

THE EFFECTIVENESS OF THE COMBINATION OF SNAKEHEAD FISH EXTRACT AND ACUPRESSURE ON ALBUMIN CONDITIONS AND BLOOD PRESSURE OF PREGNANT WOMEN WITH PREECLAMPSIA

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Abstract. One of the causes of maternal death is preeclampsia. Preeclampsia and eclampsia are caused by factors that decrease serum albumin (hypoalbuminemia) which causes a decrease in intravascular hypovolemic pressure. This study aimed to evaluate the effectiveness of snakehead fish extract and acupressure on albumin levels and blood pressure in pregnant women with preeclampsia. The research method is a non-randomized pretest-posttest control group design study and was conducted at a health center in Central Java, Indonesia. A sample of 30 subjects; 15 subjects in the experimental group, and 15 subjects in the control group. The experimental group was given snakehead fish extract 2x 500 mg every day for 14 days and acupressure at points GV 20, Li 3, and Ki 3 6 times for 14 days. Systolic and diastolic blood pressure measurements were performed on day 1 and day 14. Data analysis used paired parametric t test. The results showed that snake head extract and acupressure for 14 days had a significant decrease in diastolic from 12 mmHg to 10.66 mmHg ($p=0.000$), while in the control group there was no decrease in systolic blood pressure of 0.667 ($p=0.670$) and systolic blood pressure was 0.667 ($p=0.670$). pressure 0.667 ($p=0.670$). diastolic 2.66 $p=0.041$. In the experimental group there was an increase in albumin levels of 1.12 ($p = 0.000$). In the control group, albumin levels were -0.14 before and after the measurement did not affect albumin levels with a value of $p = 0.082$. Giving snakehead fish extract and acupressure at the KI 3 point, LV3, and GV 20 were effective in increasing albumin levels and lowering blood pressure in preeclamptic women.

Keywords: acupressure; albumin; blood pressure; preeclampsia; snakehead fish.

INTRODUCTION

Preeclampsia and eclampsia are the largest causes of mortality and morbidity for mother and baby in the world. Pregnant women with hypertension are at risk of experiencing complications 2-3% during pregnancy. Handling of hypertension in pregnant women has been done by giving anti-hypertensive drugs methyldopa 250 mg and nifedipine 10 mg. Giving antihypertensives can prolong pregnancy, but most respondents are not responsive to antihypertensive drugs. There are side effects of pharmacological therapy, including dizziness, hypotension, fatigue, depression, hypoglycemia, and IUGR.

Preeclampsia and eclampsia contribute a large number of maternal and infant mortality and morbidity in the world, where during preeclampsia and eclampsia there is a decrease in serum albumin (hypoalbuminemia) so that intravascular hypovolemic pressure decreases ([Liu et al., 2014](#)). The main cause of maternal death in cases of preeclampsia is pulmonary edema because left cord decompensation has exceeded extravascular fluid and decreased pressure on plasma colloids due to proteinuria and replacing large blood loss with crystalloids and the liver has decreased albumin synthesis ([Gunawan & Utama, 2020](#)).

Hypertension in pregnancy can reduce blood perfusion in the kidneys and decrease the rate of filtration in the glomerulus as in glomerulopathy so that there is an increase in the permeability of plasma proteins such as albumin ([Cornelis, Oduyayo, Keunen, & Hladunewich, 2011](#)). Decreased renal glomerular filtration

rate due to renal artery spasm results in decreased protein absorption resulting in proteinuria, and decreased serum albumin results in reduced intravascular hypovolemic pressure (Solberg et al., 2021); ([McNaughton, Jacobson, & Kripalani, 2014](#)); ([Jamshidnezhad, Kabootarizadeh, & Hoseini, 2019](#)). Low albumin levels result in inadequate fetoplacental circulation, multi-organ hypoperfusion, and overall endothelial damage. Lack of oxygen in the placenta stimulates the release of vasoactive substances in the blood which affect the heart.⁴ Normal albumin levels range from 3.4-5.4 g/dl.

