THE EFFECT OF CINNAMON POWDER ON THE REDUCTION FAST BLOOD GLUCOSE LEVELS DIABETES MELLITUS TYPE II OF WORKING AREA PUBLIC HEALTH CENTER TIBAWA IN GORONTALO DISTRICT

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ABSTRACT

Diabetes mellitus if not handled properly, it can lead to various kinds of complications. One therapy that is quite effective is herbal drug therapy because herbal drug therapy has low side effects and is easily accessible to the public. This study aims to determine the effect of giving cinnamon for 14 days on fasting blood glucose (GDP) levels of type II diabetes mellitus patients in the work area of the Tibawa Health Center. The design of this study was a quasi-experimental with pretest posttest with control group. The sample is 32 people from 183 diabetes mellitus patients in the work area of the Tibawa Public Health Center. The sample was divided into 2 study groups, namely education and administration of cinnamon (the case group) and the group that was given education only (control group). This study used a paired sample test to determine the magnitude of the change in each group and an unpaired sample test to determine the difference between the two groups. The results showed that there was no significant difference in fasting blood glucose levels in the two groups before and after the cinnamon intervention (p=0.832), however, there was a significant decrease in GDP levels in the case group (p=0.000) and the control group (p=0.006). Consumption of cinnamon powder at a dose of 6 grams for 14 days can reduce fasting blood glucose levels. It is recommended that you can consume cinnamon to reduce blood glucose levels in patients with type II diabetes.

Keywords: DM Management, Type II Diabetes Mellitus, Fasting Blood Glucose, Cinnamon, Cinnamomum Zeylanicum

I. INTRODUCTION

Diabetes mellitus (DM) is commonly known as diabetes. Diabetes mellitus is a disease in which the level of glucose (simple sugar) in the blood is high because the body cannot release or use insulin adequately [1]. According to the International Diabetic Federation (IDF) there are 415 million people with diabetes and the percentage of adults with diabetes is 8.5%, which means 1 in 11 adults has diabetes. In Indonesia alone the prevalence of diabetes mellitus based on RISKESDAS (Basic Health Research) according to doctor's diagnosis and symptoms in 2007 was 1.1%, in 2013 there was an increase of 1.5% and in 2018 there was an increase of 2% with an estimate of around 14 million people with diabetes mellitus. diabetes.

The management of patients with diabetes mellitus is also known as the 4 important pillars in controlling the course of the disease and complications. The four pillars are education, nutritional therapy, physical activity and pharmacology [2].

Management of diabetes mellitus includes the use of modern antidiabetic drugs, but anti-diabetic drugs are expensive. One therapy that is quite effective is herbal drug therapy because herbal drug therapy has low side effects and is easily accessible to most of the population. Cinnamon is one of the many herbal medicines used to...
treat DM and is even very safe for consumption in the long term if managed in a hygienic way. This cinnamon has two main varieties, Cinnamomum cassia (also known as Cinnamomum aromaticum) and Cinnamomum zeylanicum [3].

The use of cinnamon to have an impact on changes in blood sugar levels is caused by the active component cinnamaldehyde. The insulinotropic effect of cinnamaldehyde has been investigated and is thought to be responsible for the distribution of insulin release [4].

Based on research conducted in California on the effects of cinnamon on blood sugar and fat (blood fat) levels in diabetic patients. In ten studies controlled trials with a total of 543 patients were examined. With a dose of 6g per day administered for a period of 2-4 weeks. (6g is a little more than 2 teaspoons.) The study found there was an average reduction in fasting blood sugar levels of 24.59 mg/dL. The reduction in blood glucose levels ranged from 8.67 mg/dL to 40.52 mg/dL depending on the time and period of the study [5].

This study aims to determine the effect of giving cinnamon powder to decrease blood glucose levels, especially in patients with type 2 diabetes mellitus

II. METHODS

This research was conducted in the work area of the Tibawa Health Center, Gorontalo Regency. This study is a quasi-experimental design with a randomized pretest posttest with control group design. The population in this study were patients with type 2 diabetes mellitus in the work area of the Tibawa Public Health Center, Gorontalo Regency as many as 183 patients. The sample is 32 people from 183 diabetes mellitus patients in the work area of the Tibawa Public Health Center. The sample was divided into 2 study groups, namely education and administration of cinnamon (the case group) and the group that was given education only (control group). With the number of samples each 16 people in 1 group. Primary data were obtained directly from interviews, questionnaires and laboratory results in the form of data on the characteristics of the respondents, data on fasting blood glucose levels and food intake of the respondents. Secondary data were obtained from the family and from other reference sources that support the research. Data processing is carried out using a computer program SPSS. Data analysis used univariate test and bivariate test. Furthermore, the data that has been obtained will be presented in the form of tables and graphs accompanied by narration.

III. RESULTS

<table>
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<th>Variable</th>
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<tr>
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<tr>
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<td>Obesity</td>
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<td>4</td>
<td>12.5</td>
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</table>

Table 1 shows that most of the respondents are in the early elderly age group (46-55 years) (43.8%). All respondents are female (100%) and respondents have elementary education (26%), junior high school (37%) and high school (37%). In addition, almost all respondents have a family history of diabetes mellitus (65.6%). Table 1 also shows the respondent's body mass index which is normal (46.9%), overweight (12.5%) and obese (40.6%).

