

RED ROSELLA TEA AND AVOCADO AS SIMVASTATIN THERAPY SUPPORT REDUCE TOTAL CHOLESTEROL

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ABSTRACT

Introduction: Hypercholesterolemia is a condition characterized by high levels of total cholesterol in the blood. Many studies have proven that steeping tea rosella and flesh of an avocado can reduce total cholesterol levels. This study was conducted to determine the effectiveness of therapy companion rosella tea and avocado in lowering total cholesterol levels in hypercholesterolemic clients. **Method:** This type of research is a quasi-experimental study with pre-post test control group design. The population study was a client with hypercholesterolemia in the working area of Menganti health centers. First sample group consisted of nine respondents received the drug Simvastatin 10 mg and rosella tea consumed as much as 2 g 1x/day. The second group consisted of nine respondents received the drug Simvastatin 10 mg and avocado meat weighing 330 grams were consumed 1x/day. The control group consisted of 11 respondents have a drug Simvastatin 10 mg oral 1x daily at night before bed. All groups examined total cholesterol levels before treatment and after treatment on day 15. **Result:** The results of one-way ANOVA test showed a significant difference between before and after treatment in the first group ($p=0,001$) and the second group ($p= 0,005$), and there is no significant difference before and after treatment in the control group ($p= 0,248$). The difference between the three groups showed $p= 0.025$. **Conclusion:** The conclusion of this study is giving rosella tea, and avocado has the same effectiveness in lowering total cholesterol levels so that health workers can suggest the use of rosella tea and avocado as a companion therapy to reduce total cholesterol level.

Keywords: Hypercholesterolemia, Rosella tea, avocado, simvastatin

INTRODUCTION

Progress in the field of health and technology utilized by the community at present. Health is very expensive, so for those who are trying to maintain good healthy and for the sick seeking treatment are not harmful to him. One of them with an effort to make the treatment go back to nature. The wider community is now beginning to switch from modern medicine (medical) into complementary medicine, even though modern medicine is also very popular among the people discussed. Non-conventional intervention is one of the alternatives or complementary medical interventions. Intervention complementary (complementary therapies) are all interventions used as an adjunct to conventional interventions recommended by the implementation of individual health services. According to the Health Profile of Indonesia in 2008, the national population morbidity rate is 33.24% of the total is 65.59% chose their treatment using modern and traditional medicine, the remaining 34.41% choose outpatient treatment to health centers, physician practices or to other medical facilities. This shows public

interest in traditional medicine is quite high (Kiki 2013).

In connection with this traditional medicine governments to establish policies and laws that regulate complementary medicine among them is Law No. 36 of 2009 on Health Article 1 para 16 Healthcare is the traditional treatment or treatment in a manner and drugs that draws on the experience and skills of hereditary empirically accountable and applied in accordance with the norms prevailing in the community, Regulation of the Minister of Health, No: 1076/Menkes/SK/2003 on traditional medicine, and the Regulation of the Minister of Health, No: 1109/Menkes/Per/IX/2007 on the implementation of complementary-alternative medicine in health care facilities.

At the policy and legislation, one health worker role is a nurse. Nurses participate in the effort to develop complementary medicine through research. According to the Health Profile of Indonesia in 2008, the national population morbidity rate is 33.24% of the total is 65.59% chose their treatment using modern and traditional medicine, the remaining 34.41% choose outpatient treatment to health centers, physician practices or to

other medical facilities. This shows public interest in traditional medicine is quite high (Kiki, 2013). The use of complementary interventions is also used for clients who have problems with cholesterol levels in the blood. Cholesterol is a fatty substance found in every cell of our bodies (Bull, E.& Morrell 2007).

Today many people are trying to use alternative treatments, such as with roselle tea consumption of plant *Hibiscus sabdariffa* and consume the flesh of an avocado. Both of these materials as an alternative option because both contain the active ingredient which has a benefit when consumed it regularly through the regulatory processes in the body can lower total blood cholesterol, triglycerides, LDL and HDL may increase.

