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Assessment of the Efficiency of Listerine Mouthwash as an Adjuvant to Conventional Tooth Brushing

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***Abstract*---**To assess the effectiveness of Listerine mouthwash as an adjuvant to routine toothbrushing. The current trial was undertaken in 60 subjects who were categorized into two groups. Group A (Tooth brushing alone two times a day for two weeks) and Group B (Tooth brushing two times a day followed by 20 ml Listerine mouth rinse for 30 seconds twice daily, 30 minutes follow up tooth brushing). Plaque accumulation and gingival inflammation were evaluated using Modified Gingival Index, Turesky-Gillmore-Glickman- Modification of Quigley Hein Plaque Index and Approximal Plaque Index. The modified gingival index scores were significantly reduced in both groups and when pre and post treatment measurements of modified gingival index

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were equated in participants exercising toothbrushing accompanied by Listerine mouthwash, it was observed that the modified gingival index scores were significantly decreased. When the mean difference in plaque index values were equated in participants exercising toothbrushing accompanied by Listerine mouthwash then it was concluded that the values were significantly decreased. Listerine mouthwash could be considered as a supplement to mechanical plaque control approaches for the reason that of its exceptional antiplaque upshots, that is considered as a outcome of its excellent gradation of tenacity on the tooth surface.

***Keywords*---**Plaque, Gingivitis, Listerine.

Introduction

Diseases of the gingiva and periodontium are seen due to the inflammatory processes occurring in the tissues neighboring the dentition in retort to bacterial accretions, or dental plaque, on the tooth surfaces. In the initial stages, the disease manifests as loss of stippling and bleeding of gums. As the disease progress, it leads to loss of the alveolar bone in addition to loss of tissue attachment to the teeth which subsequently presents as mobility of teeth.[1]

Untreated dental caries and advanced periodontal disease are the utmost commonly encountered cause for the tooth loss in most of the older age individualsin all the nations, which leads to compromised quality of life.[2] If the periodontal pathologies are diagnosed timely they can be managed successfully by altering or eliminating the origin of the microbial organism and the associated risk influences, by this means averting the advancement of the pathological process and maintaining the healthy periodontal tissues.[3]

Plaque control is the routine elimination of dental plaque, oral biofilm in addition to preventing plaque accumulation on the teeth surfaces besides supplementary locations of the mouth. The initial mode of oral biofilm control is via mechanical action. Even though routine tooth brushing eliminates plaque commencing the most of the visible tooth surfaces but it fails to influence proficiently into the interdental areas.[4,5]

Numerous supplemental oral hygiene aids are available over the counter for need of the individuals. On the other hand, the multiple available options might confuse for the individuals to pick the accurate modality for themselves. Consequently, dental practitioners need to guide and educate their patients bestowing to their explicit needs by means of an evidence-based approach.[6] With this background, the current research was undertaken with the objective to assess the effectiveness of Listerine mouthwash as a addition to conventional tooth brushing.

Materials and Methods

The trial was undertaken among 60 patients, objectives were explained to the

participants and consent was obtained from them. Authorization was attained from the organizational study review board. Inclusion criteria comprised of male and female individuals suffering from chronic generalized gingivitis, who were having ≥ 20 teeth exhibiting clinical signs of inflammation restricted to gingival tissues. Teeth without any loss of attachment loss and presence of bleeding on probing in ≥ 20% dentition.

Individuals with history of smoking, those who were on medications affecting the gingival tissues, individuals with underlying systemic illness, pregnant or lactating females, subjects with history of periodontal therapy in preceding 6 months were excluded. Demographic data of all the study participants was documented. Initial screening was carried out using Modified Gingival Index, Turesky-Gillmore-Glickman- Modification of Quigley Hein Plaque Index and Approximal Plaque Index. The participants were appointed on particular day (Baseline/ Day 0) wherein scaling alongwith polishing of teeth was carried out. The indices were recorded once more subsequent to scaling alongwith polishing at baseline/Day 0 apart from which the study participants were supplied alongwith the identical toothbrush and toothpaste (Colgate toothbrush along with Colgate maxifresh toothpaste) and solicited to endure brush their teeth twice daily for the two weeks. The participants were also asked not to use any other oral hygiene measures like mouthrinses or interdental aids all through the study period. All the participants were recalled and all the clinical parameters were recorded yet again at the end of first week and second week.