Table 2. Results of Analysis of Fasting Blood Glucose Levels Before and After Intervention in Both Research Groups
In Table 2 it can be seen that the results of the paired t-test showed a significant difference between the concentration of GDP levels before and after the intervention in all groups, both case and control groups (p > 0.05). Table 2 also shows a decrease in the average concentration of GDP of respondents before and after the intervention in the case group and the control group where in the case group there is a difference of 77.37 ± 52.91 declines, while in the control group there is a decrease in the concentration of GDP before and after the intervention with a difference of 83.37 ± 98.86 mg/dL.

IV. DISCUSSION

This study looked at whether there was an effect of steeping cinnamon powder on fasting blood glucose levels in patients with type two diabetes mellitus. In table 2, based on the paired t test to see the comparison of blood glucose levels in each group before and after the intervention, the results showed a significant difference in the two groups where the p value was 0.000 < 0.05 in the case group while the control group had a p value of 0.006. <0.05 this indicates that there is a significant effect in both groups after being given education. Meanwhile, to see the effect of giving cinnamon, an independent t test was carried out by comparing the magnitude of the decrease in blood glucose levels or the difference in the decrease in fasting blood glucose levels in the two groups. The results showed that there was no significant difference in fasting blood glucose levels in the two groups before and after the cinnamon intervention.

The results of this study are also in accordance with previous research conducted the study was conducted to see the effect of giving cinnamon sticks to fasting blood glucose levels in prediabetes patients [6]. The results showed that there was no significant difference in fasting blood glucose levels in prediabetes patients with p value = 0.506 > 0.05. But there was a decrease in blood glucose levels in each study group.

This insignificant result was due to the effect of increased energy and carbohydrate intake in the case group. Research result showed that carbohydrate intake was the dominant factor related to fasting blood sugar levels [7]. Carbohydrate consumption is positively related to fasting blood glucose levels. Increased total energy consumption will also be a glycemic load that is positively related to fasting blood glucose levels and fasting glucose levels. This is based on research conducted [8]. Uncontrolled blood glucose levels in people who have an energy intake that exceeds their needs can be caused by low insulin hormone receptors on the cell surface which function to help glucose enter cells so that glucose formed from energy sources is unable to reach cells from organs that need it [9].

Insignificant results can also occur due to several factors, one of which is the length of time the respondent has suffered from Diabetes Mellitus, where the case group on average has suffered from diabetes longer than the control group. The longer a person suffers from diabetes mellitus it will result in increased damage to pancreatic cells, desensitization or decrease in glucose receptors in the pancreas gland, and damage to insulin receptors (down regulation) in peripheral tissues [10]. These three things will affect the state of diabetes mellitus. Thus, people who have suffered from diabetes mellitus for a longer time tend to experience resistance to lowering blood glucose levels when undergoing therapy/treatment.

In table 2, it can be seen that the decreasing effect given in consuming cinnamon is not significant, however cinnamon is able to reduce blood glucose levels in the case group where energy intake, carbohydrates in the case group experienced an increase and also the length of illness in the case group was longer. compared to the control group.

In the research conducted that the administration of steeping cinnamon powder (cinnamomum zeylanicum) for 14 days can significantly reduce fasting blood glucose levels in patients with type 2 diabetes mellitus (p<0.001)
There is a difference in GDP before and after administration of cinnamon powder for 7 days of intervention in patients with type 2 diabetes mellitus with a significant value (p<0.000) [12].

Meanwhile, in diabetic rats that had been induced by alloxan and then given cinnamon at a dose of 200 mg/BW, it showed that there was a 5.5% decrease in GDP levels in diabetic rats [13]. Cinnamon can reduce blood glucose levels by increasing insulin activity more than 20 times thanks to the methylhydroxy chalcone polymer contained in cinnamon. This methylhydroxy chalcone polymer will also indirectly increase the sensitivity of insulin [13].

Based on the results of analysis tests regarding the effectiveness of the content of cinnamon on the improvement of the pancreas structure carried out in mice, the results showed that the administration of steeping cinnamon powder at a dose of 0.73 mg/g bw and 1.09 mg/g bw showed that the pancreas structure of mice improved compared to the pancreas control group [14]. The administration of steeped cinnamon powder at a dose of 0.73 mg/g bw and a dose of 1.09 mg/g bw was able to repair the damage to the structure of the pancreas. The improvement in the structure of the pancreas is thought to be due to the presence of the antioxidant cinnamaldehyde in cinnamon powder, which is able to ward off free radicals caused by alloxan exposure. Cinnamaldehyde is a group of polyphenolic compounds that act as antioxidants. The content of flavonoid compounds contained in cinnamon is a group of polyphenols that have the ability to slow down the rate of autoxidation so as to help the regeneration of damaged pancreatic cells [14].

**V. CONCLUSION**

Based on the results of this study, it can be concluded that there is no significant difference in fasting blood glucose levels after consuming cinnamon infusion in the case group but there is a decrease in fasting blood glucose levels after the intervention in the case group. It is recommended for further research to do a variation of the dose of cinnamon and the duration of the intervention to see the effectiveness of cinnamon in reducing fasting blood glucose levels and to test blood glucose levels before and after the intervention using more accurate tests such as the HbA1c test where the test is not influenced by intake. food and can be done at any time without fasting first.

**REFERENCES**


