

**THE EFFECT OF MATERNAL NURTITIONAL ANEMIA  
TOWARDS LOW BIRTH WEIGT**

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**ABSTRACT**

**Background:** Nutritional anemia is still a major nutritional problem suffered by pregnant women. Anemia in pregnant women may increase the risk of miscarriage, premature birth, having a baby with low birth weight (LBW), stillbirth, perinatal death. This study aimed to determine the effect of anemia on the incidence of LBW.

**Method:** The study design was cross sectional. The study population was all pregnant women residing in the District of North Indralaya Ogan Ilir City. Study sample are pregnant women with gestational age entry trimester II (16 weeks-24 weeks, amounting to 50 pregnant women. Data analysis included univariate analysis and bivariate analysis

**Results:** The results showed that mothers with anemia 2.5 times greater risk for LBW babies compared with women who are not anemic. (OR = 2.53, 95% CI 0:44 to 14:57) after the job is controlled by variables, parity, and frequency of the ANC.

**Conclusion:** It is recommended to the Health Department / Community Health Center to conduct health education for pregnant women so that people know about the importance of prenatal care to prevent LBW and to the Society to check their pregnancy with a frequency determined by the MOH is at least 4 (four) times, so health examinations of pregnant women can monitored by health workers.

**Key words:** Anemia, Antenatal care, Low birth weight

**INTRODUCTION**

The gestation period is one time that need attention in terms of nutrition and health, so that mothers and babies who are born physically and mentally healthy. Nutritional anemia is still a major nutritional problems suffered by pregnant women. Anemia in pregnant women may increase the risk of miscarriage, premature birth, giving birth to babies with low birth weight (LBW), stillbirth, perinatal death. Pregnant women who suffer from severe anemia can suffer heart failure that can lead to death (Ministry of Health, 2001).

Various studies show that 40% of maternal deaths are caused by bleeding during delivery and anemia are important trigger factors of maternal mortality. An estimated 20% mortality was closely associated with low levels of hemoglobin (anemia) during pregnancy (Jus'at, K. and Elder Leslie). Study ever conducted Susanto, 2000, at RSUP Dr. Mohammad Hoesin Palembang showed that the incidence of Low Birth Weight Infants (LBW) in pregnant women with anemia of 80.4% of all deliveries.

The collection of field data by the Center for Nutrition Research and Development in 1970, it scores a prevalence of 46.5 to 70%, based on the results of the 1992 Household Health Survey prevalence of anemia in pregnant women at 63.5%, SKRT anemic pregnant women in 1995 amounted to 50.9 % (Center for Nutrition, 1997), whereas the results of the 2001 Household Health Survey maternal anemia prevalence of 40.1% (Ministry of Health, 2005). The prevalence of anemia



of pregnant women in South Sumatra itself is not known with certainty. This fact can be traced from the results of the health of the mother during pregnancy is one of hemoglobin. Unfortunately for the scope of this inspection was very small at only about 34.4%. The incidence of LBW in South Sumatra by 19.5%, quite higher than the national of 11.1%. (Risksda, 2007). This figure indicates a high prevalence of anemia among pregnant women when referring to research Susanto 2000. Seen from the above conditions Indralaya Northern District has indicated a high prevalence of anemia (above the national prevalence (40%). The prevalence of anemia obtained in the District of Palembang Gandus not much different from the above prediction is 45.9% (Mutahar, 2010)

Various studies have much to prove the relationship between maternal anemia and LBW incidence, but further analysis is required regarding how much contribution the incidence of anemia and other factors on the incidence of LBW. This is quite important because the results can be used to assess the priority programs of the most efficient and effective use in reducing the incidence of LBW.

## METHODS

The design of this study used a cross-sectional (cross-sectional). The design was taken to observe the relationship between risk factors and outcomes that occur in the form of a particular disease or health status at the same time. The study population was all pregnant women residing in the District of North Indralaya Ogan Ilir regency. Study sample are pregnant women with gestational age incoming second trimester (16 weeks-24 weeks), who was willing and was selected as a sample. Trimester II is selected based on considerations at the time it needs the highest red blood cells in pregnant women.

Based Lemeshow (1997), the required minimum number of samples in this study was calculated using the formula calculating the number of samples to test the hypothesis in two proportions with a two-sided test, as many as 70 respondents.

Collecting data by interview with questionnaire and Hb examinations of pregnant women through the Sahli method.

## RESULTS AND DISCUSSION

During research trials have been conducted questionnaires and training of personnel collecting data for the same perception and measurement, but the bias is unavoidable. These weaknesses include:

1. Design used in this study is cross sectional in which the assessed exposure and come out simultaneously so that the relationship of anemia with low birth weight (LBW) can not be fully interpreted as causal relationships.
2. The possibility of information bias, especially the questions regarding frequency of antenatal conduct, and spacing.

