

Use and Misuse of Systemic Antibiotics in Periodontitis Treatment

Periodontitis is one of the most common inflammatory diseases affecting humans all over the world. Its prevalence varies from one country to another, yet thanks to the decline of edentulism and the general increase of life expectancy, it has been consistently rising in the past decade.^{5,9} Moreover, nowadays patients are more inclined to keeping their natural teeth as long as possible, despite implants becoming a routine treatment.

Different options exist for treatment of periodontal lesions. A non-surgical approach is often initially proposed, followed by a surgical one. Both aim at debridement and microbial decontamination by removing plaque and calculus deposits. The traditional protocol recommends initial non-surgical mechanical debridement by scaling and root planing of the contaminated root surfaces. In cases with residual deep pockets, a corrective surgical phase is often indicated. Hand instruments, ultrasonic scalers, air-polishing devices, laser and photodynamic therapy have been advocated to obtain reliable improvement of clinical parameters. Nonetheless, some limitations were described, such as vertical deep defects, furcations involvement, or certain mechanically resistant bacteria such as *Aggregatibacter actinomycetemcomitans*. Chemical treatment using antibiotics has long been suggested. Numerous studies have shown the benefits of associating systemic antibiotics, notably amoxicillin and metronidazole, with mechanical treatment.² The problem lies in the risk of using antibiotics as a means to compensate for inefficient subgingival instrumentation. Undisrupted biofilm is more prone to resisting the effects of antimicrobial agents. It has been recommended to briefly prescribe antibiotics after scaling and root planing. However, the exact dosage and duration of antimicrobial treatment remains to be defined. Two studies revealed good clinical results after three, seven and even 14 days of systemic administration.^{3,6,1,4} Timing is another matter of debate. It has been demonstrated that giving antibiotics after the first phase could reduce the number of residual pockets and, indirectly, the number of surgical interventions.⁸

Identification of periodontal pathogens present in pockets was formerly a very common practice. Different microbiological tests were available on the market. At the time, antibiotics were indicated on the basis of the presence of specific micro-organisms. However, different clinical studies have demonstrated that testing periodontal bacteria

had no predictive value in identifying subjects who would benefit from antibiotics.³ More recently, metagenomics analyses have revealed that the oral microbial ecosystem is vast and more complex than previously described. A synergistic and dysbiotic microbiome is the origin of the homeostasis perturbation leading to the diseased state.⁷ According to the concept of “keystone pathogens”, the host response modulation plays a crucial role in the resolution of periodontal diseases. A new generation of drugs interfering with the complement system is being tested.

Antibiotics are not only used and misused in periodontology. In 2016, The European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) published its sixth report on the sales of veterinary antimicrobial agents from 29 European countries during the year 2014.⁶ In this field, the purpose of antibiotics is to both promote the growth of food-producing animals and prevent disease. Around 2276.6 tons of penicillin were prescribed among the 29 countries in 2014. Tetracyclines almost reached 3000 ton. Countries were not equal in terms of antibiotic dosages, mainly due to their livestock production. As an active ingredient, penicillin varied from 3 to 640 tons depending on the country. However, it should be noted that between 2011 and 2014, a 12% reduction in sales was observed. This drop may be explained by different campaigns whose aim it was to limit the use of antimicrobials. Awareness is still necessary, since repeated exposure to low doses of antibiotics has been correlated with the emergence of resistant bacterial strains.¹⁰ In the above veterinary study, an estimated rise of 67% in antimicrobial consumption was required to meet a higher demand for meat.

Patient welfare should remain the main objective of any treatment. If the need for additional therapy can be reduced by administration of antibiotics, the clinical benefits would overcome the risks of adverse events. Nevertheless, one should not forget that the treatment of periodontitis starts with patient information, establishment of adequate oral hygiene and elimination of the risk factors.



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