COMPARISON OF HERBAL MOUTHWASH WITH COMMERCIALLY AVAILABLE 0.2% CHLORHEXIDINE AND 2% BETADINE MOUTHWASHES IN PATIENTS AFTER STAGE-1 IMPLANT SURGERY

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ABSTRACT

Objective: The objective of the current study is to assess the antibacterial efficiency of an herbal mouthwash (clove and neem) against 0.2% chlorhexidine and 2% betadone mouthwash in patients who have undergone Stage-1 implant surgery.

Methods: 30 patients undergoing implant surgery (Stage-1) were divided into 3 groups and were given 3 different mouthwashes. The patient was recalled after 15 days. Swab samples from the site of implant were taken after 15 days and cultured. The results were tabulated.

Results: 0.2% chlorhexidine and 2% bernadine were found to have better antibacterial efficiency than herbal mouthwash ($p > 0.05$).

Conclusion: The herbal mouthwash consisting of neem and clove was not efficient in killing microbes immediately after Stage-1 implant surgery when compared to 0.2% chlorhexidine and 2% bernadine.

Keywords: Mouthwashes, Herbal, Implants, Efficiency, Stage-1 Implant Surgeries.

INTRODUCTION

Dental implants, an inevitable part of modern dentistry, are used widely to replace the missing teeth and to restore the function and aesthetics of the teeth [1,2]. Moreover, the success of the implant depends on various factors of which inflammation is a major factor [3,4]. Since the dental implant which is foreign material placed into the bone of the individual, it has the ability to increase colonies of bacteria in and around the implant region and cause many problems and ultimately failure of the implants itself [5].

Recent studies *in vivo* conditions had proved that bacterial accumulation has started within 30 minutes after the placement of implant [6]. Other studies proved that on exposure of the dental implant to oral cavity has increased the microbial count of specific species of bacteria such as Streptococci [5]. Even anaerobic bacteria showed an increased count in 48 hrs [7]. Many opportunistic periodontal bacteria such as *Actionmycetemcomitans, Peptostreptococcus* microbes and *Fusobacterium nucleatum* are responsible for the peri-implantitis in edentulous patients [8].

About 10% of the implants placed resulted in failure due to bacterial infections. Bacteria-associated infections in implants include peri-implantitis and peri-implant mucositis [9]. These microbes are also responsible for increasing the bone loss surrounding the dental implants which also contributes majorly to the failure of implants [10].

The aim of the current study is to assess the antibacterial efficacy of an herbal mouthwash (clove and neem) against 0.2% chlorhexidine and 2% betadine mouthwash in patients who have undergone Stage-1 implant surgery.

METHODS

Sample and setting

A total of 30 patients who had undergone Stage-1 implant surgery in the Implantology department of Saveetha dental college were recruited for this study from July 2016 to December 2016.The patients were divided into three groups based on the type of mouthwash they were given.

Study groups
- Group A: 0.2% chlorhexidine was given for 10 patients.
- Group B: 2% betadine was given for 10 patients.
- Group C: Herbal mouthwash was given for 10 patients.

Ethical consideration

The research protocol for this study was submitted to the scientific review board of Saveetha dental college and Hospitals and Institutional Human ethical committee. Necessary permission was obtained to conduct this study; moreover, a written informed consent was obtained from patient before proceeding with the study.

Inclusion criteria
- Patients who have undergone Stage-1 surgery.
- Patients without any other lesion in the oral cavity.
- Patients with single implant and adjacent tooth structure near the implant site.

Exclusion criteria
- Patients having systemic diseases.
- Patients with any lesions in the oral cavity.
- Patient without adjacent tooth structureor posterior most tooth.

Patients were given three mouthwashes 0.2% chlorhexidine, 2% betadine, and herbal mouthwash and were advice to use it once at morning and once at night 20 ml for 30 seconds.

Culturing techniques

Samples were collected using a sterile cotton swab which was moistened and swab was collected from the implant site and transported. The sample was cultured in brain heart infusion agar using spread plate culture method and the plates were incubated for 24 hrs and the colony forming units (CFU) was counted manually and tabulated.

Statistical analysis

The data were collected and statistical analyzed by one-way ANOVA *post hoc* bonferroni Pair wise comparison in SPSS (version 20).

RESULTS

The manually counted colony forming units were using Statistical package for social sciences (version 20).

Group C had the maximum bacterial count (10036) followed by Group A (3308) and Group B (2969).

There was a significant difference between Group A and Group B (p<0.05) (one-way ANOVA *post hoc* bonferroni pairwise comparison).

