



Case Report: Hypertension Accompanied by Obesity with Herbal Consumption of Soursop Leaf Boiling

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Abstract

Hypertension is abnormally high blood pressure, measured on at least three different occasions. Hypertension is considered if systolic blood pressure is ≥ 140 mmHg and diastolic blood pressure is ≥ 90 mmHg. Currently, hypertension has become a global problem because its prevalence continues to increase from year to year. This disease can trigger other diseases such as stroke, coronary heart disease, heart failure, and kidney disease. Obesity also has a close relationship with the occurrence of hypertension. The greater the body mass, the more blood is needed to supply oxygen and food to body tissues. In addition to pharmacological therapy, one alternative treatment that can be an option to lower blood pressure is to consume herbal plants. One of the herbal plants that can lower blood pressure is soursop leaf decoction. Patients with complaints of headaches, weakness, tension in the back of the neck, accompanied by a history of hypertension and obesity, with a diagnosis of Hypertension and Obesity are given therapy in the form of Paracetamol 500 mg 3x1 and Amlodipine 10 mg 1x1. Pharmacological interventions produced good results, namely controlled blood pressure in patients. The hypertension suffered by the patient is hypertension that is obtained due to several predisposing factors in the patient, namely age, gender, smoking habits, and obesity.

Introduction

Hypertension is abnormally high blood pressure, measured on at least three occasions. It is considered to have hypertension if the systolic blood pressure is ≥ 140 mmHg and the diastolic blood pressure is ≥ 90 mmHg. Hypertension is a disease that has affected 22% of the world's population. The incidence of hypertension in Southeast Asia reaches 36%. In Indonesia, as a result of Basic Health Research (Riskesdas) in 2018, Indonesia has a prevalence of hypertension incidence of 34.1% (Tumanduk et al., 2019).

The increase in hypertension cases, especially in developing countries, is estimated to be around 80% by 2025 from 639 million cases in 2000, estimated to be 1.15 billion cases by 2025. Risk estimates from the *Framingham Heart Study* show that, 78% of hypertension in men and 65% of hypertension in women are directly related to obesity. The risk of hypertension increased by 2.6 times in obese male subjects and increased by 2.2 times in obese female subjects compared to subjects with normal weight. Hypertension and obesity are closely related

disorders, hypertension related to obesity generally has characteristics of expansion of plasma volume and increased cardiac *output*, hyperinsulinemia and insulin resistance, increased activity of the sympathetic nervous system, sodium retention and *salt regulating hormone dysregulation* (Shaumi & Achmad, 2019).

One alternative treatment that can be an option to lower blood pressure is herbal therapy. Indonesia is known to have a lot of medicinal plants. In the international world, the use of herbal medicines has been very developed, tends to increase, and is considered an important component in basic health services. The use of herbal medicines as part of the treatment of hypertension has been increasing in the last decade, due to the perceived fewer side effects (Widiyani et al., 2020).

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Case

A 56-year-old male patient came to the health center with complaints of headache and weakness that were felt since 3 days before going to the health center, the complaint was also accompanied by a sense of tension in the back of the neck which was felt aggravated since the last 2 days. Fever is absent, cough is absent, nausea is absent, vomiting is absent, diarrhea and bowel movements are normal. The patient has been suffering from hypertension since 3 years ago, the patient rarely or does not comply in controlling his blood pressure to the health center, the patient only controls if he has complaints, but if the medication is consumed blood pressure the patient only buys at the pharmacy.

The previous history of the disease was hypertension experienced 3 years ago, and had a weight of approximately 80 kg since 3 years ago. History of smoking habits since the age of 30 until now. History of alcohol consumption denied. History of frequent consumption of foods high in salt such as ordinary salted fish 3 times a week. The patient's family history of the same disease is denied. Psychosocial history where the patient is a middle class and the patient's psychological condition is good with no history of mental disorders and has good social relationships by relating well to family and neighbors. Previous treatment history, the patient routinely consumed Amlodipine 10 mg 1x1 and a decoction of soursop leaves as herbal therapy to lower blood pressure.

