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Giving Soursop Leaf Extract (*Annona Muricata L*) to Lower Blood Pressure for Patients with Hypertension

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ABSTRACT

Introduction: In Muna Regency, if we look at the prevalence of hypertension incidence data in Katobu District with a population of 31,929 people. In 2016 it was known that the prevalence of hypertension was 80 cases per thousand population, in 2017 there were 145 cases per thousand population, in 2018 amounted to 143 cases per thousand population, in 2019 there were 145 cases per thousand population and in 2020 there were 130 cases per thousand population. Based on this, it is interesting for researchers to conduct research on Giving Soursop Leaf Extract (Annona Muricata L) To Lower Blood Pressure For Patients With Hypertension.

Method: The type of research conducted is pre-experimental research with a Pretest-Posttest design. The research was carried out in the working area of the Katobu Public Health Center from April to June 2022 totaling 56 people with a sample of 49 people.

Result: The average hypertension decreased in the first week 177.24, the second week 171.73 and the third week after administration of soursop leaf extract 171.19, the difference in blood pressure reduction of the three treatment groups. Judging from the ANOVA table, the column Sig. obtained P value (P-value) = 0.000.

Conclusion: There is a significant effect between the administration of soursop leaf extract on reducing blood pressure in patients with hypertension in the working area of the Katobu Public Health Center, Muna Regency.

Introduction

High blood pressure or hypertension is a common condition in which blood fluid in the body presses against the walls of the arteries with enough force to eventually cause health problems, such as heart disease. Blood pressure is determined by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. The more blood is pumped by the heart and the arteries will narrow, the blood pressure will increase.[1] Hypertension is one of the problems of heart disease which is still a big job for health around the world. Hypertension is the cause of various heart diseases, such as heart attack, heart

failure, stroke. Increased blood pressure is estimated to cause 7.5 million deaths, about 12.8% of all deaths. It is a major risk factor for cardiovascular disease.[2]

Based on data from the World Health Organization (WHO) in 2015 showed around 1.13 billion people in the world have hypertension, meaning that 1 out of 3 people in the world are diagnosed with hypertension. Statistics from the Australian National Health Foundation show that around 1.200.000 Australians (15% of Australia's adult population) suffer from hypertension. The number of sufferers in western countries such as England, New Zealand and Western Europe is also almost 15%. In the United States 15% of the white race at the age of 18-45 years and 25-30% of the black race are hypertensive.[3]

Basic Health Research 2018 that 1.7 million deaths due to hypertension in Indonesia. Southeast Sulawesi Health Office in 2019 cases of hypertension still ranked second out of the 10 highest recorded diseases, which amounted to 57.160 cases out of 2.571.562 people with a prevalence rate of 22.227, which means there are 23 people with hypertension for every 1000 population (26,8%) and North Buton District recorded hypertension cases, which amounted to 2.724 cases (26,4%).[4] Based on the Southeast Sulawesi Provincial Health Office records the prevalence of hypertension every year experienceenhancement. In 2014 hypertension was ranked second out of the ten largest diseases in Southeast Sulawesi Province in 2016 which was 17,67%, in 2017 it increased to 61,57%, in 2018 it became 33,62%, 2019 amounted to 26,8% and in 2020 it became 31,67%.[5]

Hypertension cases in 2020 in Southeast Sulawesi Province amounted to 36.188 cases out of 255.712 population or The prevalence of hypertension is 142 cases in 1000 population and hypertension with the lowest prevalence is Buton Regency with 7.985 cases from 119.185 population with prevalence of 67 cases in 1.000 population.[5] In Muna Districtif we look at the prevalence of hypertension incidence data in Katobu District with a population of 31.929 people. In 2016 it was known that the prevalence of hypertension was 80 cases per thousand population, in 2017 there were 145 cases per thousand population, in 2018 there were 143 cases per thousand population, in 2019 there were 145 cases per thousand population and in 2020 there were 130 cases per thousand population.[5]

Based on an initial survey of 10 hypertensive patients found in Muna Regency, precisely at the Katobu Health Center in the general poly, that there were 7 patients with hypertension who stated that they had suffered from hypertension for 5 years.and 3 other patients had a stroke with a duration of hypertension of more than 5 years.

Based on data from the Health Profile of Muna Regency in 2020 that the District with hypertension casesThe highest was in Katobu District, where there were 276 cases during the visit in July 2021, which were also known to be non-repeat visits for the same year. Prevention of hypertension can be done by doing the following things, namely eating foods rich in fiber (vegetables and fruits), reducing salt consumption, alcohol, and foods that are high in fat, lose weight, get enough rest, and exercise regularly, do regular blood pressure checks.[6]

Treatment of hypertension can be done by pharmacological and non-pharmacological. Pharmacological treatment using antihypertensive drugs. Known first-line drug classes commonly used for the initial treatment of hypertension, namely: ACE inhibitors, Angiotensin Receptor Blockers, calcium antagonists, diuretics, and beta blockers.that is: adrenergic nerve blockers, and vasodilators, but pharmacological treatment can cause side effects when taken for a certain period of time. The most common systemic side effect of all drugs is hypotension, whereas ACE inhibitors can cause coughing during treatment. Non-pharmacological treatment by exercising, maintaining a diet such as a low-salt diet and the use of herbal ingredients such as soursop leaves (*Annona Muricata L*).[7]

