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## Case Study of Giving Small White Ginger Drink (*Zingiber Officinale* Var *Amarum*) to Hypertensive Respondents

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### Abstract

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*Background: Hypertension with increasing age 45-59 years, the possibility of someone suffering from hypertension is also greater. Hypertension if not treated immediately can cause heart failure, stroke and kidney failure. So far, hypertension treatment is done pharmacologically (with drugs) or with non-pharmacological therapy (without drugs). One of the non-pharmacological therapies to control blood pressure is by giving ginger drink (zingiber officiale). Purpose: The purpose of this study was to determine the results of the application of ginger drink (zingiber officiale) to respondents with hypertension. Method: The research design used is descriptive with a case study approach. The case study was conducted by giving ginger drink then measuring blood pressure before and after giving ginger drink, the number of respondents was 3 people, ginger drink was given for 5 days, respondents consumed 100 cc of ginger drink in the morning. How to make boiled ginger water by weighing small white ginger (4 grams), then clean the small white ginger and cut it into small pieces, then heat 200 cc of water for  $\pm 10$  minutes and add the ginger, after that the boiled ginger water is filtered into 100 cc and ready to serve. Results: The results of the study showed that respondent 1 experienced a decrease in blood pressure from 150/92 mmHg to 135/76 mmHg (high normal), respondent 2 experienced a decrease in blood pressure from 150/90 mmHg to 130/80 mmHg (high normal) and respondent 3 experienced a decrease in blood pressure from 160/100 mmHg to 142/80 mmHg (grade 1 hypertension). Conclusion: Giving small white ginger drink (zingiber officinale var amarum) can lower blood pressure. Giving ginger drink can be used as a complementary therapy solution for treating hypertension.*

### Keyword:

*Ginger boiled water, Hypertension, Ginger drink, Blood pressure.*

## INTRODUCTION

The modern human lifestyle makes many people tend to like instant things, making them lazy to exercise. Increasing consumption of sodium content in instant foods, various daily routines that can cause stress and unknowingly trigger various diseases, one of which is hypertension. Hypertension as one of the non-communicable diseases is a major and serious problem, because the prevalence of hypertension is high and tends to increase. Hypertension is also often referred to as a "silent killer", because this disease occurs without any signs. If hypertension is not treated immediately, it will result in complications such as heart disease, stroke, kidney failure, and blindness (Ministry of Health, 2013). In fact, hypertension treatment is also inadequate even though effective drugs are widely available and it is widely known that people with hypertension do not maintain a diet and do not take medication regularly. This shows that most hypertension patients are not compliant in taking medication and do not receive optimal treatment.

According to WHO (World Health Organization, 2022) there are 1 billion hypertensive patients in the world and two-thirds of them are in developing countries. The number is increasingly worrying, namely 972 million (26%) adults in the world suffer from hypertension. This figure continues to increase sharply, and it is predicted that in 2025 around 29% of adults worldwide will suffer from hypertension. The prevalence of hypertension in Indonesia is quite high. Based on the results of the Riskesdas in 2021, the prevalence of hypertension increased from 2016 to 2021. The prevalence of hypertension in Indonesia reached 31.7% of the population aged 18 years and over. Of that number, 66% resulted in heart and blood vessel disease, and 60% experienced hypertension ending in stroke (Ministry of Health, 2021). The incidence of hypertension in East Java in 2021 was 22.71% or around 2,360,592 residents and in Gresik Regency in 2021 it was 36.65% or around 52,169 residents who experienced hypertension (East Java Provincial Health Office, 2021). Based on the results of the research study, the incidence of hypertension in residents of Petiken Village RT 01 RW 11, Driyorejo District, Gresik increased with each passing year. Data on hypertension was found in June-August 2022 as many as 78 cases and in June-August 2023 as many as 93 cases occurred in women 53.75% higher than men 46.25%.

Based on the cause, hypertension is generally divided into two groups, namely primary and secondary. Primary hypertension is hypertension that is not known to have a cause such as heredity, age, gender, psychological pressure, stress, obesity, lack of exercise, and high cholesterol. While secondary hypertension is hypertension caused by other diseases such as narrowing of the arteries that supply blood to the kidneys, atherosclerosis (thickening of the walls of the arteries that supply blood to the kidneys, atherosclerosis (thickening of the walls of the arteries that cause loss of elasticity of blood vessels) (Damayanti, 2014). Hypertension in the long term is very risky and becomes a health threat that can cause complications such as stroke, coronary heart disease, and kidney failure. Increased cardiac output can occur due to increased heart rate, stroke volume and increased stretching of the heart muscle fibers. In increasing cardiac output, the sympathetic nervous system will stimulate the heart to beat faster, also increasing stroke volume by selective vasoconstriction in peripheral organs, so that the blood returning to the heart will thicken (hypertrophy) and cause its function as a pump to be disrupted, its contractions are reduced (Muhammadun, 2010).