Low albumin levels result in inadequate fetoplacental resulting in endothelial damage, hypoalbuminemia is also a triggering factor in the incidence of preeclampsia in pregnant women. Hypoalbuminemia can be overcome by consuming foods that contain lots of protein.

Snakehead fish (*Channa striata*) has a high protein content, snakehead fish extract capsules have a high albumin content and are animal antioxidants. With high albumin content in snakehead fish, it is expected to be able to overcome the problem of hypertension in pregnant women.

The many impacts on pharmacological drugs need to be accompanied by non-pharmacological treatments as a complement for better results ([Han, Lee, Commodore-Mensah, & Kim, 2014](#)). Non-pharmacological treatment for mild cases of preeclampsia in pregnant women is by performing acupressure measures that aim to open and stimulate the circulation of chi by activating the meridian points called

acupoint pressure points that are close to the skin.⁶ Acupresure is a simple therapy that has no side effects because it does not require an invasive technique and is a technique that is easy to do (Mehta, Dhapte, Kadam, & Dhapte, 2017). Acupresure is a derivative of acupuncture which is a physiotherapy massage at certain points on the surface of the body. In the case of hypertension, acupresure at certain points can stimulate nerve waves that can accelerate blood circulation, relax spasms, and stabilize blood pressure.⁸ Acupresure in this study used the LV 3, GV 20, and KI 3 points.

The purpose of this study was to determine the effectiveness of the combination of snakehead fish extract and acupresure on albumin levels and blood pressure in pregnant women with preeclampsia.

METHODS

The study design was a Quasi Experiment with a Pretest-Posttest with Control Group design. This study identified the effectiveness of a combination of snakehead fish extract and acupresure on albumin levels and blood pressure in pregnant women with preeclampsia. This study contained 2 treatment groups,

namely treatment group I was given a combination of snakehead fish extract and acupresure while treatment group II as control was only given standard midwifery care according to the service. The duration of intervention for each respondent was 2 weeks. The independent variable in this study was a combination of snakehead fish extract and acupresure, while the dependent variable in this study was albumin levels and blood pressure. The population in this study were pregnant women with preeclampsia in the Wonosobo district. The sample in this study used Stratified Random Sampling. Taking the subject in the study using a non-probability sampling technique, purposive random sampling type. The instrument in this study used a tool to check albumin levels in the blood using the Bromcresol Green method, mercury sphygmomanometer, snakehead fish extract, and 3 ml of venous blood samples. Data analysis used the Shapiro-Wilk test and homogeneity test, the data were normally distributed and homogeneous, followed by the analysis of variance using the paired T-Test parametric test. Has passed the ethical clearance test at dr. Moewardi Surakarta.

RESULTS AND DISCUSSION

Table 1. The difference of albumin level in the intervention and control group

Albumin Measurement	Group			
	Intervensi		Kontrol	
	mean±SD	Min-Max	Mean±SD	Min-Max
Before	3,467±0,241	3.1-4.0	4,093±0,421	3.6-4.9
After	4,587±0,388	4.0-5.2	3,953±0,387	3.6-5.0
P-value	0,000		0,082	
Difference	1.12±0,323		-0,14±0,289	

Variabel	Group		t	P
	Intervensi	Kontrol		
Albumin	Mean ± SD	Mean ± SD		
Pre - pre	3,46 ± 0,241	4,09 ± 0,421	-4,997	0,000
Post - post	4,58 ± 0,388	3,95 ± 0,38	4,471	0,000
Δ - Δ	1,12 ± 0,323	-0,14 ± 0,289	11,238	0,000

Based the Table 1, the albumin level measurement before the intervention group showed a mean of 3.46 gr/dl and in the control group, the albumin level was 4.09 gr/dl. Measurement of albumin levels after the intervention group increased by an average of 4.58 gr/dl, while in the control group the measurement of albumin levels after decreased by an average of 3.95

gr/dl. The intervention group experienced an increase of 1.12 gr/dl, in the control group -0.14 gr/dl.

