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Preeclampsia and Low Birth Weight Incidence in Dr. Soewandhie Hospital, Surabaya

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Abstract

Low Birth Weight (LBW) is one of the factor contributing to higt infant mortality rate. The prevalence of LBW is estimated to be 15% of all births in the world where 33% - 38% occur in developing countries. The infant mortality rate in Indonesia from 2008 was followed by 248 per 100,000 live births. Factors affecting LBW are preeclampsia. The purpose of this study was to determine whether there was a relationship between preeclampsia and the incidence of low birth weight at dr. Soewandhie Hospital, Surabaya. The design of this research was cross sectional. The population was all babies born on February 1 to April 30, 2017. The sample size was 138 selected by total sampling technique. Data were collected by documentation study on secondary data, then analyzed by Chi-square test. Women who gave birth from preeclampsia were 39.9%, the incidence of LBW was 47.1%. The incidence of LBW was more common in mothers who gave birth to preeclampsia, namely 32 (58.2%). The results of Chi-Square test was obtained the p-value of 0.034 (there was a relationship between preeclampsia and the incidence of LBW). Pregnant women who are preeclampsia are at risk of delivering low birth weight babies.

Keywords: *Baby, Low Birth Weight, Preeclampsia, Pregnancy*

Introduction

A nation's health indicators can be seen in infant and child mortality. Indonesia as a developing country there is one of the problems in the neonatal period that still needs attention is Low Birth Weight (LBW) because the incidence is still high.(1) The frequency of LBW in developed countries ranges from 3.6% to10.8%, in developing countries was 10% to 43%. Ratio between developed and developing countries is 1:4.(2) According to estimates from World Health Organization (WHO), in 2013 almost all (98%) of the 5 million neonatal deaths occurred in developing or low-income countries. More than 2/3 of the number of neonatal deaths is caused by LBW. The prevalence of LBW is estimated to be 15% of all births in the world where 33% to 38% of them occur in developing countries or low socio-economic conditions. The infant mortality rate in Indonesia is still the highest compared to other ASEAN countries. Infant mortality rate in Indonesia starting in 2008 ranged from 248 per 100,000 live births.(3)

Based on the Indonesian Demographic and Health Survey (IDHS) in 2012, the Neonatal Mortality Rate in 2012 amounted to 19 cases per 1.000 live births.(4) Whereas according to the 2012 IDHS, the neonatal mortality rate in East Java was 14 cases / 1.000 live births.(5) According to Basic Health Research in Indonesia's health profile in 2014, the most common causes of death were asphyxia, low birth weight and infection. The 37% of causes of death in the first month of life were caused by breathing disorders, 34% LBW, 12% sepsis, 7% hypothermia, 6% blood disorders / jaundice, 3% post maturity and 1% conginetal abnormalities.(1) LBW incidence in Indonesia is 100/1000 live births. Whereas the incidence of LBW in Java is 11 / 1.000 live births. According to Surabaya's health profile in 2015 the incidence of LBW in Surabaya was 2.58% of 48,783 babies born. In dr. Soewandhie hospital-Surabaya has increased for 1 year. LBW data in November 2015 as many as 20% of babies born and increased to 46.5% in October 2016.

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Risk factors for LBW are fetal, placental and maternal factors. One of the maternal factors causing LBW is preeclampsia.[6] Preeclampsia in pregnant women has a variety of effects, ranging from mild to severe. Preeclampsia can slackening of blood flow to the placenta which will damage the placenta and interfere nutrition to the fetus. Nutritional supply that is less causing fetal growth is disrupted and results in LBW.[7]

To achieve a reduction in IMR, there are 4 main strategies in the Strategic Plan, namely improving access to quality health services by establishing K4 policies, namely Ante Natal Care at least 4 times, improving the skills of health workers, increasing community empowerment and increasing public health financing, namely the guarantee of delivery in the hope safe delivery and normal birth weight babies.[1] The purpose of this study was to find out the relationship between preeclampsia and the incidence of low birth weight at dr. Soewandhie Hospital Surabaya.

Method

This type of research was analytic and used a cross sectional design. The population in this study were all babies born on 1 February to 30 April 2017 in the NICU of dr. Soewandhie Hospital-Surabaya. The sample size were 138 babies taken in total sampling. The independent variable was preeclampsia and the dependent variable was Low Birth Weight. Data collection techniques were based on secondary data in the NICU and medical record data, then analyzed using Chi-square test.

Findings

Table 1. Distribution of the age of mothers

Characteristic	Frequency	Percentage
Age:		
• 20 – 35 old	80	58
• <20 or >35 old	58	42
Parity:		
• Primipara	39	28.3
• Multipara	88	63.8
• Grandemulti	11	8.0
Method of Delivery:		
• Spontaneous /Brach	59	42.8
• Cesarean Section	71	51.4
• Vacuum Exstraction	8	5.8
Gestational Age:		
• Preterm	56	40.6
• Aterm	71	51.4
• Post term	11	8.0

Based on table 1. it can be explained that the most of mother's age was 20-35 years (58%), the most of mother's parity was multiparity (63.8%), the method of delivery was mostly (51.4%) with Cesarean and the most gestational age was aterm (51.4%).