On the physical examination, it was found that the General Condition of Mild Pain/Mentis Compos, Blood Pressure 150/90 mmHg, Pulse Rate 98x/min, Respiratory Rate 22x/min, Temperature 36.8°C. Weight 80 kg, Height 167, with nutritional status measurement obtained BMI 28.7 kg/m² which is categorized as Obesity 1. The eye does not appear pale conjunctiva, *anyric sclera*. Ears, nose and mouth within normal limits. There is no enlargement of the KGB on the neck. Right and left vesicular lung sounds. Heart sounds at regular auscultation examinations. The abdomen is within normal limits. Superior and inferior extremities within normal limits, no edema and warm akral. Neurological status: Normal physiological reflex, Pathological reflex (-).

The patient was diagnosed with hypertension and started amlodipine treatment 10 mg in 2022 until now 2024 and continues amlodipine treatment 10 mg until now, and is also accompanied by taking herbal medicine in the form of soursop leaf decoction.

From the results of the examination carried out, blood pressure was 150/90 mmHg and on the measurement of nutritional status, BMI was obtained: 28.7. Before the patient knows that the patient has hypertension, the patient rarely checks his health so that the patient does not know that he has hypertension. The consumption of herbs makes patients not routinely check themselves to health facilities, as well as the habits of patients who consume foods high in salt.

Patients are diagnosed with Hypertension accompanied by Obesity, and are given therapy in the form of pharmacological therapy, namely drugs and also non-pharmacological therapy in the form of education to patients and their families. Pharmacological therapy is the administration of Amlodipin 1x1 / 24 hours / oral, and Paracetamol 3x1 / 24 hours / oral (drink if headache). In addition to pharmacological therapy, and non-pharmacological therapy in the form of education and patients also use herbal therapy by consuming a decoction of soursop leaves to lower blood pressure in patients. Soursop leaf decoction is consumed by patients 3 times a week. And in this case there is no change in the administration of therapy.

The administration of treatment in the form of amlodipine 10 mg as much as 1x1 can provide a good response to high blood pressure in patients. If accompanied by patient compliance, they routinely take medication. In this case, no follow-up examination was carried out on the patient. Patients routinely take the medication given, but sometimes patients do not routinely go to health facilities for control if there are no complaints. In this case, there were no bad events or unexpected events.

The prognosis in this case can be seen from the patient's compliance to take medication regularly in combination with herbal medicines and reducing the consumption of foods that can trigger an increase in blood pressure.

Methods

This study used a quasi-experimental design with an intervention group and a control group to evaluate the effectiveness of a combination of pharmacological drug therapy (Amlodipine) and herbal therapy (soursop leaf decoction) in lowering blood pressure in hypertensive patients with obesity. The study population included all hypertensive patients with obesity who were treated at Puskesmas X, and samples were taken *purposively* with the inclusion criteria of patients with blood pressure $\geq 140/90$ mmHg, BMI ≥ 25 kg/m², aged 30-60 years, and willing to participate in the study for 12 weeks. Patients with severe comorbidities or who were unwilling to sign *informed consent* were excluded from the study (Baddu & Ouano, 2018).

Data collection includes demographic data (age, gender, weight, height, BMI) and clinical data (blood pressure, history of hypertension, history of treatment, salt consumption habits, smoking history). The intervention group received a combination of Amlodipine 10 mg per day therapy and soursop leaf decoction 3 times a week, while the control group received only Amlodipine

10 mg per day therapy. Blood pressure measurement and compliance monitoring are done every 2 weeks for 12 weeks.

Blood pressure measurements were performed using *a calibrated digital sphygmomanometer*, and patient compliance was assessed using the *Morisky Medication Adherence Scale* (MMAS-8) questionnaire. Data analysis included a descriptive analysis to describe the characteristics of the sample, as well as an inferential analysis with paired t-test to compare the mean blood pressure before and after the intervention in each group, an unpaired t-test to compare the mean blood pressure between the intervention and control groups after the intervention, and linear regression to assess the effect of adherence to changes in blood pressure (Rejo & Nurhayati, 2021).

This research has received approval from the Health Research Ethics Committee, and *informed consent* must be obtained from each research participant after providing an explanation of the objectives, benefits, and risks of the research. Limitations of this study include limitations in control of external variables such as diet and physical activity as well as possible bias in blood pressure measurements. With this method, it is hoped that the study can provide strong scientific evidence regarding the effectiveness of the combination of Amlodipine therapy and soursof leaf decoction in lowering blood pressure in hypertensive patients with obesity.

