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The Effect of Extract (Angelica Keiskei) on Reducing Blood Pressure Level among Post-Partum Period with Hypertension

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Abstract. A third of women who experience pregnancy hypertension or pre-eclampsia will continue in the *postpartum* period and reach their peak on days 3-6 *postpartum.* The study aimed to examine *Ashitaba* extract *(Angelica keiskei)* on reducing blood pressure levels among hypertensive *postpartum.* A quasi-experimental study design, pre-test, and post-test with the non-equivalent control group were applied in this study. Thirty samples were selected and divided into the experimental group and the control group. The experimental group received the Ashitaba extract, and the control group received nifedipine. The findings showed that systolic blood pressure among the intervention group was significantly decreased than the control group. This study proved the effective Ashitaba extract as an alternative therapy to reduce blood pressure among *postpartum* hypertensive mothers

Keywords: Ashitaba extract, postpartum hypertension, blood pressure

INTRODUCTION

Hypertension is a common condition among pregnancies women (1). World Health Organization (WHO) in 2015 recorded that hypertension is the second-highest contribute to Maternal Mortality (MMR), approximately 14% of the 289,000 maternal deaths. About 10% of maternal deaths due to pregnancy hypertension disorders occur in the *postpartum* period (2). In developed countries showed caused about 25% of maternal mortality, while 9% of death because hypertension occurred in developing countries (3-4).

Hypertension ranks second as a cause of AKI in Central Java (5). One of the districts with the highest MMR is Brebes Regency, in 20 17 there were 14 MMR and 8 of them (57.1%) were caused by PEB and Eclampsia *postpartum*, in 2018 there were 12 MMR, and PEB and *Postpartum* Eclampsia created 6 of them (50%). From 2019 to April, there were 5 MMAs, and PEB and *postpartum* Eclampsia caused 2 of them (40%). Data from the puerperal room register

of Brebes Regional Hospital, in 2018, there were 350 cases of hypertension and preeclampsia, while from January to mid-April 2019, there were 96 cases (6).

Postpartum hypertension has an impact on organ systems such as hypofibrinogenemia, cardiovascular disorders, liver necrosis, pulmonary edema, brain hemorrhage, acute kidney injury, HELLP syndrome (*Hemolysis Elevated Liver enzyme Low Platelet count*), other complications (tongue biting, trauma, fracture, pneumonia aspirate)) and DIC (*Disseminated Intravascular Coagulation)* (3,7-9). Women with hypertension and preeclampsia have a 3.7 times risk of future hypertension, 2.2 times the risk of ischemic heart disease, and eight times the risk of stroke (2).

Management of *postpartum* hypertension cases can be done pharmacologically and non-pharmacologically. Pharmacological management by providing anti-hypertension drugs (7). The provision of pharmacological therapy has been proven to have good effectiveness but has side effects in its use, such as hypotension, headaches, tachycardia, kidney disorders, and problems in breastfeeding (2-10). Non- pharmacological therapy has many advantages, such as more affordable prices, easy to obtain, and can minimize side effects (11).

Non-pharmacological therapies that have been carried out for the management of hypertension such as the administration of leaves, fruits, vegetables, and roots that contain compounds or substances that can work in lowering blood pressure, one of which is Ashitaba extract *(Angelica keiskei)* (12). Ashitaba *(Angelica keiskei) has* efficacy as cytotoxic, antidiabetic, antioxidant, anti-inflammatory, antihypertensive, and antimicrobial properties (13). A shitaba contains Alkaloids, saponins, tannins, phenolics, triterpenoid flavonoids, steroids, and glycosides. The total flavonoids in Ashitaba shoots are around 219 mg / 100 gr, and the total antioxidant content of Ashitaba ranges from 1890 $\pm$ 30 mg / g dry weight. Ashitaba leaf flavonoids can be used as non-pharmacological therapy to reduce blood pressure (14)

OBJECTIVE

The study aimed to examine *Ashitaba* extract *(Angelica keiskei)* as an alternative therapy on reducing blood pressure levels among hypertensive *postpartum*.

METHOD

A quasi-experimental study design, pre-test, and post-test with the control group were applied in this study. Samples in this study were hypertension postpartum women. About thirty samples were allocated in the experimental and control groups. The method of sampling in this study used purposive sampling. This study was divided into two groups, and the experimental group received Ashitaba extract and antihypertensive drugs. The control group received only antihypertensive drugs.

