THE EFFECT OF ALLIUM CEPA ON BLOOD GLUCOSE LEVELS FOR DIABETES MELLITUS TYPE II IN PUSKESMAS KOTO KATIK KOTA PADANG PANJANG

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ABSTRACT

According to WHO, Diabetes Mellitus is the most common disease in the world with a prevalence of 35% in 2025. The IDF predicts that Indonesia will rank sixth with 12 million sufferers in 2030. Indonesia is ranked fourth in the world after the United States, India. and China in 2018. Sumatera Barat with a rate of 1.5%, Kota Padang Panjang 6.5% and Koto Katik with 288 DM patients. Treatment carried out in DM patients with pharmacological and non-pharmacological therapies. Allium cepa are an alternative management for controlling blood glucose levels because they contain hypoglycemic peptides which can reduce blood glucose levels. This study aims to determine the effect of shallot on the blood glucose levels of people with Type II diabetes.This study used a pre-experimental design with the static group comparison design in the Puskesmas Koto Katik, Padang Panjang City. The population was 263 people with Type II diabetes mellitus, and the sample was taken using purposive sampling technique of 20 people. The was collection technique was done by measuring blood glucose levels in the control group and the intervention group using glucose cholesterol uric acid (GCU). The was analysis was in the form of univariate analysis which included the mean blood glucose levels in the control and intervention groups, while the bivariate analysis used the independent t-test at the level of significance of 95% ($P \leq 0.05$).The results showed that the mean blood glucose level in the control group was 338.73 mg/dl with a standard deviation of 66.791 and in the intervention group was 261.91 mg / dl with a standard deviation of 88.033. The bivariate test results obtained a P value of 0.032 (<0.05), which means that onions have an effect on blood glucose levels.The results of this study showed the effect of giving onions on the blood glucose levels of type II DM patients. For health center officers to improve the DM control programs, namely providing independent intervention to patients, and one of them by consuming shallots to reduce blood glucose levels.

Keyword: Diabetes Millitus, Blood Glucose, Allium Cepa

INTRODUCTION

Diabetes Mellitus (DM) is a category of non-communicable disease (PTM) which is a public health problem, both globally, regionally, nationally and locally. DM is a type of metabolic disease that is always increasing every year in countries around the world. Diabetes is a series of chronic metabolic disorders due to the pancreas not producing enough insulin, resulting in absolute or relative insulin deficiency, resulting in an increase in glucose concentrations in the blood (Infodatin, 2014; Sarwono, et al, 2007).

There are two types of diabetes mellitus, namely diabetes mellitus type I (insulin-dependent diabetes mellitus) and diabetes mellitus type II (non-insulin-dependent diabetes

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mellitus). Type I diabetes or insulin-dependent DM is caused by a lack of insulin in the blood that occurs due to damage to the beta cells of the pancreas. The prominent symptom is frequent urination (especially at night), frequent hunger and thirst. Most people with this type of DM are normal weight or thin. Usually occurs at a young age and requires insulin for life.

DM type II or what is called insulin-independent diabetes is caused by the existing insulin cannot work properly, insulin levels can be normal, low or even increased, but the function of insulin for glucose metabolism is absent / lacking. As a result, glucose in the blood remains high resulting in hyperglycemia, 75% of people with type II diabetes are obese or overweight and usually have diabetes after 30 years of age. Diabetes mellitus type II is more common and covers 90% of all diabetes cases worldwide (Maulana, 2009).

According to WHO in 2011, diabetes mellitus is one of the most common diseases affecting the population worldwide and is the 2nd to fourth of the national research priorities for degenerative diseases. The prevalence of Diabetes Mellitus in the adult population worldwide is estimated to increase by 35% in two decades and affect 300 million adults by 2025. The largest share of this increase in prevalence will occur in developing countries (Gibney, 2009).

Based on statistical trends over the last 10 years, the IDF (International Diabetes Federation) predicts that Indonesia will be ranked sixth with the number of sufferers reaching 12 million in 2030 (IDF, 2011). The increasing number

of people with diabetes is 90% to 95% diabetes mellitus type II. Diabetes mellitus type II occurs due to decreased sensitivity to insulin or due to impaired insulin secretion (Smeltzer & Bare, 2013).

Based on was obtained by the International Diabetes Federation (IDF), the global prevalence rate of DM sufferers in 2013 was 382 cases and it is estimated that in 2035 it will increase to 55% (592 cases) among people with DM 40-59 years (International Diabetes Federation, 2013). This high number makes Indonesia the fourth largest number of DM patients in the world after the United States, India and China (Suyono, 2006).

