

# Comparison of the Bacterial Level by Pre Brushing and Post Brushing using Herbal and Fluoridated Toothpaste

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## Abstract :

**Aim:** To compare the bacterial level in tooth surface by pre brushing and post brushing using herbal and fluoridated toothpaste

**Objectives:**

This study is done to compare the bacterial level using herbal and fluoridated toothpaste. Tooth surface swab is collected.

**Background:**

Toothpaste has been manufactured throughout for the reduction in the bacterial level. The present study will be done to compare the bacterial level in tooth surface by pre brushing and post brushing using herbal toothpaste containing terminalia chebula, terminalia bellerica and fluoridated tooth paste. The tooth surface swab will be collected for determining the bacterial levels prior to brushing and after brushing using the herbal and fluoridated toothpaste.

**Result**

The fluoridated toothpaste reduces the bacterial level in the tooth surface when compared to the herbal and non fluoridated non herbal toothpaste.

**Keywords :** Toothpaste, pre brushing, post brushing, terminalia chebula, terminalia bellerica

## INTRODUCTION

Dental caries and periodontal diseases are essentially caused by the micro-organisms present in dental plaque. Dental plaque is a biofilm or mass of bacteria that grows on surfaces within the mouth. It appears as a white/pale yellow "slime layer," that is commonly found in between the teeth and along the cervical margins [1]. Dental plaque is also known as microbial plaque, oral biofilm, dental biofilm, dental plaque biofilm or bacterial plaque biofilm. Plaque develops when foods containing carbohydrates (sugars and starches), such as milk, soft drinks, raisins, cakes, or candy are frequently left on the teeth. Biofilm formation is a natural process in the oral environment, but needs to be controlled through regular brushing in order to prevent the development of caries and periodontal diseases. Both chemical and mechanical oral hygiene aids are used for removal and prevention of plaque. Mechanical plaque control measures, such as toothbrushes, dental floss, toothpicks and interdental brushes are very popular and are mostly used in conjunction with chemical plaque control aids, e.g Mouthrinses and medicated toothpastes [1]. In most people, brushing alone is inadequate to remove oral biofilm to an extent that the development of periodontal diseases and caries is prevented [2]. Toothpaste has been manufactured throughout for the reduction in the bacterial level. Most commonly fluoridated toothpaste has been used for plaque control. In addition to this herbal toothpaste were also used [3]. The herbal toothpaste used in this research consists of terminalia chebula, terminalia bellerica as a main source. This study is thus aimed at comparing the bacterial level by pre brushing and post brushing using herbal and fluoridated toothpaste.

## MATERIALS AND METHOD

Three toothpastes namely fluoridated, herbal and non fluoridated non herbal were selected for the assessment of bacterial level. In the present study people without caries were selected. The people selected for the study does not

use any mouthwash or antibacterial products. They were split into three groups and the appropriate toothpaste was given. The tooth surface swab before brushing was collected using cotton swab, then the tooth paste was used and the tooth surface swab after brushing was taken. By following the above method, 30 samples were taken in the early morning. The samples were transported immediately to the laboratory. The bacterial level by using the different toothpastes was determined by colony count. In this method Brain Heart Infusion agar (BHI) plates were used. The tooth surface swab was inoculated in the plates by streaking method. The bacterial level was evaluated by counting the bacterial colony.

### Groups

GROUP 1 – Non fluoridated non herbal toothpaste

GROUP 2 – Herbal toothpaste containing terminalia chebula and terminalia bellerica

GROUP 3 – Fluoridated toothpaste

## RESULTS

The bacterial level in people using the fluoridated toothpaste is low when compared to the herbal toothpaste and non fluoridated and non herbal toothpaste. The result which was obtained from the above study shows that the bacterial level was comparatively low in people using fluoridated toothpaste.

