Efficacy of Herbal Toothpaste containing *Piper betle*, *Psidium guajava* and *Garcinia mangostana* in reduction of dental plaque and gingivitis

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Introduction

The gingival disease is a common periodontal diseases worldwide. The 7th Thai national oral health survey 2012 reported the high prevalent of gingivitis among children, teenagers and adults. Tooth brushing is the most effective method in plaque control and prevention of gingivitis. The fluoridated toothpaste is recommended to used with tooth brushing for the oral care standard. Nevertheless, some herbal extracts are contained in herbal toothpaste as active ingredients. The herbal extracts were studied about their properties in antibacterial and anti-inflammation. Thus, it is the material of interest to study about its efficiency.

Objectives

1. To compare the efficacy in reduction of dental plaque between herbal toothpaste containing *Piper betle, Psidium guajava* and *Garcinia mangostana* and fluoridated toothpaste.

2. To compare the efficacy in reduction of gingivitis between herbal toothpaste containing *Piper betle, Psidium guajava* and *Garcinia mangostana* and fluoridated toothpaste.

Materials and Methods

60 volunteers were informed about study design and willing to participate with this study. The randomized control trial, double blind examiners, was performed. The volunteers were allocated randomly into 2 groups, 30 each, 1.The control group (fluoridated toothpaste) and 2.The herbal group (herbal toothpaste containing *Piper betle, Psidium guajava* and *Garcinia mangostana*).

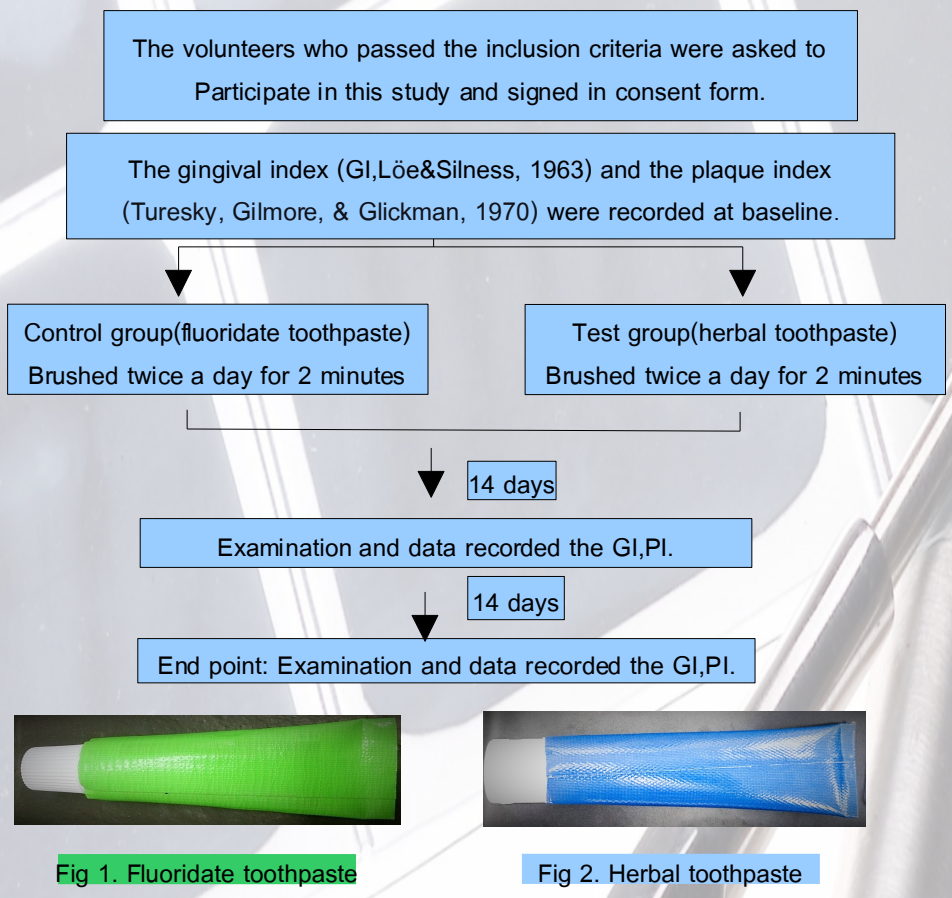

Fig 1. Fluoridate toothpaste

Fig 2. Herbal toothpaste

Statistical Analysis

Normal distribution was tested with Kolmogorov-Smirnov and homogeneity of variance was tested with Levene's test. A data was normal distribution and homogeneity. Due to parametric data, the difference in mean of GI and PI between the control and the experimental groups were analyzed using the t-test at a 95% level of confidence. Otherwise, the difference in mean of GI and PI in the same type of toothpaste in a difference time were calculated using the pair t-test, $p < 0.05$.

