

LITERATURE REVIEW : THE EFFECT OF GINGER (*ZINGIBER OFFICINALE* VAR. AMARUM) AND HONEY ON BLOOD PRESSURE REDUCTION

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ABSTRACT

The prevalence of hypertension in NTB at 2018 was 27.8%, this figure was higher than 2013, which was 24.3%. Hypertension management can be done pharmacologically and non pharmacologically. Non pharmacological therapy can be done by consuming honey and ginger. Honey and ginger contain chemical components that can help lower blood pressure. To conduct a literature study on the effect of ginger (*Zingiber officinale* var. *Amarum*) and honey on reducing blood pressure. The literature search in this literature review was carried out using five databases with low to high quality, namely Scopus, ProQuest, Pubmed, Garuda Garba, and Google Scholar. The keywords used are "ginger and blood pressure", "ginger and diastoleic pressure", "ginger and pulse pressure", "ginger and systolic pressure", "ginger officinale and blood pressure", "ginger officinale and diastoleic pressure", "ginger officinale and pulse pressure", "ginger officinale and systolic pressure", "honey and blood pressure", "honey and diastoleic pressure", "honey and systolic pressure". From 10 journals that have been reviewed, all states that honey and ginger can reduce blood pressure. Honey was able to lower blood pressure with an average decrease in systolic blood pressure by 5.6 mmHg - 30.00 mmHg and a decrease in the average diastolic blood pressure by 7.3 mmHg - 13.00 mmHg, while ginger was able to lower blood pressure by an average -The decrease in systole was 4.73 mmHg - 7.7 mmHg and the decrease in diastolic blood pressure was 5.7 mmHg - 7.27 mmHg. The average dose of honey given is 30 grams - 70 grams, while the average dose of ginger is 4 grams. Form 10 journals have been reviewed, all journals stated that honey and ginger can lower blood pressure and based on all these journals it is known that honey has a greater effect on reducing blood pressure than ginger.

Keywords: Blood Pressure, Ginger, Honey

INTRODUCTION

Hypertension is a state of increasing systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg on repeated checkup (Desira et al., 2019). Uncontrolled hypertension can cause the risk of having a stroke to be 7 times greater, the risk of experiencing congestive heart failure is 6 times greater and the risk of having a heart attack is 3 times greater than someone who does not have hypertension (Zainuddin and Irma, 2019).

According to the World Health Organization (WHO) in 2018, 71% of the 37 million deaths that occurred in the world in 2016 were caused by non-communicable diseases. Based on data collected in 2015, 22% of adults aged 18 years and over have hypertension (WHO, 2018).

According to Basic Health Research in 2018, the prevalence of hypertension in

Indonesia is 34.1%, this figure is higher than the prevalence of hypertension in 2013, which was 25.8%. According to Basic Health Research in 2013, the prevalence of hypertension in NTB was 24.3% and in 2018 there was an increase to 27.8% (Ministry of Health of the Republic of Indonesia, 2018).

Hypertension can be controlled by pharmacological and non-pharmacological therapy. Non-pharmacological therapy that can be done by consuming functional food. One example of functional food is honey. Honey contains acetyl choline which functions to improve blood circulation and lower blood pressure. Honey can protect blood vessels from atherosclerosis because it contains phenols and flavonoids (Wijaya et al., 2018).

Aini's research (2018) shows that consuming original honey which is produced

by Apis Dorsata as much as 20 ml and hypertension diet counseling for 14 days can decrease blood pressure (Aini, 2018). Besides honey, a food can be used for non-pharmacological therapy is ginger. The gingerol content in ginger has benefits as an antioxidant and anticoagulant (Tamrin et al., 2017). Tjen's research (2018) shows that consuming ginger water made from 4 grams of ginger and 200 cc warm water for 14 days can decrease blood pressure (Tjen., 2018).

Based on this background, the researchers were interested in conducting a literature review on "The Effect of Ginger (*Zingiber officinale* var. *Amarum*) and Honey on Blood Pressure Reduction".

METHOD

This type of research is a literature review which is a comprehensive summary of several research studies that are determined based on certain themes. The literature search was carried out in October-November 2020. The literature search in this literature review used five low to high quality databases is Scopus, ProQuest, Pubmed, Garuda Garba and Scholar. Keywords in this literature review are adjusted to the Medical Subject Heading (MeSH), namely "ginger and blood pressure", "ginger and diastoleic pressure", "ginger and pulse pressure", "ginger and systolic pressure", "ginger officinale and blood pressure", "ginger officinale and diastoleic pressure", "ginger officinale and pulse pressure", "ginger officinale and systolic pressure", "honey and blood pressure", "honey and diastoleic pressure", "honey and systolic pressure".

