

SYSTEMIC ANTIMICROBIAL THERAPY AS AN ADJUNCT TO SCALING AND ROOT PLANING

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Abstract: The association of the mechanical treatment with a general antimicrobial one can lead to the consolidation of the obtained results. The present clinical trial was performed in order to study the effects of systemic administration of metronidazole and amoxicillin as an adjunct to scaling and root planing (SRP) in patients with generalized chronic periodontal disease. The 50 patients were randomly distributed into 2 different samples of 25 subjects each: one received systemic antimicrobial treatment and the 2nd sample of subjects received a placebo drug. In each patient, 2 quadrants (1 in the maxilla and 1 in the mandible) were exposed to SRP and the contralateral quadrants were left without subgingival instrumentation. SRP combined with systemic administration of amoxicillin-metronidazole was the most efficient in improving the clinical parameters of the periodontal disease.

INTRODUCTION

The treatment of the periodontal disease aims at maintaining the health of the gingival sulcus, obtaining new attachment, by inhibiting the activity of the pathogens in the gingival plaque and reducing their number.

The initial local mechanical treatment, combined with a proper oral hygiene can be efficient, arresting or preventing further periodontal attachment loss. There are also clinical situations when the results obtained after the mechanical treatment are not the desired ones because some of the root surfaces are inaccessible or because of the complexity of the plaque pathogens.

The association of the mechanical treatment with a general antimicrobial one can lead to the consolidation of the results obtained by mechanical treatment, because it helps the immune system of the host, by acting on the pathogen that persist in the periodontal structures. Some chemotherapeutic agents can reduce the destruction of collagen and bone due to their capacity to inhibit the enzyme collagenase.

In choosing the systemically administered antibiotic we have to take into account its spectrum of action and the date about the bacteria species that are present in the gingival sulcus, in order for the treatment to be efficient.(1)

Systemic antibiotics reach the periodontal tissues by transudation from the serum then to the gingival sulcus through the crevicular and junctional epithelium, so their concentration in this site will be lower than in other parts of the body. In order for the antibiotic to be efficient in this site, the structure of the plaque biofilm has to be disrupted.(2)

A systemically administered antibiotic will produce antimicrobial effects in other areas of the oral cavity too, reducing bacterial counts on the tongue and other mucosal surfaces, thus preventing the re-colonization of subgingival sites by the pathogenic bacteria.

Systemic administration of antibiotics raises a series of controversies linked to their therapeutic value in the treatment of

periodontal disease.

PURPOSE

The present clinical trial was performed to study the effects of systemic administration of metronidazole and amoxicillin as an adjunct to scaling and root planing (SRP) in patients with chronic recurrent periodontal disease.

METHODS

This study was a clinical trial controlled with Split Mouth Design and it was performed on 50 patients selected among the patients that came to the Department of Periodontology of the University of Dental Medicine, University of Medicine and Pharmacy of Țirgu-Mureș.

The inclusion criteria were as follows:

- the diagnosis of generalized chronic periodontitis,
- presence of at least 16 teeth, and 4 non adjacent sites with periodontal pocket depth of minimum 5 mm,
- age between 37-59 years old, irrespective of sex,
- proper cooperation.

The exclusion criteria were as follows:

- presence of systemic disease,
- poor oral hygiene after oral hygiene instruction,
- smoking,
- pregnant or lactating women,
- periodontal treatment over the previous 6 months,
- antibiotic therapy over the last year.

All patients were informed about the protocol, the benefits and risks of participating in the study, and informed consent of the patients was obtained. The study was approved by the ethics committee of scientific research of the University of Medicine and Pharmacy of Țirgu-Mureș. The following indices for each patient were recorded in an observations sheet: gingival index (GI), papillary bleeding index (PBI) and probing pocket depth (PPD) in all periodontal units.

The 50 patients were randomly distributed into 2

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CLINICAL ASPECTS

different samples of 25 subjects each. One sample of subjects received systemic antimicrobial treatment for a week (metronidazole and amoxicillin). During the corresponding period, the 2nd sample of subjects received a placebo drug. In each of the 50 patients, 2 quadrants (1 in the maxilla and 1 in the mandible) were exposed to non-surgical subgingival scaling and root planing, and the contralateral quadrants were left without subgingival instrumentation. Thus, 4 different treatment groups were formed:

- group A: antibiotic therapy plus SRP,
- group B: antibiotic therapy, no SRP,
- group C: placebo therapy plus SRP,
- group D: placebo therapy, no SRP.