Method

The type of research conducted is a pre-experimental study with a pretest-posttest design regarding the effect of giving soursop leaf extract (*Annona muricata L*) on reducing blood pressure in patients with hypertension. In this study, the population was 276 people with hypertension in Muna Regency at the visit in July 2021. It is known that there are 2 (two) categories, namely hypertension sufferers with a total of 220 people

and 56 people with hypertension without other comorbidities. For the purpose of research treatment, the researchers only took a population suffering from hypertension without comorbidities amounting to 56 people with a sample of 49 people.

Result

Table 1 shows that the results of the summary of descriptive statistics from the treatment data for the first week decreased by an average of 4.79592, and the second week 10.30612, for the third week 17.44898 where t-count is greater than t-table (4.081 for the first week of observation, 8.365 for the first week of observation and 11.353 for the observation the first week with t table 1.69092) with a significance value of 0,000 < from 0,05 which indicates there is an effect, or it can be concluded that through administration of soursop leaf extract can provide changes in blood pressure reduction in statistics, it is explained that Ha is accepted and Ho is rejected.

Table 2 shows that the respondents who were given the treatment with Soursop Leaf Extract had a decrease in hypertension, in the first week 177.24, the second week 171.73 and the third week after administration of the soursop leaf extract 171.19.

Table 3 shows that the differences in blood pressure reduction of the three treatment groups. Judging from the ANOVA table, the column Sig. obtained P value (P-value) = 0,000. Thus, at the level of significance = 0,05, it can be concluded that Ho is rejected so that there is a significant difference in the average decrease in blood pressure based on the three treatment groups.

Table 1
Distribution of Effect of Soursop Leaf Extract on Hypertension Patients

Response (n)	Average drop in blood pressure		t-count	t-table	Sig.
	Treatment	Average BP Decrease			
49	week 1	4,79592	4,081	1,69092	0,000
	week 2	10,30612	8,365	1,69092	0,000
	week 3	17,44898	11,353	1,69092	0,000

Table 2
Descriptive ANOVA Test

	n	Mean	Std. Deviation	Std. Error	95% CI for Mean	
					Lower Bound	Upper Bound
After Treatment Week I	49	**177,24**	12,207	1,744	173,74	180,75
After Treatment Week II	49	171,73	12,729	1,818	168,08	175,39
After Treatment Week III	49	164,59	11,266	1,609	161,36	167,83
Total	147	**171,19**	13,077	1,079	169,06	173,32

Table 3
Distribution of ANOVA Test Results

Blood pressure					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3944,218	2	1972.109	13,509	**0.000**
Within Groups	21022,449	144	145,989		
Total	24966,667	146			

Discussion

The application of soursop leaf extract on reducing hypertension in the first week

The results of the summary of descriptive statistics from the first week of treatment data decreased by an average of 4.79592 where t-count was greater than t-table (4,081>1,69092) with a significance value of 0,000< from 0,05 which indicates there is an effect, or it can be concluded that through the administration of leaf extract Soursop can provide a change in the decrease in blood pressure in the statistics explained that Ha is accepted and Ho is rejected.

Soursop leaves containalkaloids, tannins, and several other chemical constituents including Annonaceous acetogenins. Acetogenins are compounds that have cytotoxic potential. Cytotoxic compounds are compounds that can be toxic to inhibit and stop the growth of cancer cells(8). Acetogenins are strong inhibitors of the mitochondrial complex or NADH (Nicotinamide Adenine Dinucleotide Hydrogen) dehydrogenase. This substance will result in a decrease in the production of ATP (Adenosine triphosphate) is a nucleotide which in biochemistry is known as the molecular unit of intracellular energy exchange; meaning, ATP can be used to store and transport chemical energy in cells) whichwill cause cancer cell death, then trigger the activation of the apoptotic pathway and activate p53 (tumor suppressor gene that acts to stop tumor growth) which can stop the cell cycle to prevent uncontrolled proliferation.[9]

Previous research by [7] stated the Effectiveness of Soursop Leaf Tea (*Annona muricata linn*) on Hypertension, Variable : Independent : Soursop Leaf and Dependent Variable : Hypertension, Research Result: Soursop leaf contains monotetrahydrofuran acetogenin compounds, such as anomuricin A and B, gigantetrosin A, annonacin10-one, muricacin A and B, annonacin, and goniothalamic and potassium ions. The efficacy of these compounds has a significant effect on reducing blood pressure. Conclusion Soursop leaf tea (*Annona muricata linn*) can be used as a non-pharmacological therapy option because of its content that can lower blood pressure.

Giving soursop leaf extract has a slow effect in lowering blood pressure but has a smaller impact when compared to chemical drugs, people generally prefer to boil soursop leaves whose effectiveness cannot be measured. As well as the more important choice, most choose chemical drugs in lowering blood pressure which are considered fast.