Instruments in this research are 1) Questionnaire characteristics of respondents include age, parity, type of labor, history of pregnancy, history of childbirth, past childbirth history, and family history. 2) standard operating procedures observation sheets to control the consumption of Ashitaba extract and antihypertensive drugs has been validated and according to standard WHO 3) Digital sphygmomanometer as a tool to measure blood pressure which has been validated and calibrated 4) Ashitaba extract in capsule form for intervention in postpartum hypertensive mothers.

The data were analyzed using the descriptive and Wilcoxon test. Descriptive analysis is used to describe the characteristics of each variable in the age, parity, type of labor, history of pregnancy, history of childbirth, past childbirth history, and family history. Analysis decrease

in the average - average systolic blood pressure and diastolic pre-test and post-test in the intervention and control groups using a test *Wilcoxon* and *Test Dependent T-Test.* Analysis of differences in average systolic and diastolic blood pressure pre-test and post-test between the intervention and control groups using the *Mann Whitney* test and the *Independent T-Test.* This study has been approved by the Health Research Ethics Commission of Dr. Moewardi Regional Hospital, Sebelas Maret University Medical School, number: 5 45 / I V / HREC /2019

RESULTS

Characteristic of respondents

Table 4.1 showed the characteristics of respondents. The findings confirmed that more than half of the patients in the intervention group were 21-35 years old (53.3%), and the control group (66.7%). Most of the people in the intervention group were multipara parity (73.4%). 47.7% of patients in the control group also multipara parity. In terms of delivery type, both the experimental and control groups were the normal type of delivery. They have a history of hypertension during pregnancy (66.7 % of intervention) and (80% of the control group).

Regarding the history of

labor, most of the patients in the intervention group (73.3%) and the control group (80%) had a history of normal deliveries. They also have a family history of hypertension with the intervention group was 66.7% while the control group was 53.3% of family history with hypertension.

Table 1. Characteristic of respondents

Characteristic	Group				p-value*
	Intervention (n=15)		Control (n=15)		
	N	%	N	%	
Age					
<20 years	1	6.7	1	6.7	
21-35 years	8	53.3	10	66.7	0.733
>35 years	6	40	4	26.6	
Parity					
Primipara	2	13.3	5	33.3	
Multipara	11	73.4	7	467	0.305
Grandemultipara	2	13.3	3	20	
Type of labor					
Normal	11	73.3	11	733.	1.000
SC	4	26.7	4	26.7	
Hypertension history					
Normal	4	26.7	2	13.3	
Hypertension	10	66.7	12	80	0.654
Gestational					
Chronic Hypertension	1	6.6	1	6.7	
Labor history					
Normal	11	73.3	12	80	
complication	4	26.7	3	20	1.000

Puerperal history					
Normal					
Hypertension	10	66.7	9	60	
Gestational	2	13.3	2	13.3	0.969
Chronic Hypertension	1	6.7	1	6.7	
Family History of Hypertension					
No	5	33.3	7	46.7	0.709
Yes	10	66.7	8	53.3	

Mean difference of systolic blood pressure before and after receiving the intervention among the experimental group and the control group

Table 4.2 showed that the Mean difference of systolic blood pressure before and after receiving the intervention among the experimental group and the control group. The findings showed that before receiving the intervention, the systolic blood pressure was 156.73 mmHg, and after receiving the intervention, the systolic blood pressure was 132.00 mmHg. It was indicated that 24.73 mmHg of blood pressure reduction with a *p-value of* 0.001. In the control group using the *dependent t-test* showed the average blood pressure before the intervention 155.33 mmHg and after the intervention 141.73 mmHg so that there was a decrease of 13.60 mmHg with a *p-value of* 0.000.