Re-examinations regarding the clinical parameters were performed after 3 months. And the teeth included in groups B and D were also exposed to non-surgical periodontal therapy (SRP).

The statistical analysis was done using SPSS version 15.0 statistical analysis software. The values were represented in number (%) and mean \pm standard deviation (SD).

RESULTS

For the evaluation of data, a proportional change was used to study the post-treatment effect of different groups.

For the first group of patients, of which the study groups A and B were made up, in the examinations regarding the clinical parameters that were performed after 3 months from the mechanical treatment associated with systemic antibiotic treatment, we obtained the results mentioned in table no. 1.

Table no. 1. Comparison of proportional changes (in percentage %) in periodontal parameters in groups A and B between baseline and 3 months after treatment

	GI	PBI	PPD
Group A	81.25 \pm 3.45	83.64 \pm 4.37	62.35 \pm 6.75
Group B	28.47 \pm 6.25	38.16 \pm 5.42	13.57 \pm 4.34

For the second group of patients, which included the study groups C and D, in the examinations regarding the clinical parameters that were performed after 3 months from the mechanical treatment, we obtained the results from table no. 2.

Table no. 2. Comparison of proportional changes (in percentage %) in periodontal parameters in groups C and D between baseline and 3 months after treatment

	GI	PBI	PPD
Group C	35.62 \pm 5.43	50.34 \pm 8.45	20.53 \pm 3.15
Group D	2.47 \pm 1.25	1.78 \pm 1.28	0

DISCUSSIONS

The treatment of periodontitis begins frequently with a non-surgical phase that includes scaling and root planing (SRP) and, on occasions, with the use of systemic antibiotics. As we observed in our study, systemic antimicrobial therapy using a combination of amoxicillin and metronidazole as an adjunct to SRP can enhance the clinical benefits of non-surgical periodontal therapy in adults. Mechanical therapy (scaling and root planing) combined with systemic administration of amoxicillin-metronidazole (group A) was the most efficient in improving the clinical parameters of the periodontal disease. The antibiotic regimen alone (group B) was less effective than mechanical therapy (group C).

The combination of amoxicillin and metronidazole as an adjunctive treatment to scaling and root planing (SRP) was proposed for the treatment of chronic periodontitis and many studies have proven its effectiveness.(3,4,5)

Even if the benefits of the systemic antibiotic

treatment are recognized by a lot of researches, there is not a unanimous opinion about the type of antibiotic chosen of the periodontal conditions or its optimal dosage.(6)

Systemic usage of metronidazole and amoxicillin, used with or after the initial periodontal treatment in adult periodontitis patients, leads to significant better clinical and microbiological results than initial periodontal treatment alone.(7-12)

A study that was performed to compare the effects of associating metronidazole and amoxicillin with SRP, supports the benefits of using these antimicrobial agents as adjunctives for SRP in chronic periodontal disease.(13)

By analysing the data from the speciality literature, Hafajje and colab. concluded that the use of systemically administered antibiotics as an adjunctive for SRP appears to determine an improvement of the clinical situation, compared to the therapies that do not use these agents. The clinical effects are similar to all antibiotics, so the selection for a certain patient has to be made based on other factors.(14)

Keestra and colab. have performed a meta-analysis and have observed that the association of systemic antibiotics with SRP offers the improvement of the clinical situation more than SRP alone. Although there are not significant statistical differences between antibiotics, the authors observed that there is a trend in using metronidazole alone or combined with amoxicillin, which gave more significant improvements than the treatment with doxycycline or azithromycin.(15)

The clinical benefits of metronidazole and amoxicillin use after completion of full-mouth scaling and root planing (SRP) in the treatment of generalized aggressive periodontitis were proven to be better than those obtained with SRP alone and can reduce the need of surgical treatment.(16)

The indiscriminate use of antibiotics could lead to the appearance of more highly antibiotic-resistant strains of bacteria associated with periodontal diseases. To remove this inconvenience, subgingival plaque samples from patients with periodontitis must be collected and cultured on selective and nonselective culture media and then determinate the antibiotic susceptibility of the isolated periodontopathogens.(17)

CONCLUSIONS

Systemic antibiotic therapy with metronidazole and amoxicillin used as an adjunctive to SRP care improve the clinical benefits of non-surgical periodontal therapy in adults.

The use of systemic antibiotics combined with scaling and root planing (SRP) should be sustained by clearly established needs by subgingival determinations of microorganisms.

The administration of systemic antibiotics has to be an adjunctive to the appropriate local treatment and should never replace it.

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