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## **EFFECT OF AMBON BANANA CONSUMPTION TO DECREASE BLOOD PRESSURE IN PREGNANT WOMAN WITH PREECLAMPS**

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### **ABSTRACT**

**Background:** Preeclampsia greatly affects maternal and fetal mortality and morbidity being dependent on gestational age at the time of preeclampsia. Maternal mortality in Indonesia is still marked by three major causes of death: haemorrhage, hypertension in pregnancy (HDK) and infection. This study aims to determine the effect of giving bananas ambon (ambon bananas?) in pregnant women with preeclampsia.

**Method:** This research used analytic survey method with experimental research design. The research design used prepost control design. The sample used was 20 pregnant women with pre-eclampsia, of which 10 were treated and 10 were controls.

**Result:** The result of T-Test paired showed that the effect of the use of ambon banana in the systolic blood pressure treatment group was 0.0001 ( $P < 0.05$ ) and diastole was 0.031 ( $p < 0.05$ ). Similarly, in systole the effect of banana utilize on the decrease in systolic blood pressure in groups was 0.101 ( $p > 0.05$ ) and in diastole 0.445 ( $p > 0.05$ ).

**Conclusion:** Provision of bananas in pregnant women is quite influential in the blood pressure pistol both systole and diastole with a difference of 10 mmHg.

**Keyword :** Pregnancy, Banana, Preeclampsia

### **INTRODUCTION**

Preeclampsia is an increase in systolic and diastolic blood pressure in pregnant women up to 140/90 mmHg accompanied by protein in urine more than 300mg per 24 hours or 30mg / mmol in the urine spot after 20 weeks of gestation [1, 2]. Preeclampsia greatly affects maternal mortality and morbidity and the fetus depends on the age of pregnancy in the event of preeclampsia. Preeclampsia has an impact on intrauterine growth delays, low birth weight (LBW), premature birth, asphyxia, and even causing death [2].

Maternal mortality in Indonesia is still dominated by three major causes: haemorrhage, hypertension in pregnancy and infection. The prevalence of bleeding and infection has decrease, while the prevalence of hypertension in pregnancy is increasing. In 2013 more than 25% of maternal deaths in Indonesia are due to hypertension in pregnancy [3]. The prevalence of maternal mortality in Central Java is not much different, hypertension in pregnancy becomes the main cause of maternal death (26.34%), followed by bleeding by 21.14% and infection by 2.76% [4].

One predisposing factor for the occurrence of preeclampsia or eclampsia is the existence of past history of chronic hypertension or previous hypertensive vascular disease, or essential hypertension [5]. Treatment of preeclampsia can be done with pharmacological and non pharmacological treatments. Pharmacological treatment can be done with the use of magnesium sulphate, aspirin, etc. [6]. While non-pharmacological one can be achieved by providing high energy intake such as saturated and unsaturated fatty acids, vitamin C, potassium and magnesium intake. Drogue and Madias (2007) showed that hypertensive patients who consumed potassium-rich foods with adequate sodium significantly lowered blood pressure by 3.4 mmHg at systolic pressure and 1.9 mmHg at diastolic pressure [7].

Based on the data obtained from the Central Java Provincial Health Office, Semarang City has the highest maternal mortality rate in Central Java as much as 35 cases. While in 2015 the number of pregnant women in Bandarharjo Puskesmas is 1382 people, which 76% of them are pregnant women with high risk (Resti) and 24% of them are normal pregnant women. One case of pregnant women with Resti and preeclampsia is 5.4%. While in 2016 there are 1309 pregnant women, which 78.6% of them are pregnant women with high risk (Resti) and 21.4% of them are normal pregnant women with the incidence of preeclampsia as much as 4.5%. In May pregnant women who are affected by preeclampsia as many as 20 people. The purpose of this research is to know the effect of giving an ambon banana to a pregnant mother with preeclampsia. So that we can know the effect of giving an ambon banana to decrease blood pressure in a pregnant woman.

