The Effect of *Nephelium longata* L Honeyconsumption on Decreasing of Cholesterol Level for Hypercholesterolemia Patient at Medical Clinic of Farras Husada of Sowan Lor, Kedung, Jepara

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Abstract. Cholesterol is not a type of disease, but rather the result of the body's metabolism of fat that we makan.Kolesterol would be detrimental to the cause of deadly diseases such as coronary heart disease, stroke, hypertension, and diabetes when the amount exceeds normal limits.Risksdas in 2013 obtained measurements of cholesterol levels in the population aged >15 years who have an abnormal total cholesterol levels by 35.9%. men 30%, women 39.6%.City at 39.5% and the country side at 32.1%. This study aims to examine the effect of Honey Consumption on decreasing Cholesterol Levels in Patients Hypercholesterolemia in Polyclinics of Farras Husada of Sowan Lor Kedung of Jepara. This study used quasi-experimental study. By making the total cholesterol level checked first before being given the honey*Nephelium longata* L then check back in total cholesterol levels after 14 days are given honey. With the draft pre-test and post-test nonequivalent control grup. This study showed that the cholesterol before it is given in the intervention group amounted to 233.94. Average cholesterol levels after given. With 200.65 P value 0.000 <0.05. This means that cholesterol-lowering There is a difference before and after. As for the control group, the average cholesterol level before it amounted to 287.20. Average cholesterol levels after at 252.40. Premises P value 0.001 <0.05. This means that there are differences decrease cholesterol levels before and after the control group.

Conclusion: There was a significant effect of honey *Nephelium longata* L consumption to decrease cholesterol levels in the intervention group and there is effect on cholesterol lowering in the control group.

1. Introduction

Cholesterol which is not a type of disease is actually a result of body's metabolism of fat that we eat. Cholesterol will lead deadly diseases such as coronary heart disease, stroke, hypertension, and diabetes when it has unnormal or exceeds normal limits. Diseases of excess cholesterol are called hypercholesterol or hyperlipidemia [1]. Cholesterol can generally be prevented before moving into bad cholesterol in the body that can threaten trought illness carried out by the cholesterol. Cholesterol may be prevented without using medical or chemical medicines and there are many ways to prevent and lowering cholesterol in order to remain in control [2]. Cholesterol will increase due to many saturated fats and poor lifestyles. The highest cholesterol is obtained from sources of animal products such as meat, milk and eggs. Actually, the body really needs cholesterol to help shape the cell wall as the base material of the formation of steroid hormones and assourse of energy for body. Cholesterol is naturally produced by liver that contributes to cholesterol up to 80% and 20% from other sources of food and
beverages consumed every day [3]. The prevalence of hypercholesterolemia in the United States reached 16.2% in adulthood (Rodger et al., 2011), in Bangladesh and Nepal found 16% and 13% of hypercholesterolemia. The prevalence of hypercholesterolemia in Swiss reached 17.4% [4]. The American Heart Association (AHA) estimated that over 100 million Americans have total cholesterol of > 200 mg / dl, which is quite high in categories and more than 34 million Americans have cholesterol levels of > 240 mg / dl, which are high and require therapy [5]. The results of RISKESDAS in 2013 showed that cholesterol levels of 15 years old population had abnormal cholesterol levels of 35.9%, including 30% male and 39.6% female. From urban dwellers with abnormal cholesterol levels 39.5% and rural residents with abnormal cholesterol levels of 32.1%. For the measurement of low HDL rates of Indonesia's population was 22.9%, and for Indonesia's high LDL rate was 15.9% [6].

To those who have high cholesterol levels in their body do not show any symptoms, but when doing an examination on the laboratory tests it can be seen that the cholesterol levels in the blood have exceeded the normal limits. If the levels of cholesterol in the blood are rising, it will cause negative effect on the body and some diseases caused by cholesterol such as heart disease, stroke, and blood vessel constriction. Foods that increase cholesterol levels in the blood are increasing like egg yolk, calamari, beef brains, quail eggs and very dangerous drinks are alcoholic beverages, such as beer, wine, and drinks made with yeast [7]. Based on preliminary survey conducted on January 21, 2016 at Faras Husada Medical Center, Sowan Lor, Kedung District, Jepara. At examination of 8 patients. After cholesterol levels, 6 patients from 8 who were diagnosed had high cholesterol levels with an average of 220 mg / dl.

