

# The Comparison Between Dental Plaque Score Before and After Gargling with Tongra Original Honey 5% Solution (Study of Student in Dentistry of Syiah Kuala University)

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## ABSTRACT

Dental plaque is a yellow-grayish substance which contains bacteria and attachment on tooth hard surface, including on restoration. Dental plaque can causes dental caries and periodontal disease. Dental plaque accumulation can easily formed if there is no adequate dental plaque control. Dental plaque control can be done mechanically with scaling, root planing, tooth brushing, and the use of dental floss. Dental plaque control chemically can be done by using mouth rinse, one of them with Tongra original honey 5% solution. The purpose of this study was to observe the difference between dental plaque score before and after gargling with Tongra original honey 5% solution. This study was experimental clinical study. Subjects of this study were 54 people, consisted of students in Dentistry of Syiah Kuala University which corresponding to inclusion criteria. On the first day, study was done by examining plaque score using O'Leary palque index, then subjects were given Tongra original honey 5% solution with using instruction. Gargling process by using Tongra original honey 5% solution was done for six days. On the sixth day, subjects were re-examined for final plaque score. Data were analyzed by using Wilcoxon test. Statistic analysis result showed that there was a significant difference between dental plaque score before and after gargling with Tongra original honey 5% solution with  $p$ -value=0,000 ( $p<0,05$ ). Based on this study result, could be concluded that gargling with Tongra original honey 5% solution effectives to decrease dental plaque score.

**Keywords:** Tongra original honey 5% solution, O'Leary, dental plaque score.

## INTRODUCTION

Dental plaque is a yellowish-colored substance that contains bacteria and adheres to hard surfaces of teeth, including on restoration.<sup>1</sup> Plaque may cause caries and periodontal disease, therefore careful hygiene should be performed to prevent plaque accumulation.<sup>2</sup> Maintenance of oral hygiene can be performed with plaque control. Plaque control can be done mechanically and chemically.<sup>3</sup> Scaling

and root planing, as well as brushing after breakfast and before bedtime and the use of dental floss is included into mechanical plaque control. Plaque control is mechanically favored by society because of its simpler method and relatively cheap cost.<sup>3,4</sup>

Chemical plaque control can be performed using mouthwash. Mouthwash is a product that contains antiseptic and antibacterial active ingredients.<sup>5</sup> Mouthwashes are classified as



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drugs that can be purchased without a doctor's prescription, which is why it is often used for long periods of time and can cause side effects unnoticed by the user. One commonly recommended mouth rinse is a mouthwash containing chlorhexidine (CHX).<sup>6</sup>

Long-term use of CHX can cause side effects of taste flavor change, spotting or staining yellow-brownish on the teeth and on the tongue.<sup>7</sup> Along with the times, many of the mouthwash users know the side effects and switch to using mouthwash made from natural ingredients. Various studies of mouthwash made from natural ingredients have been done, such as by using honey.<sup>8</sup>

Honey has an effective antibacterial potency to eradicate oral pathogens<sup>9,10</sup> because it contains natural elements, including potassium elements that can prevent moisture that inhibits bacterial growth,<sup>11,12</sup> Moreover honey is also effectively used as a treatment of periodontal disease, canker sores, and other diseases in the oral cavity.<sup>9,10</sup> In Indonesia there are various types of honey, among them cattle honey (*Apis mellifera*) and honey forest (*Apis dorsata*).<sup>13</sup>

Original honey Tongra is one type of forest honey, which also includes the type of polyfloral honey (type of honey obtained from some types of flowers). This honey has several advantages compared with livestock honey (monofloral) of which is, the color of darker honey. Forest honey also has a higher water content than honey, but it is also very good for health because it contains natural antibiotics produced by wild bees.<sup>14</sup>

Syarli research (2002) showed a decrease in plaque formation after rinsing with honey solution.<sup>8</sup> Jain Research (2015) showed a decrease in plaque accumulation due to the use of herbal medicine.<sup>15</sup> This study aimed to find out the ratio of plaque scores before and after rinsing with the original Tongra honey 5 % in Unsyiah dentistry student class of 2016.

### Research methods

This study is a clinical experimental study with one group pre-test post test design. The

research was conducted on April 4-10, 2017 at the Faculty of Dentistry of Syiah Kuala University. The research population is Dentistry students of Unsyiah class of 2016. The subjects in this study used a Slovin's formula.

$$n = \frac{N}{(1 + Ne^2)}$$

n = Number of samples

N = Population

e = Error tolerance = 0.05

$$n = \frac{N}{(1 + Ne^2)}$$

$$n = \frac{62}{(1 + 62 \times 0.05^2)}$$

n = 53.67, rounded to 54

So, the subject of this study is 54 people. The research subjects are students of Dentistry subjects are students of Dentistry students of Unsyiah class of 2016 who meet the inclusion criteria. Where the exclusion criteria is, using a fixed orthodontic appliance, smoking, using protesa, have a history of diabetes mellitus, have a history of epilepsy disease, perform skeling or root planing in the last 15 days, using mouthwash for the last 15 days, and student who is in menstruation period.