Efforts to reduce cholesterol levels are necessary to remember the first Hypercholesterolemia can occur at the age of 50 years and over. But now, research in 2004 by the National Heart, Lung and Blood Institute showed that 9.3% of hypercholesterolemia occurs at a young age i.e., 25-34. Not surprisingly, the National Heart, Lung and Blood Institute in the United States advocated for routine check cholesterol levels sometime after the age of 20 years, the goal estimates the risk of heart disease. WHO reported in February 2012 and that the number of clients of heart disease in developing countries like Indonesia will increase by 137% in 2020, whereas in developed countries is only 48%. Research and Development of the Ministry of Health stated that the percentage of deaths from cardiovascular disease increased from 5.9% (2004) to 9.1% (2007) and 19.0% (2011). Hypercholesterolemia is also a risk factor for the cause of death at a young age, as reported by the World Health Organization (WHO) in 2002, there were 4.4 million deaths due to CHD are due to hypercholesterolemia or 7.9% of the total number of deaths at a young age (Yulinda 2015).

Based on these issues, the case needs to be handled hypercholesterolemia effectively. Efforts to reduce hypercholesterolemia, in addition to the provision of treatment with cholesterol-lowering drugs may be accompanied by efforts to alternatives to the use of herbs. Research on granting steeping red rosella flower petals already been done to lower blood cholesterol levels as well as the flesh of an avocado. It's just that until now has never been any studies to determine the

effectiveness of the comparison between the tea Rosella flower petals dried red and fresh Avocados in a decrease in total cholesterol levels for clients hypercholesterolemia. Therefore, researchers wanted to examine the comparative effectiveness of tea Rosella with Avocado fruit in a decrease in total cholesterol levels in hypercholesterolemic clients.

METHOD

The design of this research is a quasi-experimental pre-posttest control group design. The treatment group consisted of group 1 who were given intervention of rosella tea and simvastatin, group 2 given the flesh of avocado and simvastatin, while the control group was group 3 which only given simvastatin.

The population in this study were all clients of hypercholesterolemia in Puskesmas Menganti Gresik. The sample in this study is part of hypercholesterolemia existing clients in Puskesmas Menganti Gresik. Sample inclusion criteria were aged 25-50 years, men and women with total cholesterol levels ≥ 200 mg/dl, can read and write. Exclusion criteria samples are client hypercholesterolemia with concomitant diseases such as stroke or cardiovascular disease, liver disease, diabetes mellitus, thyroid, gastritis, client hypercholesterolemia who have low blood pressure (hypotension), clients who are allergic rosella tea or avocado.

The tools used in this research are: questionnaire, observation sheets, food recall, scales for weighing cake dried rosella petals weighing 2 grams of avocado flesh and weighing 330 grams, the tool checks the blood cholesterol level is 100. Biolizer research material is dried petal tea red rosella obtained from PT Dita renowned, bacon avocado butter types derived from avocado farmers in Lumajang, and venous blood specimen taken from the respondents.

Rosella flower petals dried red and the flesh of an avocado is ripe given to the treatment group. Dried flower petals red rosella weighed weighing 2 grams are packed in small plastic wrap number 14 and a teaspoon of sugar are packaged in a small plastic wrap and some 14 drug simvastatin 10 mg was given to each of the respondents in the treatment group 1. Meat Avocado ripe weighed weighing 330 grams for one-time consumption given once daily for 14 days as well as drug

Simvastatin 10 mg were given to each respondent in the treatment group 2. in the control group given the drug Simvastatin 10 mg taken once daily consumed at night before bed.

At the end of the study, after the intervention for 14 days in the treatment group 1, 2, and control groups were then carried back to the measurement of blood cholesterol levels at day 15. The respondents in the evening before the examination is recommended to fast for at least 8 hours. Respondents to the clinic the next morning to do blood tests in the laboratory clinic. The results included in the observation sheet The collected data normality test. In the treatment group, 1 and 2 tested using the Shapiro-Wilk normality. In the treatment group 1 and 2 to analyze the decrease in total cholesterol levels using a paired t test. Based on the analysis using SPSS, the research data in the control group are not normally distributed, then the appropriate test is Wilcoxon. In the treatment group 1, 2 and control after the completion of the normality test are then performed statistical tests as follows:

1. Univariate analysis

Univariate analysis performed to obtain descriptive characteristics of each of the variables studied included demographic data as well as confounding variables. All demographic data described by the value of the number and percentage of each group then presented using tables and interpreted.