Hypertension treatment efforts can be given pharmacologically and non-pharmacologically, for non-pharmacological treatment is one of the treatments for patients because it is considered safer and can also increase the effectiveness of antihypertensive drugs. In addition, there are also complementary therapies such as herbal therapy that can be used to treat hypertension using herbal plants such as mengkudu, ginger, bay leaves, turmeric, starfruit and garlic (Syaifuddin, 2013). Ginger is an herbal plant that is easy to get and the price is cheap. Among the general public, ginger is commonly consumed as a complement to dishes, this can be used as a solution to treat hypertension non-pharmacologically. Giving Ginger Drinks is a drink made from ginger brewed using hot water can be served warm/cold. Ginger drinks are refreshing and have health benefits, one of which is to lower blood pressure.

Ginger has benefits in the cardiovascular system, namely increasing the flow of body fluids by stimulating blood circulation throughout the body. Ginger also contains phenol compounds such as

shogaol and gingerol which have antioxidant effects that can reduce free radicals and can lower blood pressure through blocking voltage-dependent calcium channels by inhibiting the activity of Angiotensin Converting Enzyme (ACE) (Elisabet Alva Nadia, 2020). Ginger contains the chemical compound Gingerol which is used to block calcium channel vitrification in blood vessel cells so that vasodilation or vasoconstriction of blood vessels will occur which stimulates a decrease in smooth muscle contractions of the arterial walls so that it will cause a decrease in blood pressure. Ginger also contains Potassium which inhibits the release of renin Angiotensin which will increase the excretion of sodium and water so that sodium and water retention in the blood is reduced and blood pressure will decrease (Braga, 2019). In a study conducted by (Palupi, 2015) entitled Benefits of giving boiled ginger water (*Zingiber Oficinale*) on differences in blood pressure in adult women with hypertension in Sukawana Village, in this study the research respondents were given 100 cc of ginger water made from 4 grams of ginger cut into small pieces and boiled in a pan containing boiling water as much as 200 cc for  $\pm 10$  minutes while stirring occasionally until the water volume becomes 100 cc. After that, it was poured into a measuring cup as much as 100 cc while filtering, add honey with a ratio of 100 cc: 2 tablespoons, then given to respondents for 5 consecutive days can lower blood pressure (Palupi, 2015).

In a study conducted by (Rafika Ramadhanti Vidya, et al, 2019) entitled Effectiveness of Giving Boiled Ginger on Changes in Blood Pressure in Elderly Hypertensives in the Kartasura Health Center Work Area, in this study boiled ginger was effective in lowering blood pressure. In this study, respondents were given 100 cc of ginger water made from 4 grams of ginger cut into small pieces and boiled with 200 cc of water for  $\pm 10$  minutes, after which 100 cc was filtered and honey was added with a ratio of 100 cc: 2 tablespoons, then given to respondents for 5 consecutive days (Palupi, 2015).

## METHODS

The research design used is descriptive with a case study approach, aiming to describe and illustrate the characteristics, quality and relevance of activities, research with methods carried out through observation, interviews and documentation

(Nursalam, 2020). This study took 3 respondents who had hypertension with an age range of 45-59 years, male/female, did not maintain a healthy diet, did not consume antihypertensive drugs regularly, diagnosed for at least 2 years, did not have comorbidities/complications. Researchers observed blood pressure using an observation sheet, then were given ginger drink intervention for 5 days in the morning, then their blood pressure was re-observed after 1 hour of giving ginger drink.

## RESULTS

Based on the results of data collection of respondent characteristics, the following results were obtained:

### Respondent 1

Mrs. I is female, 52 years old, her last education is high school and she works as a housewife, Mrs. I has a history of hypertension since 2 years. In her daily life, the respondent consumes food with a little salt, uses food flavorings every day, the types of drinks consumed are water  $\pm 1000$  ml a day and 2 glasses of black coffee/day. Mrs. I rarely checks with a doctor and does not take medication regularly. Previously, she had consumed hypertension medication such as Amlodhipine taken 2x a day. Mrs. I does not often do sports activities. Mrs. I has no history of hypertension in the family.

