

Assessment of Antagonistic Effect to Plaque Sufficiency of Green Tea, Herbal, and Chlorhexidine Mouth rinse in Patients Encountering Orthodontic Treatment- A Randomised Control Trial

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Received: August 2020

Accepted: August 2020

ABSTRACT

Background: Periodontal diseases are chronic inflammatory conditions portrayed by loss of connective tissue, alveolar bone resorption, and formation of periodontal pockets. The beginning of periodontal diseases can be constrained by regular plaque control practices in orthodontic patients. Mouthwashes are a safe and successful conveyance framework for antimicrobials and can assume a significant job in plaque decrease. Subsequently, this examination was embraced to decide the adequacy of green tea and herbal mouthwashes over the best quality level, that is, chlorhexidine. **Methods:** The investigation led was a triple-blinded, randomized, controlled, equal clinical preliminary. The patients wearing orthodontic fixed appliances (n = 30) with age scope of 15–30 years were included for the investigation. The mouthwashes were given to the subjects in a translucent container named I, II, and III. Randomization and allocation covering was performed. The blinded commentator analyzed the patient and determined their plaque record scores for each resulting visit at days 3, 7, and 14. **Results:** The outcomes from single direction ANOVA at days 3, 7, and 14 demonstrated that there is noteworthy distinction in the counter plaque score among the mouthwashes with P = 0.000. **Conclusion:** This examination reasoned that herbal mouthwash and chlorhexidine wash have indicated comparative anti-plaque results. Green tea extract mouthwash indicated lesser anti-plaque adequacy when contrasted with chlorhexidine and herbal mouthwash.

Keywords: Antiplaque, Chlorhexidene, Herbal Mouthwash, Orthodontic Appliances.

INTRODUCTION

Periodontal infection is a chronic inflammatory condition characterized by loss of connective tissue, alveolar bone resorption, and arrangement of periodontal pocket that outcome from an intricate association between periodontal pathogens and the host's resistant response.^[1] Periodontitis starts with gingival provocative injuries and whenever left untreated may advance into periodontitis by trading off the periodontal mechanical assembly. The essential etiologic factor adding to a periodontal diseases is dental plaque.^[2] The progression into a periodontal disease can be overseen by mechanical and chemical plaque control practices.^[3] Mechanical plaque control rehearses are the most suggested and incorporate standard tooth brushing

and flossing.^[4] These methodologies are not 100% effective because of the anatomic constraints, for example, crowding and malalignment of the teeth, and thus, require the need of different procedures. This includes a chemical approach and the anti-plaque agents can be conveyed as mouthwashes, gels, dentifrices, and biting gums. Late methodologies incorporate biguanides, catalysts, and basic oils, and furthermore natural concentrates have been investigated to have plaque inhibitory effects.^[5] Mouthwashes are a protected and powerful conveyance framework for antimicrobials and have a high productivity in diminishing plaque. Out of all the compound operators, chlorhexidine is viewed as the highest quality level due to its powerful antiplaque viability. Chlorhexidine mouth wash is a cationic bis-guanide biocide which is powerful against oxygen consuming and anaerobic organisms.^[6] It is a considerable mouthrinse, which is adsorbed onto the oral mucosa and discharged over time.^[7] The primary mechanism of activity is by disturbing the layer, causing focus subordinate development restraint and cell death.^[8] The second most

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normally devoured fluid after water is tea.^[9] Green tea is separated from the leaves of *Camellia sinensis* that have been exposed to least oxidation while preparing. Studies have demonstrated that green tea is a cancer prevention agent and has strong antibacterial properties.^[1] The significant segment present in green tea is polyphenols, particularly, flavonoids like catechin.^[10] Studies have discovered that the polyphenols present in green tea hinders the development of microscopic organisms causing periodontal issues and helps in forestalling halitosis, dental caries, gum disease, and furthermore, periodontitis.^[11,12]

MATERIALS AND METHODS

The examination led was a triple-blinded, randomized, controlled, parallel, clinical trial. The patients wearing an orthodontic fixed appliance (n =30) were included for the investigation, and they were separated into three gatherings. Group A: 0.2% chlorhexidine mouthwash (Clohex); Group B: Herbal mouthwash (HiOra); Group C: Green tea extracts mouthwash. The included investigation subjects were inside the age gathering of 15–30 years. Randomization of the subjects into different groups was done utilizing a chit system. The blinding was performed by giving the mouthwashes to the subjects in a translucent container marked I, II, and III. The reviewer was blinded on randomization and allotment camouflage. The investigators inspected the patient and determined their plaque index scores at standard and in the resulting visits at days 3, 7, and 14.

