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The Effect of Green Tea on Blood Pressure Reduction among Hypertension Patients

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Abstract

Background: Blood pressure is an important indicator of the circulatory system. An increase or decrease in blood pressure will affect the balance in the body. Hypertension is a condition when the systolic blood pressure is more than 140 mmHg and the diastolic pressure is more than 90 mmHg. High blood pressure is also called the silent killer because it is a deadly disease. Green tea (Camellia Synesis) contains polyphenols, these compounds can reduce the risk of cardiovascular diseases such as blood cholesterol levels and blood pressure. **Objective**: This study aims to analyze the difference in blood pressure before and after giving green tea to hypertensive patients at the Imelda Hospital in Medan. **Method**: The research method used in this study is the Quasi-Experiment method with a research design using pre-test and post-test one group design. The population of this study was 295 patients or respondents and the sample in this study were 33 patients or respondents. Data were analyzed by Univariate and Bivariate using Wilcoxon test. **Result**: The results showed that the effect of giving green tea on blood pressure was p-value = 0.000 <0.05, which means that there was an effect of giving green tea on blood pressure at Imelda Hospital Medan. **Recommendation**: It is hoped that this research will serve as information for the public to know about the benefits of giving green tea to lowering blood pressure as an alternative to non-pharmacological therapy so that blood pressure remains normal and stable

Keywords: blood pressure, hypertension, green tea

INTRODUCTION

Blood pressure is the force required for blood to flow through blood vessels and circulate throughout the human body, an increase or decrease in blood pressure will affect homeostasis in the arteries, arterioles, capillaries, and venous systems, resulting in continuous blood flow. While hypertension is a condition where the systolic blood pressure is above 140 mmHg and the diastolic pressure is above 90 mmHg (1). Hypertension will become a serious health problem if not controlled. Because the longer the blood pressure on the artery walls can damage many vital organs in the human body (2).

The World Health Organization (WHO) estimates that currently the global prevalence of hypertension is 22% of the total world population. Of the number of sufferers, only less than one-fifth make efforts to control their blood pressure. The African region has the highest prevalence of hypertension at 27%. Southeast Asia is in the 3rd highest position with a prevalence of 25% of the total population. WHO also estimates that 1 in 5 women worldwide have hypertension. This number is greater among the male group, which is 1 in 4 (3).

The results of the 2018 Basic Health Research based on the results of measurements of the population aged 18 years and over, the prevalence of hypertension in Indonesia is 34.1%, while the prevalence of hypertension by province in Indonesia, especially the province of North Sumatra is 29.1%, and the prevalence of hypertension by district/city in the province of North Sumatra in the city of Medan 25.21%, Tebing Tinggi 29.5%, Binjai 29.8%, Karo 45.4%, Deli Serdang 31.3% (4).

Based on the initial survey conducted by researchers, data obtained from the Medical Record of the Imelda General Hospital from December 1, 2021 to May 31, 2022, the number of patients receiving treatment was 295 patients., including 142 male patients and 153 female patients. In hypertension patients from the age of 5-14 years as many as 1 patient, age 15-24 years as many as 6 patients, age 25-44 years as many as 40 patients, age 45-65 years as many as 174 patients, age> 65 years as many as 74 patients.

High blood pressure is called the silent killer, which is a silent killer because it is a deadly disease that does not show typical symptoms. Symptoms are headache, shortness of breath, heart palpitations, fatigue, ringing in the ears (tinnitus), nosebleeds, blurred vision caused by damage to the brain, eyes, heart and kidneys. High blood pressure can affect anyone, young or old (5).

Long term use of antihypertensive drugs can cause Drug Related Problems. Medication Related Problems are unforeseen circumstances that often affect the patient involved, in which the patient's drug therapy may actually or may affect the patient's health, such as non-adherence, drug interactions, and allergies to prescription drugs, and if long-term therapy may result in adverse effects. pharmacological side effects that harm multiple organs (6).

Another alternative is needed that aims to reduce the level of dependence on drugs to be able to maintain the quality of life of hypertensive patients (7). In addition, there are also complementary therapies such as herbal therapy that can be used to treat hypertension using herbal plants such as noni, bay leaf, turmeric, star fruit, onions, and green tea (8).

