The Effect of Tea Tree Essential Oil in the treatment of Gingivitis

Alfred Menat [1,*], Cecília Rozan[2], Helena Barroso[2], Abdesselam Zhiri[3], Ana Cristina Manso[2]

1: Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal, MIMD, Estudante
2: Egas Moniz Center for Interdisciplinary Research (CiiEM), Egas Moniz School of Health & Science, 2829-511 Caparica, Almada, Portugal, Docente
3: Inula (Pranarôm), Director of Research, 7822 Ghislenghien, Belgium
*Contact : alfred.menat@gmail.com

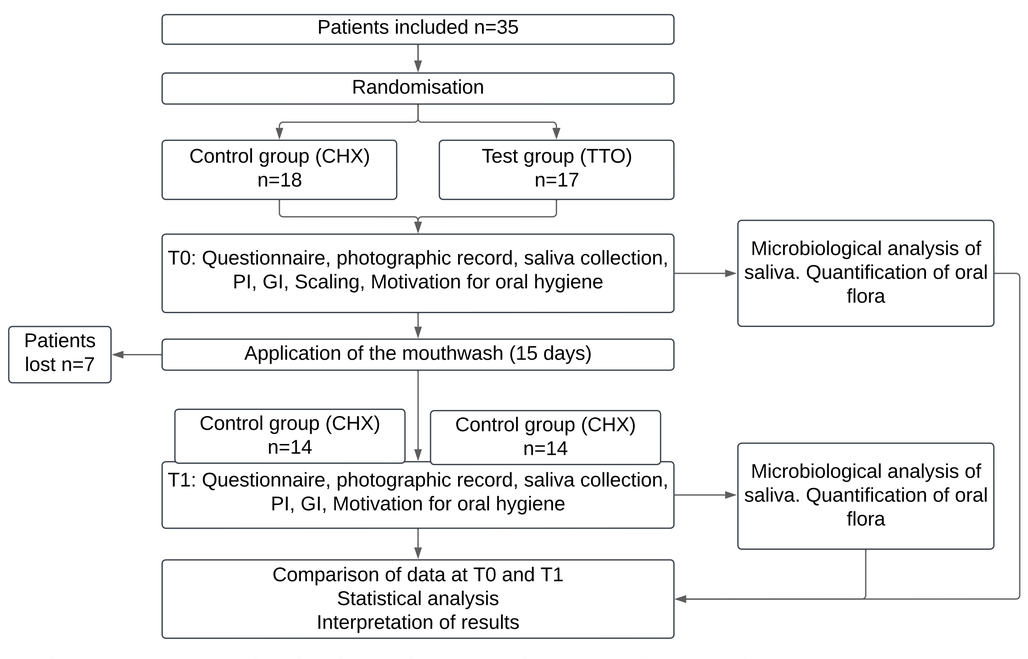
Objective

The aim of this study is to evaluate whether Tea Tree essential oil is a possible alternative to Chlorhexidine in the treatment of gingivitis, in terms of controlling *Streptococcus mutans* bacteria and reducing the plaque index (PI) and gingival index (GI).

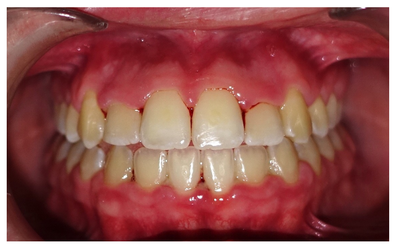
Introduction

Gingivitis, considered the most prevalent periodontal disease, is an inflammatory condition limited to the free and attached gingiva, resulting from the accumulation of bacterial biofilm at or slightly below the gingival margin, without periodontal attachment loss [(1)]. Chlorhexidine (CHX) is widely recognized as the gold standard in chemical plaque control and the treatment of gingivitis[(2)]. However, prolonged use of CHX is associated with several adverse effects, such as staining, dysgeusia, paraesthesia, increased calculus formation, burning sensation, mucosal ulcerations, black hairy tongue, and parotid gland swelling [(3-6)]. Tea Tree essential oil (TTO) (*Melaleuca alternifolia*) is known for its antibacterial, antiviral, anti-inflammatory, antifungal, immunomodulatory, antiseptic, and healing properties[(7)]. Recent studies have demonstrated its bactericidal efficacy against *Streptococcus mutans*, without reporting significant adverse effects in the oral cavity[(8)].