Subjects with great systemic health with at least 26 teeth were selected for the examination. Only fixed orthodontic appliance wearers were included. Patients who have undergone periodontal treatment were rejected from the investigation. Patients with systemic diseases, for example, diabetes that would increment the oxidative pressure were barred from the study.

At baseline, total oral prophylaxis was accomplished for all the people taking part in the investigation. Dental plaque was disclosed utilizing a single tone plaque disclosing agent to ensure all the deposits have been expelled. The subjects were requested to forgo utilizing toothpaste however rather to keep utilizing mechanical guides, that is, toothbrush followed by the utilization of mouthwash.

The subjects were approached to utilize the allotted mouthwash two times every day for the following 14 days. Each subject was educated to utilize 10 ml of the relegated mouthwash at a specific determined time for 1 min. At each washing, the subject was solicited to utilize 10 ml from the distributed mouthrinse, and the arrangement was gargled around the mouth for a moment and afterward ousted out. The patients were recalled for

examination at day 3, day 7, and day 14, and the plaque scores were recorded, individually. The subjects were permitted to come back to their standard oral cleanliness routine.

RESULTS

The descriptive statistics of the study have been given in Table 1, Figure 1. At baseline, chlorhexidine, herbal, and green tea extract separate indicated a mean of 1.97, 2.00, and 2.00, individually. On day 3, it indicated 1.70, 1.73, and 1.90, separately, and on day 7, 1.23, 1.33, furthermore, 1.75, separately. Day 14 revealed a mean of 1.00, 1.05, and 1.63, separately. The information uncovered that the mean of the plaque file was bit by bit lessening at each audit and essentially decreased on day 14. The plaque index scores between various time span inside chlorhexidine, herbal mouthwash, furthermore, green tea extract mouthwash have been appeared in Table 2. The time stretch between baselines till day 3rd indicated a mean of 14.5, 11.38, and 12.34 individually. The span from day 3 to day 7 indicated a t value of 14.7, 9.92 and 9.32 respectively and the time stretch between day 7 and day 14 showed a t value of 22.15, 12.07, and 7.19 respectively. This data were significantly significant for all the three mouthwashes.

Table 1: Descriptive Analysis

Group	Time Interval	Mean±Sd
Chlorhexidine	Baseline	1.97±0.21
	3 rd Day	1.70±0.15
	7 th Day	1.23±0.11
	14 th Day	1.00±0.10
Herbal	Baseline	2.00±0.18
	3 rd Day	1.73±0.12
	7 th Day	1.33±0.16
	14 th Day	1.05±0.20
Green Tea Extract	Baseline	2.00±0.19
	3 rd Day	1.90±0.19
	7 th Day	1.75±0.16
	14 th Day	1.63±0.20

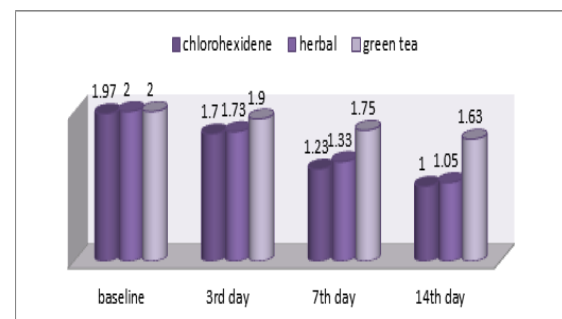


Figure 1: Representing Mean

[Table 3] revealed the examination of the plaque index scores of chlorhexidine, herbal, and green tea extract mouthwash simultaneously span. At baseline f value was found to be 0.12, on 3rd day it

was 9.7, on 7th day it was found to be 55.57 and on 14th it was found to be 120.43 respectively.

