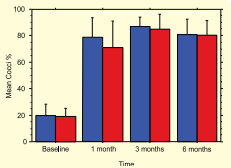



Figure 2

### Mean proportion of cocci ( Cocci%)

There was a concurrent rise in the mean proportion of cocci in both groups. The rise was statistically significant when compared to baseline (*paired t-test, p<0.001*)(Figure 2).

Table 1: Mean proportion of spirochaetes and curved rods (SpCR%), their mean change (ΔSpCR%), mean proportion of cocci (Cocci%) and their mean change (ΔCocci%) in test and control groups

| | Baseline | | 1 month | | 3 months | | 6 months | |
|---|---|---|---|---|---|---|---|---|
| | Test | Control | Test | Control | Test | Control | Test | Control |
| SpCR% | 52.7 | 53.7 | 9 | 15.2 | 1.4 | 1.3 | 9.4 | 8.3 |
| ΔSpCR% | - | - | 43.7 | 38.5 | 51.2 | 52.4 | 43 | 45.4 |
| Cocci% | 19.3 | 19.1 | 79 | 71.3 | 88 | 85.4 | 80.5 | 80.1 |
| ΔCocci% | - | - | 58.9 | 52.2 | 67.9 | 66.3 | 60.8 | 61 |

There were no statistically significant differences between the groups regarding the proportions of spirochaetes and cocci at any time point of the study (Table 1).

## DISCUSSION

- In the present study, both test and control groups had significant microbiological improvements following treatment. There was a significant decrease in pathogenic bacterial load after one stage mechanical debridement regardless of the use of CHX.
- Differential counts of plaque smears were used to monitor the changes in the microbial load due to the treatment, as this method is simple, easy, inexpensive and gives an overview of the microbial flora in terms of morphotypes present in the subgingival plaque.
- The silver stain is a simple, inexpensive and rapid method for differential counting of subgingival plaque flora. There is no limitation of time in counting silver stained samples, a permanent mount can be obtained and no special microscope is required.
- A shift from pathogenic morphotypes to beneficial species was noted. Both treatments reduced the microbial load indicating that CHX in the treatment protocol had very little or no effect. In a similar study, Quirynen *et al.* (2000)[4] also failed to show any significant difference in the microbiological parameters when comparing full-mouth disinfection with a full-mouth scaling and root planing.

## CONCLUSION

Full-mouth disinfection confers no additional microbiological benefits over a one-stage mechanical debridement in adult periodontitis patients.

### Acknowledgements

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### References

1.Quirynen *et al.* (1995) *Journal of Dental Research* **74**(8), 1459-1467.
2.Coffey *et al.* (1995) *Journal of Periodontology* **30**, 342-*348*
3. Listgarten & Hellden (1978) *Journal of Clinical Periodontology* **5,** 115-132.
4.Quirynen *et al.* (2000) *Journal of Clinical Periodontology* ***27****, 578-589.*