Table 2. Mean difference of systolic blood pressure before and after receiving the intervention among the experimental group and the control group

Variable	Before	After	Delta	p-value
	Mean±SD	Mean±SD		
Intervention group	156.73± 3.90	132.00± 7,97	-24.73	0.001[a]
Control group	155.33± 3.35	141.73± 7,09	-13.60	0.000[b]

Note: a = *Wilcoxon*
b = *Dependent T Test*

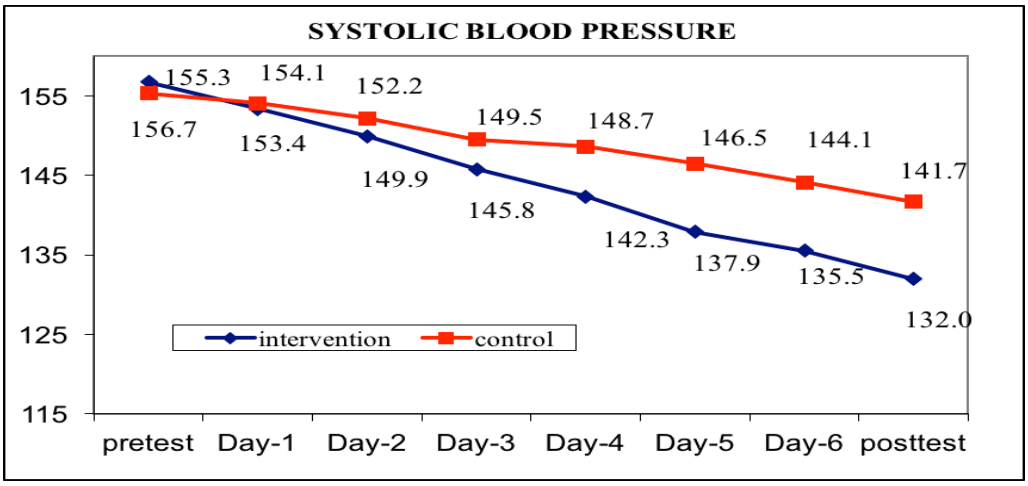

Figure 4. 1 Mean difference of systolic blood pressure among the experimental group and control group

Mean difference of diastolic blood pressure before and after receiving the intervention among the experimental group and the control group

Table 4.3 showed that the average of diastolic blood pressure before and after the intervention. The findings explained that before the intervention was 97.73 mmHg and after

the intervention 82.07 mmHg so there was a decrease of 15.67mmHg with a *p-value of* 0.001. The control group showed the average blood pressure before the intervention 97.13 mmHg and after the intervention 86.46 mmHg, so there was a decrease of 10.67 mmHg with a *p-value of* 0.001.

Diastole	Before Mean±SD	After Mean±SD	Delta	p-value
Intervention	97.73± 2.37	82.07± 5.09	-15.67	0.001[a]
Control	97.13± 2.37	86.46 ± 5.09	-10.67	0.001[a]

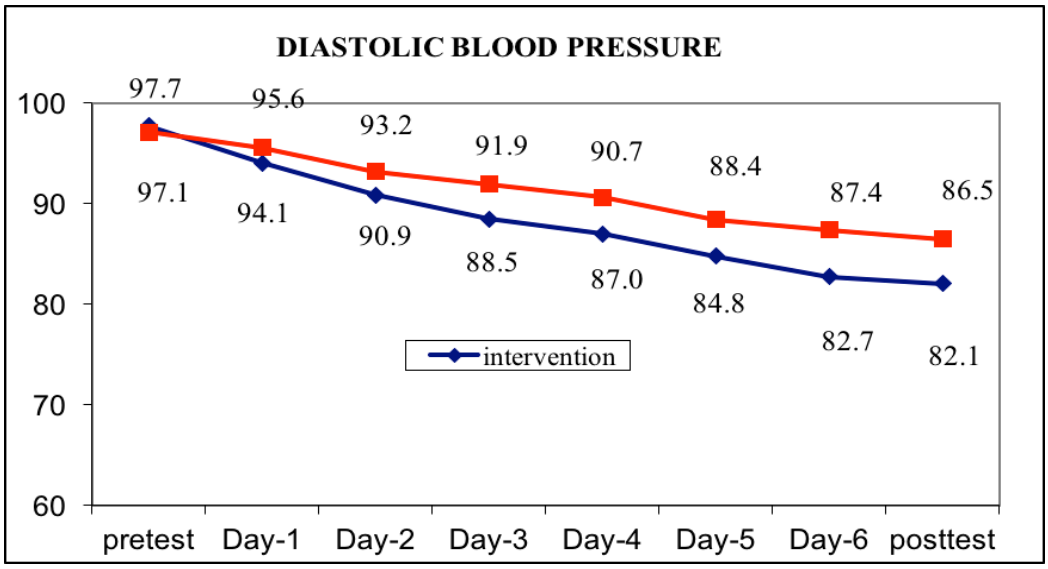

Figure 4. 1 Mean difference of diastolic blood pressure among the experimental group and the control group

