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Type: Original Research

Efficacy of Antioxidant Mouthrinse for Healing and Plaque Reduction in Patients with Gingival Inflammation

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Abstract

Aim: This research sought to assess the clinical effectiveness of an antioxidant mouthrinse that includes sodium hyaluronate, coenzyme Q10, tea tree oil, and aloe vera in individuals diagnosed with clinical gingivitis. The main objective was to evaluate the mouthrinse's effectiveness in reducing plaque and promoting tissue healing.

Material and Methods: A clinical study conducted at a single center, employing a single-blind design, involved 84 patients who were diagnosed with clinical gingivitis. In this study, participants were randomly assigned to one of three groups: a control group that received only oral hygiene instructions, a group that underwent oral prophylaxis (Group B1), and a group that received an antioxidant mouthrinse in addition to oral prophylaxis (Group B2). At baseline, Day 7, and Day 14, clinical parameters including the Plaque Index (PI), Gingival Index (GI), and Probing Depth (PD) were assessed.

Results: The findings revealed that Group B2, which utilized the antioxidant mouthrinse, demonstrated notable enhancements in both Plaque Index (PI) and Gingival Index (GI) when compared to the control group. No notable changes in PD reduction were recorded that reached

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statistical significance. Group B2 showed the most significant decrease in plaque and gingival inflammation, highlighting the effectiveness of the mouthrinse as a complementary treatment.

Conclusion: The use of an antioxidant mouthrinse formulated with herbal and natural components has demonstrated a significant reduction in plaque accumulation and gingival inflammation among individuals suffering from gingivitis. Although the impact on probing depth was not statistically significant, the mouthrinse presents a promising addition to traditional oral hygiene methods for the management of gingivitis.

Keywords: Antioxidant Mouthrinse, Gingivitis, Plaque Reduction

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Introduction

Gingivitis is a prevalent and preventable condition affecting the gums, marked by inflammation primarily due to the buildup of plaque. Untreated gingivitis can escalate into more serious periodontal diseases, leading to permanent harm to the periodontal tissues.[1] The approach to managing gingivitis primarily focuses on mechanical plaque control, emphasizing the importance of oral hygiene practices like tooth brushing and flossing. However, there is a growing interest in adjunctive treatments, such as mouthrinses, which may enhance oral health outcomes. Recent research has explored the potential of mouthrinses containing natural antioxidants, suggesting they could provide a dual advantage by alleviating oxidative stress while also facilitating tissue repair.[2] Numerous natural compounds have shown promise in enhancing periodontal health, attributed to their anti-inflammatory, antimicrobial, and antioxidant characteristics. Sodium hyaluronate, a type of glycosaminoglycan, plays a significant role in wound healing by enhancing tissue regeneration processes.[3] Coenzyme Q10, recognized for its antioxidant properties, has shown beneficial effects on gum health by decreasing oxidative stress and promoting cellular repair mechanisms. Tea tree oil, recognized for its antimicrobial properties, has undergone significant research regarding its effectiveness in managing plaque buildup and alleviating gingival inflammation. Aloe vera is recognized for its anti-inflammatory and healing properties, making it a valuable component in various therapeutic applications, such as periodontal therapy.[4,5]

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The inclusion of these natural compounds in a mouthrinse formulation may improve plaque control and promote the healing of inflamed gingival tissues. The antioxidant properties of these ingredients could play a significant role in reducing gingival inflammation and may also aid in preventing the reformation of plaque, which is a crucial element in the progression of gingivitis.[6] Moreover, the synergistic impact of these components, as observed in specific formulations, could provide enhanced advantages over relying on a solitary active ingredient.[7] The rising incidence of gingivitis, particularly among individuals with inadequate oral hygiene practices, underscores the urgent demand for effective supplementary treatments.