2. Analysis Bivariat

The bivariate analysis was performed on two variables to determine the relationship or not. Among the independent variables with the dependent variable characteristics of respondents in total cholesterol levels by the

statistical test. Data in the form of nominal (gender, occupation, food recall, physical activity/exercise, and smoking was analyzed using contingency coefficient. Data education, long-suffering, body mass index (BMI) were analyzed using a categorical form spearman`s correlation test. Age Pearson statistical test.

The test that used to compare the two data before and after treatment for each group In the treatment group was paired T-test. ANOVA test was used to compare the decline in total cholesterol levels between treatment groups 1, 2 and the control group.

RESULTS

The test results of normality with Shapiro-Wilk test showed the treatment group 1 and 2 normal distribution of data so as to compare data before and after treatment using paired T-test. In control group, data is not normally distributed so as to compare data before and after taking the drug using the Wilcoxon test. The test results of a test of homogeneity of variances, the three groups have the data shows the same variant as the value of $p = 0,404$ or $p > 0.05$. A further test is used Bonferroni test.

The results of paired t-test show that blood cholesterol levels of hypercholesterolemic client decreased significantly, This is evidenced by the value of significance $p=0,001$ or $p < 0,05$ (table 1). Show that in group 2, the results if the test statistic Paired T-Test many reduce cholesterol levels of the total significant to client hypercholesterolemia who gets avocado meat and Simvastatin medicine. This is evidenced by the value of significance $p=0,005$ or $p < 0,05$ (table 2).

Table 1. Average total blood cholesterol levels before and after treatment in group 1

Group 1	Number f %	Total Cholesterol Levels (mg/dl)± Standart Deviation	pValue
<i>Pre-Test</i>	8 100	258,4 ± 31,464	0,001
<i>Post-Test</i>	8 100	193,9 ± 34,893	

Table 2. Average total blood cholesterol levels before and after treatment in group 2

Group 2	Number f %	Total Cholesterol Levels (mg/dl)± Standart Deviation	p-Value
<i>Pre-Test</i>	9 100	252 ± 31,941	0,005
<i>Post-Test</i>	9 100	179,3 ± 49,922	

Table 3. Average total blood cholesterol levels before and after treatment in control group

Group 3	Number f %	Total Cholesterol Levels (mg/dl)± Standart Deviation	p-Value
<i>Pre-Test</i>	11	221,5 ±13,779	0,248
<i>Post-Test</i>	11	205,5 ± 46,025	

Table 4 Effectiveness between treatment groups 1, 2, and control

Group	Mean ± Standart Deviation	p-Value
P1 (n=8)	64,50 ± 34,978	0,025
P2 (n=9)	72,67 ± 55,996	
K (n=11)	16,00 ± 46,052	

Information:

P1 = Group 1, Rosella tea by steeping 2 gr/hr and drug Simvastatin 10 mg

P2 = Group 2, given flesh of an avocado 330 gr/hr and drug Simvastatin 10 mg

K = The control group, given the drug Simvastatin 10 mg

The result of control group shows that giving only simvastatin medicine to a client with hypercholesterolemia reduce total blood cholesterol but not significant ($p=0,248$ or $p>0,05$) (table 3).

Table 4 showed ANOVA test result in a significant difference between first group, two group and the control group with $p=0,025$.

DISCUSSION

Results of research can be seen in the treatment group 1 and 2 found a significant decrease in total cholesterol levels between pre-test and post-test. This suggests that the companion therapy rosella tea and bacon avocado effective in lowering total cholesterol levels in clients with hypercholesterolemia. The results of the study in the control group there was no decrease in total cholesterol levels were significantly in hypercholesterolemic clients who received the drug Simvastatin. The results showed that when seen from the difference between each group, the treatment group 2, has the greatest difference is 72.6 mg/dl, it is supported by the results of ANOVA test showed no significant difference between treatment groups 1, 2 treatment and control groups.