## **METHODS**

This research uses quasi-experimental research design using prepost control design. The characteristic of this research is to use causal relationship of the experimental group and control group. Experimental and control groups were consumption pre-test prior to intervention. Experimental group was given intervention in the form of consumption of ambon banana while the control group was not given any intervention. Bananas are given as much as 400 grams a day with a given dose of 200 grams in the morning and evening. While control group was not given any intervention. After the intervention post-test was done by measuring blood pressure in the experimental group and control group to determine the change in blood pressure after intervention. Independent variable in this research is giving ambon banana and the dependent variable of this research is blood pressure in the pregnant mother.

The hypothesis of this study is "There is an effect of giving ambon banana to decrease blood pressure in the pregnant mother". Sampling technique used is total sampling, so all population become the sample is the research. The existing sample meets inclusion and exclusion criteria. The population of this study was pregnant women with preeclampsia in the working area of Bandarharjo Community Health Center. The samples used were 20 pregnant women with pre-eclampsia, 10 of which were treated and 10 of which were controls. This research is done in April - June 2017 in the working area of the health center of Bandarharjo. In this study, we used paired t-test statistic test.

## **RESULTS**

Distribution of Respondent Characteristics

Table 1. Distribution Characteristic Of Respondents

Characteristic of Respondent	Frequency	Percent (%)
Work		
Work	5	25
Not Work	15	75
Education		
Primary School	7	35
Junior High School	4	20
Senior High School	9	45
Parity		
Primipara	6	30
Multipara	14	70

Based on Table 1, most of the respondents do not work (75%). Most of them have high school education (45%) and majority of multiparous respondents (70%).

Effect of Ambon banana on systolic blood pressure and diastole on treatment and control group

Table 2. Paired T-test test Effect of Ambon banana on systolic blood pressure and diastole in treatment and control group

Group	Blood pressure	Mean Pre	Mean Post	Mean Differenced	<i>P</i>
Intervention	Systolic	145	126.171	18.829	0,0001
	Diastolic	90	83.4286	6.5714	0,031
Control	Systolic	140	136	4	0,101
	Diastolic	91	93	-2	0,445

Based on Table 2, the result of paired t-test showed that there was an effect of the use of ambon banana in the systolic blood pressure treatment group of 0.0001 ( $P < 0.05$ ) and diastole by 0,031 ( $p > 0,05$ ). Similarly in systole the effect of banana use on the decrease in systolic blood pressure in groups was 0.101 ( $p > 0.05$ ) and in diastole 0.445 ( $p > 0.05$ ).

## DISCUSSION

The results showed that mean systolic blood pressure after treatment decreased when compared with mean systolic blood pressure before treatment. This occurs caused by pregnant women who consume fewer foods that contain high calcium, causing high blood pressure in both systole and diastole [9]. Calcium can also help in the formation and maintenance of bones and teeth [10-11]. If the calcium intake in the body is low to maintain the balance of calcium in the blood, parathyroid hormone will stimulate the removal of calcium from bone into the blood. Calcium in the blood will bind free fatty acids so that the blood vessels become thickened and hardened so it will decrease the elasticity of the heart that will increase the blood pressure [12]. Based on the results of previous research conducted by Lestari and Tangkilisan, it was

mentioned that the consumption of bananas in 1 week will lower blood pressure by 10% or 9.27 mmHg [13-14].

There were differences in blood pressure in treatment groups of 126,171 mmHg with a mean systolic compared to blood pressure in the control group of 136 mmHg. While for the diastolic in the treatment group of 83.4286 mmHg and in the control group of 93 mmHg. The average yield of systolic blood pressure before administering ambon banana was not very different from the systolic difference of 18,829 mmHg and diastole of 6,5714 mmHg. The difference between 10 mmHg in systole and diastole of treatment and control group was observed. This is consistent with the theory that said preeclampsia is a condition where in pregnant women systolic blood pressure and diastole  $\geq 140/90$  mmHg and it is accompanied by urine protein  $> 300$  mg / 24 hours or 30 mg / mmol in urine spot after 20 weeks gestation [1,2]. Babies born to mothers suffering from preeclampsia tend to have a small gestational age and are rarely affected by respiratory disorders, but it will decrease their mortality. This is one of the pathophysiological differences of premature infants with an indication of preeclampsia [15].