2. Methods
This study was quasy experimental study which was not real experimental study because this study does not meet the requirements such as experimental methods that can be said to scientifically follow certain rules. This study used static group comparassion. In the initial design, all objects were measured or tested and not compared. It is only to look for who would be the intervention and the control group. There are two variables in this study in the way that giving honey is independent variable and cholesterol level reduction is dependent variable. The population were hypercholesterolemic patients in the Farras Husada Medical Center, Sowan Lor V, Kedung, Jepara District consisting of 46 people. The population were divided into both intervention and control group. In practice to have an intervention group and a control group determined based on the results of the measurement which became the reference (focus on hypercholesteremia). The technique used is by measuring all cholesterol levels of prospective respondents, then calculating the average value. All prospective respondents who had cholesterol levels above the average were included in the intervention group and the control group. It should also be emphasized that the intervention group and the control group do not have to have the same amount.

The technique of selecting the sample used purposive sampling, purposive sampling is a method of sampling for specific purposes. The reason is that hypercholesterolemia occurred at Farras Husada Medical Center in Sowan Lor, Kedung, Jepara Regency which will be measured for cholesterol levels will be divided into two groups whose numbers are not necessarily the same in each group.

In determining the sample, there are two sample criteria that have been used in this study, namely:

2.1. Inclusion criteria
- Respondents have average cholesterol level of 220 mg / dl and more than 220 mg / d.
- Willing to be a respondent by following each research process.
- Not suffering from severe diseases such as kidney, DM, cancer and others.

2.2. Exclusion criteria
- Withdraw from the data collection process.
- Having complications for the diseases.
Of the 46 respondents who had the desired criteria as many as 32 people to be used as research respondents, the instruments used were observation sheets and observation tools (lipid test by taking respondents' blood samples). Data in this study were analyzed using univariate and bivariate analysis. Univariate analysis was analyzed, namely cholesterol levels of hypercholesteremia patients before and after giving honey. The bivariate analysis used was statistical test analysis.

3. Result

3.1. Age of Respondents

Table 1. Frequency Distribution of Samples based on age

| Ages     | Intervention | Control |
|----------|--------------|---------|
|          | N  | % | N | % |
| 20-29    | 1  | 5.9 | 0 | 0 |
| 30-39    | 1  | 5.9 | 0 | 0 |
| >40      | 15 | 88.2 | 15 | 100 |
| Total    | 17 | 100 | 15 | 100 |

Source: Primary Data, 2016

Based on Table 1 it can be seen that the majority of the study sample in the intervention group and the control group were between > 40 years old, consisting of 15 people or 88.2% and 15 people, or 100% respectively.

3.2. Gender

Table 2. Frequency Distribution of Samples Based on Gender

| Gender      | Intervention | Control |
|-------------|--------------|---------|
|             | N  | % | N | % |
| Men         | 3  | 17.6 | 2 | 13.3 |
| Women       | 14 | 82.4 | 13 | 86.7 |
| Total       | 17 | 100 | 15 | 100 |

Source: Primary data, 2016

Based on table 2 showed that most of samples of intervention and control groups were both female, consisting of 14 people or 82.4% and 13 people or 86.7% respectively.

3.3. Job

Table 3. Frequency Distribution of Samples Based on Job

| Job         | Intervention | Control |
|-------------|--------------|---------|
|             | N  | % | N | % |
| Jobless     | 10 | 58.8 | 9 | 60 |
| Businessman | 3  | 17.6 | 1 | 6.7 |
| Trader      | 3  | 17.6 | 4 | 26.7 |
| Tailor      | 1  | 5.9  | 1 | 6.7 |
| Total       | 17 | 100 | 15 | 100 |

Source: Primary Data, 2016

Based on table 3 showed that most of samples in the intervention and control groups were currently housewives, consisting of 10 people or 58.8% and 9 people or 60% respectively.

3.4. Univariate Analysis

3.4.1. Cholesterol levels before having treatment for both intervention and control groups

Table 4. Frequency Distribution Based on Mean, Median & Modus of Cholesterol Levels Before Given the Consumption of Longan Honey

| Variable     | Mean | Median | Modus | SD     | Min | Max |
|--------------|------|--------|-------|--------|-----|-----|
| Intervention |      |        |       |        |     |     |
| Before Treatment | 233.94 | 230   | 220  | 14.237 | 220 | 262 |
| Control      |      |        |       |        |     |     |
| Before Treatment | 287.20 | 280   | 280  | 18.405 | 269 | 325 |
Based on table 4, the results of cholesterol levels before treatment showed that in the intervention group, the mean value of treatment was 233.94, median value was 230, mode was 220 with 17 respondents, standard deviation was 14.237 and minimum value of 220 and maximum value of 262. Meanwhile, in the control group before (initial observation) cholesterol levels indicate that the mean control value was 287.20, median value was 280, mode value was 280 with 15 respondents, standard deviation was 18.405 and minimum value of 269 and maximum value of 325.