The role of Rosella flower petals itself is as anti-cholesterol due to the effect of antioxidant compounds contained by rosella flower petals are flavonoids and polyphenols can reduce fat deposits (LDL) in the blood vessels (Mardiyah; Sarwani; Ashadi; Rahayu 2009). Flavonoids are one of the antioxidants and can capture free radicals. Flavonoids stabilize free radicals by lowering the energy activity and further inhibit the oxidation of

LDL. Inhibition of oxidation of LDL cholesterol levels decreased. Substance anthocyanins can lower lipid profile, namely, cholesterol, triglycerides, and blood LDL cholesterol and raise HDL cholesterol levels. Also, the content of niacin in Rosella can degrade back triglycine (Totong 1993) ride synthesis. Niacin can also affect the activity of the enzyme lipoprotein lipase resulting in decreased production of LDL in the liver resulting in a decrease in total cholesterol, LDL, and triglycerides. Niacin can increase HDL. Rosella also contains vitamin C can reduce the absorption of triglycerides by acting as a laxative (Sotyaningtyas 2007), Vitamin C is in addition to reduce the absorption of triglycerides also plays an important role in the breakdown of cholesterol in the body.

In the treatment group, 2 showed that administration of the drug Simvastatin and flesh of an avocado could cause a decrease in total cholesterol levels. The results are consistent with results of previous studies (Setiawan 2015) which states Ethanol Extract Fruit Avocados can lower total cholesterol levels in male Wistar rats. Other research supports is research Anggraheny (2007) which states that the provision of avocado juice led to a decrease in total cholesterol levels were significant at all doses compared to the control group. The results of the study (Usman 2013) shows that there are differences in the average decrease cholesterol levels in the intervention group and the control group.

All three previous studies avocado flesh before being given processed first, there is presented in the form of juice or extracted. In this study conducted avocado meat supplied directly without being processed first. So that

the dose is given appropriate without an addition of other materials such as water when making juice. It also allows individuals to consume and retain the active ingredients contained therein to stay awake. According to (Sediatama, A. 2000) flesh of an avocado contains 72.2% Omega-9 oleic acid which is a phytochemical that demonstrate the ability to affect the availability of blood plasma cholesterol. Meat avocado also contains 90% unsaturated fatty acids which have a complex function that is as bioregulator endogenous, structural function, namely water barrier on the skin, nerve tissue as nerve stimulation conducting material, the cell membrane as signal transduction. Regulatory functions, including gene expression, growth factors, moisture membrane and the formation of eicosanoids. Also, the fruit flesh avocado contains beta-sitosterol which phytochemical compounds that serve to normalize blood levels of LDL, triglycerides and total blood fats.

According to Budiana, N.S. (2013) of approximately 90% content of fat in avocados is that 80% in the form of oleic acid, a monounsaturated fat which beneficial for health. The advantages include lowering LDL, total cholesterol, and triglycerides and stabilize blood sugar levels. Fiber and monounsaturated fatty acids along with vitamin C, E and glutathione, may protect arteries from damage due to deposition of LDL. The content of beta-sitosterol can reduce the absorption of cholesterol in the intestine. In the control group, there was no decrease in total cholesterol levels were significantly in hypercholesterolemic clients who received the drug simvastatin alone. Simvastatin is a drug indicated for lowering cholesterol on clients who have hypercholesterolemia. Simvastatin drugs are chemical modifications of the compounds produced by fungi. These drugs included in the HMG-CoA reductase inhibitors that may inhibit the formation of cellular cholesterol and causes a decrease in serum cholesterol and serum LDL, with a slight increase or no change in the levels of LDL (Karch 2010).

Performance Simvastatin drugs are cholesterol-forming enzyme thus inhibiting cholesterol levels in the blood is reduced. The effectiveness of these drugs would be even better when accompanied by the application of

a healthy lifestyle such as exercise regularly and stay away from greasy foods.

CONCLUSIONS

Based on the results of the study showed that there are a significant decreases in total cholesterol levels before and after receiving treatment both of the rosella tea with Simvastatin medicine and avocado meat with Simvastatin medicine on hypercholesterolemia clients. There was a significant difference between three groups in reduction of total cholesterol in hypercholesterolemia clients. In conclusion, if they are only consuming Simvastatin medicine like in a group of controlled, without consuming Rosella tea or Avocado meat, the decreasing of total cholesterol in hypercholesterolemia patient is not too good or giving the non-significant result.

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