Riskesdas was, states that the national prevalence of diabetes mellitus in 2013 which occurs at all ages is 1.5%. Whereas in 2018 there was an increase in the prevalence of the population suffering from diabetes mellitus, namely 2%. Referring to the national prevalence, in 2018 West Sumatra had a total prevalence of DM of 1.5%, where West Sumatra was ranked 21 out of 34 provinces in Indonesia. Based on age, many sufferers are in the age range 55-64 years with a prevalence of 6.3% (Kemenkes RI, 2018).

The incidence of Diabetes Mellitus in the City of Padang Panjang in 2018 was 2118 or around 6.5%. The highest number of cases based on the number of visits to the Puskesmas was in the working area of the Bukit Surungan Public Health Center, amounting to 977 cases with a fairly large area, while the Koto Katik Puskesmas working area with an area that was not too large was in the third place with the highest incidence of Diabetes Mellitus, amounting to 288 cases.

consisting of 25 cases of Type I DM and 263 DM Type II (Puskesmas Profile Was at Koto Katik, 2018).

Uncontrolled diabetes refers to glucose levels that exceed target limits and result in immediate short-term effects (dehydration, weight loss, blurred vision, hunger) and long-term (micro and macro vascular damage (Mikail, 2012).

According to PERKENI (2006), there are many factors that influence the incidence of Type 2 Diabetes Mellitus, including family history of diabetes, age, history of low birth weight (<2.5 kg). Meanwhile, factors that increase the risk of Diabetes Mellitus are overweight, lack of physical activity or lifestyle, diet, hypertension, dyslipidemia, unhealthy diet and stress. In type-II DM patients are generally obese and the process is more influenced by the environment such as lifestyle and diet. This is because the target cells (muscle and body fat) which are supposed to take in sugar in the presence of insulin, do not respond normally to insulin. This type of diabetes is often without complaints, and if there are symptoms it is lighter than type-I diabetes mellitus (Soegondo, et al, 2005; Hartono, 1995).

Management given to DM patients can be done with pharmacological and non-pharmacological therapies. Non pharmacological management can be done by adjusting the diet, exercise and consuming herbal ingredients. Meanwhile, pharmacological management can be in the form of oral hypoglycemic drugs or antihyperglycemic agents and insulin, but this management has undesirable side effects such as swelling in the peripheral areas. This reason has led to increased interest in DM sufferers in using non-pharmacological therapies using natural ingredients derived from plants such as shallots as an alternative management for controlling blood glucose levels (Wulandari, 2010).

Shallots are a plant that is believed to have the ability to control blood glukose levels. In some countries such as Europe, Asia and the Middle East consuming raw shallots is a good habit. Raw shallots have long been known as a traditional medicine to control blood glucose and cholesterol levels (Maulana, 2009).

Several studies that have been done show that in onions there are peptide compounds that are hypoglycemic, which can reduce blood sugar levels. These chemical compounds can pharmacologically help the pancreas produce insulin. Thus the process of metabolizing glucose into glycogen can be better so that the dissolved glucose in the blood will be reduced (Jaelani, 2007).

The results of research conducted by Hidayat S. A & Chilyatiz, Z (2017), using the Wilcoxon signed ranks test showed that red onions were able to reduce blood glucose levels of 14 respondents with an average blood glucose level before and after being given shallots of 278 , 93 mg / dl and 251.64 mg / dl with a significant level of p = 0.001 <α.

The results of Wahdania's (2012) study using the Quasi-experimental method, the results showed that there was a decrease in blood glucose levels in 6 respondents (60%) by 5-50 mg / dl, an increase in blood sugar levels in 2 respondents (20%) by 2 -8 mg / dl

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and there was no change in blood glucose levels in 2 respondents (20%) after being given shallots for 2 weeks with a significance value of p = 0.080 (p> 0.05).

Based on the results of a preliminary study conducted by researchers at the Puskesmas Koto Katik in November 2018, it was found that the number of type II DM patients was higher than type I DM, namely there were 263 patients with type II DM and 25 type I DM patients. Almost 85% of all Patients with Type II diabetes regularly consume drugs to lower their blood glucose levels.

The results of interviews with 10 people with Type II DM, 6 of whom said that they consumed pharmacological drugs obtained from the Puskesmas such as Metformin 500 mg and Glibenclamide 500 mg with a drinking dose 2 times a day but there was swelling in the legs, the patient also said that he was tired of drinking medicine obtained from the health center so that DM sufferers switch to traditional medicines such as mangosteen peel and melur while 4 other sufferers have consumed mangosteen peel to lower blood glucose, 10 DM sufferers also said they had never tried using red onions because so far they had not know if onion is one of the traditional medicines that can reduce blood glucose levels, so that DM sufferers tend to consume more fruit and mangosteen peel.

Based on the above background, researchers have conducted research on the effect of giving onions on the blood glucose levels of Type II Diabetes Mellitus sufferers in the Puskesmas Koto Katik.