There was no significant difference between Group A and Group C, Group B and Group C (p>0.05) (one-way ANOVA *post hoc* bonferroni pairwise comparison).

There was a significant difference.

Table 1 showing a significant difference in the bacterial colony forming unit cultures from samples collected from patients using a, b, and c mouthwashes. p<0.001 one-way ANOVA, bonferroni pairwise comparisons Fig 1.

Table 2 showing a significant difference in the bacterial colony forming unit cultures from samples collected from patients using a, b, and c mouthwashes. p<0.001 where p value is lesser than 0.001 from the result one-way ANOVA. Post hoc bonferroni pair wise comparison.

DISCUSSIONS

In our current study, there was maximum bacterial load present in patients using herbal mouthwash when compared to patients using chemical mouthwash such as chlorhexidine and betadine. Betadine was found to be more effective against the bacteria in comparison to patients using chlorhexidine.

There are various factors which could have influenced the results of the study.

The regularity of the use of mouthwash

The regularity of the use of the mouthwash could have influenced the results of the study, as irregular use of the mouthwash could have increased the bacterial load in the patient's oral cavity. However, the patients were reminded periodically about the use of mouthwash in specific time and particular quantity.

Dietary habits

Dietary habits of the patients are potential factors in influencing the results of the study as increased carbohydrate consumption; increase the sugar levels in oral cavity which could have elevated the microbial population in the oral cavity.

Bacterial profile

Bacterial profile of the patients would have influenced the study as some of the patients would have already had a high bacterial count in nature, which might have given the high bacterial count in the study groups. However, in the current study, the pre-operative bacterial count was not recorded which proves to be a limitation.

Immunity of the patient

Immunity of the patient is also one of the vulnerable factors which could have influenced the study as immunocompromised patients would have increased microbial count when compared to normal patients. Immunocompromised could be due to placement any other artificial valve or implants in the body for many systemic diseases. However, in our current study, patients with systemic diseases were excluded from the study, so that this factor could have not influenced the study.

- Studies have been conducted on herbal mouthwashes [11-13] which are proven to be beneficial in various aspects of dentistry. However, in our current study, the preoperative bacterial count were not recorded; hence, further research on comparison of pre-operative and post-operative bacterial count may enlighten the scope of the herbal mouthwashes.

CONCLUSION

The herbal mouthwash which consist of neem and clove (p>0.05) was not as effective in killing the microbes immediately after the
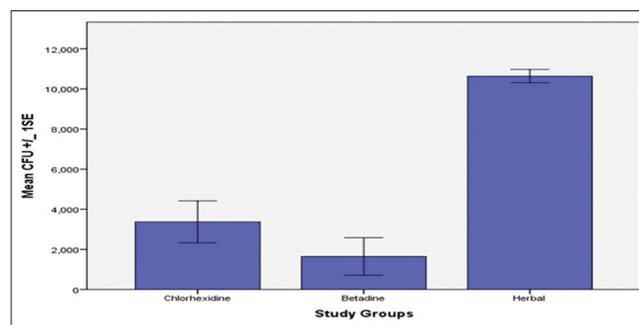
Table 1: Comparison of the 1% betadine, 0.2% chlorhexidine, and herbal mouthwash by one-way ANOVA where p<0.05

Test groups	N	Mean	SD	SE	Significance
0.2% chlorhexidine	10	3373	3308	1096	0.00
2% betadine	10	1646	2969	938	
Herbal mouthwash	10	10036	1051	332	

SD: Standard deviation, SE: Standard error

Fig. 1: Comparison of the colony forming units of 1% betadine, 0.2% chlorhexidine, and herbal mouthwash (one-way ANOVA bonferroni test)

Table 2: Comparison of the 1% betadine, 0.2% chlorhexidine, and herbal mouthwash by one-way ANOVA where p<0.05

Dependent variable: CFU Bonferroni						
(I) Group	(J) Group	Mean difference (I-J)	SE	Significant	95% confidence interval	
					Lower bound	Upper bound
Chlorhexidine	Betadine	1726.600	1179.024	0.464	−1282.81	4736.01
	Herbal	1179		0.000	−10275.91	−4257.09
	Chlorhexidine					
	Herbal					
	Chlorhexidine					
	Herbal					

*The mean difference is significant at the 0.05 level. CFU: Colony forming units. The significant value is 0.05

Stage-1 implant surgery when compared with 0.2% chlorhexidine and 2% betadine. Moreover, 2% betadine ($p<0.05$) was found to be more effective than 0.2% chlorhexidine when the 2 mouthwashes was compared. Hence, use of 2% betadine over chlorhexidine is recommended to patients to avoid implant failure due to microbial contamination.

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