Organic compounds in bananas work like ACE inhibitors. ACE inhibits the release of angiotensin-2, a substance that results in increasing blood pressure through constriction of the blood vessels. ACE is noted in bananas so that foods rich in potassium such as bananas can help lower blood pressure. Daily recommendation of consuming potassium is 4700mg per day. One of the foods that contain high potassium is bananas, which are about 422mg of potassium. Giving two bananas a day can lower blood pressure by 10% in a week [16]. While during the study period patients within the control group had received therapy in accordance with standard treatment of preeclampsia without being given banana intervention.

Ambon banana's effect on systolic and diastolic blood pressure in treatment and control group is shown on Table 2. Paired T-test result obtained  $\rho$  value data on systolic blood pressure treatment group before and after given ambon banana is 0.000 ( $\rho < 0.05$ ). So  $H_0$  is rejected and  $H_a$  accepted. It means that there is an effect of giving ambon bananas to decrease systolic blood pressure in pregnant women. While  $\rho$  value of diastolic blood pressure before and after given ambon banana in group treatment equal to 0.031 ( $\rho < 0.05$ ). So  $H_0$  is rejected and  $H_a$  is accepted. It means that there is an influence of ambon banana to decrease diastolic blood pressure in a pregnant woman.

However, there was a difference in the control group of  $\rho$  values on systolic blood pressure before and for 7 days without being given an ambon banana amounted to 0.101 ( $\rho > 0.05$ ). So  $H_0$  is accepted and  $H_a$  is rejected. It means no effect on the control group. While the value of  $\rho$  value on diastolic blood pressure before and for 7 days without being given a ambon banana amounted to 0.445 ( $\rho > 0.05$ ). So that  $H_0$  is accepted and  $H_a$  is rejected. It means no effect on the control group. Data obtained by maternal blood pressure in the control group is unstable, going up and down.

Intake of foods which is rich in protein and potassium such as bananas can decrease the blood pressure in patients with hypertension [13-17]. The potassium in the body will deliver the nerve impulse as well as the release of energy from proteins, fats, and carbohydrates during metabolism [10]. Increasing the levels of potassium in the blood will balance sodium levels and reducing urinary sodium levels so that it can avoid the increase of blood pressure in patients with hypertension [18]. In addition eating foods with high protein and potassium, low-sodium diet, sodium and physical activity can be invoked as hypertension therapy [19-21]. This is in line with Dwi Lestary's research in 2016 entitled "The Effectiveness of Banana Fruit To Decrease Diastolic Blood Pressure on Pregnant Women with Hypertension" with a sample of 19 people. The results showed that almost all pregnant women who had decreased diastolic blood pressure of 77.8% given bananas for 7 days with a dose of 3 times a day are having lower diastolic blood pressure. The average drop in blood pressure, after being given bananas for 7 days was 9.27 mmHg [14].

## CONCLUSION

Preeclampsia is an increase in systolic blood pressure (140 mmHg) and diastolic (90 mmHg) in pregnant women accompanied by urine protein > 300mg per 24 hours or 30mg per mmol in urine spot after 20 weeks' gestation. In 2013, 25% of maternal deaths in Indonesia are due to hypertension in pregnancy, while in Central Java preeclampsia is the leading cause of maternal deaths of 26.34%, followed by haemorrhage 21.14% and infection of 2.76%. Increase of blood pressure in both systolic and diastolic in pregnant women is caused by lack of consumption of foods containing high potassium. So hopefully pregnant women can consume more foods which are high in potassium to suppress the occurrence of hypertension.

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