MATERIAL AND METHODS

This research was conducted using a pre-experimental design with the design of The Static Group Comparison. namely sample A was given treatment and sample B was not given treatment, both were not carried out pre-test but carried out by post-test then observed and carried out repeatedly after that the results were compared (Wasis, 2008). With the following design forms:.

Group	Pre-test	Intervensi	Post-test
Eksperimen	-	P	01
Kontrol	-	-	02

Research design

Information:
P   : Intervention (Allium Cepa)
01   : Measurement of blood glucose levels in the intervention group after being given shallots
02   : Measurement of blood glucose levels in the control group

The research was conducted in the Koto Katik Puskesmas, Padang Panjang City from July to August 2019. The population in this study were people with Type II diabetes who were in the Koto Katik Puskesmas, totaling 263 people, the type of sampling used purposive sampling technique. estimated at 20 people. Reserves for research are 10% of the 20 respondents, namely 2 backup respondents according to inclusion and exclusion criteria.

Was collection techniques, namely primary data and secondary data, were directly carried out by measuring blood glucose levels in the control group and the

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intervention group using Glucose Cholesterol Uric Acid (GCU) in accordance with research ethics.

Was were analyzed with a computerized system and displayed in a form of univariate analysis which included the average blood sugar levels of the control and intervention groups, and bivariate analysis using the Independent t-test at the level of significance of 95% (P $\leq$ 0.05).

RESULTS
A. Analisa Univariat

The average result of the respondent's blood glucose level in the control group in the Puskesmas Koto Katik was 338.73 mg / dl with a standard deviation of 66.791, a minimum value of 235 mg / dl and a maximum value of 479 mg / dl and

DISCUSSION

A. Analisa Univariat
Blood glucose levels in the control group in people with Diabetes Mellitus Type II

Based on the results of research conducted by researchers, it was found that the average blood glucose level of respondents in the control group in the Puskesmas Koto Katik Community was 338.73 mg / dl with a range between 235 mg / dl to 479 mg / dl.

The results of the study were supported by Hidayat S. A & Chilyatiz, Z (2017), showing that allium cepa were able to reduce blood glucose levels of 14 respondents with an average blood glucose level before and after being given shallots of 278.93 mg / dl and 251 , 64 mg / dl.

The results of this study are in line with the theory of Bilou

the average result of blood glucose levels respondents in the intervention group after being given shallots in the Puskesmas Koto Katik were 261.91 mg / dl with a standard deviation of 88.033, a minimum value of 180 mg / dl and a maximum value of 473 mg / dl.

B. Analisa Bivariat

Hypothesis test results showed the effect of shallots on the respondent's blood glocose levels with a difference in the mean value of 76.818 mg / dl, the difference in the standard error value was 33.318 mg / dl. Based on statistical tests using the independent t test, it was found that the p value = 0.032 (<0.05), which means that there is an effect of allium cepa on blood glucose levels of type II diabetes mellitus patients

(2003) which states that a family history of DM will give a high probability of developing diabetes mellitus. Heredity is a very important factor in the occurrence of DM. If one family member suffers from DM then the others must also suffer from DM.

According to Maulana (2009) DM type II or what is called DM that is not dependent on insulin is caused by the existing insulin cannot work properly, insulin levels can be normal, low or even increased but the function of insulin for glucose metabolism is not / less. As a result, glucose in the blood remains high, causing hyperglycemia, 75% of people with type II diabetes are obese or overweight and usually have diabetes after 30 years of age. Diabetes mellitus type II is more common and covers 90% of all diabetes cases worldwide. Maulana (2009) also stated that those who are

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above normal body weight have a lot of fat reserves.

Researchers assume that high blood sugar levels in respondents are due to the respondent's unhealthy and irregular diet and lifestyle so that blood sugar levels cannot be controlled, and most of the respondents' ages are in the old adult age group (> 45 years). in the elderly phase, the body no longer moves as actively as the productive age. With increasing age, biological function will decrease due to the aging process so that many diseases attack in old age. In the elderly, body movements tend to be passive, even the elderly are often lazy to move, this is what accelerates the occurrence of type II diabetes.

Blood glucose levels in the intervention group after giving shallots to people with Type II Diabetes Mellitus. Based on the results of research conducted by researchers, it was found that the average blood sugar level of respondents in the intervention group after being given shallots in the Puskesmas Koto Katik Community was 261.91 mg / dl with a range between 180 mg / dl to 473 mg / dl.

The results of the study are in line with research conducted by Wahdania (2012), in her research it was found that there was a decrease in blood sugar levels in 6 respondents as much as 5-50 mg / dl after being given shallots with an average value of 168,600 mg / dl.

