Factors That Influence The Event of Low Birth Weight Baby (LBW) in Mother at Payangan, Bali

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Abstract. Infant mortality is an important indicator in determining the health status of a country. The main predisposing factor of infant mortality is Low Birth Weight (LBW). LBW can have long-term effects on child developments therefore the high incidence of low birth weight can affect the quality of human resources. The purpose of this study was to determine the predisposing factors of the occurrence of LBW in Payangan sub-district, Bali. This research was an analytical research with a case control design to assess predisposing factors of the occurrence of LBW by assessing medical records of pregnant women. The sample of this study was 46 mothers with a history of childbirth. Sampling method done with consecutive sampling. In this study two analyzes were carried out, namely univariate analysis and bivariate analysis. Univariate analysis was done to measure the frequency based on parity, multiple pregnancies, nutrition of pregnant women, and anemia in pregnant women. Meanwhile, a bivariate analysis with chi square method was done to test the significance of each variable on the independent variable. Results obtained five predisposing factors, namely maternal age, parity, multiple births, nutritional status, anemia, those which had correlations to the incidence of LBW in Payangan Health Center were twin births, nutritional status, and anemia with P value of <0.05. Conclusion made from results of this study was the variables that have significant effect were variables of twin births, nutritional status, and anemia, while parity did not have a significant effect. Suggestion made that it can provide benefits to health workers at health centers and pregnant women about LBW risk factors.
Keyword : Influence, Birth Weight Baby, Mother.

1 Introduction

Infant mortality is an important indicator in determining the health status of a country. In Indonesia, based on data from the Central Statistics Agency (BPS), in 2012 there were 34 infant mortality rates per 1000 inhabitants. Whereas in the province of Bali, based on BPS data, in 2012 there were 29 deaths per 1000 inhabitants [1], [2].

The main predisposing factors of infant mortality are Low Birth Weight (LBW). Low Birth Weight is an infant with a birth weight of less than 2500 grams regardless of gestational age. Based on data from the World Health Organization (WHO), the incidence of LBW is estimated more than 20 million infants in the world or around 15% of all births in the world. In Indonesia, from all perinatal deaths, of around 2-27% were due to LBW with the incidence rate between one region and another shows a variation between 9-30% [3].

The number of infant deaths in Gianyar Regency until October 2014 was 68 cases out of 5100 live births. The infant mortality rate until October 2014 was 13.33/1000 live births. The causes of all cases of infant mortality were LBW in 28 infants (41.17%), congenital abnormalities in 20 infants (29.41%), asphyxia in 13 infants (19.12%), sepsis in 2 infants

(2.94%), pneumonia in 3 infants (4.41%), and aspirations in 2 infants (2.94%), therefore it can be concluded that the main cause of infant mortality in the regency of Gianyar was LBW. While the highest LBW incidence rate in Kabupaten Gianyar happened in the district of Serangan [4].

Payangan sub-district can be classified as rural area with the majority of the population living as farmers. In this case, it also represents other regions in Gianyar regency and Bali in general, therefore it can overview of the risk factors of the incidence of LBW. Low birth weight can have long-term effects on child developments therefore the high incidence of low birth weight can affect the quality of human resources [5].. Hence we need to take preventive measures to improve maternal and child health during pregnancy and after childbirth.

2 Method

This study was a case control study, 46 people included in the case and control group. The inclusion criteria of this study were all pregnant women that have been examined in Payangan Health Center and recorded as given birth on the medical record. Meanwhile the exclusion criterion was pregnant women who do not have complete medical records at Payangan Health Center. The sample was taken using a consecutive sampling method by collecting cases to meet the minimum number of sample then the control group selected according to the mother's age. Ethical feasibility was given by the Ethics Feasibility Institute of Udayana University/Sanglah Hospital in Denpasar. The maternal age, parity, multiple pregnancies, nutrition of pregnant women, and anemia in pregnant women, were analyzed using chi square, the p value <0.05 was considered as significant.

3 Results And Discussion

Data on the characteristics of the research subjects can be seen in the table 1.