This research seeks to assess the clinical effectiveness of an antioxidant mouthrinse that includes sodium hyaluronate, coenzyme Q10, tea tree oil, and aloe vera in individuals diagnosed with clinical gingivitis. The research will delve into the plaque-reducing and healing properties, offering important insights into its potential role as a supplementary treatment for managing gingivitis and enhancing overall periodontal health.[8]

Materials and Methods

This study was conducted at a tertiary care center in Gujarat and was designed as a single-center, single-blind clinical case investigation. A total of 84 patients participated in the study, which spanned a duration of 14 days. Participants were randomly allocated into three distinct groups, each consisting of 28 individuals.

Control Group: Participants received only oral hygiene instructions without any additional intervention. Clinical parameters were evaluated at baseline, on day 7, and again on day 14.

Test Group B1: Oral prophylaxis was conducted, with clinical parameter evaluations taking place at baseline, day 7, and day 14.

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In Test Group B2, participants underwent oral prophylaxis and were instructed to use an undiluted antioxidant mouthrinse three times a day for a duration of 14 days. Clinical parameters were evaluated at baseline, on day 7, and again on day 14.

Inclusion Criteria:

1. Healthy patients aged 18-60 years.
2. At least 20 teeth are present.
3. Patients diagnosed with stage II, III, or IV gingivitis.
4. Willingness to sign an informed consent form.

Exclusion Criteria:

1. Deep periodontal pockets (>4 mm).
2. Patients with orthodontic appliances or prostheses interfering with evaluation.
3. History of allergies to study ingredients, major systemic conditions, pregnancy, lactation, or heavy smoking/alcohol abuse.

Clinical Parameters:

1. Probing Depth (PD): Reduction in periodontal pocket depth.
2. Plaque Index (Sillness & Loe, 1964).
3. Gingival Index (Loe & Sillness, 1963).

Statistical Analysis:

Statistical analysis was performed using SPSS software (version 21.0). One-way ANOVA was used to evaluate the efficacy of the mouthrinse in reducing plaque, gingival inflammation, and probing depth at baseline, day 7, and day 14.

Results

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Figure 1 illustrates the average measurements of the Plaque Index (PI), Gingival Index (GI), and Probing Depth (PD) recorded at three distinct time points: baseline, day 7, and day 14, across the three groups (Control, B1, and B2). The findings reveal the evolution of clinical parameters over time in response to the interventions implemented. The group utilizing the antioxidant mouthrinse alongside oral prophylaxis exhibited the most notable enhancements in plaque index, gingival index, and probing depth, particularly by the 14th day. The labels on each bar provide the exact mean values for each parameter across various time points.

Figure 2 illustrates the percentage decrease in the Plaque Index (PI), Gingival Index (GI), and Probing Depth (PD) at three different time points: Baseline, Day 7, and Day 14, across the three groups. The chart demonstrates the progression of clinical parameters over time, highlighting that Group B2, which incorporated the antioxidant mouthrinse alongside oral prophylaxis, exhibited the most notable reductions. The percentage reduction is determined by assessing the values at baseline against those recorded on day 14, highlighting the treatments' efficacy in diminishing plaque, gingival inflammation, and probing depth.

Figure 1: Descriptive data of change in PI, GI and PD at different intervals of time after mouthwash usage X axis- time interval Y- axis- Mean value of PI, GI and PD