Material and methods



Each patient included in the study met the inclusion criteria, in particular the presence of gingivitis, and did not present any exclusion criteria such as periodontitis or associated systemic pathology.



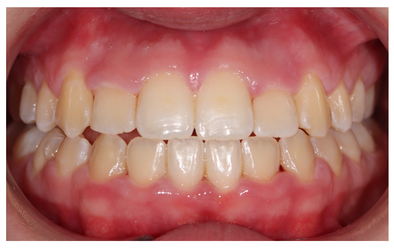


Fig. 1: A: Patient from the test group (TTO) before the 15-day protocol application. B: The same patient after 15 days of treatment with the TTO-based mouthwash

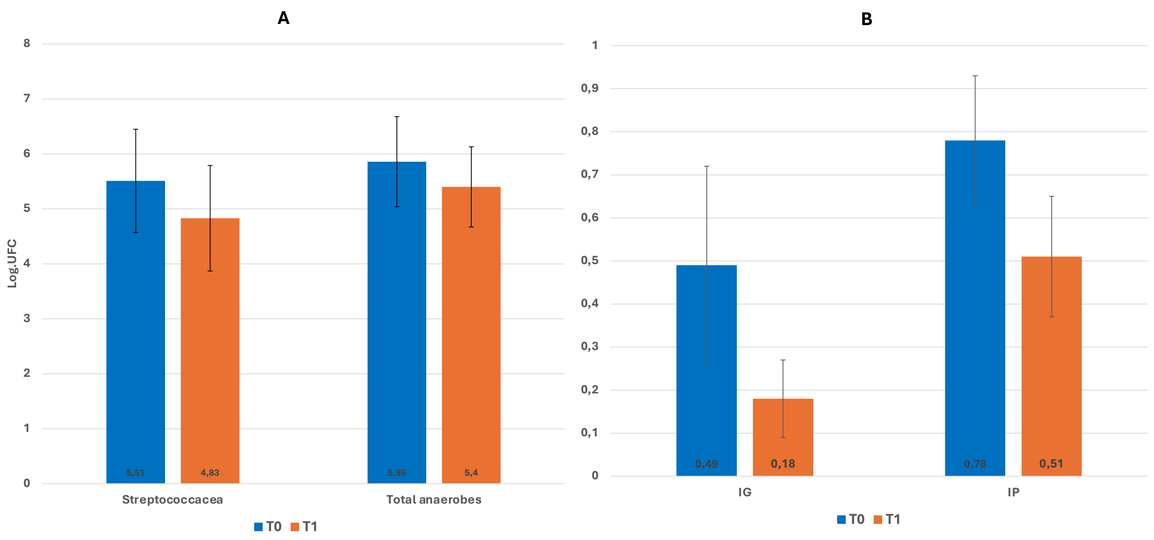
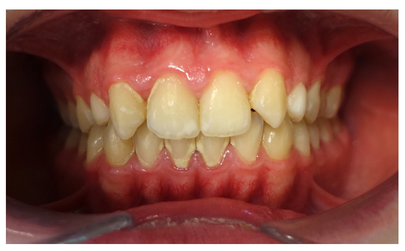


Fig. 2: A: Streptococcacea mean count in Log.CFU and total anaerobic bacteria mean count of patients from the test group, before (T0) and after (T1) the 15-day protocol, **B**: mean measurement of PI and GI of the test group before (T0) and after (T1) the 15-day protocol

Results

No significant difference ($p>0.05$) was observed between the two groups in the improvement of clinical parameters (PI and GI) and the quantification of total anaerobic microorganisms. Although significantly different from the control group, there was a significant decrease in the count of microorganisms from the *Streptococcacea* group in the test group ($p<0.05$). It is worth highlighting that several side effects were reported in the control group but not in the test group, including taste disorders, mouth burns, discolouration of dental surfaces, black hairy tongue and tingling sensations. In the test group, the most commonly reported undesirable effect was intense taste.