Table 5. Frequency distribution of cholesterol levels before in the intervention group and control group

| Source: Primary Data, 2016 |
|---------------------------|

In table 5, it shows that cholesterol levels in the treatment group before giving honey therapy is the frequency of increasing by 17 people (100%), and cholesterol levels in the frequency decreases by 0 people (0%). And in the frequency control group an increase in cholesterol levels was 15 people (100%), and at a frequency decreased by 0 (0.00%).

3.4.2. Cholesterol levels have been given treatment to the intervention and control groups

Table 6. Frequency Distribution Based on the Mean, Median & Mode of Cholesterol Levels After Consumption of Longan Honey

| Variable                  | Mean | Median | Modus | SD    | Min | Max |
|---------------------------|------|--------|-------|-------|-----|-----|
| Intervention After treatment | 200.65 | 206 | 200 | 24.612 | 119 | 220 |
| Control After treatment   | 252.40 | 252 | 260 | 26.095 | 215 | 300 |

Source: Primary Data, 2016

Based on table 6, the results of cholesterol levels after treatment showed that in the intervention group, the mean value of treatment was 200.65, median value 206, mode 200 value with 15 respondents, standard deviation 24.612 and minimum value 119 and maximum value is 220. Whereas in the control group after (final observation) cholesterol levels showed that the average control value was 252.40, median value 252, mode 260 value with number of 15 respondents, standard deviation 26.095 and minimum value 215 and maximum value is 300.

Table 7. Frequency Distribution of cholesterol levels After the intervention group and the control group

| Source: Primary Data, 2016 |
|---------------------------|

In table 7, it showed that cholesterol level in the treatment group after giving honey therapy was the frequency of increasing by 0 people (0.00%), and the cholesterol level in the frequency decreased by 17 people (100%). And in the frequency control group, cholesterol levels increased by 0 people (0.00%), and at a frequency of 15 people (100%).

Table 8. Comparison of Average of Cholesterol Levels Before and After Honey Consumption

| Cholesterol Level | N   | Mean  | SD     | p value |
|-------------------|-----|-------|--------|---------|
| Intervention      |     |       |        |         |
| Before Treatment  | 17  | 233.94| 14,237 | 0,000   |
| After Treatment   | 17  | 200,65| 24,612 |         |
| Control Group     |     |       |        |         |
Based on Table 8. it can be seen that the average cholesterol level before honey consumption in the intervention group was 233.94 with a standard deviation of 14.237. The average cholesterol level after consuming honey was 200.65 with a standard deviation of 24.612. The results of statistical tests with Wilcoxon test obtained P value of 0.000 <0.05, then Ha was accepted and Ho was rejected. This means that there is a significant difference in decreasing cholesterol levels before and after honey consumption therapy in the intervention group. Whereas for the control group, the average cholesterol level before (initial observation) was 287.20 with a standard deviation of 18.405. The average cholesterol level after (final observation) is 252.40 with a standard deviation of 26.095. Statistical test results with Wilcoxon test obtained P value of 0.001 <0.05, then Ha was accepted and Ho was rejected. This means that there is a difference in the decrease in cholesterol levels before (initial observation) and after (final observation) in the control group.