According to Purwanti, A & Haidar, H (2014) onions contain peptides which are very useful for reducing blood glucose levels, so that with allium cepa we can treat diabetes or diabetes. The peptides in allium cepa by experts are made into

diabetes drugs. Allium cepa have a high antioxidant content and are rich in vitamins and other substances such as phosphorus, zinc, and other beneficial substances for the body. The well-known properties of allium cepa are as a lowering of blood pressure, blood glucose and cholesterol.

Researchers assume that blood glucose levels in the intervention group are proven to have decreased where the average blood glucose before consumption of shallots is 301 mg / dl after the respondent consumes allium cepa, blood glucose has decreased by an average of 261.91 mg / dl. This is due to the presence of substances in onions that can reduce blood glucose levels in the body, namely peptides and flavonoids. This compound works as an antioxidant and stimulates the activity of pancreatic beta cells to produce more insulin so that it can work more effectively in bringing glucose into cells and making it a source of energy for carrying out daily activities. In addition, respondents can also adjust a healthy diet and lifestyle so that blood glucose can be controlled.

B. Analisa Bivariat
The Effect of Giving Shallots on Blood Glucose Levels of Type II Diabetes Mellitus Patients

Based on the results of research conducted by researchers, the mean difference in blood glucose levels was 76.818 mg / dl. Based on statistical tests using the independent t test, it was found that the p value = 0.032 (<0.05), which indicates that there is an effect of allium cepa on blood glucose levels of type II diabetes mellitus patients in the Puskesmas Koto Katik.

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The results of this study are in line with research conducted by Hidayat S. A & Chilyatiz, Z (2017), using the Wilcoxon signed ranks test showing that allium cepa can reduce blood glucose levels of 14 respondents with an average blood glucose level before and after. given shallots of 278.93 mg / dl and 251.64 mg / dl with a significant level of p = 0.001 <α.

The results of the same study conducted by Wahdania (2012) using the Quasi-experimental method, the results showed that there was a decrease in blood glucose levels in 6 respondents (60%) by 5-50 mg / dl, an increase in blood glucose levels in 2 respondents (20 %) as much as 2-8 mg / dl and there was no change in blood glucose levels in 2 respondents (20%) after being given shallots for 2 weeks with a significance value of p = 0.080 (p> 0.05).

This is also supported by the theory of Maulana (2009) which states that allium cepa are a plant that is believed to have the ability to control blood glucose levels. In some countries such as Europe, Asia and the Middle East consuming raw shallots is a good habit. Raw shallots have long been known as a traditional medicine to control blood glucose and cholesterol levels.

Non pharmacological management can be done by adjusting the diet, exercise and consuming herbal ingredients. Meanwhile, pharmacological management can be in the form of oral hypoglycemic drugs or antihyperglycemic agents and insulin, but this management has undesirable side effects such as swelling in the peripheral areas. This reason has led to increased public interest, especially DM sufferers in using non-pharmacological therapies using natural ingredients derived from plants such as shallots as an alternative management for controlling blood glucose levels (Wulandari, 2010).

According to the researchers' assumptions, there are differences in blood glucose levels in diabetes mellitus sufferers after respondents consume allium cepa due to the presence of peptide and flavanoid compounds in allium cepa which can reduce blood glucose levels in diabetes mellitus sufferers. Based on the research that has been done, there is a significant decrease in respondents who consume shallots with an average difference of 76.818 mg / dl.

Another factor that plays an important role is the activities and exercise carried out by the respondents, because by exercising it can burn fat in the body so that if someone does exercise regularly, they will have controlled blood glucose levels. In this study, there were also respondents who experienced a decrease in blood glucose levels which was not too significant, this was evidenced by the fact that the respondents only reduced the portion of eating rice while the habit of consuming snacks was also frequent, such as snacking. This is what causes blood glucose levels to always remain and even if there is a decrease it is not too different from before.

Public awareness is needed and the important role of health workers in overcoming this DM problem because Diabetes mellitus if not managed properly can lead to various chronic diseases, such as cerebrovascular disease, coronary

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heart disease, leg vascular disease, eye, kidney, and nerve diseases. . If blood glucose levels can always be controlled properly, it is hoped that all these chronic diseases can be prevented, or at least inhibited.

CONCLUSION

The average blood glucose level of the control group in people with Type II Diabetes Mellitus in the Puskesmas Koto Katik was 338.73 mg / dl with a minimum value range of 235 mg / dl and a maximum value of 479 mg / dl. The average blood glucose level of the intervention group after giving shallots to Type II Diabetes Mellitus sufferers in the Puskesmas Koto Katik was 261.91 mg / dl with a minimum value range of 180 mg / dl and a maximum value of 473 mg / dl. The effect of the provision of shallots on the blood glucose levels of Type II Diabetes Mellitus sufferers in the Puskesmas Koto Katik Community with the results of statistical tests using the t independent test, the p value was 0.032 (<0.05), which means that there was a significant effect.

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