From the collection of pregnant women in North Indralaya sub-district obtained 50 respondents pregnant. This figure is smaller than the sample adequacy rate, this is due to limitations of time and breadth of research areas. But if, carried out tests on the power of the study (power of the test or 1-beta) obtained 70%, meaning that if the research is stated then there is a relationship between anemia and low birth weight and maternal anemia incidence of the trust equal to approximately 70%. In univariate analysis will be presented the characteristics of respondents with each risk factor. Of the 50 respondents who were pregnant in mind that most respondents did not

have anemia that is equal to 52.0%. The prevalence of anemia is obtained from this result is not so much with the national figure is the result of research Husaini (1989) who found the prevalence of anemia among pregnant women trimester I-II of 55.7%. To view the distribution of maternal health factors in the District of North Indralaya Ogan Ilir Year 2010 can be seen in the table below :

**Table 1**  
Frequency Distribution of Mother Characteristics  
in the District of Indralaya Utara OI Year 2010

Variable	Category	n	%
Anemia	Yes	24	48.0
	No	26	52.0
LBW	Yes	7	16.3
	No	36	83.7
Age	< 20	5	10.0
	20-35	37	74.0
	≥ 36	8	16.0
Parity	Primipara	7	14.0
	2-3	34	68.0
	≥ 4	9	18.3
Pregnancies space	< 2 year	6	12
	≥ 2year	38	76
	Missing	6	12.0
Upper Arm Circumference	< 23.5 cm	3	6.0
	≥ 23.5 cm	47	94.0
History of Miscarriage	No	2	4.0
	Yes	48	96.0
ANC Frequency	Less	21	42.0
	Enough	29	58.0
Education level	Not complete primary school	5	10
	Complete primary school	25	50
	Complete junior high school	9	18
	Complete senior high school	2	4
	Graduate from Academy / PT	0	0
Occupation	No	8	16.0
	Yes	42	84.0

Of the 50 respondents who were pregnant in mind that the respondents did not complete primary school by 5 people (10.0%) finished primary school while 25 people (50%), graduated from junior high school as many as nine people (18.0%), graduated from high school and college graduation respectively 9 people (18.0%) and 2 (4.0%). This figure is also in accordance with the Indonesia Demographic and Health Survey (IDHS) 2007, that most junior high school-educated Indonesian women. Mothers with low education and low economic status are usually less aware of the importance of prenatal care as it also has limitations in getting a strong antenatal care, lack of nutritious foods during pregnancy, often stress that all this will interfere with maternal and fetal health (MOH, 1997) .



**Table 2**  
The relationship of risk factors on the incidence of LBW

Variable	Category	LBW Status				OR crude (95% CI)
		Yes		No		
		n	%	n	%	
Anemia	Yes	4	21.1	15	78.9	1
	No	3	9.7	28	90.3	<b>2.4 (0.49-12.61)</b>
Age	< 20 and > 35	2	18.2	9	81.8	1
	20-35	5	15.6	27	84.4	1.2 (0.19-7.2)
Paritas	1 and ≥ 4	1	6.3	15	93.8	1
	2-3	6	17.6	28	82.4	0.3 (0.03-2.83)
Education level	graduated from junior high school	19	48.7	20	51.3	1
	high school and above	4	36.4	7	63.6	1.7 (0.42-6.61)
Occupation	Yes	3	37.5	5	62.5	1
	No	4	9.5	38	90.5	5.7 (0.97-33.25)
Upper Arm Circumference	< 23.5 cm	0	0	3	100	-
	≥ 23.5 cm	7	14.9	40	85.1	
ANC Frequency	< 4	3	17.6	14	82.4	1
	≥ 4	4	12.1	29	87.9	1.5 (0.31-7.91)
Pregnancies space	< 2 year	3	50.0	3	50.0	1
	≥ 2 year	4	10.5	34	89.5	8.5 (1.26-57.19)
History of Miscarriage	Yes	0	0	2	100	-
	No	7	14.6	41	85.4	

In this bivariate analysis, age of the respondents are grouped into two groups : high risk (age <20 years and age 35-49 years) and low risk (age 20-34 years). Based on the above table can be seen the value Odds Ratio (OR) = 1.2 with 95% CI = (0.19-7.2) mean age of respondents with a high risk of potentially 1.2 times more likely to have children with low birth weight compared to respondents with low risk age. Close relationship between mother's age with the incidence of LBW births seen in the data in the United States in 1971-1981, the relationship between age and incidence of LBW shaped letter U. Young mothers aged 15-19 years and women aged 35 years or more, have a higher risk of LBW delivery than in mothers aged 20 years or under 30 years (Institute Of Medicine, 1985). The results are consistent with the results of research conducted by Alisyahbana (1990) in Surtiati (2003) which says that the mother is younger than 17 years and more than 35 years had a 2 times greater risk of having a baby with low birthweight compared to mothers aged 17 - 35 years.