DISCUSSION

Mean difference of systolic blood pressure before and after receiving the intervention among the experimental group and the control group

Based on table 4.2 on systolic blood pressure data analysis using *the Wilcoxon* test for the intervention group showed that the mean blood pressure before the intervention was 156.73 mmHg and after the intervention 132.00 mmHg. Therefore, there was a reduction of 24.73 mmHg with a *p-value of* 0.00 1 In the control group using the *dependent t-test* showed the mean blood pressure before the intervention 155.33 mmHg and after the intervention 141.73 mmHg so that there was a decrease of 13.60 mmHg with a *p-value of* 0,000.

Postpartum hypertension is an increase in blood pressure in the first 24 hours *postnatal* in women who have experienced pregnancy hypertension or de novo hypertension (postpartum) marked by blood pressure> 140/90 mmHg with or without proteinuria with a minimum of 2 times examination with an interval of 4 hours. 9, 2.7IIn hypertension three systems have an essential role in maintaining arterial blood pressure, namely renin-angiotensin and aldosterone. One component is *an ACE (Angiotensin Converting Enzyme)*. Several extracts and compounds in plants were confirmed in *in-vitro* as *ACE inhibitors*, one of which is a flavonoid. Flavonoids have a complex chemical compound that can reach into the

active center of *ACE*. Compounds flavonoids can be used as antihypertensive, reduce st res, and inhibit oxidative *ACE* activity (15-16).

One of the plants that have flavonoid content is Ashitaba leaf. Ashitaba leaves other active compounds, namely phenolic, saponin, tannin, alkaloids, and steroids. The total flavonoid in leaves ashitaba is two 19 mg / 100 g wet weight, and the total value of the antioxidant activity of ashitaba ranges from 1890 +_30 mg / g dry weight (14).

Ashitaba leaf flavonoids can help lower blood pressure through hypotensive effects by inhibiting the activity of *ACE* and as a diuretic. Flavonoids inhibit the action of ACE, which plays an essential role in the change of *angiotensin n I* to *angiotensin II* as a cause of narrowing of blood vessels and increased blood pressure. Inhibiting the work of *ACE* through flavonoid compounds is intended to prevent the formation of *angiotensin I* to *angiotensin II* so that vasodilation or blood vessels dilate. Therefore, blood flows to the heart, and *Total Peripheral Resistance (TPR)* falls and decreases in cardiac output resulting in a decrease in blood pressure (17-18). Flavonoids are one of many sources of antioxidants that have a protective effect on endothelial function and aggression platelet to reduce the risk of coronary heart disease and cardiovascular and blood pressure. Research on Ashitaba plants is efficacious as a cytotoxic, antidiabetic, antioxidant, anti-inflammatory, antihypertensive, and antimicrobial activity carried out both in vivo and in vitro (13).

How it works *ACE inhibitors* and diuretics through Ashitaba leaf flavonoids is the same as the workings of pharmacological drugs, namely captopril and nifedipine (15,17,18). Research related to the reduction of blood pressure using plants that contain flavonoids as the main ingredient has been widely carried out. In a study of Ashitaba leaves as an alternative therapy to reduce maternal blood pressure in postpartum hypertension based on Shimizu's research, it was stated that Ashitaba *(Angelica Keiskei)* against hypertension in rats proved to be effective in reducing blood pressure with a *p-value* < 0.05 (19).