Table 2. Distribution of the history of preeclampsia

Preeclampsia	Frequency	Percentage
Yes	55	39.9
No	83	60.1
Total	138	100.0

Based on table 2 it can be explained that mothers who give birth with preeclampsia during pregnancy were high (39.9%).

Table 3. Distribution of the incidence of LBW

LBW	Frequency	Percentage
Yes	65	47.1
No	73	52.9
Total	138	100.0

Based on table 3, it can be explained that out of 138 babies born, almost a small portion (47.1) were LBW

Table 4. The correlation between the history of preeclampsia and the incidence of LBW

Preeclampsia	LBW Incidence				Total		p-value
	LBW		Not LBW				
	f	%	f	%	f	%	
Preeclampsia	32	58.2	23	41.8	55	100	0.034
Not preeclampsia	33	39.8	50	60.2	83	100	
Total	65	47.1	73	52.9	138	100	

Table 4 shows that the incidence of LBW was more common in mothers who gave birth with preeclampsia, namely 32 (58.2%). The p-value of Chi-square test was 0.034, which meant that there was a relationship between preeclampsia and the incidence of LBW.

Discussion

The results of descriptive analysis show that the incidence of LBW is more prevalent in mothers giving birth with preeclampsia and the results of statistical analysis indicate that there is a relationship between preeclampsia and the incidence of LBW.

The results of this study are in accordance with the theory expressed by Prawirohardjo[7] that pregnancy with preeclampsia will be at great risk for babies born with low birth weight babies. In pregnancy with preeclampsia begins with a disturbance in the growth of placenta. Trophoblast cells that attack the fertilized ovum normally can restructure the maternal spiral arteries in the decidual layer of the uterus to create blood pressure, a high blood supply to the developing fetus placental blood vessels that should experience widening so that blood flow to the placenta increases during pregnancy fails (failure of spinal artery remodeling). In preeclampsia the arteries become stiff and hard so that blood supply is not normal as it should be.[7] Placental development has not finished as late as 18 weeks gestation and if this does not progress normally, the spiral arteries that supply the planenta will remain narrow. Spiral arteries do not experience dilation and muscle relaxation resulting in decreased blood flow to the placenta and hypoxia and placental ischemia. Hypoxia and ischemia in a continuous placenta will stimulate the formation of free radicals, namely hydroxyl radicals (-OH) which are considered as toxins. Free radicals that become fat peroxide will cause oxidative strees which is a condition where free radicals are more dominant than antioxidants. Oxidative stress at a later stage along with circulating toxic substances can stimulate damage to the vascular endothelium.

Placental problems cause disruption of blood supply, O2 and CO2, nutrient exchange to the placenta, damage to the endhotel and placental blood vessels resulting in impaired supply of nutrients to the fetus, thus impacting

fetal growth not in accordance with gestational age.[8]

In this study mothers who were preeclampti were only a small proportion so that babies with low birth weight were also small. This is supported by the condition of the mother where a small portion is <20 years old and >35 years old. Pregnant women with age <20 years have a high potential to develop preeclampsia and result in low birth weight because their reproductive and psychological organs are not yet stable. Whereas mothers who are pregnant >35 years of age can experience cardiovascular system disorders and pathology at the endhotel. In addition, mother / primipara respondents also have the potential to experience preeclampsia because mothers experience stress more often and the presence of an immunological mechanism besides endocrine and genetic, namely the formation of antibodu blocking against incomplete placental antigens.

The results of this study are almost similar to research conducted at Military Hospital Amritsar by LT Cel G Singh, et al.[9] which showed that preeclampsia is a factor that causes Low Birth Weight Babies in most cases. In addition, the results of this study are also in line with the results of research by Aziz, et al.[10] at the Hasan Sadikin Hospital in Bandung which shows that there is a correlation between the weight of low birth weight babies and preeclampsia.

Efforts that can be made to prevent the occurrence of LBW due to preeclampsia with regular checkups, discipline in taking drugs given by doctors, adequate rest with a left tilt position so that the fetus can get more O_2, avoid stress, diligently consume foods that contain lots of protein, green vegetables and nuts and eat lots of high antioxidant foods and preparation for labor since the antenatal period.

Conclusion

Based on the results of the study, it can be concluded that there is a relationship between preeclampsia and LBW incidence in the NICU of dr. Soewandhie Hospital-Surabaya. Therefore midwife has expected to provide counseling and midwifery care in pregnant women with preeclampsia because it can causes babies born with LBW.

Conflict of Interest-No

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