In this further analysis of education of respondents classified into two groups: low education (less than junior high school graduation) and higher education (completed high school and up). Statistical test results obtained with the value of OR = 1.7 95% CI = 0.42-6.61 means that less educated respondents have a chance of almost 2 times more likely to have children with low birth weight compared to highly educated respondents. Determine the level of education of many of the attitudes and actions of a mother in the face of various problems such as providing vaccinations for their children, give ORS when diarrhea eg willingness to be participants in family planning, including setting up food for pregnant women to prevent infant with low birth weight (LBW). That the mother has a crucial role in the health and growth of children can be shown by the following fact, children of mothers have higher educational backgrounds will have the opportunity to live and grow better (MOH, 2000).



From the results of a statistical test values obtained  $OR = 5.7$  with  $95\% CI = 0.97-33.25$  means that respondents who work have a chance of almost 6 times more likely to have children with low birth weight than respondents who did not. It is not in accordance with MOH (2003b), which states that work affecting the socio-economic status and this will affect in getting adequate antenatal care and nutrition fulfillment. Working mothers can increase the household income so as to obtain medical care during pregnancy and fairly regularly in the fulfillment of nutrition so that it can deliver the baby of normal weight than if only the husband who worked in the household.

On further analysis, parity grouped into two groups: high risk (1 and  $\geq 4$ ) and low risk (2-3). Statistical test results obtained with the value of  $OR = 0.3$   $95\% CI = 0.03-2.83$  parity means that respondents with a high risk of having a chance 1.342 times lower as compared to respondents with low risk parity. Close relationship between parity with the incidence of LBW births seen in the data in the United States in 1971-1981, the relationship between parity and incidence of LBW shaped letter U. Mothers who had parity 2-3 had a low risk to give birth to low birth weight, while mothers with parity 1 and more than 4 have a high risk of delivery LBW (Institute of Medicine, 1985). Based on the results of research in Garut Budiman (1996) obtained results that mothers who had parity more than 4 people have the possibility of delivery LBW 2.11 times greater than the mother who has a parity of less than or equal to 4 people.

Analysis of the relationship with the incidence of low birthweight birth spacing obtained statistical test results obtained with the value of  $OR = 8.5$   $95\% CI = 1.26-57.19$  mean spacing of respondents who had  $<24$  months had a chance eight times more likely to have children with low birth weight compared to respondents who have a birth spacing  $\geq 24$  months. The ideal spacing is 2 years or more, because they are shorter birth spacing would cause a mother has not been enough to restore the condition of her body after giving birth before. This is one of the causes weakness and death of mother and infant is born. According Sitorus (1999) the risk of reproductive processes can be suppressed if the minimum distance between the birth of two years.

Results of research at the General Hospital Red Cross Indonesia Bogor by Surtiati (2003) obtained results that of 111 mothers who had birth spacing of less than 2 years or more than 4 years, which has the risk of LBW at 18.92%. While of the 27 mothers who had a spacing of between 2-4 years had a risk of low birth weight is only 14.81%. This suggests that mothers with birth spacing of less than 2 years and more than 4 years have a greater risk of LBW occurred compared with mothers who have a spacing of between 2-4 years. Analysis of the frequency of prenatal care relationship with the incidence of LBW statistical test results obtained values obtained  $OR = 1.5$  with  $95\% CI = (0.31-7.91)$  of respondents means that the frequency of inspection does not quite have the chance of pregnancy were 1.5 times more likely to have children with low birth weight status compared respondents that the frequency of pregnancy sufficient examination. This research study carried out in accordance with Kartika (2001) which states that there is a significant association between the frequency of prenatal care with the incidence of low birthweight ( $Pvalue = 0.033$ ).  $OR = 2.827$  mean value of the frequency of ANC respondents have adequate risk 2.8 times more likely to occur with a frequency of LBW compared to the ANC inadequate responders.

Likewise, the results of research Rosemary (1997) which showed that statistically there is a relationship between the frequency of examination of pregnancy with the incidence of LBW. Incidence of LBW in women with poor prenatal care visits ( $\leq 3$  times) had a 4.59 times greater risk than women with good inspection visit ( $> 3$  times) ( $P value = 0.0029$ ,  $CI: 1.64$  to  $26, 96$ ). Research conducted by Roa. BT. et al (2007) also showed that there is a significant relationship between frequency of antenatal incidence of LBW in rural Haryana India.



## CONCLUSIONS AND SUGGESTIONS

The results showed that mothers with anemia risk 2.4 times more likely to give birth to LBW babies compared with women who are not anemic. (95% CI 0.49-12.61) after. It is recommended to the Health Department / Community Health Center to conduct health education for pregnant women so that people know about the importance of prenatal care to prevent the occurrence of LBW and the Society for pregnancy check with the frequencies that have been determined by the Ministry of Health that is at least 4 (four) times the examination so that the health of pregnant women can be monitored by health workers

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