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Original Research

Comparative evaluation of efficacy of 0.2% sodium hypochlorite (Hi Wash) mouthwash with 0.2% chlorhexidine mouthwash on plaque-induced gingivitis

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ABSTRACT:
Background: Gingivitis induced by plaque can present a range of observable signs and symptoms of localized inflammation affecting the gingiva, which is triggered by the buildup of microbial biofilm on the teeth. Hence; the present study was conducted for evaluating efficacy of 0.2% sodium hypochlorite (Hi Wash) mouthwash with 0.2% chlorhexidine mouthwash on plaque-induced gingivitis. **Materials & methods:**40 patients of both genders diagnosed with gingivitis were enrolled. The participants were divided into two groups, each consisting of 20 individuals: Group A and Group B. Patients in Group A received a mouthwash containing 0.2% sodium hypochlorite (Hi Wash), while those in Group B were administered a mouthwash with 0.2% chlorhexidine, both for a duration of three weeks. Clinical parameters, including bleeding on probing assessed by the gingival bleeding index, plaque index, and gingival index, were documented at baseline and after three weeks. Following this period, scaling and root planning were performed. All data were recorded in a Microsoft Excel spreadsheet and subsequently analyzed statistically using SPSS software. **Results:**Mean age of the patients of group A and group B was 41.3 years and 44.8 years respectively. while comparing the baseline and post-treatment values, significant improvement in plaque index, gingival index and gingival bleeding index was seen among patients of both group A and group B. However; while comparing in between the two study groups, non-significant results were obtained. **Conclusion:** The efficacy of a 0.2% sodium hypochlorite mouthwash is comparable to that of a 0.2% chlorhexidine mouthwash in the treatment of gingivitis.
Key words: Sodium hypochlorite, Chlorhexidine, Gingivitis.

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INTRODUCTION

Gingivitis induced by plaque can present a range of observable signs and symptoms of localized inflammation affecting the gingiva, which is triggered by the buildup of microbial biofilm on the teeth. Even when the levels of dental plaque biofilm are reduced, an inflammatory infiltrate remains within the gingival tissues as part of the body's physiological immune surveillance.[1, 2] However, the onset of gingivitis occurs when dental plaque accumulates over a period of days or weeks without being disrupted or removed, leading to a breakdown in the symbiotic relationship between the biofilm and the host's immune-inflammatory response, resulting in the emergence of an incipient dysbiosis.[3] Various systemic factors, such as endocrine disorders, hematological conditions, dietary influences, and pharmacological agents, can alter the immune-inflammatory response. Gingivitis related to plaque and/or fluctuations in endogenous hormones, medications, systemic diseases, and nutritional deficiencies displays several key characteristics.[4, 5]Sodium hypochlorite has been

utilized as a root canal irrigant for over a century, with concentrations typically ranging from 1.0% to 5.25%. Additionally, sodium hypochlorite demonstrates significant antimicrobial efficacy against oral biofilms.[6,] [7]Chlorhexidine gluconate (1,1'-hexamethylene bis [5-(p-chlorophenyl) biguanide] di-D-gluconate), commonly referred to as CHX, is a gluconate salt and a biguanide compound that has been utilized in clinical settings since the 1950s. This compound serves as a broad-spectrum antimicrobial agent, effectively disrupting cellular membranes. Consequently, it is employed as a disinfectant for the sanitation of non-living clinical surfaces and catheters. Additionally, due to its general biocompatibility, it is frequently used in oral applications as an antiseptic mouthwash by both dental professionals and the public to inhibit the formation of bacterial biofilm and plaque.[8- 10]Hence; the present study was conducted for evaluating efficacy of 0.2% sodium hypochlorite (Hi Wash) mouthwash with 0.2% chlorhexidine mouthwash on plaque-induced gingivitis.