This study was supported by Ritongga research 2017 using Rosella flower tea as a restricted intervention p postpartum maternal blood pressure hypertension. The content used in the rosella flowers is flavonoid compounds such as the Ashitaba leaf. In the study of the ravage, it was obtained that there were differences in the mean value of systolic and diastolic blood pressure before and after the intervention of respondents who were given rosella tea with systolic mean before intervention by 158.67 mmHg and after the intervention to 119 mmHg. This also occurs in diastolic blood pressure with an average before the intervention of 95 mmHg to 73.33 mmHg after the intervention. The results of *paired t-test* analysis showed p-value = 0.00 <0.05 on systolic and diastolic blood pressure, meaning that there were significant differences in systolic and diastolic blood pressure values before and after the rosella tea decoction intervention was given (20). Ashitaba extract 245 mg and nifedipine e have the potential to reduce maternal blood pressure postpartum hypertension. The potential of Ashitaba extract can be seen from the difference in the systolic and diastolic blood pressure of the control group as a whole as well as the changes per day.

Mean difference of diastolic blood pressure before and after receiving the intervention among the experimental group and the control group

Based on table 4.3 on diastolic blood pressure data analysis using *the Wilcoxon* test, the intervention group showed that the mean blood pressure before the intervention was 97.73 mmHg, and after the intervention, 82.07 mmHg. Therefore, there was a reduction of 15.67mmHg with a *p-value of* 0.00 1 In the control group showed the average blood pressure before the intervention 97.13 mmHg and after the intervention 86.46 mmHg. Therefore, there was a decrease of 10.67 mmHg with a *p-value of* 0.001.

The most common causes of postpartum hypertension are gestational hypertension, preeclampsia, and chronic hypertension during pregnancy. Complications caused by postpartum hypertension consist of damage to blood vessels, brain hemorrhage, kidney abnormalities, kidney failure, heart problems, strokes, retinal injuries, eye disorders, and liver necrosis. Treatment of hypertension aims to prevent complications through pharmacological treatment. The provision of antihypertensive drug therapy for postpartum mother with hypertensive should be safe for mother and breastfeeding infants. In the UK, there are no antihypertensive drugs licensed for breastfeeding because even in low amounts, it still tends to be absorbed in breast milk (2, 7).

Based on *eight joint national committees* (JNC 8), antihypertensive drugs are divided into several groups consisting of *receptor blockers, β blockers, calcium channel blockers,* ACE inhibitors, and *thiazide-type diuretics.* Based on eight joint national committees (JNC 8), antihypertensive drugs consisted of receptor blockers, β blockers, calcium channel blockers, ACE inhibitors, and thiazide-type diuretics. The National for Health Clinical Excellence (NICE) recommended for using *calcium-channel blockers* such as nifedipine as a choice. However, it should remain with a doctor's prescription and supervision (7, 21). Another hypertension drug, as such as enalapril, may reduce blood pressure levels. However, it does not recommend for pregnant women since it has side effects of hypotension and contraindications in patients with impaired kidney function (10, 22, 23).

The administration of nifedipine e drug is recommended following an oral dose of 1 0 or 20 mg, which has been proven in dealing with blood pressure in pregnancy and postpartum following doctor's recommendations and monitoring. Although breast milk is found in small amounts, nifedipine e has side effects in some people, such as heart problems, mild headaches (7, 10).

An anti-hypertensive drug such as nifedipine was effective in reducing systolic and diastolic blood pressure for seven days of blood pressure monitoring. However, when compared with a group of intervention changes in blood pressure reduction in the intervention group were accompanied by the provision ashitaba extract has a mean difference in change in blood pressure higher than those only given medication nifedipine e alone. The limitations of this study only examined blood pressure. Researchers cannot fully control the external variables that can influence research, such as anxiety factors and nutritional patterns.

CONCLUSION

Ashitaba extract has the potential to decrease the mean systolic blood pressure in women with postpartum hypertension by 24.73 mmHg and diastolic blood pressure by 15.67 mmHg more significant than the group given antihypertensive medication alone with a decrease in mean systolic blood pressure by 13.60 mmHg and pressure diastolic blood 10.60 mmHg. In subsequent studies, researchers can add variables such as anxiety and nutritional patterns and use other biomarkers such as levels of Nitric Oxide, MDA, which are associated with an increase in blood pressure.

REFERENCES

(1) Ryan RM, Mccarthy FP. Hypertension in pregnancy. Artic Press Case-Based Learn. 2018: 1-7.
(2) Bramham K, Nelson-Piercy C, Brown MJ, Chappell LC. Postpartum management of hypertension. BMJ. 2013; 346 (7897): 30-34.