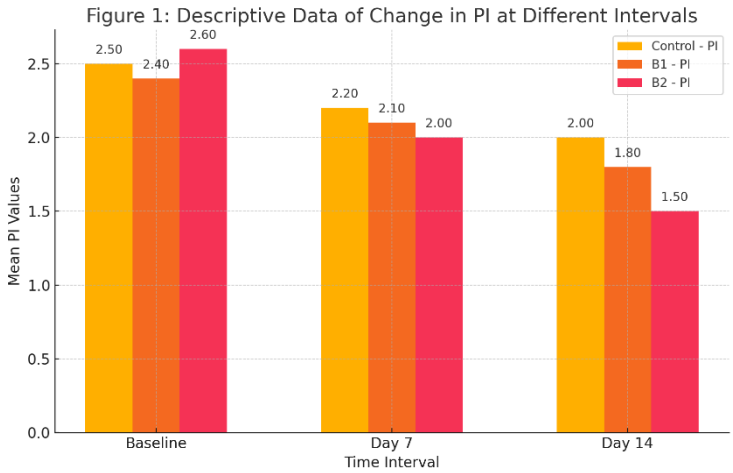

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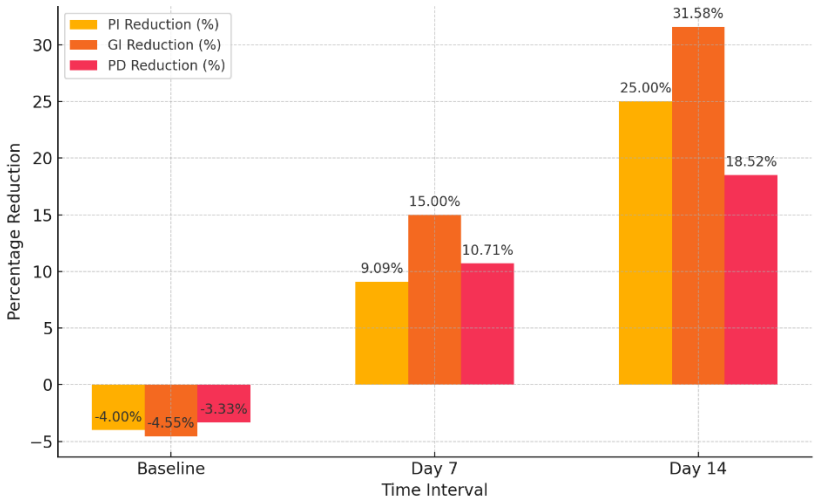
Figure 2:



Discussion

This research assessed the efficacy of an antioxidant mouthrinse formulated with sodium hyaluronate, coenzyme Q10, tea tree oil, and aloe vera in individuals diagnosed with clinical gingivitis. The findings revealed that the mouthrinse, when paired with oral prophylaxis, led to a notable decrease in plaque and gingival inflammation in comparison to the control group. The observed reduction in probing depth did not achieve statistical significance.

Recent findings indicate that mouth rinses rich in antioxidants, particularly those infused with herbal and natural components, could serve as a beneficial supplementary treatment for gingivitis management. The properties of these ingredients are well-documented, showcasing their anti-inflammatory, antimicrobial, and healing effects, which could play a significant role in enhancing gingival health. Sodium hyaluronate has shown promising tissue regeneration capabilities in periodontal therapy, while coenzyme Q10 has been found to enhance gingival health by promoting cellular repair and minimizing oxidative damage.[2] Tea tree oil, known for its antimicrobial properties, is essential in managing plaque buildup and gum inflammation, while aloe vera has demonstrated effectiveness in alleviating inflammation and aiding in wound healing.[3] Group B2,

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which utilized the mouthrinse, demonstrated improved outcomes in minimizing plaque and gingival inflammation, reinforcing the idea that natural antioxidants may play a beneficial role in oral health. The results of this study are consistent with earlier research that has underscored the promise of herbal components in the treatment of periodontal disease.[7] Nonetheless, additional research involving larger participant groups and extended follow-up durations is essential to validate these results and investigate the potential long-term advantages of these mouthrinses. The absence of notable changes in probing depth suggests that although the mouthrinse is effective in managing inflammation, it may fall short in enhancing more advanced periodontal metrics. This underscores the necessity for more thorough treatment strategies.[8]

Conclusion

A mouthrinse rich in antioxidants, featuring sodium hyaluronate, coenzyme Q10, tea tree oil, and aloe vera, has shown notable effectiveness in diminishing plaque and gingival inflammation among individuals suffering from clinical gingivitis. Although the decrease in probing depth did not reach statistical significance, the blend of these natural ingredients presents a hopeful adjunctive therapy for enhancing oral health. The findings indicate a promising role for herbal and antioxidant mouth rinses in the management of periodontal health, underscoring the necessity for additional research to assess their long-term efficacy and influence on more complex periodontal measures.

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