Result and Discussion

Hypertension or high blood pressure is a manifestation of a hemodynamic balance disorder of the cardiovascular system, where the pathophysiology is multifactorial, so it cannot be explained by only one single mechanism. Hypertension concerns a lot of genetic, environmental factors and hemodynamic regulatory centers. If simplified, hypertension is actually an interaction of *cardiac output* (CO) and total *peripheral resistance* (TPR) (Adawiyah et al., 2024).

According to WHO, Hypertension is a condition in which blood vessels have high blood pressure, namely systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg. Hypertension is also often referred to as a silent killer because it can attack anyone suddenly and become one of the diseases that can result in death. The limit on blood pressure is set and known as the JNC VII (Rojak, 2019) *The Seventh Report of The Joint National Committee on Prevention, Detection, Evaluation and Treatment of High Blood Pressure*). This stipulation has also been agreed upon by WHO, international hypertension organizations and regional hypertension organizations, including those in Indonesia. From these limitations, it can be seen that those who have normal blood pressure are when their blood pressure is lower than 120/80 mmHg. Above these limits are already included in the category of pre-hypertension and or hypertension (Suryaningsih & Septiari, 2023.)

Hypertension is one of the chronic diseases with a high prevalence. Data from WHO, hypertension affects 22% of the world's population, in Southeast Asia alone has a hypertension incidence rate of 36%. In 2025, it is predicted that adults around the world will experience hypertension by 29% (Hasanah et al., 2016).

Risk factors for hypertension are age, gender, family history, genetics (risk factors that cannot be changed or controlled), smoking habits, salt consumption, saturated fat consumption, used cooking oil, drinking habits, obesity, lack of physical activity, stress, estrogen use (Tambunan & Siregar, 2022).

As we age, the risk of developing hypertension will be greater because of changes in the structure of large blood vessels, so that the lumen becomes narrower and the walls of blood vessels become stiffer and eventually there will be an increase in blood pressure. Based on the age group of sufferers, the prevalence of hypertension at the age of > 75 years is around 63.8%, the age of 65-74 years is about 57.6%, the age of 55-64 years is about 45.9%, the age of 45-54

years is about 35.6%, the age of 35-44 years is about 24.8%, the age of 25-34 years is about 14.7%, and the age of 15-24 years is about 8.7% (Miyusliani & Yunita, 2011).

According to the theory, men are more at risk of developing hypertension and cardiovascular disease than women before menopause. The mechanism of the cause is not yet clearly known, but there is a role of the hormone low testosterone. Menopausal women have a higher risk factor for hypertension than premenopausal women. Its pathological mechanism is not yet known for sure but is influenced by estrogen levels in the body (Putri, 2018).

The relationship between genetic factors and the incidence of hypertension gives mixed results because it is influenced by various other factors such as different races, backgrounds, and environments. Hypertension is a disease that is influenced by various factors, so the theory of polygenic hypertension or hypertension influenced by many genes is considered to play a more role in the occurrence of hypertension (Wahyudi & Noordia, 2021).

A history of smoking habits can increase blood pressure through the mechanism of release of norepinephrine from the nicotine-driven adrenergic nerve endings. A person who smokes more than one pack per day has twice as much vulnerability to hypertension when compared to non-smokers.

From the calculation of the nutritional status of the patient, it was found that the patient's BMI was 28.7 kg/m² which was categorized as obese. The method used in measuring obesity is Body Mass Index (BMI). BMI is used for the level of a person's nutritional status. Weight in kilograms divided by height in square meters (kg/m²) is expressed as BMI. If the BMI \geq 25 kg/m², then a person is declared obese (Bertalina & Anonymous, 2016).

BMI is greatly influenced by several things, such as nutritional intake, diet needs to be maintained, physical activity that is needed, lifestyle, level of knowledge, environmental conditions, exposure to chronic diseases, fat percentage, and others. The higher the excess intake received in a person, of course, the higher the likelihood that a person will experience an increase in BMI (Body Mass Index).

Obesity is a major factor that affects blood pressure and also the development of hypertension. Approximately 46% of patients with a body mass index of 27 are hypertensive. Obesity is a condition in which there is a buildup of excess fatty tissue, which has a bad impact on health. Obesity is a characteristic of the population of hypertensive patients. The cardiac output and blood volume of obese hypertensive patients were higher than those of non-obese hypertensive patients (Andri et al., 2022).

