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College of Dentistry



The effect of super oxidized water mouthwash on the level of IL₁ β in the GCF and some clinical periodontal parameters for patients with gingivitis.

(Randomized clinical trial)

A Thesis

Submitted to the council of the College of Dentistry University of Baghdad in Partial Fulfillment of the Requirement for the Degree of Master of Science in Periodontics

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Abstract

Background

One of the most predominant periodontal diseases is the dental biofilm induced gingivitis. : For the past 20 years, super-oxidized solutions have been shown to be powerful antimicrobials and disinfectants via oxidative damage. The taste is better than chlorhexidine and doesn't stain the teeth. Microsafe®, a super-oxidized solution for gingival care, offers a completely improved approach to treatment of gingivitis. The neutral potential of Hydrogen, super oxidized water was certified as an antiseptic in México in 2004. Interleukin 1 beta is one from interleukins family and it is released by many cells such as macrophage to control immune response.

Aim of the study

To evaluate the efficacy of super oxidized water mouthwash by improving gingival health in dental biofilm induced gingivitis.

Objectives

Determine the effect of Microsafe® 99.97% mouthwash three times daily on the pro inflammatory cytokines (IL₁β) in the gingival crevicular fluid and determine its effect on the clinical periodontal parameters (plaque index, gingival index and bleeding on probing) compared to 0.12% Alcohol free chlorhexidine(Kin gingival®) twice daily in participants with dental biofilm induced gingivitis who continue to perform regular mechanical oral hygiene measures.

Materials and methods

Forty-five adult male patients with generalized gingivitis participated in the double blinded randomized controlled parallel study divided into three groups(15 patients in each group), two mouth rinses and distilled water(negative control) used during seven days periods as adjunctive to regular mechanical oral hygiene, one group received super oxidized water mouth rinses(Microsafe®) three times daily and the second group received Alcohol-free chlorhexidine 0.12% solution(kin gingival®) twice daily and the third group received distilled water twice daily (negative control).

The first visit included plaque index measurement after that we removed the supra gingival plaque by cotton roll to avoid contamination with the periopaper strip during GCF collection, then GCF collected from targeted sites(upper incisors, labial side) after that the other clinical periodontal parameters (gingival index and bleeding on probing) were measured and then scaling and polishing were done after sample collection because of gingival bleeding which occur during scaling then inform the patient to use the coded bottle which was giving to the participant by the assistant not involve in the study so the researcher did not know the type of mouthwash that was given to the participant. The mouthwashes were given for one week with routine mechanical dental home care(brushing and interdental cleaning). In the second visit after one week, the plaque index was measured first, then the GCF sample was collected from the same teeth after that the other periodontal parameters were measured again (gingival index and bleeding on probing).

Results

According to the plaque index, highly significant improvement of all treatment groups was observed in the second visit one-week post treatment.

Microsafe® showed to have clinical outcomes closed to the effect of chlorhexidine (the positive control) than the negative control group(distilled water group). According to the gingival index, there was a significant difference among the study groups in 2nd visit after treatment and chlorhexidine was appeared to be most effective when compared to Microsafe® .

According to bleeding on probing, there was a highly significant differences between distilled water group and Microsafe® group before treatment. All the treatment groups showed reduced bleeding on probing one-week between the 1st visit and the 2nd visit ; although, chlorhexidine showed better outcomes (the mean difference was 14.258) when compared to distilled water and Microsafe® groups(the mean differences were 10.838, 9.9 respectively).

The level of IL-1 β showed a highly significant difference in chlorhexidine group in the 2nd visit after treatment (46.062(pg/L) versus 22.958(pg/L)) when compared to distilled water and Microsafe® groups which also showed a significant change (65.517(pg/L) versus 50.277(pg/L) and 55.920(pg/L) versus 46.351(pg/L) respectively).

conclusion

There was a positive effect of topical application of Microsafe® mouthwash. This was improved by clinical periodontal parameters (plaque index, gingival index and bleeding on probing). Furthermore, there was a positive reduction in the IL_ 1 β after topical application of Microsafe®

Trial registration

This study registered at (<http://clinicaltrials.gov>. (the reference no. NCT04328753)