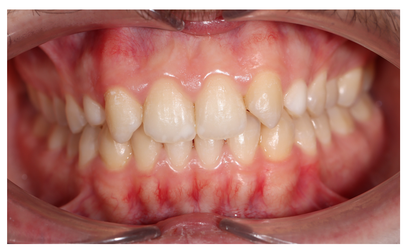


Fig. 4: A: Patient from the control group (CHX) before the 15-day protocol application. B: The same patient after 15 days of treatment with the TTO-based mouthwash

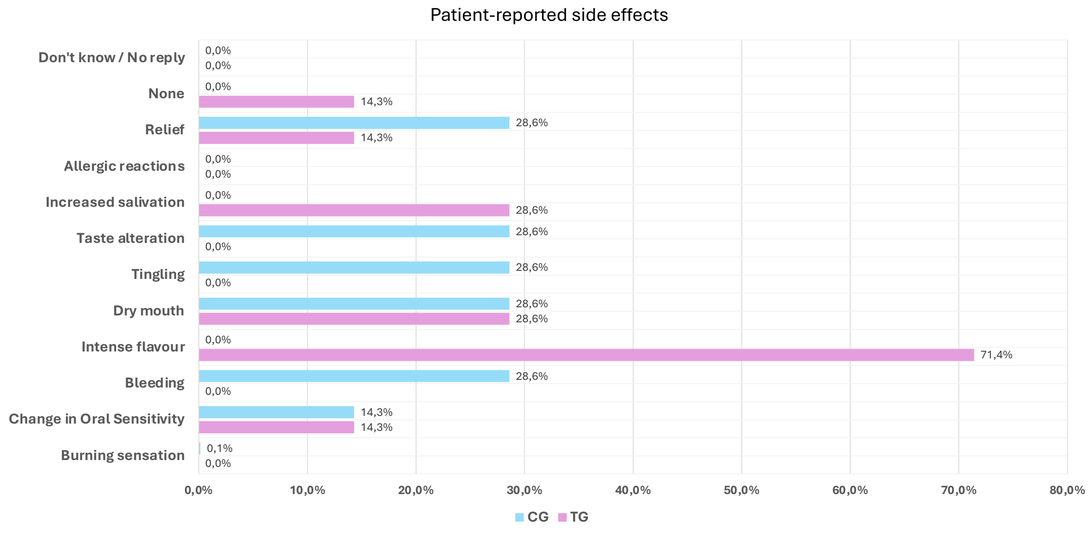


Fig. 5: Side effects reported by patients in the control group (CG) and in the test group (TG) after the 15-day protocol

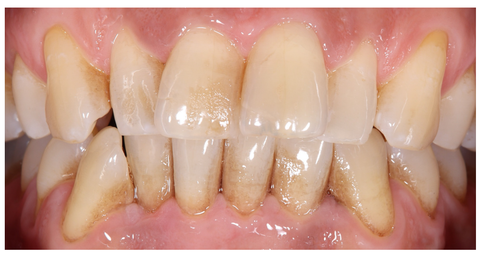


Fig. 3: Pigmentation of dental surfaces in a patient from the control group (CHX) after the 15-day protocol

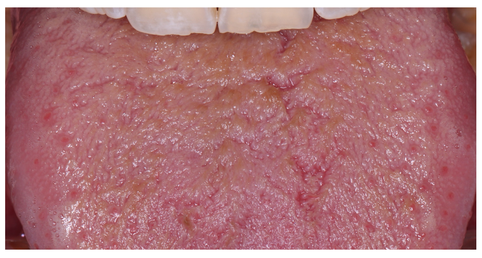


Fig. 4: Black-hairy tong in a patient from the control group (CHX) after the 15-day protocol

Conclusion

TTO, the sole active ingredient in the mouthwash used in the test group, appears to demonstrate significant efficacy in controlling the bacterial load of the oral flora. A marked reduction in both the PI and the GI was also observed following its use. Furthermore, in line with the current literature, far more side-effects were reported in the control group (CHX) than in the test group (TTO). These findings suggest that TTO may represent a promising alternative to CHX in the management of gingivitis.

Acknowledgment

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Bibliography