Investigation of Treatment with Periimplantitis with Antibiotic therapy

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Abstract

The purpose of the study is to determine the effect of the antibiotic treatment therapy of periimplantitis in dentistry. The study includes two groups of patients, divided by the treated position. The first group are patients treated with antibiotic, the second group are patients treated with antibiotic and metronidazole preparation. Seedings were done before and after the treatment. A clear distinct advantage has emerged in the combined treatment of periimplantitis with antibiotics and metronidazole. In conclusion, in the treatment of periimplantitis should be combined the effect of an antibiotic preparation and a metronidazole preparation to potentiate their action, and to capture a full range of antimicrobial protection.

Keywords: *periimplantitis, antibiotic, metronidazole, bacterial*

Intorduction

The purpose of the study is to determine the effect of the bacterial flora in periimplantitis in dentistry. The main task is to establish whether there is a difference in antibiotic alone and separately in combination and the application of an antibiotic and metronidazole preparation.

(1) Scientific data confirm the leading role of microorganisms in the development of inflammatory diseases in the human tissues. The inflammatory flora around the dental implants is associated with a gram of a negative microflora that is analogous to that of periodontal disease. (2)

The periimplantitis is defined as an infection of hard and soft tissue around the implant. There is a number of classifications of periimplants by different metrics: Schwarz, Spiekermann, Zhang, Passi, BMP, Froum and Rosen, Ata-Ali and others. (3, 4) The Different classifications overlap with various indicators, such as - defect development time, shape of the defect, bone loss, etc.

The major causes of periimplantitis are *Prevotella intermedia*, *Porphyromonas gingivalis*, *Aggregatibacter actinomycetemcomitans*, *Bacterioides forsythus*, *Treponema denticola*,

Prevotella nigrescens, *Peptostreptococcus micros*, *Fusobacterium nucleatum*. The Periimplantitis also influences many factors such as diabetes, tobacco, oral hygiene, harmful habits, working environment, occlusion, etc. (5)

The classical treatment of periimplantitis aims to influence the bacterial infection. It may be non-surgical treatment, mechanical treatment, mechanical treatment associated with administration of antibiotic agents, surgical treatment, etc. (6)

The subject of the present study is only the microbiological parameters influenced by the result of antibiotic therapy and the metronidazole therapy. The classical treatment of periimplants with antibacterial drugs per os, is either antibiotic therapy or the combination with a metronidazole preparation. (7) Amoxicillin, as part of the aminopenicillin group, has a wide range of action against gram negative and gram positive microbes. Penicillins are derivatives of the 6-aminopenicillanic acid. After the connection to the penicillin-binding proteins (PBPs), they activate autolytic enzymes in the bacterial wall and suppress the synthesis of the peptidoglycan - its main ingredient. What occurs is an osmotic bacteriosis and death for the microorganisms. The penicillins act bactericidally on friction with extracellular microorganisms. The amoxicillin has a slight negative impact on gastrointestinal tract and a relatively low allergy risk of less than 10%. The usual dose is up to 3g daily divided into three intakes. (8)

The other group of antibiotics that are actively applied are the lincosamides. The lincosamides are a group of antibiotics that have similar antibacterial activity with the macrolides and the chloramphenicol - *suppress the protein synthesis in the microorganisms during the phase of elongation*, binding to the ribosomal 50S subunit. They have a fast appearing bacteriostatic effect predominantly on the gram-positive microorganisms, similar to the benzylpenicillin. Their spectrum of action includes gram-positive bacteria (mostly staphylococci), and gram-negative only include the anaerobic rods. (9) Lincosamides are administered orally and injected. They are distinguished by their good ability to penetrate into bones and soft tissues. The usual dose is up to 2grams daily divided in three intakes. The classical drugs of this corpse are Clindamycin and Dalacin. The nitroimidazoles are the third most widely used group in the treatment of peri-implants. Nitroimidazoles are synthetic AMPs with high activity against anaerobic bacteria and pathogens of protozoan infections. Nitroimidazoles have a selective bactericidal effect action on those micro-organisms whose enzyme systems

are capable of reducing the nitro group. The active recovered forms of the drug disrupt the replication of DNA and the protein synthesis in the microbial cell, they inhibit the tissues' breathing.

Nitroimidazoles are active against many anaerobes, both gram-negative and gram-positive: bacteroids, clostridias, *Fusobacterium* spp., *Eubacterium* spp., *Peptostreptococcus* spp., *P. niger*, *G.v.* Sustainable is *P.acnes*.(10, 11) A classical preparation of this group is Flagel. Treatment with it should not be continued more than 10 days. It is possible to cause gastrointestinal disturbances. The usual dose is 200-400mg, divided three times per day.

In the treatment of perimplants, the combination of Amoxicillin and Metronidazole has been acquired a widespread use in dental practice.

Material and Methods

For this purpose, two patient groups of 5 people were allocated. Group A and Group B, with similar perimplants, such as a defect and a clinical picture. One group A was treated only with the antibiotic Amoxicillin 0.500 three times a day for 7 days. Group B was treated with a combination of Amoxicillin and Flagyl respectively at a dose of 0.500 three times daily and 0.250 three times daily for 7 days.

Before to treatment, bacterial culture samples were detected for each patient placed in sterile containers and sent to a control laboratory. In the same way a sample was taken on the 7th day after the treatment. The seed showed mainly bacterias of the type: *Eubacterium nodatum*, *E. brachy*, *E. saphenum*, *Filifactor alocis*, *Slackia exigua*, *Parascardovia denticolens*, *Prevotella intermedia*, *Fusobacterium nucleatum*, *Porphyromonas gingivalis*, *Centipeda periodontium* and *Parvimonas micra*.

After treatment, there were mainly bacteria of the type: *Streptococcus* were *Pseudoramibacter alactolyticus*, *Veillonella*, *Actinomyces israelii*, *Actinomyces*, *Propionibacterium* and *Parvimonas micra*.

Distributed as follows fig. 1

	Before treatment	After treatment
Group A	100%	30%
Group B	100%	10%

Figure 1. Treatment efficiency ratio

Results

Two groups were grouped, Group A using only Amoxicillin and Group B with use of Amoxicillin and Flagel. The advantage was found in using Amoxicillin and Flag which covers the entire spectrum of bacterial invasion of the periimplants. A similar bacterial flora was found in both groups.

In group A, the bacterial flora on the seventh day had decreased about 70%, in group B the bacterial flora had decreased by 90% from the baseline. The treatment efficacy grouped before and after showed a clear treatment advantage when combining two preparations with marked antimicrobial activity (Fig. 2)

Discussion

The use of antibiotic therapy for periimplanitis is debatable. From one hand it has many treatment options such as non-surgical treatment, mechanical treatment, laser therapy and many other options. (12,13,14) On the other hand the antibacterial therapy is a sure and fast way to influence the pathogenic flora that has begun the periimplantitis. The combination of two of the most commonly used preparations Amoxicillins and Flagil certainly

boosts the efficiency and ensures a secure influence over the periimplants.

Conclusion

The need for antibacterial therapy in the contemporary treatment of the periimplants is not a panacea, but can successfully help the healing process in case that it is selected as an opportunity. Of course, additional research is needed to establish with certainty their clinical relevance.

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