At Day 14 after recording of the clinical parameters the study participants were divided into 2 groups comprising of 30 individuals in each group.
Group A: Toothbrushing alone two times a day for two weeks.
Group B: Toothbrushing two times a day followed by 20 ml mouth rinse (Cool mint Listerine, Pfizer Company Ltd) for 30 seconds twice daily, 30 minutes subsequent to tooth brushing.

The participants were recalled at Day 28 and the clinical parameters were recorded. The collected data at was statistically analysed and intragroup alongwith intergroup comparisons were done at 0, 14 and 28 days. Statistical Package for the Social Sciences (SPSS) for Windows (Version 20.0; SPSS, Chicago, IL, USA was used and analysis were carried out utilising Repeated measures of ANOVA with Boneferroni post hoc test.

Results

The mean modified gingival index was 0.78 ± 0.14 and 0.84 ± 0.06 at day 0, which decreased to 0.66 ± 0.21 and 0.71 ± 0.21at 2 weeks and was further reduced to 0.51 ± 0.11 and 0.49 ± 0.08 at 4 weeks, in group I and group II respectively. (Table 1)

When pre and post treatment measurements of difference of mean modified gingival index were compared at 14 days and 28 days were significantly lower than baseline (0.16 ± 0.12, P=0.034 and 0.25 ± 0.04, P=0.014) respectively in group I and group II (0.15 ± 0.13, P=0.021 and 0.31 ± 0.21, P=0.028). Likewise,

the values were found to be significantly lower from 14- 28 days (0.16 ± 0.19, P=0.042) in group I and group II (0.21 ± 0.14, P=0.039). (Table 2)

The mean plaque index was 0 ± 0 at baseline, which was increased 0.58 ± 0.21in group I and 0.44 ± 0.18 in group II at 14 days which then reduced to 0.40 ± 0.15 in group I and 0.51 ± 0.09 in group II at 28 days. (Table 3)

When pre and post treatment measurements of difference of mean plaque index were compared it was found that the plaque index score at 14 days and 28 days were significantly higher than baseline (-0.59 ± 0.23, P=0.031 and -0.41 ± 0.04, P=0.024) in group I and (-0.68 ± 0.11, P=0.011 & -0.51 ± 0.12, P=0.005) in group II respectively. However, the values were found to be significantly lower from 14-28 days (0.19 ± 0.11, P=0.039) in group I and (0.21 ± 0.02, P=0.002) in group II. (Table 4)

The mean approximal plaque index was 0 ± 0 at baseline, which increased to 49.21 ± 11.21 in group I and 61.32 ± 5.11in group II at 14 days which then reduced to 32.1 ± 12.26 in group I and 42.47± 2.73 in group II at 28 days respectively. (Table 5)

When pre and post treatment measurements of difference of mean approximal plaque index were compared, it was found that the approximal plaque index score at 14 days and 28 days were significantly higher than baseline (-49.12 ± 11.21, P=0.026 and -32.51 ± 6.28, P=0.016) respectively in group I and (-57.33 ± 21.23, P=0.011 and -39.43 ± 4.16, P=0.022) respectively. However, the measurements were found to be significantly lower from 14 - 28 days (18.58 ± 12.34, P=0.029) in group I and (19.11 ± 12.32, P=0.048) in group II. (Table 6)

Discussion

Effective plaque control is essential for preventing various gingival and periodontal pathologies and for maintaining the health of periodontal tissues. It has been proposed that mechanical control of the dental plaque biofilm is one of the basic step for averting dental caries besides periodontal diseases.[7,8]

The various methods of mechanical plaque control comprise toothbrushing alongwith a tooth paste, use of a floss, interdental cleaning aids besides tongue cleaning. Mechanical plaque control using a toothbrush accompanied by tooth paste is considered as a furthermost reliable and popular oral hygiene measure.[8] Because of the lack of the reach of the toothbrushes to in the interproximal surfaces, use of other adjuvant methods like chemical plaque control agents and interdental cleaning attaining consideration as discrete entities. Chemical plaque control agents and interdental plaque biofilm control methods ought to be utilised as adjunct to toothbrushing to counterpart the mechanical cleaning to prevent the supragingival plaque establishment besides the progression of gingivitis and periodontitis.[9]