Result

The reduction of the plaque index and gingival index between 2 groups were not difference statistically significant (Fig 3,4). However, the score of plaque index and gingival index between at baseline and endpoint in both groups were decreased statistically significant.

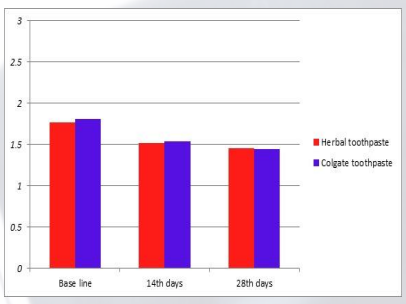

Fig 3. Comparison of gingival index between 2 groups.

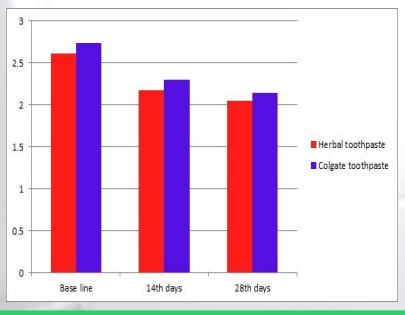

Fig 4. Comparison of plaque index between 2 groups.

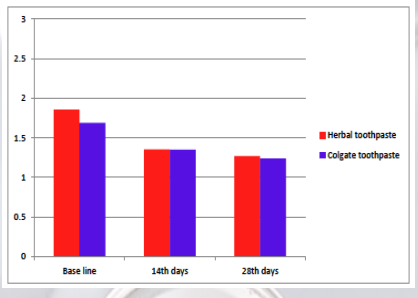

Fig 5. Gingival index at buccal and lingual aspects of anterior teeth

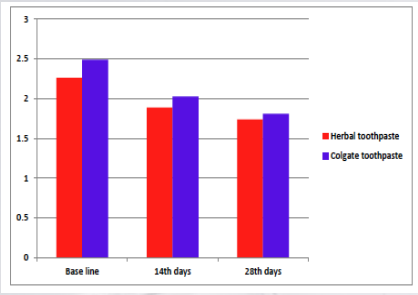

Fig 6. Plaque index at buccal and lingual aspects of anterior teeth

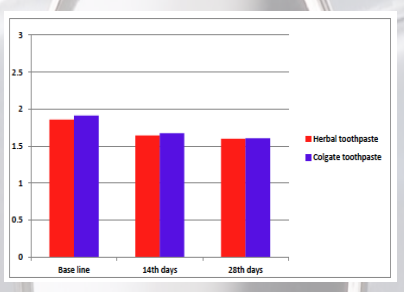

Fig 7. Gingival index at buccal and lingual aspects of posterior teeth

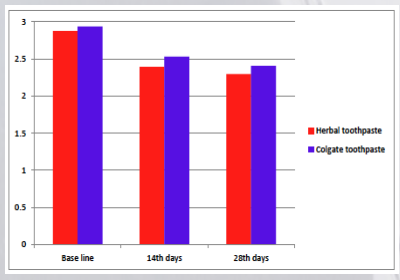

Fig 8. Plaque index at buccal and lingual aspects of posterior teeth

Discussion and conclusion

The results of this clinical study demonstrated that both toothpastes presented reduction in the plaque index and gingival index. Most of the volunteers had oral hygiene and periodontal status improvement.This results are in agreement with the study by George, Hegde, Rajesh, and Kumar (2009), the herbal toothpaste was as effective as the fluoridated toothpaste in the control of plaque and gingivitis.

A comparison of plaque and gingival index reduction by herbal toothpaste in anterior and posterior teeth on the first day, second week and fourth week showed same significant reduction. Moreover, different kind of toothpaste showed indifferent efficiency of plaque and gingival index reduction around anterior teeth as well as posterior teeth. As shown in the Fig 5,6,7,8, anterior teeth tend to have higher reduction rate than posterior teeth, because anterior teeth's area is easily to clean. Following the report from Prasad et al. (2011), the frequencies for higher plaque index were common on posterior teeth more than on anterior teeth.

As a result, both herbal and fluoridated toothpastes had similar ability to reduce dental plaque and prevent gingivitis. This research had limitation of volunteers and experimental times. Then the further study should be performed to proof the efficacy of herbal toothpaste.

References

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