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study

Optimising the workflow of non-surgical periodontal treatment in daily practice

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Background

The workflow for the treatment of periodontitis has been included in the European Federation of Periodontology's clinical practice guideline on the treatment of periodontitis stages I-III (Sanz et al., 2020)[1].

As well as the therapeutic options, an essential prerequisite for success is to educating patients on periodontal diagnosis, aetiology, and risk factors. Indeed, the first step of treatment consists of patient education that aims to guide behavioural changes and increase patient motivation towards homecare and risk-factor control (including, smoking cessation).

The second step of therapy, consisting of subgingival instrumentation, may be performed in one or more treatment sessions. Wennström et al. (2005)[2] evaluated the efficacy of full-mouth ultrasonic debridement preceded by an initial phase of patient education as compared to traditional quadrant scaling and root planing. Significantly more chair time was spent per closed periodontal pocket when opting for conventional quadrant-wise treatment compared to a guided approach to periodontal infection control (GPIC).

The available body of evidence comparing the two treatment modalities consists mainly of studies in which selected populations were treated under ideal conditions.

Aim

To evaluate the effectiveness of the GPIC approach as compared to conventional section-wise non-surgical therapy (CNST) in terms of clinical and patient-centred outcomes in the general population, under conditions found in practice.

Materials & methods

- Ninety-five dental hygienists were randomly assigned to perform either:
  - A single session of full-mouth ultrasonic debridement preceded by educational sessions aiming at the establishment of adequate oral hygiene (GPIC). Patients had to demonstrate sufficient oral hygiene (full-mouth plaque score <30%), prior to mechanical treatment.
  - Conventional section-wise non-surgical therapy (CNST), with one to two weeks between appointments.
- Two to four weeks after baseline treatment, patients in both groups were scheduled for oral-hygiene control.
- Three months thereafter, pockets with residual PPD ≥5mm and clinical signs of inflammation were retreated.
- At the six-month follow-up, a clinical examination was performed, and patients' self-perceived oral health was questioned. Pocket closure (probing pocket depth, 4mm) was the primary outcome measure.
- The time (minutes) used for patient education/motivation and time (minutes) used for mechanical instrumentation was recorded.
- Multilevel models were used to predict probability of pocket closure at six months.

1 Sanz, M., Herrera, D., Kebschull, M., Chapple, I., Jepsen, S., Berglundh, T., Sculean, A., Tonetti, Maurizio S., on behalf of the EFP Workshop Participants and Methodological Consultants (2020). Treatment of stage I-III periodontitis-The EFP S3 level clinical practice guideline. *J Clin Periodontol, 47 Suppl 22*, 4-60. doi:10.1111/jcpe.13290

2 Wennström, J. L., Tomasi, C., Bertelle, A., & Dellasega, E. (2005). Full-mouth ultrasonic debridement versus quadrant scaling and root planing as an initial approach in the treatment of chronic periodontitis. *J Clin Periodontol, 32*(8), 851-859. doi:10.1111/j.1600-051X.2005.00776.x

Outcome	GPIC	CNST	p-value	B	95% CI	p-value2
Total treatment time (*)	134 ± 40	161 ± 61	<.001			
Chair time re-treatment at 3 months (*)	37.8 ± 15.4	40.2 ± 22.3	.136			
Pocket closure (%) (*)	69.3	71.5				
Time efficiency (minutes of instrumentation per closed pocket) (*)	9.5 ± 10.5	14.5 ± 20.8	.001			
Pocket closure shallow sites (5-6mm) (%) (*)	72	75				
Pocket closure shallow deep sites (≥7mm) (%) (*)	30	33				
PPD at baseline (**)				-1.10	-1.19 to -1.02	.000
Smoking (ref: non-smoker) (**)						
Current smoker				-0.65	-1.06 to -0.22	.003
Former smoker				-0.35	-0.71 to 0.02	.066
Age (**)				-0.03	-0.05 to -0.02	.000
Tooth type (ref: Anterior) (**)						
Premolar				-0.33	-0.50 to -0.15	.000
Molar				-0.93	-1.09 to -0.77	.000

Note: (*) Data are represented as mean ± SD and %. Total number of participants n = 615. Abbreviations: CNST, conventional non-surgical therapy; GPIC, guided periodontal infection control. aχ2-test and independent samples t-test.
(**)Adjusted for systemic health and gender. LL = 4581.88 Wald test 0.000 R2 0.27. Abbreviations: BMI, body mass index; CI, confidence interval; CNST, conventional non-surgical therapy; GPIC, guided periodontal infection control; PPD, probing pocket depth.

Results

- A total of 689 patients agreed to participate in the study.
- Average treatment time was 134±40 minutes for GPIC and 161±61 minutes in the CNST group.
- Chair time for retreatment at three months was similar in both groups.
- Pocket closure at six months amounted to 70%, irrespective of the treatment modality.
- Pocket closure was more frequent at initially shallow sites (86%) rather than at deep sites (50%).
- Time efficiency, expressed as minutes of instrumentation per closed pocket, was significantly in favour of GPIC (9.5±10.5 min/closed pocket) as compared to CNST (14.5±20.8 min/closed pocket).
- Seventy-five percent of all patients judged their oral health to be substantially improved with no significant difference between the two groups.
- Disease severity, smoking, patient age, and tooth location had a significant impact on pocket closure at six months.

Limitations

- The calibration of 95 involved clinicians in terms of treatment and examination procedures is a difficult matter, and considerable differences may still have been present.
- As patient compliance and plaque control is an important prerequisite for successful periodontal therapy, an important limitation of the study is the lack of data on plaque accumulation.
- Despite their potential effect on tooth prognosis and treatment complexity, periodontal-defect morphology and furcation involvement are not reported on in this study.

Conclusions & impact

- Both GPIC and CNST are effective non-surgical treatment protocols for periodontitis.
- Nevertheless, GPIC was more time-efficient, thus providing benefits to both patients and clinicians.
- The importance of smoking cessation should be stressed during patient education.
- In daily practice, introducing a phase of patient education to establish a sufficient level of oral hygiene prior to a single session of non-surgical periodontal treatment might result in greater time efficiency compared to the conventional quadrant-wise approach.

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