




RELATIONSHIP OF WEIGHT GAIN, ANEMIA AND AGE WITH LOW BIRTH WEIGHT INFANTS

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Abstract

Background: The incidence of LBW is still an important health problem because it contributes to infant mortality. There are several factors that influence the occurrence of LBW there are weight gain, anemia and mother's age during pregnancy. The incidence of LBW in east java province in 2018 was 6,4%, this figure was 0,2% higher than the national rate. The purpose of this study to determine the relationship between maternal weight gain during pregnancy, anemia and mother's age with low birth weight babies at RSUD Dr. M. Soewandhie Surabaya. **Method:** This study used an observational analytic method with a case control approach. Sampling with consecutive sampling technique. Sampling used medical record data for mothers giving birth in the delivery room of RSUD Dr. M. Soewandhie Surabaya in 2018. The sample of this study were 45 mothers giving birth to babies with low birth weight (LBW) and 45 mothers giving birth to babies with normal birth weight (BBLN). Data analysis used the chi-square test. **Result:** The results of the chi-square test analysis with α 0,05 showed that anemia in the mother ($p = 0.02$) related with low birth weight. Meanwhile maternal weight gain during pregnancy ($p = 0.06$) and the mother's age ($p = 1$) were not related to LBW. **Conclusion:** These research showed that there is correlation between anemia and Low Birth Weight and there is no related between maternal weight gain and mother's age on Low Birth Weight.

Keywords: LBW, maternal weight gain, anemia, mother's age

INTRODUCTION

Low birth weight babies are still one of the highest causes of infant mortality, WHO estimates that ≥ 20 million low birth weight babies are born each year. The incidence of LBW in developing countries is 4 times greater than the rate of LBW in developed countries. In Indonesia, according to Riskesdas (2018), the incidence of LBW reached 6.2% and in East Java Province reached 6.4%. The secondary data obtained from Dr M. Soewandhie Surabaya Hospital in 2018 was 15.38%.

The World Health Organization (WHO) defines LBW as a baby born with a low birth weight of less than 2,500 grams. LBW can cause various health problems, both short-term health problems and long-term health problems. Short-term problems that occur in LBW include metabolic disorders, immunity disorders,

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respiratory disorders, circulatory system disorders, fluid and electrolyte disorders. While the long-term impacts or problems can be in the form of psychological problems and physical problems (Izzah, 2018).

Factors that can affect the occurrence of LBW are maternal haemoglobin levels, maternal age at delivery, type of delivery, maternal education level, maternal occupation, number of parities, maternal living environment, smoking history, history of alcohol consumption, history of abortion, maternal blood pressure, history of systemic disease in the mother, gestational age at delivery, maternal body mass index before delivery, maternal upper arm circumference, height and maternal weight (Aryana, 2021).

According to research conducted by Capriyanti (2016), factors that influence the incidence of Low Birth Weight are age, haemoglobin levels, and pregnancy complications. According to Pantiawati (2010) factors that can cause LBW include maternal factors, placental factors, foetal factors and environmental factors. Maternal factors include age, education, occupation, pregnancy distance, gestational age, parity, multiple pregnancy, hypertension, anemia, behaviour. Research conducted by Rini (2015) found that maternal age is associated with the incidence of LBW, namely pregnant women with high risk (<20 years or >35 years) have a risk of 36.1 times greater to give birth to LBW than pregnant women who are not included in the resti age. Maternal Hb level during pregnancy has a risk of LBW of 23.38 times. Research conducted by Khoiriah (2015) found a relationship between maternal weight gain during pregnancy and the incidence of LBW.

Until now low birth weight babies are still one of the important health problems in developing countries and are one of the factors that contribute to infant mortality, especially in the perinatal period. In addition to being a contributing factor to the increase in morbidity and infant mortality, LBW results in inhibition of growth and development, hearing loss, vision, learning disorders, mental retardation, behavioural problems and cerebral palsy, and is susceptible to lower respiratory tract infections (Agustina, 2016). Based on the data and problems described above, researchers are interested in conducting research on the relationship between maternal weight gain during pregnancy, anemia and maternal age with low birth weight babies at RSUD Dr. M. Soewandhie Surabaya.

METHOD

This research design uses analytical observations with a case control approach. The population used for this study were all mothers giving birth in the delivery room of Dr M. Soewandhie Hospital in 2018. The sampling technique used was consecutive sampling, with 45 respondents for the case group and 45 respondents for the control group. With the criteria of the case group, namely mothers giving birth with low birth weight babies with aterm pregnancy, birth weight babies < 2500 grams, and have complete medical records. And in the control group, namely mothers giving birth to normal birth weight babies with aterm pregnancy, birth weight \geq 2500 grams, and have complete medical records. This study has two variables, namely low birth weight babies as the dependent variable and maternal weight gain during pregnancy, anemia, and maternal age as independent variables. This study was conducted after being declared ethically sound by the Health Research Ethics Committee of RSUD Dr M. Soewandhie, Surabaya. Data collection was conducted in July-August 2019 using secondary data, namely medical records. Data analysis in this study used the chi square test with a significance level of 5% to determine whether or not there was a relationship between the variables of weight gain, anemia, and maternal age with low birth weight babies.

