OXYSAFE® – Innovative technology based on active oxygen for the treatment of periodontal diseases

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Periodontitis is the most common oral disease. It is estimated that up to 70 % of the population is affected. Inadequate oral hygiene, smoking, diabetes, and genetic predisposition are some of the factors that lead to the occurrence of periodontitis. The clinical features include tooth loosening, the formation of gingival pockets with bone loss and the simultaneous presence of signs of inflammation, which are expressed in bleeding, edema, often with pus discharge, and almost always unpleasant breath. Bacterial infection is the main cause. Periodontal pockets that are more than 3mm deep require treatment. The treatment plan begins with non-surgical periodontal therapy, which consists of supra- and subgingival cleaning. The gold standard in non-surgical periodontal therapy is the so-called Scaling and Root Planning (SRP). The deposits of subgingival plaque and tartar are removed. Thus the number of periodontal pathogens (Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Prevotella intermedia), which are often present in the plaque, is significantly reduced. The main goal of causal therapy is to reduce the inflammation of the periodontal apparatus, and to promote the repair and regeneration of the supporting structures of the tooth. In general, the adjuvant use of antibiotics is possible for advanced chronic periodontitis and aggressive periodontitis, Mechanical removal of subgingival debris and debridement of gingival pockets is a very important part of treatment to remove bacterial biofilm.

In periodontal therapy, chemical agents such as hydrogen peroxide, iodine, chlorhexidine, photodynamic therapy and preparations based on active oxygen have their rightful place. However, even though Chlorhexidine has been used in periodontal therapies for many years, it often causes side effects such as loss of taste, as well as discolouration of the teeth and tongue. The molecules of chlorhexidine are also often too large to penetrate the biofilm sufficiently. In addition, home use of a mouthwash solution is only recommended for two weeks. An alternative that has been on the market since 2017 is OXYSAFE. It is a patented technology based on a hydrocarbon-oxygen complex that is activated by contact with the oral mucosa. Activated oxygen is released in the treated area and the anaerobic bacterial flora is significantly reduced. Put simply, proteins in the biofilm are oxidized, which leads to improved biofilm permeability deep into the periodontal pocket. Anaerobic bacteria have no nutrient base, dissolve in the cell walls and are destroyed. OXYSAFE is available in two different viscosities, in liquid and a gel-like form. OXYSAFE as a gel is used in the practice during periodontal therapy, which remains in the periodontal pockets for a long time and thus prevents the early colonisation of bacteria. To maintain the success of the treatment and for chemical control of the plaque, the patient is prescribed OXYSAFE in its liquid form as a mouth rinse for twice daily rinsing according to conventional oral hygiene. In addition, the oxygen-enriched micro-environment has a positive effect on the healing of the damaged perdiodontium. OXYSAFE is antibacterial and fungicidal. The mucosal cells and osteoblasts remain intact. Neither is OXYSAFE cytotoxic nor does it contain peroxides and free radicals.

Case report

A 55-year-old patient comes to the clinic of the Periodontology Department of the Zagreb Clinical Hospital for a first examination. He is a smoker and has no systemic diseases. The examination of the orthopantomogram and the clinical examination indicate periodontitis. Here is an example of the use of OXYSAFE on anterior tooth 11. The probing depth on tooth 11 was 7 mm both mesially and distally and there was bleeding. There was also vertical bone loss (Figures 1, 2).

Figures 1, 2:
The pocket probing depth is 7 mm both mesially and distally, and there is also vertical bone loss.

OXYSAFE Intro Kit, 3 x 1 ml Gel REF 155 040
3 x 250 ml liquid + 3 x application canulas

OXYSAFE Gel, I, 3 syringes à 1 ml REF 155 041
OXYSAFE Liquid, 250 ml REF 155 042

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In consultation with the patient, an initial periodontal therapy was agreed upon with the additional use of active oxygen-based gel (OXYSAFE). The gel was inserted into the periodontal pocket with a cannula and left there for five minutes. After five minutes, the subgingival instrumentation (Figures 3 – 6) was carried out with a piezo device. The OXYSAFE gel was then applied again and remained in the gingival pockets. (Figure 7). Upon the patient's check-up seven days later, he already mentions an improvement. The tissue is rosy with no signs of inflammation. (Figure 8).

Figures 3, 4:
OXYSAFE application in the periodontal pocket, exposure time 5 min.

Figures 5, 6:
Subgingival instrumentation with a piezo device.

Figure 7:
Re-application of OXYSAFE

Figure 8:
Gum disease after 7 days.

Conclusion

Causal periodontal therapy aims to eliminate supragingival and subgingival plaques, as well as calculus. The destruction of the biofilm reduces the inflammation, and repairs and regenerates the periodontium. Preparations based on active oxygen are used as additional chemical agents to control plaque and to prevent early colonization of periodontal pathogens. The combination of a causal therapy and the use of OXYSAFE, the results show excellent healing and a significant reduction in inflammation after just seven days. The patients are provided with OXYSAFE Liquid to rinse the oral cavity and to maintain a healthy oral flora. There are already many positive research results from the University of Nijmegen, the Netherlands.

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