Republic of Iraq
Ministry of Higher Education
and scientific Research
University of Baghdad
College of Dentistry

Evaluation of Anti-Plaque Effectiveness of A Combination of Salvadora Persica L. and Camellia Sinensis Var. Assamica: A Randomized Controlled Crossover Clinical Trial

A Thesis Submitted to the Council of the College of Dentistry/University of Baghdad in partial fulfillment of the requirements for the degree of Master of Science in Periodontics

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2019 A.D. **1440 A.H.**

Abstract

Background

Dental plaque plays a major role in the etiology of periodontal diseases. periodontal diseases are preventable by regular plaque control methods which are either mechanical or chemical. Since the mechanical plaque control measures require time, motivation and manual dexterity. Many chemical anti-plaque formulations have been used as an adjunct to mechanical methods to improve the oral health. The gold standard chemical anti-plaque agent is the Chlorhexidine. However; its use is burdened by its side effects. Many herbal formulations have been investigated to find an alternative to Chlorhexidine with fewer side effects. Of these herbal formulations *Salvadora persica L.* and *Camellia Sinensis Var. Assamica* are widely investigated for their anti-plaque and antimicrobial properties.

Aim

The aim of this study was to evaluate the anti-plaque efficacy of a combination of 0.25 mg/ml *Camellia Sinensis Var. Assamica* and 7.82 mg/ml *Salvadora persica L.* aqueous extracts for a longer period of 4 days in vivo.

Methods

A 4-day plaque re-growth, double-blinded, randomized crossover trial was carried out. A week after receiving polishing and scaling, all participants (n=14) which were male dental students aged (19-23) years received polishing at base line and rinsed with 15 ml of randomly allocated mouthwashes (either Combination, 0.12% Chlorhexidine or placebo) twice

daily without oral hygiene measures for 4 days. At the first day of the trial, samples of saliva were collected before the intervention and 2h after the intervention to determine the bacterial load using quantitative polymerase chain reaction (qPCR). After 24 h and at day 4 time points, plaque index was scored, plaque quantity was recorded using digital plaque image analysis (DPIA), and then the participants entered a 6 days washout period with regular oral hygiene measures. The same protocol was repeated for the next 2 mouthwashes.

Results

The Combination mouthwash significantly reduced plaque accumulation as compared to placebo and the reduction was comparable to that of Chlorhexidine and it also reduced the amount of *Streptococcus sanguinis, Actinomyces viscosus* and *Actinomyces naeslundii* (primary colonizers) in saliva.

Conclusion

The Combination mouthwash had antiplaque activity for a 4 days period and might be a potential alternative to synthetic mouthwashes.

Trial registration

This study was registered in ClinicalTrials.gov as NCT03790904 in January 3, 2019.