RESULT AND DISCUSSION

Tabel 1. Characteristics of labouring mothers in Case Group and Control Group

No	Variable	Low Weight Birth		Not Low Weight Birth	
		n	(%)	n	(%)
1	Level of Education				
	SD	4	4.4	5	5.6
	SMP	9	10	15	16.7
	SMA	28	31.1	22	24.4
	PT	4	4.4	3	3.3
2	Employment				
	Employed	15	16.7	16	17.8
	Unemployed	30	33.3	29	32.2
3	Gravida				
	Primigravida	13	18.9	13	14.4
	Multigravida	28	31.1	32	35.6
4	IMT				
	Low	10	11.1	4	4.4
	Normal	27	30.0	28	31.1



	High	6	6.7	6	6.8
	Obesity	2	2.2	7	7.8
5	Weight gain				
	<11,5 kg	15	33.3	27	30
	11,5 - 16 kg	45	16.7	18	20
6	Hb Levels				
	<11 gr%	15	16.7	27	30
	≥ 11 gr%	30	33.3	18	20
7	Age				
	< 20 atau >35 th	13	14.4	13	14.4
	20 – 35 th	32	35.6	32	35.6

In table 1, it is known that the respondents with the most education category are high school level. Most of the respondents did not work. Most respondents in both groups were multigravida mothers. Most respondents had normal BMI. Most respondents experienced weight gain <11.5 kg. Most respondents had Hb levels ≥11 gr%. Most of the respondents were 20-35 years old.

The results of the analysis used in this study are Chi Square, obtained the following results:

Tabel 2. Hasil uji chi square

Factor	N	p
Weight Gain	90	0.662
Hb Levels	90	0.02
Age	90	1

In Table 2, the results of chi-square test analysis with α 0.05 showed that anemia in mothers ($p=0.02$) was associated with LBW. While maternal weight gain during pregnancy ($p=0.06$) and maternal age ($p=1$) were not associated with LBW.

WHO states that 2/3 of pregnant women in Indonesia suffer from anemia. Based on this number, about 20% end up with LBW. Anemia is a case that can be easily prevented but the incidence is so high. Most pregnant women do not know about LBW as a result of anemia.

Anemia in pregnancy can increase the incidence of LBW due to impaired transfer of Hb to the fetus through the placenta as one of the sources of nutrients for the fetus. Iron nutritional anemia occurs due to insufficient iron nutrients absorbed from the daily diet for the formation of red blood cells, causing an imbalance between iron intake and expenditure in the body. This can cause oxygen distribution to tissues to be reduced which will reduce tissue metabolism so that fetal growth will be inhibited and result in LBW. The need for nutrients, especially iron, in pregnant women increases according to the increasing age of pregnancy. If

there is an increase in iron demand without being accompanied by adequate intake, iron reserves will decrease and can lead to anemia. The amount of iron needed during pregnancy is much greater than women who are not pregnant, this is because the need for Fe increases for the needs of the placenta, fetus in the womb and the needs of the mother herself.

During pregnancy, a mother stores 1,000 mg of iron. The amount of iron in a newborn is approximately 300 mg while the amount of iron needed by the mother to prevent anemia due to increased blood volume is 500 mg. Pregnant women with risky BMI have a 2.4 times greater chance of giving birth to babies with LBW (Fahmi, 2020). According to the theory presented by Husin (2014), one of the factors that influence the weight of the baby born from maternal factors is the mother's weight gain during pregnancy. However, in this study, weight gain during pregnancy was not associated with the incidence of LBW, this is in line with research conducted by Wigianti (2020) which states that there is no significant relationship between maternal weight gain during pregnancy and the incidence of LBW. The baby's birth weight is not only influenced by the mother's weight gain during pregnancy but also influenced by the mother's age, parity, pregnancy distance, and diseases suffered by the mother both before and during pregnancy. Other factors from the fetus that affect the sex of the fetus, congenital defects, viral and bacterial infections and twin fetuses as in the theory presented by Cuningham (2006). In addition to the above factors according to Proverawati (2010), other factors that can affect the occurrence of LBW are environmental factors, how often the mother makes antenatal visits, the gestational age of the fetus at the first antenatal visit, a history of poor pregnancy, socio-economic status, type of maternal employment, iron and folic acid levels and the sex of the baby.

According to Prawiroharjo (2011) the age of the mother is very young, still in the age of growth has a higher risk of giving birth to a low birth weight baby because of the competition between the baby and the mother because the mother herself is still in the age of growth. The age of pregnant women > 35 years will further increase the risk of diseases such as hypertension which is one of the predisposing factors for LBW birth. Although from the previous explanation, maternal age has various risks, age does not always have a negative influence on



one's health. Some other factors that influence include nutritional status in pregnancy, the mother's level of education, knowledge, work experience, physical burden, environmental factors, economic problems and whether or not the mother regularly conducts antenatal examinations. The results of this study are in line with research conducted by Asih (2013) and Yana (2016), namely there is no relationship between maternal age and the incidence of LBW.

CONCLUSION AND SUGGESTION

This study shows that there is an association between anemia and low birth weight and no association between maternal weight gain and maternal age with low birth weight.

This study still has many weaknesses, for further research it is expected to add other factors that explain the influence on the incidence of low birth weight babies such as the presence of comorbidities such as tuberculosis disease, hypertension, nutritional status of mothers with SEZ.

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