The use of soursop leaf extract in capsule form is more practical and has been checked by the National Agency of Drug and Food Control for effectiveness and benefits. However, it has a slow reaction if consumed in just one week.

The application of soursop leaf extract on reducing hypertension in the second week

From the statistical summary, it is known that the results of the second week of observations with a value of 10.30612 where t-count is greater than t-table (4,081 > 1,69092) with a significance value of 0,000 < from 0,05 which indicates there is an effect, or it can be concluded that the administration of soursop leaf extract can provide Changes in the decrease in blood pressure in the statistics explained that Ha was accepted and Ho was rejected.

For surveillance purposes, the Indonesian Ministry of Health defines hypertension as a state of increasing TDS 140 mmHg and or TDD 90 mmHg on two measurements with an interval of five minutes in a calm state.

Soursop leafwith the Latin name *Annona muricata L*. turns out to contain many benefits for herbal medicine ingredients, and to maintain body condition. Behind these benefits, it turns out that it cannot be separated from its content which contains many active chemical compounds.[10]

Soursop plants have benefits from roots to fruit. One of the content in soursop fruit is fiber and anti-oxidants, soursop also has an active compound called isquinoline alkoid which functions as an analgesic (reducing pain) and anti-inflammatory (anti-inflammatory), able to reduce high blood pressure. Studies show that plant extracts lower blood pressure through blockage of calcium ion channels, and this Ca^{+} antagonism is further demonstrated by its ability to relax high K^{+-} induced contractions. The hypotensive effect has beenassociated with alkaloids such as coreximine, anomurine, and reticulin, and some essential oil components such as-caryophyllene.[11]

Previous research has also been conducted where the Effect of Soursop Leaf Tea (Annona muricata Linn.) on Lowering Blood Pressure in Young Adult Males, Variable: Independent: Soursop Leaf, Dependent: Blood Pressure of Young Adult Males, Result: Known Data analysis using the paired "t" test method and the unpaired "t" test, with = 0,05, using computer software, the significance was determined based on the p-value 0,05) between the mean systolic and diastolic blood pressure before and after drinking soursop leaf tea. Soursop leaf tea has an effect on reducing normal systolic and diastolic blood pressure in adult men.[12]

The use of soursop leaves as an alternative for reducing hypertension in the community has been largely understood from various references such as via the internet and also some information from the local community, but its use in the form of stew and for capsule form has not been mostly consumed due to the purchase value which is quite expensive so consume only in the form of two weeks is sufficient. Though the results of the study are known within two weeks has not had a significant effect.

The application of soursop leaf extract on reducing hypertension in the third week

From the results of the study, it is known that for the third week the average decrease is 17,44898, where t-count is greater than t-table (11,353 > 1,69092) with a significance value of 0,000 < from 0,05 which indicates there is an effect, or it can be concluded that through administration of soursop leaf extract can giving a change in the decrease in blood pressure in the statistics it is explained that Ha is accepted and Ho is rejected.

Acetogenins is a strong inhibitor of the mitochondrial complex or NADH (Nicotinamide Adenine Dinucleotide Hydrogen) dehydrogenase. This substance will result in a decrease in the production of ATP (Adenosine triphosphate) is a nucleotide which in biochemistry is known as the molecular unit of intracellular energy exchange; meaning, ATP can be used to store and transport chemical energy in cells) which will cause cancer cell death, then trigger the activation of the apoptotic pathway and activate p53 (a tumor suppressor gene that acts to stop tumor growth) which can stop the cell cycle to prevent unwanted proliferation. under control.[9]

One of the content of soursop leaves that has enough benefits is saponins compound One of the secondary metabolites produced from various plants and plants is soursop. Saponins contain glycoside components which can be divided into three groups, namely, triterpenoids, steroids, and glycoalkeloid. Saponins are amorphous molecules that are soluble in water, but their solubility depends on the temperature and pH of the water.

Soursop leaves are used as an alternative medicine for the treatment of hypertension, namely by consuming soursop leaf extract. In addition to treating hypertension, soursop plants are also used for treatment fever, diarrhea, anti-seizure, anti-fungal, anti-parasitic, anti-microbial, backache, gout, itching, boils, flu, and others.[13]

Previous research was also conducted by it is known that public knowledge about soursop leaves for hypertension, with the results of research on public knowledge about soursop leaves for hypertension in Ngalas, South Klaten, which is included in the level of good knowledge as many as 27 people (90%), while only 3 people (10%).[14]

Chemically the content of soursop leaves has several chemical molecular bonds that function in lowering blood pressure and other benefits for health, thus an effective and safe solution for lowering blood pressure is to utilize local wisdom such as herbal plants that have high value. Consumption of soursop leaf extract with a frequency of more than two weeks is considered effective for lowering blood pressure but still always consults the medical party to see the development of his health.

Conclusion

There is a significant effect between the administration of soursop leaf extract on reducing blood pressure in patients with hypertension in the working area of the Katobu Public Health Center, Muna Regency. It is recommended to the local government of Muna Regency to improve treatment by utilizing local wisdom such as herbalists and the like to reduce the consumption of chemical drugs whose use must be confirmed by a doctor.

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