One of the efforts to lower blood pressure is by giving green tea (Camellia Synesis). Green tea is a type of tea that is not fermented or non-fermented and contains more catechins (one of the flavonoid components), every 100 grams of tea leaves has 17 kJ calories and contains 75-80% water, 16-30% catechins, 20% protein , 4% carbohydrates, 2.5-4.5% caffeine, 27% fiber, and 6% pectin (Luthfi, 2020). Green tea obtained by drying the leaves that are still fresh has several good effects on health, one of which is reduce the risk of cardiovascular diseases such as blood cholesterol levels and blood pressure (9).

Based on research conducted on 44 stage 1 hypertensive women in Irian by consuming green tea and resistance training it affects blood pressure reduction (10). There is also a study which found that after three months the participants consumed green tea significantly reduced systolic and diastolic blood pressure with a p-value <0.01 (11).

Research on women aged > 40 years, after consuming green tea supplementation for 4 weeks found a significant decrease in systolic blood pressure at 24 hours (12). Accordingly, twenty-four studies were also collected showing that green tea significantly lowered systolic blood pressure with a p-value of 0.004 (13). Based on fourteen randomized controlled trials (RCT) studies, the majority of green tea consumption produced a significant effect on systolic and diastolic blood pressure (14).

Tea has the main benefit that comes from the polyphenols contained in it in the body, these compounds help the performance of the enzyme superoxide dismutase (SOD) which functions to get rid of free radicals. As is known, free radicals generated from oxidation processes in the body are harmful to health because they can block blood flow so that it can cause cardiovascular disease (15).

Based on this description, researchers are interested in researching "The Effect of Giving Green Tea on Blood Pressure in Hypertensive Patients at the Imelda Hospital in Medan .

OBJECTIVE

This study aims to analyze the difference in blood pressure before and after giving green tea to blood pressure in hypertensive patients.

METHODS

This study uses a Quasi-Experiment design, with a pre-test and post-test approach to one group design, which is to make comparisons between groups before and after being given treatment. The study population was all hypertensive patients who received outpatient treatment at Imelda Hospital from March to August 2022. The sampling method was purposive sampling carried out with certain considerations (16) with inclusion criteria, namely patients diagnosed with hypertension, systolic pressure > 140 mmHg, and 33 cooperative respondents.

The data collection technique used was a manual sphygmomanometer and a calibrated stethoscope which is a tool for measuring blood pressure. The measurement results are recorded in the observation sheet that has been prepared. The BP measurement scores were divided into three groups: 1) Grade 1 hypertension (BP 140-159 mmHg), 2) Grade 2 hypertension (BP 160-179 mmHg), and 3) Grade 3 hypertension (BP ≥ 180 mmHg).

The intervention was carried out by giving 250 cc of water that had been brewed with green tea. Tea water is drunk 2 times a day, in the morning at 08.00 WIB and in the afternoon after eating at 12.00 WIB for 7 days. Prior to data collection, researchers explain the purpose of the study, procedures, benefits of this research, and also related to informed consent for respondents. Data was collected before and after the intervention, directly measuring the respondent's blood pressure using a sphygmomanometer and a stethoscope. The data analysis used was the p-value<0.05, then Ha is accepted) because the respondent's data were tested for normality with the Shapiro-Wilk test with a p-value of 0.001 or an abnormal distribution.

Ethical consideration

To protect the respondent's human rights, the research was carried out after the researcher obtained the feasibility of the study and received approval from the Ethics Committee of the University of Imelda Medan, Number: 156/LPPM-UIM/V/2022/e.

RESULTS

Table 1. Characteristics of Respondents

Characteristics	Frequency	Percentage (%)
Age		
45-56 years	18	54.5
56-65 years	15	45.5
Gender		
Man	8	24.2
Woman.	25	75.8
Education		
Primary school	6	18.2
Junior High School	9	27.3
Senior High School	18	54.5
Profession		
Entrepreneur	14	42.4
Employee	3	9.1
Laborer	3	9.1
Housewife	13	39.4

Total	33	100

Table 1 shows the results that more than half of the respondents aged 45-56 years were 54.5%, three-quarters were female by 75.8%, more than half had high school education by 54.5%, and almost half were self-employed by 42 .4%.