4. Discussion
The result of this study showed that the majority of respondents aged between > 40 years. This is in line with the research done by Ruth Grace, Aurika, Carolin, (2012) that prevalence of hypercholesterolemia of 25-34 year age group was 9.3% and increased according to age increase of up to 15.5% in the 55-64 year age group. Other studies in Thailand in 2006 showed that patients with hypercholesterolemia of 30-39 years old were 22.8%, 40-49 years old were 25.6%, and 50-59 years old were 20.9% [8]. The older age, the higher cholesterol level, this is caused by aging factors that cause decreased body organs [1]. In old age coronary arteries which are simply likened to pipelines, the longer the crust becomes. Bad cholesterol is dirt that is contained in the water, if the blood dose increases then the arterial ecstasy will disappear, it shows that age affects blood cholesterol levels [9]. In this study, the majority of respondents were female. This is in line with the results of this study in accordance with the results of the Basic Health Research (Risksdas) in 2013, that the proportion of male gender characteristics was 30% and women were 39.6%.(6). In MONICA II obtained increased to 16.2% for women and 14% of men. When women have not experienced menopause, women have lower total cholesterol levels than men of the same age. This is influenced by levels of estrogen hormones(10). But when women experience menopause which causes a decrease in estrogen hormones, women experience a tendency to develop hypercholesterolemia. Therefore postmenopausal women are more susceptible to increased blood cholesterol levels [7]. In this study, the majority of respondents work now as No Work / Housewife. The things that affect cholesterol levels are smoking, consuming less fruits and vegetables, consuming excess alcohol, obesity and lack of activity. Activities that cause less cholesterol buildup in the blood [3]. The effect of physical activity on lipid parameters is mainly in the form of decreased triglycerides and an increase in HDL cholesterol. Aerobic exercise can reduce triglyceride concentrations by up to 20% and increase HDL cholesterol concentration by 10%. Meanwhile, resistant exercise only decreases TG by 5% without influence on HDL concentration [4].

The results of the research carried out by giving honey and measuring blood cholesterol levels before and after treatment for 14 days, obtained data that the average cholesterol level before being given honey consumption in the intervention group was 233.94 mg / dl. The average cholesterol level after consuming honey was 200.65. This shows a decrease in the average cholesterol level of 33.29 mg / dl. These results indicate that the consumption of honey can reduce blood cholesterol levels in respondents with hypercholesterolemia. Whereas for the control group, the average cholesterol level before (initial observation) was 287.20 mg / dl. The average cholesterol level after (final observation) is 252.40 mg / dl. This shows a decrease in the average cholesterol level of 34.8 mg / dl. These results indicate that without the consumption of honey can also reduce blood cholesterol levels in respondents with hypercholesterolemia. This may be due to factors of food intake, smoking habits, and daily activities.
The results of statistical tests with Wilcoxon test in the intervention group obtained P value of 0.000 <0.05 and in the control group P value of 0.001 > 0.05, therefore Ha was accepted and Ho was rejected. This means that there is a significant difference in decreasing cholesterol levels before and after honey consumption therapy in the intervention and control groups.

Nutrient Content of Honey Per 100 Gram (Energy (cal) 304; Protein (g) 0.3; Carbohydrate (g) 82.3; Fiber (g) 0.1; Vitamin B6 (mg) 0.02; Vitamin C (mg) 1; Vitamin E (mg) 1; Riboflavin (mg) 0.04; Niacin (mg) 0.3; Pantothenic acid (mg) 0.2; Folic acid (mg) 3; Calcium (mg) 5; Phosphorus (mg) 6; Sodium (mg) 5; Potassium (mg) 51; Magnesium (mg) 3; Iron (mg) 0.5; Zinc (mg) 0.1; Copper (mg) 0.2) [11, 12, 13]. In various honey studies there are content of phenolic compounds that are useful to prevent the formation of atherosclerotic plaque which is the main cause of cardiovascular disease. In previous studies phenolic was shown to have the greatest effect on increasing HDL cholesterol levels. Several studies have shown that increasing HDL cholesterol levels can slow the progression of atherosclerotic plaques and can reduce the number of cardiovascular diseases [14, 15, 16].

5. Conclusions

1. Characteristics of respondents: the majority of respondents were aged> 40 years, of 15 people (88.2%) in the intervention group and 15 people (100%) for the control group. Female are 14 people (82.4%) in the intervention group and 13 people (86.7%) in the control group. Working as a housewife is 10 people (58.8%) in the intervention group and 9 people (60%) in the control group.

2. Cholesterol levels before being treated in the intervention group averaged 233.94 mg / dl and the average cholesterol level after treatment was 200.65 mg / dl. While the results of the data before cholesterol levels (initial observation) in the control group the average cholesterol level was 287.20 mg / dl and the average cholesterol level after (final observation) was 252.40 mg / dl.

3. There are significant influence of consumption of honey on decreasing cholesterol levels in hypercholesterolemia patients in Farras Husada Medical Center in Sowan Lor Village, Kedung District, Jepara Regency in 2016 (p = 0.000; α = 0.05).

6. References

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