### Respondent 2

Mrs. S is female, 50 years old, her last education is high school and she works as a trader, the respondent has a history of hypertension for 4 years. In daily life, respondents consume food with little salt, use food flavorings every day, the types of drinks consumed are water  $\pm 5-8$  glasses a day, 1 glass of black coffee in the morning and 1 glass of tea in the afternoon. Mrs. S always checks at the Health Center but does not regularly take antihypertensive drugs. The type of drug that is often taken is amlodiphin. Mrs. S takes medicine only if her blood pressure rises, if her blood pressure has dropped or is stable, she does not take antihypertensive drugs. Mrs. S does not often do sports activities. Mrs. S has no history of hypertension in the family. Respondent 3

Mr. A is male, 56 years old, his last education is junior high school and has a job as a driver, the respondent has a history of hypertension for 8 years. In daily life, the respondent consumes food that tends to be salty, every day his wife cooks using flavorings, the types of drinks consumed are water  $\pm 8$  glasses a

day and 3 glasses of black coffee / day. Mr. A is also an active smoker who can smoke almost  $\pm$  5-7 cigarettes / day. Mr. A rarely checks his illness at the Health Center and does not regularly take antihypertensive medication. Mr. A's wife said that she usually provides antihypertensive medication, namely amlodipine, but only takes it when Mr. A feels dizzy. Mr. A does not often do sports activities. Mr. A has no history of hypertension in the family.

The results of blood pressure measurements before being given ginger drink on January 9, 2023, in Mrs. I, namely 150/91 mmHg with the category of grade 1 hypertension, in Mrs. S, namely 150/90 mmHg with the category of grade 1 hypertension and blood pressure in Mr. A, namely 160/100 mmHg with the category of grade 2 hypertension. At the first meeting, the researcher first explained the purpose of the study and explained the benefits of consuming ginger drink. The three respondents agreed and signed the consent form to become respondents. The three respondents seemed enthusiastic in listening to the explanation. The first respondent said there were no complaints, the second respondent said a stiff neck and the third respondent said a headache and a heavy neck. At the second to last meeting, the three respondents remained enthusiastic in consuming ginger drink. Respondents 1 and 2 said that while consuming it, their bodies felt fresher, while respondent 3's headache and heavy neck decreased and were no longer felt. The results of blood pressure measurements after being given ginger drink for 5 days on 3 respondents showed that in the first respondent there was a decrease in systole of 15 mmHg and diastole of 16 mmHg, in the second respondent there was a decrease in systole of 20 mmHg and diastole of 10 mmHg, while in the third respondent there was a decrease in systole of 18 mmHg and diastole of 20 mmHg.

## DISCUSSION

Blood pressure in the three hypertensive respondents from the observation results before being given ginger drink, respondents 1 and 2 were in the category of grade I hypertension, namely 150/92 mmHg and 150/90 mmHg, while in respondent 3 it was in the category of grade II hypertension, namely 160/100 mmHg. There are two factors that trigger hypertension, namely controllable and uncontrollable factors. Controllable factors include obesity, lack of exercise, lifestyle such as salty foods, smoking,

Indonesian Academia Health Sciences Journal alcohol consumption and stress. While uncontrollable factors include heredity/genetics, gender, and age.

Based on the age factor, in the results of this study the three respondents entered adulthood, namely 52, 50 and 56 years, in the results of the questionnaire of the three respondents, Mrs. I said that she had suffered from hypertension for 2 years, Mrs. S said that she had suffered from hypertension for  $\pm$  4 years while Mr. A said he had suffered from hypertension for  $\pm$  8 years. According to research (Eni Nuraeni, 2019) states that those aged >45 years are more at risk of suffering from hypertension, as age increases, changes will occur in the arteries in the body so that they become wider and stiffer, resulting in reduced capacity and recoil in the blood accommodated through the blood vessels. This causes blood pressure to increase. The aging process also causes disruption to neurohormonal mechanisms such as the renin-angiotensin-aldosterone system and also causes increased plasma concentration and the presence of Glomerulosclerosis and intestinal fibrosis resulting in increased vasoconstriction and vascular resistance, resulting in increased blood pressure.

Based on hereditary factors, in the results of this study, the three respondents said they did not have a history of hypertension in the family. According to research (M. Hasan Azhari, 2017) states that there is a relationship between heredity and the incidence of hypertension, respondents who have a family history of hypertension have a 3.6 times greater chance of developing hypertension compared to respondents who do not have a family history of hypertension. Based on gender, in the results of the three respondents in this study, blood pressure in female respondents tended to be higher than in men. According to research conducted by Kusumawaty, J., et al., (2016) which states the incidence of hypertension in women when a woman experiences menopause. This happens because menopausal women experience a decrease in the hormone estrogen which previously played a role in protecting blood vessels from damage or preventing the occurrence of atherosclerosis. Based on lifestyle, the results of the study, the three respondents said that they did not routinely take antihypertensive drugs, did not often exercise/do activities and the food they cooked tended to be salty.