The researcher selects research subjects based on inclusion and exclusion criteria. Researchers provide information about what will be done to the subject of research. Students who agree to be the subject of research are given informed consent to sign. After the informed consent is signed, an initial plaque score will be examined using the O'Leary plaque index. For measurements, the first discoloration is performed by using the disclosing solution.<sup>16</sup> The assessment is performed by noting whether or not the deposits are stained at the dentogingival junction on all tooth surfaces (mesial, distal, buccal and lingual) except in the occlusal part. The total score for this O'Leary plaque index can be calculated by the formula: <sup>16,17</sup>

$$\text{RKP Score} = \frac{\text{Amount of tooth surface that accumulated by plaque}}{\text{Amount of all tooth surface}} \times 100.$$

The selected subjects were given instructions on the use of original Tongra honey 5% solution as a mouthwash made by researchers by mixing 95 ml of aquadest and 5 ml of native honey. To the subject was instructed maintenance oral hygiene by brushing after breakfast and before bedtime and using honey mouthwash that has been prepared by researchers for 6 days, as much as one dose of mouthwash bottle cap.

This gargle action will be done for 6 days. On the 6th day, the subject plaque score will be re-examined, using the O'Leary plaque index and using a disclosing solution which will then be the final plaque score.

The obtained data will be analyzed using Statistical Package for the Social Science (SPSS). Data analysis performed is paired t-test.

#### Research result

Based on the above descriptive statistics it is found that there is an effect of plaque score with the original Tongra honey solution 5%. This can be known through the mean and standard deviation values before rinsing original Tongra honey solution 5%. higher than after rinsing with original Tongra

honey solution 5%.. This needs to be confirmed again with the Wilcoxon test.

Based on the above statistical test results, it can be seen that the plaque score of subjects before and the plaque score of subjects after rinsing with the original Tongra honey solution 5% showed a significant difference ( $p < 0.05$ ).

#### DISCUSSION

Dental plaque is a grayish yellow substance that contains bacteria and adheres to hard surfaces of teeth, including on restoration.<sup>1</sup> Plaque may cause caries and periodontal disease, therefore careful hygiene is necessary to prevent the occurrence of plaque accumulation, such as scaling, root planing, tooth brushing and the use of dental floss and by using mouthwash, such as with a honey solution.

Table 5.2. showed a decrease in plaque score on the subject rinsing with original Tongra honey solution 5% for 6 days. The mean score of plaque before rinsing with original Tongra honey solution 5% was 23,644, and the mean score of plaque after rinsing was 15,915. The decrease of plaque score between before and after rinsing

**Table 5.1. Mean and Standard Deviation Data Value**

	N	Mean	Std. Deviation
Plaque score before rinsing with original Tongra honey solution 5%	54	23,644	10,2531
Plaque score after rinsing with original Tongra honey solution 5%	54	15,915	8,2765

**Table 5. 2: Wilcoxon Test**

	N	Mean Rank	Total Rank	<i>p</i>
Plaque score before	54 <sup>a</sup>	27.50	1485.00	
and after rinsing with original				
Tongra honey solution 5%	0 <sup>b</sup>	0.00	0.00	0.000*
	0 <sup>c</sup>			
	54			

a: Plaque score after rinsing < Plaque score before rinsing

b: Plaque score after rinsing > Plaque score before rinsing

c: Plaque score after rinsing = Plaque score before rinsing

\*: significant and hypothesis acceptable if  $p$ -value < 0,05

with original Tongra 5% honey solution, this happened because of antibacterial properties in honey,<sup>18,19</sup> besides the substance owned by honey is bactericidal and bacteriostatic such as antibiotics.<sup>20</sup> Antibacterial properties that can inhibit bacterial growth include osmotic effects, acidity, hydrogen peroxide, phytochemical factors,<sup>21</sup> and lymphocyte enhancement and phagocytosis activity.<sup>9</sup> The dissolved honey increases the production of hydrogen peroxide, and provides antiseptic effects at the antibacterial level.<sup>8,9</sup> Besides the bacteria can not live and thrive in honey because honey contains elements of potassium that is the element that prevents moisture which inhibit bacterial growth.<sup>22,23</sup>

Table 5.3. shows the results of statistical tests with Wilcoxon test, where the results of this study in accordance with research conducted by Syarli (2002) and Jain (2015) which showed a decrease in plaque accumulation due to the use of honey.

## CONCLUSION

Based on the result of this research, it can be concluded that rinsing with original Tongra honey solution 5% effectively reduces plaque accumulation in dentistry student of Syiah Kuala University class of 2016.

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