There is a link between obesity and the incidence of hypertension (increased blood pressure). This excess weight is associated with an increase in insulin in the blood related to sodium and water reabsorption, causing blood volume to increase. Increased blood volume will increase cardiac output and have an impact on increasing blood pressure and hypertension. Obesity also causes hyperactivity of the sympathetic nerve so that it causes systemic vasoconstriction and increases heart rate, this can cause hypertension (increased blood pressure) (Lorenza et al., 2023).

Based on the results of research conducted by Nurvitasari, it shows that the proportion of respondents who suffer from hypertension is more obese, namely 32 respondents (55.2%), so it can be concluded that most of the respondents with obesity experience hypertension, this may be due to a diet that often eats foods with coconut milk and also often consumes fried foods every time they eat, moreover, the oil used is used oil (used cooking oil), limited physical activity, family history of suffering from hypertension and obesity in addition to how to cook food with coconut milk soup that is often warmed can increase the amount of fat in food which causes the accumulation and formation of plaque in blood vessels (atherosclerosis) to become

narrower and less elastic so that blood pressure can increase and become one of the risk factors for obesity and hypertension (Kiyimba et al., 2023).

One of the alternative treatments or non-pharmacological treatments that can be an option to lower blood pressure is herbal therapy. Herbal therapy is one of the options of complementary therapy that can be used as a supporting therapy from conventional therapy. The herbal therapy used can function as a vasodilator and vasorelaksan. Vasodilators are substances that can function to help dilate blood vessels so that they can have a relaxing effect on smooth muscles. While vasorelaksan is a substance that can help the process in lowering blood pressure (Neamsuvan et al., 2018).

One of the plants that is consumed as herbal medicine and can be used to lower blood pressure is soursop leaf decoction. Soursop leaves contain *monotetrahydrofuran acetogenin* compounds (active compounds that have toxin-killing activities), such as *anomurisin A* and *B*, *gigante rosin A*, *murcatosin A* and *B*, goniothalamine and antioxidants that can prevent free radicals, dilate, flex blood vessels and lower blood pressure. The parts used as herbal medicine in soursop are fruits, leaves, and seeds. Soursop leaves contain flavonoid compounds, tannins, alkaloids, quinones, polyphenolates, and minerals such as magnesium, calcium, and potassium (Chukwuma et al., 2019).

Soursop leaves that are estimated to lower blood pressure are potassium. The potassium ions in the extracellular fluid will cause the heart to relax and also make the heart rate slow. In addition, potassium can also regulate the balance of body fluids with sodium, inhibit the production of renin, play a role in arteriole vasodilation and reduce endogenous vasoconstriction responses, to blood pressure. Soursop leaves have antioxidants that can ward off free radicals, just like other natural ingredients, these antioxidants can flex and dilate blood vessels and lower blood pressure. Soursop leaves are usually processed in the form of capsules or boiled soursop leaves, which contain a nutrient for health.

Conclusion

Hypertension is a disease caused by various factors. These factors can be modified or cannot be modified. Various factors in this case, namely age, gender, smoking habits, and obesity, can be predisposing factors for hypertension in patients and it is possible to worsen the patient's own health condition. Hypertension is one of the non-communicable diseases. This type of disease cannot be transmitted from person to person. However, the number of cases continues to increase along with the improvement of living standards and lifestyle changes, especially those related to physical activity, diet, stress and most importantly, the degenerative process along with increasing life expectancy. Therefore, it is very important to conduct early screening in those who already have at least one risk factor for hypertension. This is done so that hypertension can be controlled immediately from an early age and minimize the possibility of complications in the future.

In this case, the patient considers that the disease he suffers from is very important, especially for the patient's survival in the future and the disease can also result in having grandchildren. Based on the therapy he received, the patient felt that it was very necessary to undergo early treatment and routine control at a health facility in order to control the high blood pressure that the patient suffered.

Before the anamnesis and physical examination of the patient, prior informed consent has been carried out to the patient himself. The patient was given an explanation in the form of the purpose of the anamnesis and physical examination, and asked for consent to be used as a patient in this case report with the patient's name to be disguised.

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