Table 1. Chracteristics data of the research subjects

No	Risk Factor Characteristic	Categories	Cases (%)	Control (%)
1	Maternal age	20-35 years	34 (74,0)	33 (71,8)
2	Parity	<20 years/>35 years	12 (26,0)	13 (28,2)
3	Twin births	<3	41 (89,1)	45 (97,8)
4	Nutritional status	≥3	5 (10,9)	1 (2,2)
5	Anemia in pregnancy	Twin	8 (17,6)	0 (0)

Table 1 showed the distribution of research subjects according to age, parity, twin births, nutritional status and the presence of anemia during pregnancy. Based on Table 1, it can be seen that more mothers have children less than 3, single born, normal nutritional status and without anemia. These results indicate a good health condition for pregnant women.

3.1 Relationship between Parity and LBW Events

Table 2 showed that the number of subjects with more than 3 parities was most prevalent in the case group, but the chi square test showed that parity did not significantly affect the incidence of LBW in the Payangan area (p = 0.20).

Table 2. Results of Bivariate Analysis between Parity and LBW Events

		Parity		Total
		<3	≥3	
Case	Control	45	1	46
Control	Case	41	5	46
Total		86	6	92

X2= 2,85, p = 0,20, OR= 5,48 (CI 95%: 0,61-48,95)

Parity is the number of children born by a mother. Many children will have an impact on maternal and infant health status, one of which is the incidence of LBW. The frequency of parity with univariate statistical tests that conducted at Payangan Health Center included 92 samples of pregnant women which was divided into 2 categories, the first category of pregnant women with parity <3 as many as 86 pregnant women (93.5%) devided into 41 pregnant women (89.1%) in the case group and 45 pregnant women (97.8%) in the control group. The second category of pregnant women with parity ≥3 of 6 pregnant women (6.5%) which was devided into 5 pregnant women (10.9%) in the case group and 1 pregnant women (2.2%) in the control group.

The bivariate statistical test between parity and LBW incidence found that there was no relationship between parity and the incidence of LBW at Payangan Health Center. These results showed that hypothesis of parity influencing the incidence of LBW was not in accordance with the incidence of LBW at Payangan Health Center. This might be caused by the parity mostly <3 therefore the risk of experiencing LBW was low. In addition, the distance between pregnancy and birth in pregnant women significantly reduced the risk of parity as a causative factor for LBW.

The results of this study was consistent with the research conducted by Amalia (2011) which states that parity does not affect the birth of infants with LBW [6]. The results of this study was not in accordance with the research conducted by Nuryani, et al., (2013) which states that mothers with high parity were at risk of giving birth to babies with LBW due to parity increases the risk for mother and baby, moreover the distance between pregnancies was less than two years so that the mother will be weak due to frequent pregnancy, childbirth, breastfeeding, and caring for the child [7].

Table 3. Results of Bivariate Analysis between Twin Births and LBW Events

		Parity		Total
		<3	≥3	
Case	Control	46	0	46
Control	Case	38	8	46
Total		84	8	92

X2= 8,76, P= 0,00, OR= 20,53 (CI 95%: 1,06-1,38)

In twin pregnancies, fetal weight is lighter than single pregnancy (primipara). This is because the distribution of blood and nutrition for each twin baby is not the same. Mothers with multiple pregnancies need more nutrients and foods, because lack of nutrition for

mothers with multiple pregnancies will have an impact on the birth of their babies, one of which is LBW.

Bivariate statistical tests between twin births and LBW events were found to have a relationship between twin births and the incidence of LBW at Payangan Health Center. These results showed that the hypothesis of twin births influencing the incidence of LBW in accordance to the incidence of LBW at Payangan Health Center.

This study was in accordance with research conducted by Masitoh, et al., (2014) which states that there was a significant relationship between multiple pregnancies and the incidence of LBW (P = 0.00). According to Masitoh, et al., (2014) the average birth weight of twins was lower than the weight of single-born babies (primipara), this was because twin births frequently premature in labor which can increasing the mortality among twins. Another opinion from Endriana et al., (2012) and Alya (2013) stated that, in twin pregnancies, excessive uterine distention exceeds the tolerance limit occured which has an impact on prematurous delivery. Mothers with multiple pregnancies need more nutrients and foods because in a twin pregnancy, mother with nutrition deficiency disorders such as anemia and other deficiency diseases can lead to low birth weight [8], [9], [10]. Another study conducted by Sulistyorini & Putri (2015) reported that there was no relationship between multiple pregnancies and the incidence of LBW (P = 0.11), so the results of this study were not in accordance with the results obtained by the study about LBW event at Payangan Health Center [11].