MATERIALS & METHODS

The current research aimed for comparing the effectiveness of 0.2% sodium hypochlorite (Hi Wash) mouthwash with 0.2% chlorhexidine mouthwash on plaque-induced gingivitis. 40 patients of both genders diagnosed with gingivitis were enrolled. Inclusion criteria for this study encompassed patients aged over 16 years, possessing a minimum of 20 natural teeth, exhibiting a bleeding index exceeding fifty percent, and diagnosed with mild-to-moderate gingivitis. The participants were divided into two groups, each consisting of 20 individuals: Group A and Group B. Patients in Group A received a mouthwash containing 0.2% sodium hypochlorite (Hi Wash), while those in Group B were administered a mouthwash with 0.2% chlorhexidine, both for a duration of three weeks. Clinical parameters, including bleeding on probing assessed by the gingival bleeding index, plaque index, and gingival index, were documented at baseline and after three weeks. Following this period, scaling and root planning were performed. All data were recorded in a Microsoft Excel spreadsheet and subsequently analyzed statistically using SPSS software.

RESULTS

Mean age of the patients of group A and group B was 41.3 years and 44.8 years respectively. while comparing the baseline and post-treatment values, significant improvement in plaque index, gingival index and gingival bleeding index was seen among patients of both group A and group B. However; while comparing in between the two study groups, non-significant results were obtained.

Table 1: Comparison of plaque index among two study groups

Time interval	Group A	Group B	p-value
Before treatment	1.79	1.83	0.23
After treatment	0.61	0.66	0.28
p-value	0.000*	0.001*	-

*: Significant

Table 2: Comparison of Gingival index

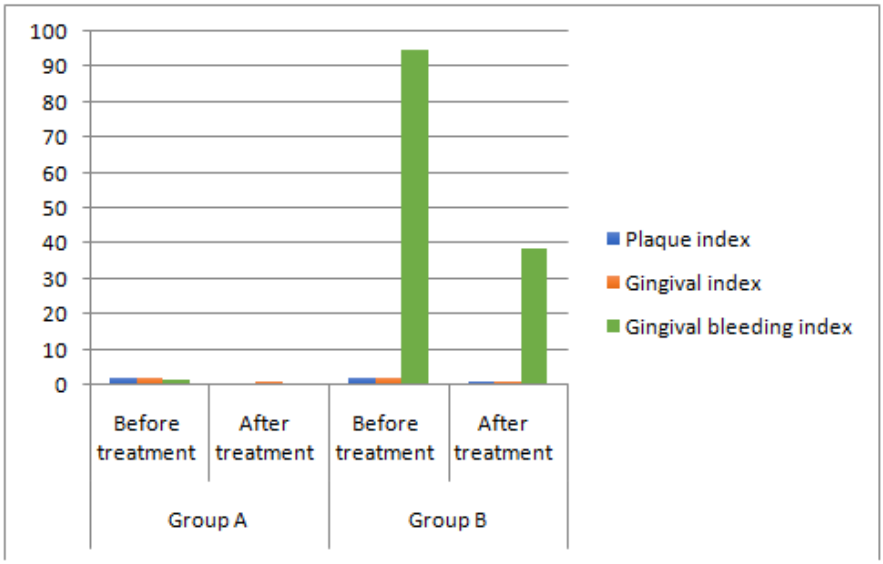
Time interval	Group A	Group B	p-value
Before treatment	1.78	1.75	0.46
After treatment	0.66	0.69	0.81
p-value	0.002*	0.000*	-

*: Significant

Table 3: Comparison of Gingival bleeding index

Time interval	Group A	Group B	p-value
Before treatment	92.46	94.88	0.76
After treatment	35.16	38.91	0.55
p-value	0.000*	0.000*	-