### GROUP 1 [NON FLUORIDATED TOOTHPASTE AND NON HERBAL TOOTH PASTE]

BEFORE	AFTER	percentage reduction
60	32	47
100	72	28
72	32	66
56	24	58
76	48	37
		MEAN = 47.2

## GROUP 2 [HERBAL TOOTHPASTE]

<i>BEFORE</i>	<i>AFTER</i>	<i>percentage reduction</i>
116	52	66
128	36	72
88	48	50
132	68	49
100	32	68
		MEAN = 61

## GROUP 3 [FLOURIDATED TOOTHPASTE]

<i>BEFORE</i>	<i>AFTER</i>	<i>percentage reduction</i>
116	32	73
56	32	43
72	20	73
104	16	85
100	44	66
		MEAN = 68

**Table showing the comparative efficacy of three different toothpastes**

<i>NON FLUORIDATED NON HERBAL TOOTHPASTE</i>	<i>HERBAL T T O O T H P A S T E</i>	<i>FLUORIDATED T O O T H P A S T E</i>
Percentage reduction	Percentage reduction	Percentage reduction
47	66	73
28	72	43
66	50	73
58	49	85
37	68	66
MEAN = 47.2	MEAN = 61	MEAN =68

## DISCUSSION

The fluoridated toothpaste consists of triclosan copolymer. It has been suggested that triclosan blocks lipid biosynthesis by specifically inhibiting the enzyme enoyl-acyl carrier protein reductase (ENR). This feature of fluoride toothpaste can be attributed to reduce the bacterial level. Although the commonly used and recommend toothpastes by WHO, ADA, FDI is the fluoride and triclosan containing. But the excess use of the fluoride can cause the dental fluorosis so the recommended amount of the fluoride should be used as the ingredients in the toothpaste. The fluoride tooth paste reduces the number of streptococcal colony forming units of dental plaque despite the fact that fluoride was added to the toothpastes first with aiming to preserve the product and then to protect the teeth[4].

Using natural medicines to cure various diseases has become an increasing trend. Herbal medicine has made significant contribution to modern medical practice [5]. Herbal toothpaste is less toxic when compared to the fluoridated toothpaste. Herbal toothpaste is safer for usage than the fluoridated toothpaste. Although the Herbal product had less potency in reducing the bacterial load when compared to the fluoridated

toothpaste in this study, but the terminalia chebula and terminalia belerica present in the herbal toothpaste also found to reduce the bacterial load to some extent. Terminalia chebula which is present in the herbal toothpaste has other uses like they used for treating chronic ulcers, leucorrhoea, pyorrhoea and other fungal infections of the skin. Terminalia belerica is used for various purposes, the fruit obtained from that has medicinal values. It is used as an astringent, laxative, anthelmintic, germicidal and antipyretic. It is used in conditions such as cough, tuberculosis, eye diseases, dyspepsia, dysentery, leprosy. They cleanse the blood and promote the hair growth. The fruit extracts have antibacterial activity against *Micrococcus pyogenes* and *Escherichia coli*. Continuous usage of the herbal toothpaste may help in reducing the bacterial load. The fluoridated toothpaste has a beneficial effect on the tooth surface, but the herbal toothpaste produces an overall cleansing effect in the oral cavity on continuous usage. The herbal toothpaste is biocompatible when compared to the fluoridated toothpaste. The herbal toothpaste can be used to reduce the fluoride toxicity. The non fluoridated non herbal toothpaste is also less toxic when compared to the fluoridated toothpaste but the bacterial load is not reduced to a greater extent when compared to the fluoridated and herbal toothpaste.

## CONCLUSION

Increase and the alteration in the proportion of the bacterial load of the normal flora is responsible for the dental caries and periodontal diseases. Caries development starts by the pellicle formation on the tooth surface. There are a number of toothpastes available in the markets that meant to reduce the pellicle formation and bacterial level on the tooth surface. This study has proved that the fluoridated toothpaste has a capacity of reducing the bacterial level when compared to the herbal toothpaste and non fluoridated toothpaste. This fluoridated toothpaste provides a better cleansing effect on the tooth surface when compared to others. However, it must be recognized that 1000 ppm fluoride containing toothpastes are not recommended for children. Herbal toothpastes show reduction in the bacterial load slightly lower than the fluoridated toothpaste thus reducing the adverse effect of fluoride toxicity. Herbal toothpastes are safer when compared to the fluoridated toothpaste for children less than 3 to 8 years.

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