(3) Nzelu D, Dumitrascu-biris D, Hunt KF, Cordina M, Kametas NA. Pregnancy outcomes in women with previous gestational hypertension: A cohort study to guide counseling and management. Artic Press. 2017: 0-1.
(4) Moroz LA, Simpson LL, Rochelson B. Seminars in Perinatology Management of severe hypertension in pregnancy. Semin Perinatol. 2015: 1-7.
(5) Central Java Provincial Health Office. Health Profile of Central Java Province. 2017.
(6) Brebes Regional Hospital. Medical records report at Brebes Regional Hospital. 2018.
(7) Smith M, Waugh J, Nelson-Piercy C. Management of postpartum hypertension. Gynaecol Obstet. 2013; 15 (1): 45-50.
(8) Magee LA, Dadelszen P Von, Dphil M. Hypertension in Pregnancy. Mayo Clin Proc. 2018; 93 (11): 1664-1677.
(9) Ghuman N, Rheiner J, Tendler BE, White WB. Hypertension in the postpartum woman: Clinical update for the hypertension specialist. J Clin Hypertens. 2009; 11 (12): 726-733.
(10) Powles K, Gandhi S. Postpartum hypertension. Cmaj. 2017; 189 (27): E913.
(11) Hussaana A, Pertiwi D, Chodidjah C, Widiyanto B, Indrayani UD, Sarosa H. Formula for Antihypertensive and Captopril Herbs are equally effective in patients with hypertension. Universa Med. 2017; 35 (2): 81.
(12) Ismalia N, Zuraida R, Lampung U, BI Nutrition, Medicine F, Lampung U. Effects of Tomato (Lycopersicon esculentum Mill) in Lowering High Blood Pressure Effect of Tomato (Lycopersicon esculentum Mill) for Decreasing High Blood Pressure. 2016; 5: 107-111.
(13) Caesar LK, Cech NB. A review of the medicinal uses and pharmacology of Ashitaba. Planta Med. 2016; 82 (14): 1236-1245.
(14) Sembiring BB, Manoi F. Identification of Ashitaba Plant Quality. Institute for Drug and Aromatic Plant Research. 2011; 22 (2): 177-185.
(15) Widiasari S. Angiotensin Converting Enzyme Inhibition Mechanism by Flavonoids in Hypertension. Collab Med J. 2018; 1 (2): 30-44.
(16) Siddiqi U, Plaat F. The treatment of hypertension in pregnancy. Artic Press Pharmacol. 2017; 18 (2): 106-109.
(17) Nadila F. Antihypertensive Potential of Chayote Fruit Extract for Hypertension Treatment. 2014; 3: 34-38.
(18) Utami vina nurul, Hadisaputro S, Rahayu S. Effect of coriander extract (coriandum sativum) on the changes in blood pressure of postnatal mice. 2016; 11 (1): 175-185.
(19) Shimizu E, Hayashi A, Takashi R, Aoyagi Y, Murakami T, Kimoto K. Effects of Angiotensin I-converting Enzyme Inhibitors from Ashitaba (Angelica keiskei) on Blood Pressure of Spontaneously Hypertensive Rats. J Nutr Sci Vitaminol (Tokyo). 1999; 45 (3): 375-383.
(20) Ritonga NJ, Setiani O, Umaroh, Budhi K, Amri F. Roselle flower (Hibiscus sabdariffa) in the treatment of hypertension in postpartum mothers. J Nurs Belitung. 2017; 3 (3): 229-237.
(21) Plan FUP, Delivery OF. Management of postnatal hypertension - top tips. : 14-15.
(22) Muhadi, Joint G, Committee N. JNC-8: Evidence-based Guidelines for the Management of Hypertension Patients. Cdk. 2016; 43 (1): 54-59.
(23) World Health Organization. Prevention and Treatment of Pre-eclampsia and Eclampsia.; 2011. doi: WHO / RHR / 11.30
(24) NHBPEP. The National High Blood Pressure Education Program Working Group on High Blood Pressure in Pregnancy. American J Obstet Gynecol. 2000; 183: 1-22.
(25) Sibai BM. Etiology and management of postpartum hypertension-preeclampsia. Am J Obstet Gynecol. 2012; 206 (6): 470-475.