Table 2: Plaque Index Comparison Between Different Time Intervals

Group	Time Interval	T-Value	P-Value
Chlorohexidene	Baseline Versus Day 3	14.5	0.000*
	Day 3 Versus Day 7	14.7	0.000*
	Day 7 Versus Day 14	22.15	0.000*
Herbal	Baseline Versus Day 3	11.38	0.000*
	Day 3 Versus Day 7	9.92	0.000*
	Day 7 Versus Day 14	12.07	0.000*
Green Tea	Baseline Versus Day 3	12.34	0.000*
	Day 3 Versus Day 7	9.32	0.000*
	Day 7 Versus Day 14	7.19	0.000*

Paired t test

Table 3: Comparison Between Time Intervals

Time Interval	F-Value	P-Value
Baseline	0.12	0.000*
3 rd Day	9.7	0.000*
7 th Day	55.57	0.000*
14 th Day	120.43	0.000*

ONE way ANOVA *statistically significant

DISCUSSION

This examination revealed that chemical plaque control practices function as a viable in addition to mechanical plaque control practice in forestalling irritation of the gingiva and diminishing the plaque arrangement. The chemical plaque control agents incorporate mouthwashes and local drug delivery agents. Chlorhexidine, created in 1950 stays to be the best quality level hostile to plaque control agents till date because of its properties such as substantivity and hostile to plaque efficacy.^[13] However, numerous examinations report that drawn out utilization of chlorhexidine is related with brownish staining of teeth and tongue, modified taste sensation, and oral desquamation in children.^[14] The anti-plaque viability of chlorhexidine was ascribed to the maintenance of this compound in the oral cavity and its moderate release.^[15] Although the plaque regrowth potential and gingival irritation were altogether decreased in chlorhexidine contrasted with the herbal and green tea extract mouthwash, the last mentioned two mouthwashes didn't display opposite symptoms. The utilization of a specific sort of mouth wash still keeps on being a begging to be proven wrong issue. As of late, the utilization of natural mouthwashes is on the ascent. This is a result of its decreased or no impacts and its common cause and furthermore practical when contrasted with chlorhexidine. The natural mouthwash Hiora was utilized for this

investigation containing pilu (S. Persicus), Nagavalli, pippemintsatva, and suryakshara. Nagavalli flute player betle shows antimicrobial, mitigating, and cell reinforcement properties.^[16] Pilu (Salvadorapersica) shows cell reinforcement properties. Peppermint containing menthol actuates cold-delicate TRPM8 receptors in the oral mucosa inspiring a "cold" sensation.^[17] The Sanskrit name of potassium nitrate is "suryakshara" and, it is utilized to lessen the torment of sensitive teeth through its desensitizing impact on dentinal nerves. It is soluble in taste and cooling in nature. Green tea is known for its compelling calming and cell reinforcement properties. Its cell reinforcement properties assume an essential job in the administration of gingival aggravation by bringing down the oxidative stress.^[18] Numerous investigations revealed that the utilization of green tea helps in the counteraction of periodontal infection and the overall maintenance of oral wellbeing.

This investigation reveals that there is a recognizable decrease of plaque after each visit, with the most noteworthy decrease seen during the time period of baseline till day 14. Numerous different investigations have revealed critical decrease of plaque after the utilization of green tea mouthwash.^[18,19] Green tea catechins, for example, epigallocatechin-3-gallate have answered to obstruct the creation of harmful metabolites of P. gingivalis.^[20] Green tea catechins have additionally answered to bring down the statement of framework metalloproteinase-9 in bone-framing cells (osteoblast) and, forestall the arrangement of osteoclasts. Thus, green tea can possibly forestall alveolar bone resorption on account of a periodontal disease.^[21]

CONCLUSION

Control of plaque is fundamental for the counteraction of any fiery condition to advance into an incessant periodontal condition. Mouthwashes forestall plaque control with ordinary use and in keeping up the wellbeing of the periodontium. This examination revealed that the viability of herbal mouthwash compares to that of the "best quality level" chlorhexidine. The viability of green tea extract mouthwash was similarly lower than that of chlorhexidine and herbal mouthwashes. In any case, more examinations must be performed to demonstrate that home grown mouthwashes can liken the "gold standard" chlorhexidine mouthwash.

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How to cite this article: Bajjad AA, Kour N, Kak MM, Farooq S, Mehmood N, Sharma AS. Assessment of Antagonistic Effect to Plaque Sufficiency of Green Tea, Herbal, and Chlorhexidine Mouth rinse in Patients Encountering Orthodontic Treatment- A Randomised Control Trial. *Ann. Int. Med. Den. Res.* 2020; 6(5):DE18-DE21.

Source of Support: Nil, **Conflict of Interest:** None declared