Changes in the mean albumin levels in mild preeclampsia respondents who carried out 2 blood sampling to measure albumin levels before and after the intervention with snakehead fish extract and acupressure and changes in albumin levels in the control group can be seen in the following figure.

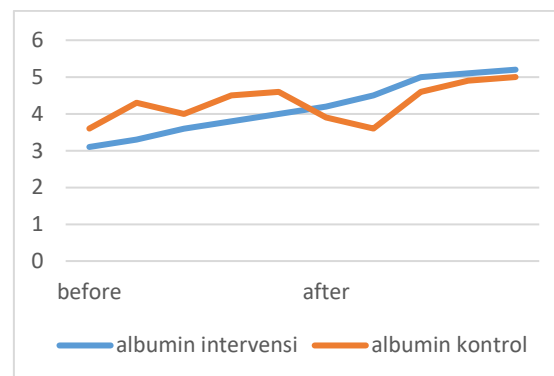


Figure 1. Description of albumin level in the intervention and control group

Based on Figure 1, shows that albumin levels in the intervention group respondents before and after giving snakehead fish extract and acupressure experienced a significant increase. In the paired t-test measuring albumin levels before and after in the intervention group, statistically, there was an effect on albumin levels after being given snakehead fish extract and acupressure with a value of $p=0.000$. In the control group, the albumin

level before and after the measurement did not affect the albumin level with a value of $p=0.082$.

The results of statistical tests that have been carried out can be concluded that the administration of snakehead fish extract 500 mg x 2 a day for 14 days and 6 times acupressure in 14 days can increase the albumin levels in the intervention group by 1.12 gr/dl and affect the albumin levels.

Table 2. The difference of systolic pressure in the intervention group and control group

Blood pressure measurement	Group			
	Intervention			
	Systole		Systole	
	mean \pm SD	Min-Max	mean \pm SD	Min-Max
Before	139.3 \pm 7.03	130-150	138.6 \pm 5.16	130-150
After	127.3 \pm 4.57	120-130	139.3 \pm 5.93	130-150
p	0,000		0,000	
Difference	-12 \pm 5.6		-10 \pm 2.5	

*paired t-test

Variabel	Kelompok		t	p
	Intervensi	Kontrol		
Sistol	Mean \pm SD	Mean \pm SD		
Pre - pre	139,3 \pm 7,037	138,6 \pm 5,164	0,296	0,770
Post - post	127,3 \pm 4,57	139,3 \pm 5,936	-6,200	0,000
Δ - Δ	12,00 \pm 5,60	-0,667 \pm 5,936	6,008	0,000

*independent t-test

Table 3. The difference of diastolic pressure in the intervention group and control group

Blood pressure measurement	Group			
	Control			
	Diastole		diastole	
	Mean \pm SD	Min-Max	Mean \pm SD	Min-Max
Before	90.67 \pm 2.58	90-100	91.33 \pm 3.51	90-100
After	80.00 \pm 0.00	80-80	88.67 \pm 3.51	80-90
P-value	0.670		0.041	
Difference		0.66 \pm 5.93		-2.66 \pm 4.57

* paired t-test

Variabel	Kelompok		t	p value ^a
	Intervensi	Kontrol		
Diastol	Mean \pm SD	Mean \pm SD		
Pre - pre	90,67 \pm 2,582	91,33 \pm 3,519	-0,592	0,559
Post -	80,00 \pm 0,000	88,67	-	0,000

	post		±3,519	9,539	
	Δ - Δ	10,66±2,581	2,66±4,577	5,896	0,000

**independent t-test*

Based on the table above, the measurement of systolic blood pressure before the intervention group with a mean of 139.3 mmHg and diastole 90.67 mmHg. In the control group, the mean measurement of systole was 138.6 mmHg and diastole 91.3 mmHg. Measurement of systole after the intervention group with a mean of 127.3 mmHg and diastole 80 mmHg, while in the control group systole before the mean was 139.3 mmHg and diastole 88.67 mmHg.