Mouthwashes are proved to have the properties to distribute medicinal components to all surfaces of teeth and endure effectivity for longer time duration reliant on their ingredients.[10] It has been suggested previously that the oral cavity

is dark and moist and the microorganisms fabricating dental plaque flourish in such milieu, it takes 12 hours for the microbes to reaccumulate and initiate pathogenic effects; hence to limit such effect, brushing of the teeth two times a day was advised.[11]

In our study the modified gingival index scores were drastically lowered at 2 weeks which was further reduced at 4 weeks from day 0 and the values were found to significantly decrease from 2 to 4 weeks. These findings were in line with results of the other studies in the literature who proposed that tooth brushing can significantly improve health of gingival tissues.[12-14]

As soon as measurements of modified gingival index before and after treatment were equated in participants exercising toothbrushing accompanied by Listerine mouthwash, it was observed that the modified gingival index scores significantly reduce from day 0 to 2 weeks and then to 4 weeks and also from 2 weeks to 8 weeks. When mean plaque index and approximal plaque index were compared in tooth brushing alone group it was perceived that the scores were significantly hightened at 2 weeks and 4 weeks. When the mean difference in plaque index values were matched in participants exercising toothbrushing accompanied by Listerine mouthwash the values obtained were significantly reduced from 2 weeks to 4 weeks.
In the present study, the use of Listerine reduces noteworthy ratio in plaque index scores, which was analogous to the outcomes reported by Mythri et al., Sharma et al.,[15] It has been proposed that phenolic compounds of Listerine show anti-inflammatory in addition to prostaglandin synthetase inhibitory activity hence Listerine exhibit both the antibacterial and anti-inflammatory properties.[10]

Conclusion

These observations from the present study suggest that Listerine mouthwash could be considered as a supplement to mechanical plaque control methods for the reason that of its exceptional antiplaque outcomes, resulting in exceptional point of tenacity on the tooth surface.

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Tables

Table1
Mean modified gingival index for all groups at baseline, 14 and 28days

	Group IMean±SD	Group IIMean±SD
Base line	0.78±0.14	0.84±0.06
2 weeks	0.66±0.21	0.71±0.21
4 weeks	0.51±0.11	0.49±0.08

Table2
Intragroup comparison of difference in modified gingival index at different time phase (Repeated measures of ANOVA with Boneferroniposthoctest)

	Group I Mean±SD	Group II Mean ± SD
Base lineto2 weeks	0.16±0.12	0.15±0.13
	P=0.034*	**P=0.021***
Base lineto4 weeks	0.25±0.04	0.31±0.21
	P=0.014*	**P=0.028***
14to28 days	0.16±0.19	0.21±0.14
	P=0.042*	**P=0.039***

*Significant

Table3
MeanTuresky-Gillmore-Glickman-Modification of Quigley Hein Plaque Index for different groups at baseline,2 weeks and4 weeks (Repeated measures of ANOVA with Boneferroniposthoctest)

	GroupI	GroupII
Base line	0 ±0	0 ±0
2 weeks	0.58±0.21	0.69±0.01
4 weeks	0.44±0.18	0.51±0.09

Table 4
Intra Group Comparison of Turesky-Gillmore-Glickman-modification of Quigley Heinplaqueindex at different time intervals (Repeated measures of ANOVA with Boneferroni post hoc test)

	GroupI Mean±SD	**GroupII** Mean±SD
Base lineto2 weeks	-0.59± 0.23	-0.68± 0.11
	P=0.031****	**P=**0.011****
Base lineto4 weeks	-0.41± 0.04	-0.51± 0.12

	P=0.024*	**P**=0.005*
14to28 days	0.19±0.11	0.21±0.02
	P=0.039*	**P**=0.002*

*Significant

Table5

Mean approximal plaque index for allgroups: atbaseline, 2 weeks and 4 weeks

	Group IMean±SD	Group IIMean±SD
Base line	0 ±0	0 ±0
2 weeks	49.21± 11.21	61.32±5.11
4 weeks	32.1±12.26	42.47±2.73

Table6

Intra group comparison of approximal plaque index at different time phase

	Group I Mean ± SD	Group IIMean ± SD
Base lineto2 weeks	-49.12±11.21	-57.33 ±21.23
	P=0.026*	**P**=0.011*
Base lineto4 weeks	-32.51± 6.28	-39.43 ±4.16
	P=0.016*	**P**=0.022*
14to28 days	18.58± 12.34	19.11±12.32
	P=0.029*	**P**=0.048*

*Significant