

The Differences Of Infant Outcome In Mothers With Severe Preeclampsia, Preeclampsia With Complication, And Normal Pregnant Women

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Abstract

The results showed that there were differences in gestational age ($p = 0.000$), APGAR score ($p = 0.000$), birth weight ($p = 0.001$), birth length ($p = 0.000$) in severe preeclampsia, severe preeclampsia with complications, and maternal. pregnant normally. The results of this analysis indicate that infant outcomes are worse in mothers with preeclampsia.

Keywords: *infant output, preeclampsia, normal pregnancy*

1. INTRODUCTION

Severe preeclampsia is one of the complications that occur in pregnancy. Severe PE is characterized by hypertension in which systolic blood pressure is ≥ 160 mmHg and / or diastolic blood pressure is 110 mmHg with proteinuria ≥ 300 mg / day. Severe PE can also be accompanied by other complications such as renal insufficiency, liver problems, neurological complications, or haematological complications (1). Mothers who experience preeclampsia can increase the risk of cardiovascular disease, including chronic hypertension, stroke, coronary artery disease, diabetes and kidney disease later in life (2). Severe preeclampsia not only affects pregnancy but also affects perinatal outcome. Perinatal outputs that often occur are LBW, IUGR, asphyxia, SGA (small for gestational age), fetal distress, premature birth, and even death (3).

Previous studies have found a significant association between severe preeclampsia with SGA (small for gestational age), moderate-severe asphyxia and prematurity. Mothers with severe preeclampsia are more at risk of experiencing SGA (small of gestation age), asphyxia, and prematurity than women who are normally pregnant (4).

Preeclampsia is closely related to low levels of certain micronutrients. Some of the essential micronutrients during pregnancy are folic acid and magnesium. This research is a continuation of the research of Artika Hairani Mainurung and Chandra Ariani Saputri in 2019, where in the previous study, folic acid and magnesium levels were examined in the sample used in this study, from the results of the study it was found that mothers with severe preeclampsia and severe preeclampsia with complications having an average level of folic acid and an average level of magnesium that is lower than that of women who are pregnant normally (5,6).

Several studies have shown that the mean levels of magnesium and folic acid in mothers are not only associated with pregnancy outcomes but also with infant outcomes. Magnesium sulfate has been shown to help prevent and treat eclampsia in women with high blood pressure during pregnancy and in mothers at risk of preterm birth to protect the baby's brain and improve long-term outcome for the baby.(7). Folic acid helps reduce plasma homocysteine concentrations in pregnant women, homocysteine plays a role in maternal endothelial dysfunction by reducing nitrate oxidation and oxidative stress. Folic acid deficiency for pregnant women needs to be avoided because it is not only dangerous for pregnant women but folate deficiency can lead to dangerous consequences for the baby including neural tube defects, babies who are deficient in folic acid are also at higher risk of low birth weight, nervous system damage, stillbirth, and brain damage (8,9).

The purpose of this study was to analyze the differences in infant outcomes in mothers with severe preeclampsia, severe preeclampsia with complications, and normal pregnancies caused by low levels of magnesium and folic acid.

2. RESEARCH METHODS

This study is a longitudinal study with a prospective cohort design. This study is a continuation of previous studies where in previous studies, serum magnesium and folic acid levels were examined in women with severe preeclampsia, severe preeclampsia with complications, and normal pregnant women. In this follow-up study, prospective data were the outcomes for infants from the three groups of respondents.

Time and place of research

This research was conducted in September 2020 in four hospitals in Makassar South Sulawesi, i.e Dr. Wahidin Sudirohusodo Hospital, Sitti Khadijah I Mother and Child Hospital (RSIA), Hasanuddin University Hospital and Sitti Fatimah Regional Health Hospital for Mother and Child (RSKDIA). The sample used for this study was 72 samples consisting of mothers and babies. Samples were divided into three groups, namely 30 samples for normal pregnancy, 30 samples for severe preeclampsia and 12 samples for severe preeclampsia with complications taken through medical records.

Research stage

The study was carried out after obtaining permission from the research location and the Ethics Commission for Medical Research, Hasanuddin University Medical Faculty with a number UH20070291 protocol. Data collection used medical records of mothers and babies with a history of normal pregnant women, pregnant women with severe preeclampsia, and pregnant women with severe preeclampsia with complications. Data taken in the form of maternal characteristics and outcomes in infants, namely gestational age, APGAR score, birth weight and birth length..