Snakehead or *Channa Striata* is a freshwater fish species that has high nutrition of the amino acid glycine and lipid arachidonic acid. Snakehead fish contains high protein as much as 70%, 21% albumin, zinc, amino acids, iron, and selenium. 9500 mg of snakehead fish extract has a protein content of 70.5% which includes 21% albumin, Mg 0.3200 mg, Fe 0.0115 mg, Ca 0.7300 mg, copper 0.0025 mg, Zn 0.0175 mg, Mn 0.0025 mg, Mi 0.0023 mg, Co 0.0015 mg, Se 0.0031 mg. Albumin contained in snakehead fish is 60% of the protein in blood plasma. The results of Veronika's research on 133 respondents showed the incidence of maternal morbidity was 33.8% and maternal mortality was 3.8% of patients experienced hypoalbuminemia in cases of severe preeclampsia and eclampsia (Guest, 2013); (Sivgin et al., 2013).

According to research results from Wahyuni by giving 2gr of snakehead fish extract for 7-10 can increase albumin levels in the blood by 0.6-08gr/dl ($p=0.001$). In

patients with low albumin levels after 8 days of intervention, albumin levels have increased (Chen & Wang, 2014). In the study, Syuma concluded that high albumin snakehead fish extract can increase albumin and MDA levels (Ayuda-Durán et al., 2019).

In the Ogawa study, with 139 patients, 33 respondents had gestational hypertension and 106 preeclamptic patients, there was a significant relationship between AT III and Albumin activity in gestational hypertension ($p=0.003$) and preeclampsia ($p=0.003$). Snakehead fish extract has the potential to increase albumin levels in the blood serum of preeclamptic patients.

Acupressure to treat hypertension has been conducted in many studies, one of which is by Haryani by providing acupressure in reducing the pain scale of hypertensive patients with a significant magnitude of 0.5 which means moderate (Bulut, Alemdar, Bulut, & Şalcı, 2020). Whereas in Lestari's study using other methods, namely Effleurage massage and music therapy to reduce blood pressure in maternal preeclampsia gave 0.2 which means very weak (Kesumawati, Mardiyono, & Latifah, 2020).

Previous research, conducted by Kesumawati, used acupressure and acumoxa at the HT 7 and LI11 meridians and moxibustion at the GV 20 and KI 3 points to reduce blood pressure for pregnant women with gestational hypertension. The results obtained were

1.494 which means very strong.16

Based on the results of previous research, it was shown that snakehead fish extract was effective for increasing albumin levels. In previous studies, the use of acupresure and moxibustion at the HT7, LI11, GV 20, and KI3 points was effective in reducing blood pressure in pregnant women with hypertension. So the researchers chose to research a combination intervention of snakehead fish extract and acupresure at points KI 3, LV3, and GV 20, to increase albumin levels and reduce blood pressure for pregnant women with mild preeclampsia.

The results of measuring albumin levels in the intervention group and the control group obtained a significance level of 1.6 which means very strong. In the measurement results of systolic blood pressure in this study, it was found a significance level of 2.26 which means very strong, and the diastolic blood pressure value of 2 (Ogawa et al., 2014). which means very strong.

CONCLUSIONS

Giving snakehead fish extract 500 mg x 2 every day for 14 days and acupresure at points KI 3, LV3 and GV 20 as much as 6 times for 14 days is effective in increasing albumin levels and decreasing blood pressure in preeclamptic mothers.

The administration of snakehead fish extract and acupresure was effective against the increase in albumin levels with a value of P=0.000

The administration of snakehead fish extract and acupresure was effective in reducing systolic blood pressure with a

value of P=0.000 and diastole with a value of P=0.000.

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