Table 2. Blood Pressure Distribution of Hypertensive Patients Before Giving Green Tea (n=33)

Blood Pressure	Frequency	Percentage (%)
Normal Height 130-139 mmHg	-	-
Hypertension Grade 1. 140-159 mmHg	23	69,7
Hypertension Grade 2. 160-179 mmHg	10	30,3
Total	33	100

Table 2 shows the results before giving green tea respondents with hypertension grade 1. 140-159 mmHg as many as 23 respondents (69.7%), respondents with hypertension grade 2. 160-179 mmHg as many as 10 respondents (30.3%).

Table 3. Blood Pressure Distribution of Hypertensive Patients After Giving Green Tea (n=33)

Blood Pressure	Frequency	Percentage (%)
Normal Height 130-139 mmHg	3	9,1
Hypertension Grade 1.140-159 mmHg	30	90,9
Hypertension Grade 2.160-179 mmHg	-	-
Total	33	100

Table 3 shows that before giving green tea, 23 respondents (69.7%) had hypertension grade 1. 140-159 mmHg, 10 respondents (30.3%) had grade 2 hypertension, 160-179 mmHg.

Table 4 Distribution of Blood Pressure Differences Before and After Giving Green Tea to Hypertensive Patients (n=33)

Blood Pressure	*Mean*	SD	*p-value*
Before	152.58	6.265	0.001
After	145.61	6.220	

Table 4 shows that the average value of blood pressure before the intervention was 152.58 with a standard division value of 6.265. While the average value of blood pressure after the intervention was 145.61 with a standard deviation of 6.220. The results of the analysis test showed that there was an effect of drinking green tea for 7 days on blood pressure in hypertensive patients at Imelda Workers' Hospital in Indonesia (difference in mean 6; p-value <0.05).

DISCUSSION

Based on the results of the study that there was a decrease in blood pressure in hypertensive patients, after the intervention of giving green tea. The average value before the intervention was 152.58 to 145.61. This is also evidenced by the Wilcoxon test which shows a p-value <0.05, which is 0.001. In other words, there is an effect of giving green tea on blood pressure in hypertensive patients at Imelda Hospital Medan in 2022.

According to the results of the study which stated that green tea consumption was able to significantly reduce systolic blood pressure levels of 1.98 mmHg and diastolic pressure of 1.92 mmHg. The positive effect of green tea on blood pressure was obtained after consuming low doses (<582.8 mg/day) with long-term duration (>12 weeks) (17). There are also research results showing the average decrease in systolic blood pressure to the administration of green tea (Camellia sinensis) in hypertension patients is 25.33 mmHg, while the average decrease in diastolic blood pressure is 1.81 mmHg. There is an effect of giving green tea on blood pressure in patients with hypertension (18).

The results of this study are also supported by the statement that camellia sinensis is a good herbal therapy for people with hypertension because it contains polyphenols, which can prevent free radicals that can block blood flow (19). Tea has the main properties that come from the polyphenols contained therein. In the body, this compound helps the performance of the enzyme superoxide dismutase (SOD), which functions to get rid of free radicals. Free radicals resulting from the oxidation process in the body are harmful to health because they can block blood flow so that it can cause cardiovascular (heart) disease.

The catechin compounds in green tea have been known medically to have many benefits such as being able to reduce the risk of cancer, tumors, lowering blood cholesterol, preventing high blood pressure, killing bacteria and fungi, killing influenza viruses and keeping the breath from smelling bad (20).

One study also states that the content of tea is rich in flavonoid compounds that can play an important role in the treatment of high blood pressure. Diet plays an important role in the treatment and control of high blood pressure. Clinical data show that a 5 mmHg reduction in blood pressure can reduce the risk of stroke and ischemic heart disease by 34 and 21%, respectively (12).

CONCLUSION

The conclusion in this study is that there is an effect of drinking green tea for seven days on reducing blood pressure in hypertensive patients at the Imleda Hospital

So that later from this research it is hoped that people with hypertension in the community can apply the right green tea infusion according to the education given by health workers and become additional information for conducting further research on giving green tea to people with hypertension

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