3. DISCUSSION RESULT

Table (1) Differences in infant outcomes in the three groups of respondents

Diagnosis	N	Age of Gestation (Sunday) Mean ± SD	<i>p</i>	APGAR Score Mean ± SD	<i>p</i>	Birth weight (gram) Mean ± SD	<i>p</i>	Birth length (cm) Mean ± SD	<i>p</i>
Normal	30	38.37 ± 1.42		0.79 ± 0.02		3036.50 ±		48.23 ±	

						377.22		1.52	
Severe preeclampsia	30	36.87 ± 1.43	0.000 *	0.72 ± 0.08	0.000 *	3000.53 ± 667.24	0.001 *	47.57 ± 2.90	0.000 *
Severe preeclampsia with complications	12	36.17 ± 1.89		0.68 ± 0.07		2220.83 ± 585.43		43.87 ± 3.22	

* $p: <0.05$

* Kruskal Wallis test

The results in this study (Table 1) indicate that there are differences in gestational age, APGAR scores, infant weight and birth length in the normal pregnancy group, severe preeclampsia, and severe preeclampsia with complications.

The pathophysiology of preeclampsia is the occurrence of vascular endothelial dysfunction, dysfunction in spasms and increased blood pressure causing changes in the cardiovascular system in the form of arteriolar spasms which can interfere with uteroplacental blood flow. Basically, the placenta gets a lot of blood supply from the uteroplacental arteries. Decreased blood flow to the placenta causes impaired function of the placenta. Arteriolar spasms that occur suddenly can cause asphyxia. If the spasm lasts a long time, this can interfere with fetal growth and if there is an increase in the tone and sensitivity of the uterus to stimuli, it can lead to premature labor (10).

In the case of preeclamptic mothers, the placental circulation is not normal (insufficient placenta). The process of invasion of trophoblast cells in the muscle layer of the spiral arteries is imperfect so that the muscle layer of the spiral arteries remains stiff and hard, as a result, the lumen of the spiral arteries does not allow distension and vasodilation, the spiral arteries are relatively vacuous and there is failure to remodeling the spiral arteries. This results in a decrease in uteroplacental blood flow and there is placental hypoxia and ischemia. It is the result of this abnormal placentation that causes several perinatal complications (11,12).

The results of previous studies indicate that preeclamptic mothers are at risk of delivering preterm babies and neonates with low Apgar scores (13,14). Other studies have found that mothers with severe preeclampsia are more likely to deliver preterm babies and have low Apgar scores (4).

In addition, this study is also in line with previous studies where preeclamptic mothers had a higher risk of giving birth to babies with low birth weight. (14,15). However, these findings are different from previous studies which found no difference in LBW between the exposed group and the control group (16). Another different study only looked at the mean birth weight in preeclamptic mothers and the control group(17).

Nutrition during pregnancy really needs to be considered, especially meeting the needs of magnesium and folic acid during pregnancy for better baby outcomes.

In relation to magnesium and preterm events, oral magnesium administration can prevent preterm birth by reducing the risk of placental dysfunction. Mothers who are deficient in magnesium have a higher risk of developing chronic hypertension, preeclampsia, placental dysfunction, and prematurity.(18).

In a study on the effect of magnesium supplementation on pregnancy outcomes, it was shown that pregnancy outcomes such as preeclampsia, preterm birth, Apgar score below 7 and birth weight were significantly better in the group receiving magnesium supplements than in the control group. Magnesium supplements during pregnancy can reduce the incidence of various pregnancy complications. The use of the correct dose of magnesium plays an

important role in the treatment of problems in unwanted pregnancy and prevents preterm birth, LBW, and preeclampsia (19).

In a study by (20) found that folic acid supplementation can significantly reduce the risk of small of gestation age (SGA) but if the mother's folic acid intake can be fulfilled since the preconception period. Another study by (21) found that the use of folic acid during pregnancy is very important to prevent the incidence of low birth weight and preterm birth. The mother's daily intake of folic acid of 400 µg can significantly reduce this risk.

4. CONCLUSION

The outcome of infants of mothers with severe preeclampsia or severe preeclampsia with complications, due to insufficient levels of magnesium and folic acid, can cause shorter gestational age, decreased Apgar scores, low birth weight and short birth weight.

RECOMMENDATION

- 1- It is hoped that further researchers will be able to directly monitor the development of babies from preeclamptic mothers.
- 2- Health workers, especially midwives, began providing supplementation with magnesium and folic acid as additional vitamins since the preconception period.

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