Based on the research results, respondents 1 and 2 said that their bodies felt fresh after being given ginger drink. According to research (Artalesi, 2012) it was found that most respondents said that they felt



calm and some said their bodies felt fresher and the headaches and muscle tension in the neck that they experienced decreased or even disappeared. While respondent 3 based on the research results, said that during a week of consuming ginger drink, his headaches decreased, complaints of feeling heavy in his neck were no longer felt. This is in line with (Lalage, 2015) that boiled ginger can lower blood pressure because warm water has an impact on blood vessels where the warmth of the water makes blood circulation smooth, stabilizes blood flow and heart function. Based on the research results and the theory above, the researcher argues that giving ginger drink for 5 consecutive days has effects such as the body feeling fresh, complaints of dizziness and heaviness in the neck are reduced.

Based on the results of blood pressure measurements after giving ginger drink to the three respondents on the fifth day, the results showed that respondent 1's blood pressure was 135/76 mmHg (high normal), respondent 2's blood pressure was 130/80 mmHg (high normal) and respondent 3's blood pressure was 142/80 mmHg (grade 1 hypertension). From these results, there was a decrease in blood pressure in the three respondents. Mrs. I was initially in the grade 1 hypertension category (150/92 mmHg) to the high normal category (135/76 mmHg), Mrs. S was initially in the grade 1 hypertension category (150/90 mmHg) to the high normal category (130/80 mmHg) and Mr. A was initially in the grade 2 hypertension category (150/90 mmHg) to the grade 1 hypertension category (142/80 mmHg). Based on the results of the study, it showed that the blood pressure results after being given ginger drink in respondent 1 decreased by 15 mmHg systolic and 16 mmHg diastolic, in respondent 2 there was a decrease in systolic 20 mmHg and 10 mmHg diastolic, while in respondent 3 there was a decrease in systolic 18 mmHg and diastolic 20 mmHg. During the 5 days of the study, the three respondents experienced varying changes in blood pressure, both systolic and diastolic blood pressure. These results are relevant based on the research of Rafika Ramadhanti Vidya (2019) which stated that ginger decoction has an impact on significantly lowering systolic blood pressure, namely by 16 mmHg. In this study, there was a decrease in blood pressure in the three respondents after being given ginger drink. The same thing was also stated (Lalage, 2015) that ginger decoction can lower blood pressure because warm water has an impact on blood vessels where the

warmth of the water makes blood circulation smooth, stabilizes blood flow and heart function.

Ginger has benefits in the cardiovascular system, namely increasing the flow of body fluids by stimulating blood circulation throughout the body. Ginger also has an antioxidant effect that can reduce free radicals and can lower blood pressure through blockade of voltage-dependent calcium channels. Ginger can also lower blood pressure by inhibiting ACE activation, this is influenced by the content of ginger, namely Flavonoid, Saponin, and non-Flavonoid Phenol compounds. Flavonoids have an inhibitory effect on the activity of angiotensin-converting enzyme (ACE) which causes the formation of angiotensin II from angiotensin I to decrease so that vasodilation occurs, then cardiac output decreases and finally blood pressure decreases (Al-Azzawie, Aziz & Rusa, 2014). Ginger contains amino acids and minerals that will make blood circulation smoother, thereby reducing the risk of hypertension (Herbie, 2015). Based on the results of the research and the theory above, researchers argue that giving ginger drinks (*zingiber officiale*) with Flavonoid compound content has an inhibitory effect on the activity of angiotensin-converting enzyme (ACE) which causes the formation of angiotensin II from angiotensin I to decrease so that vasodilation occurs, then decreased cardiac output and finally decreased blood pressure so that it can be used as a complementary therapy solution for treating hypertension. While consuming ginger drinks, it is also balanced with a healthy lifestyle to obtain maximum results.

## CONCLUSION

Evaluation of the final results after giving ginger drink after 5 days in the three respondents experienced a decrease in blood pressure on the 5th day. The results obtained in respondent 1 were 135/76 mmHg (high normal), respondent 2 had 130/80 mmHg (high normal) and respondent 3 had 142/80 mmHg (grade 1 hypertension).

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