3.2 Relationship between Nutritional Status of Pregnant Women and LBW Events

Table 4 showed that the number of subjects whom KEK was found mostly in the cases group and the chi square test showed that pregnant women with KEK was significantly influence the incidence of LBW in the Payangan Health Center (p = 0.01). These results can be interpreted as pregnant women with KEK have the potensial of 17,65 times experiencing LBW births.

Table 4. Results of Bivariate Analysis between Nutritional Status of Pregnant Women and LBW Events

		Nutritional status of Pregnant Woman		Total
		Normal	KEK	
Case	Control	46	0	46
Control	Case	39	7	46
Total		85	7	92

X2= 7,58, p = 0,01, OR= 17,65 (CI 95%: 1,04-1,33)

The nutritional status of pregnant women is an important factor that influences the incidence of LBW. One of the nutritional problems that are often experienced by pregnant women is KEK. The nutritional status of pregnant women can be determined by measuring the arm circumference. If the arm circumference of pregnant women <23.5 cm, pregnant women categorized as KEK, but if ≥23.5 cm then the nutritional status of pregnant women is normal.

The bivariate statistical test between the nutritional status of pregnant women and the incidence of LBW was found to have a relationship between the nutritional status of pregnant women and the incidence of LBW in Payangan Health Center. These results showed that the hypothesis of nutritional status in pregnant women influences the incidence of LBW according to the incidence of LBW at Payangan Health Center.

This study in accordance with the research conducted by [6] and [11] which reported that the nutritional status of pregnant women was one of the risk factors for pregnant women giving birth to babies with LBW (P = 0.00 & P = 0.01) . Pregnant women who experience nutritional status of KEK will inhibit fetal growth; will be at a high risk of giving birth to babies with LBW, in addition to impaired fetal growth and development. But this study was not in accordance with the research conducted by Mahayana, et al., (2015) which stated that there was no relationship between the nutritional status of pregnant women and the incidence of LBW (P = 0.25) [6], [11], [12].

3.3 Relationship between Anemia in Pregnant Women and LBW Events

Table 5 showed that the number of subjects who have anemia status was most prevalent in the case group and the chi square test showed that pregnant women with anemia status have a significant effect on the incidence of LBW in Payangan Health Center (p = 0.03). These results can be interpreted that pregnant women with anemia have a potential of 4.50 times experiencing LBW births.

Table 5. Results of Bivariate Analysis between Anemia in Pregnant Women with LBW Events

		Anemia in pregnant women		Total
		Normal	**Anemia**	
Case	Control	43	3	46
Control	Case	35	11	46
Total		78	14	92

X2= 5,39, P= 0,03, OR= 4,50 (CI 95%: 1,16-17,41)

The World Health Organization (WHO) states that anemia in pregnant women occurs if the Hb level is less than 11 g%. Anemia in pregnancy will reduce the transportation of nutrients and oxygen to the placenta, causing disruption of pregnancy, one of which is LBW.

Bivariate statistical tests between anemia in pregnant women with LBW events found that there was a relationship between anemia in pregnant women and the incidence of LBW in Payangan Health Center.

These results showed that the hypothesis of anemia in pregnant women having an effect on the incidence of LBW according to the incidence of LBW at Payangan Health Center.

This study was consistent with the research conducted by [5] which states that pregnant women who have anemia give birth to babies with low birth weight, with the results of statistical tests obtained P value = 0.002, it can be concluded that there was a significant relationship between anemia status and LBW incidence. in the city of Singkawang. In addition, this study was not in accordance with the research conducted by [13] which stated that there was no association between Hb levels of pregnant women and LBW incidence in Pariaman city with a p value of 0.85 [5], [13].

4 Conclusions

Conclusion made from results of this study was the variables that have a significant effect to low birth weight were the variables of twin births, nutritional status, and anemia, while the

parity did not have a significant effect. Suggestion made that it can provide benefits to healthcare workers at health centres and pregnant women about LBW risk factors.

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