The strategy used to find articles is using the PICOS framework. The population analyzed was hypertensive patients who were given honey or ginger intervention with a study design experimental research with the type of quasi-experimental studies or pre-experimental studies and the results of these studies were that there was an effect of giving ginger or honey on blood pressure.

Based on the results of literature searches through publications on five databases and using keywords that have been adjusted to MeSH, the researchers obtained 218 articles that match these keywords. The search results that have been obtained were then checked for duplication, it was found that 26 articles were the same so they were excluded and the remaining 192 articles. The researcher then conducted a screening based on the title (n = 16),

abstract (n = 16) and full text (n = 16) which was adjusted to the theme of the literature review. The assessment that was carried out based on the eligibility of the inclusion and exclusion criteria was obtained as many as 10 articles that can be used in the literature review.

RESULT AND DISCUSSION

Study Characteristics

10 articles that satisfy the inclusion criteria were divided into two sub-discussions based on the topic of literature review namely, the effect of honey on blood pressure reduction (5 studies), the effect of ginger on reducing blood pressure (4 studies) and the effect of honey and ginger on reducing blood pressure (1 study). Based on the 10 journals analyzed, it is known that all of these journals use quasi experimental research designs with pre-test and post-test designs. The time for intervention was from 5 days to 4 weeks, with a sample size minimal 5 sample and maximum 50 sample. The dose of honey is 30 grams - 70 grams and can reduce systolic blood pressure is 5.6 mmHg - 30.00 mmHg and decrease diastolic blood pressure is 7.3 - 13.00 mmHg. While giving ginger an average of 4 grams and can reduce systolic blood pressure is 4.73 mmHg - 7.7 mmHg and decrease diastolic blood pressure is 5.7 mmHg - 5.27 mmHg.

Characteristics of Study Respondents Age

Based on the 10 literature analyzed, 7 literature identified the correlation between age and hypertension and it can be concluded that the average respondent in the study was ≥ 45 years old.

Gender

Based on the 10 literature analyzed, 7 literature identifies the correlation between sex and hypertension. It is known that most of the hypertension affects elderly women. Based on 7 literatures, it is known that the amount of male respondents is 63 and female respondents is 119.

Profession

Based on the 10 literature analyzed, 1 literature identifies the correlation between profession and hypertension, it is known that the amount of respondents who work is 10 and those who do not work is 12.

Effect of Honey on Blood Pressure

The average giving of honey is 30 grams to 70 grams can decrease in systolic blood

pressure is 5.6 mmHg - 30.00 mmHg and decrease in diastolic blood pressure is 7.3 mmHg - 13.00 mmHg. Amount of doses given and the length of time given did not affect the average of reduction in blood pressure. This can be seen from the effect of giving 35 grams of honey for 7 days, cause greater decrease in blood pressure than giving 20 ml of honey or approximately the same as 56 grams of honey for 14 days.

Effect of Ginger For Blood Pressure

The average of ginger was 4 grams, and caused a decrease in systolic blood pressure by 4.73 mmHg - 7.7 mmHg and a decrease in diastolic blood pressure by 5.7 mmHg - 7.27 mmHg.

Effect of Honey and Ginger For Blood Pressure

Honey and ginger can be combined to increase effectiveness in lowering blood pressure. Giving extract ginger from 4 grams ginger with 100 cc of water and 20 ml honey can reducing blood pressure in elderly people with hypertension. This can be seen from before being given ginger extract, the amount of respondents with mild hypertension was 9 respondents, moderate hypertension was 20 respondents, and severe hypertension was 7 respondents. The blood pressure of the elderly with hypertension after being given ginger extract with mild hypertension was 19 respondents, moderate hypertension was 12 respondents and severe hypertension was 5 (Tamrin et al., 2017).

Study Characteristics

Based on the journal's assessment that has been done, the average critical appraisal score is 96.7%. And based on the analysis of the risk of bias that has been carried out, it is known that the possibility of bias that can occur because the 10 journals analyzed did not pay attention to confounding variables.

Characteristics of Study Respondents Age

Hypertension is a disease caused and influenced by many factors. Hypertension can occur at the age of over 45 years. The prevalence of hypertension increases with increasing age at ≥ 40 years. This is due to changes in the structure and function of cells, tissues and organ systems. Generally, these changes will cause physical and psychological decline (Tamrin et al., 2017).