*: Significant



Graph 1: Comparison of plaque index, Gingival index and Gingival bleeding index

DISCUSSION

Clinical gingival inflammation represents a specific condition that is localized to particular sites, for which various measurement systems have been developed and validated. Epidemiological research consistently demonstrates its widespread prevalence on a global scale. Nonetheless, it is important to recognize that the characterization and assessment of gingival inflammation at the site level (referred to as a "gingivitis site") differs fundamentally from the characterization and assessment of a "gingivitis case" (GC), which pertains to an individual patient diagnosed with gingivitis. Furthermore, the presence of a "gingivitis site" does not automatically imply the existence of a "GC." Establishing a universally accepted definition for a gingivitis case would furnish essential data that would enable oral health practitioners to evaluate the efficacy of their preventive measures and treatment protocols, prioritize therapeutic interventions by healthcare providers, and facilitate ongoing surveillance efforts.[10- 12]Hence; the present study was conducted for evaluating efficacy of 0.2% sodium hypochlorite (Hi Wash) mouthwash with 0.2% chlorhexidine mouthwash on plaque-induced gingivitis.

Mean age of the patients of group A and group B was 41.3 years and 44.8 years respectively. while comparing the baseline and post-treatment values, significant improvement in plaque index, gingival index and gingival bleeding index was seen among patients of both group A and group B. However; while comparing in between the two study groups, non-significant results were obtained. Mishra R et al conducted an evaluation of clinical parameters in patients with gingivitis over a period of 21 days, utilizing 0.2% sodium hypochlorite and 0.2% chlorhexidine mouthwashes. A total of 60 individuals exhibiting gingival inflammation were assessed based on clinical indicators, including the bleeding on probing index, plaque index, and gingival index, at both the baseline and the 21-day mark. The participants were divided into two groups: Group A received Hi Wash mouthwash, while Group B was administered 0.2% chlorhexidine mouthwash, with each group comprising 30 patients. The results indicated a significant reduction in the scores of clinical parameters for both Group A and Group B after 21 days, demonstrating a decrease in plaque-related gingival inflammation without the need for scaling and root planning. The findings suggest that 0.2% sodium hypochlorite mouthwash is comparably effective to 0.2% chlorhexidine in managing gingivitis, serving as a beneficial adjunct to mechanical plaque removal, characterized by its safety, minimal side effects, reduced staining, and suitability for routine use.[11]Shanker K et al conducted a comparative study to evaluate the effectiveness of 0.2% chlorhexidine versus 0.25% sodium hypochlorite as mouthwashes in managing chronic gingivitis. The study involved 80 participants diagnosed with chronic marginal gingivitis, all of whom underwent non-surgical periodontal therapy to achieve a healthier gingival condition. The subjects were divided into two groups, each consisting of 40 individuals. Participants in Group A utilized a 0.2% chlorhexidine mouthwash, while those in Group B employed a 0.25% sodium hypochlorite mouthwash, both as adjuncts to their regular brushing routine for a duration of two weeks. Following this period, the gingival health of the participants was assessed using the Oral Hygiene Index Simplified (OHIS), Plaque Index (PI), and Modified Gingival Index (MGI), with results compared between the two groups. The average OHIS score for Group A was recorded at 1.38, compared to 1.05 for Group B. The mean PI scores were 3.62 for Group A and 2.32 for Group B. Additionally, the mean MGI scores were 1.22 for Group A and 1.20 for Group B. Notably, Group B demonstrated superior outcomes relative to Group A. Statistical analysis of the OHIS and PI indicated

significantly improved results for Group B, while the MGI scores did not reveal any significant differences.[12]

CONCLUSION

This study demonstrated that 0.2% sodium hypochlorite (Hi Wash) mouthwash is equally effective as 0.2% chlorhexidine mouthwash in treating plaque-induced gingivitis. Both mouthwashes significantly improved plaque index, gingival index, and gingival bleeding index after three weeks. However, no significant difference was found between the two study groups. These findings suggest that 0.2% sodium hypochlorite mouthwash can be considered a viable alternative to 0.2% chlorhexidine mouthwash for managing gingivitis. This study contributes to the development of effective oral care strategies.

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