Changes in the elderly that can cause hypertension is changes in blood vessels, decreased elasticity of the aortic wall, heart valves thicken and become stiff, and decreased ability of the heart to pump blood (Nina Putri C & Meriyani, 2020).

Gender

Sujati et al (2016) stated that when young adults, hypertension is more common in men, but after the age of 55, hypertension is more common in women, this is associated with hormonal changes after menopause. (Sujati et al., 2016). Menopause causes the protective vaso mechanism carried out by the hormone estrogen to be lost (Garwahasada and Wirjatmadi, 2020). The hormone estrogen plays a role in maintaining good blood vessel walls and preventing blood clots from forming. The imbalance of the hormones estrogen and progesterone will affect the condition of blood vessels and blood pressure (Hutasoit and Azwar, 2019).

Profession

Individuals who have low activity are at risk of developing hypertension 30-50% than active individuals. Lack of physical activity can increase the risk of developing hypertension, because low physical activity can increase the risk of being overweight. People who are low in activity also tend to have a higher heart rate, so the heart muscle has to work harder with each contraction (Susanti and Sutresna, 2020).

Effect of Honey on Blood Pressure

One component of honey is flavonoids. Flavonoids identified in honey are catechins, kaempferol, naringenin, luteoin and apigenin. (Rahma et al., Nd). Function catechin is to lower blood pressure. Catechin can inhibit the activity of the angiotensin converting enzyme (ACE) which produces angiotensin II, so that excessive angiotensin II activity in vasoconstriction can be controlled (Widiasari, 2018). Honey also contains acetyl choline which functions to improve blood circulation and helps lower blood pressure (Anggraini, 2019).

Musyayyadah et al (2020) stated that giving honey as much as 70 grams can decrease in systolic blood pressure is 30.00 mmHg. This is greater than the results of the study by Jafar et al (2017), decrease in systolic blood pressure of 5.6 mmHg. This can be due to the range decrease in blood pressure not

only due to the dose in the intervention material, but the decrease in blood pressure is also affected by several factors such as age, family history of disease, body mass index, education level, work stress, physical activity, caffeine consumption, drug consumption, and smoking habits (Fitriani and Nilamsari, 2017)

Effect of Ginger For Blood Pressure

Ginger has benefits in the cardiovascular system, which is to stimulate blood circulation throughout the body which will cause an increase in the flow of body fluids. Ginger can lower blood pressure through voltage dependent calcium channel blockade. Ginger can also inhibit ACE activation and cause a decrease in blood pressure (Tjen, 2018).

The main component of white ginger is a ketone phenolic homologous compound known as gingerol (Tamrin et al., 2017). *Gingerol* have antioxidant and anticoagulant properties as anti-cancer and can prevent blood clots, so that it can inhibit blood vessel blockage which is the main cause of strokes and heart attacks. (Tamrin et al., 2017).

Effect of Honey and Ginger For Blood Pressure

Giving honey is more effective at lowering blood pressure than ginger. This can be due to the higher antioxidant content in honey. . Antioxidants in honey can improve oxidative pressure, causing a decrease in blood pressure through the vasodilation mechanism of the coronary arteries which has a hypotensive effect (Musyayyadah et al., 2020)

Honey contains lots of flavonoid components, such as luteolin, quercetin, apigenin, fisetin, kaempferol, ishoramnetin, acacetin, tamarixetin, chrystin, and galangin so that they act as antioxidants. (Legowo, 2015). Quercetin can reduce oxidative stress, inhibit the activity of Angiotensin Converting Enzyme (ACE), increase relaxation of vascular endothelium and regulate cell signaling and gene expression (Widiasari, 2018). Honey also serves as a protection against capillary vascular problems and arteriosclerosis (Marvia and Astuti, 2017). Tannin in honey generally function as antioxidants. Tannin can reduce fat absorption by working with mucosal proteins and epithelial cells in the intestine. So that tannins can lower cholesterol in the blood and maintain the elasticity of blood vessels (Fransiskas et al., 2019)

Ginger can lower blood pressure by blocking calcium which causes contraction of smooth muscle tissue in organs & artery walls. So that the contraction of smooth muscle tissue in the organs and artery walls is reduced and causes relaxation of muscles and artery walls. Relaxation of muscles and artery walls causes blood flow to be smooth and there is a decrease in blood pressure. Ginger also contains saponins which play a role in nourishing renin (RAA system) in the kidneys, there by reducing the formation of angiotensin II, decreasing the formation of angiotensin II, which can lower blood pressure (Tjen, 2018)

CONCLUSION

All journals state that giving honey and ginger can lower blood pressure. And giving honey has a greater effect on lowering blood pressure than ginger.

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