

Maternal age and anemia are risk factors of low birthweight of newborn[☆]

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Abstract Low birthweight is one of the risk factors that contribute to infant mortality especially during perinatal period. Low birthweight is still a worldwide problem because it is a newborn's death. In essence many factors that affect the incidence of low birthweight they are maternal age and anemia. The purpose of this study is to analyze the maternal age and anemia are risk factors of low birthweight newborn. This research is an analytic observational study with case control study. The sample of this study amounted to 32 cases and 32 controls. The instrument used observation sheet by looking at the data in Medical Record. The analysis used is bivariate with person chi-square test to see the maternal age and anemia are risk factors of low birthweight newborn. The result of this study proved maternal age affect as low birthweight newborn, evidenced by statistic analysis p -value <0.05 is 0.001 and Odd Ratio: 16.2 (Confident Interval 95%: 1.94–135.38), and anemia affect as low birthweight newborn, evidenced by statistic analysis p -value <0.05 is 0.001 and Odd Ratio: 6.3 (Confident Interval 95%: 3–13.198). The results of this study can be concluded that maternal age and anemia have affect of low birthweight newborn.

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Introduction

Low birthweight is one of the direct causes of infant death, so it needs serious attention. Because low birthweight has

specific mortality and consequent consequences that have psychological and neurological effects after a period of crisis and life that will eventually become a new problem in the family environment.¹ The literature study conducted by Villar, predicted the lunar monthly low birthweight rate in developing countries was 4 times greater than in developed countries, and this number increased 6.6 times in cases of moderately birth-weighted low birthweight (Intra Uterine Growth Retardation). Infant mortality in Indonesia is still high compared with other developing countries Infant Mortality Rate (MMR) is the number of infant deaths in the first 28 days of life per 1000 live births This figure

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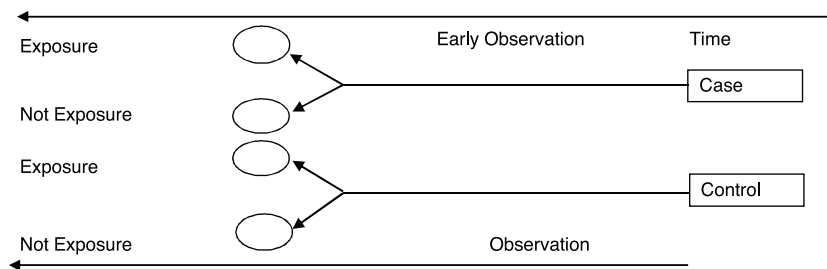


Figure 1 Case control study design.⁵

No	Maternal Age & Anemia	Low Birthweight		Total
		Yes	No	
1	(+)	a	b	a+b
2	(-)	c	d	c+d
	Total	a+c	b+d	a+b+c+d

Figure 2 Contingency table.⁶

is one indicator of the health status of the nation The high rate of infant mortality can be an indication that maternal and neonatal services are inadequate, therefore an effort is needed to reduce the Infant Mortality Rate.² Individual Survey Results of the IDHS in 2012 show that Maternal Mortality Rate in Indonesia reaches 359/100,000 live births and Infant Mortality Rate reaching 32/1000 live birth Mdan report data from regions received by Ministry of Health RI shows that the number of mothers who died from pregnancy and childbirth in 2013 reached 5019 people. While the number of babies who died in Indonesia reached 160,681 children. Child mortality tends to increase in 2007 reached 25.5% in 2010 reached 23.8% and in 2013 to 34.3%.³

Infant mortality is also affected by the following factors: maternal age and anemia. Age under 20 years and over 35 years old is considered a risk during pregnancy. Pregnancy at the age of less than 20 years of childhood pelvic and uterine and immature reproductive organs, over 35 years of age, the maturity of the reproductive organs decreases compared with the age of 20–35 years. Parity extensively includes gravid/number of pregnancies, premature/number of births, and abortion/number of miscarriages. While the lack of hemoglobin levels causes the blood to not send enough oxygen to the entire tissue, so the process of metabolism and the exchange of important nutrients in the tissues are disrupted. As a result, this situation will affect the pregnant woman and the fetus she contains. Anemia state will affect the baby who will be born.⁴

Material and methods

This research is an observational study. The research design used is Case Control Study,⁵ a design which is a research design that measurement or observation done by way of determining cases and control then ceckt backward variable treatment gradually. Research conducted measurements or observations about the relationship between the maternal age and anemia with the low birthweight of newborn. The purpose of study is to analyze maternal age and anemia are factors affect of low birthweight of newborn in RSUD Arifin Achmad Riau Province (Fig. 1).

The statistical test to be used is chi square test by calculating significance. The level of confidence is determined $p=0.05$ with Confident Interval 95%: If the value $p > 0.05$ then the research hypothesis is rejected. If the value of $p < 0.05$ then the research hypothesis is accepted. Furthermore, it is also obtained a large value of risk (Odds Ratio, OR) exposure to the case by using table 2×2 as shown in Fig. 2.

Results and discussion

Based on the results of research that has been done in RSUD Arifin Achmad Province, can be illustrated in Table 1.

A. Maternal age

Based on the above table, it can be concluded that there is a significant relationship between maternal age with the incidence of low birthweight. This is evidenced by indigo p -value < 0.05 , that is 0.001 and age $< 20 / > 35$ years are more at risk of 16.2 times for the baby experiencing low birthweight incidence when compared with the mother age 20–25 years.

The results of the above study are in accordance with the study of Tazkiah et al.,⁷ that maternal age < 20 and < 35 years can significantly lead to birth of low birthweight (OR: 2.825; 95% CI: 1.37–5.823).

The study was also supported by the results of Karima and Achadi.⁸ Research proving that there is a significant relationship between age and the incidence of low birthweight. Mother age < 20 and or > 35 years is at risk of 3.8 times to have low birthweight. When compared to mothers aged 20–35 years. The < 20 years old mother’s age has uterus and pelvis that have not grown optimally to reach adult size. As a result, the safety and health of the fetus in the womb is disrupted, so it can suffer from anemia, because it has to share red blood cells with the fetus conceived so women aged > 35 years have a network of reproductive organs and physiological functions of the birth canal is no longer flexible, and found degenerative diseases in the mother’s body so that the risk both to health and safety of the mother and to the baby conceived.

Table 1 Effect of maternal age and anemia of low birthweight newborn.

Variable	Low birthweight				p value	OR/CI 95%
	Case		Control			
	n	%	n	%		
<i>Maternal age (n = 64)</i>						
a. <20/>35 Thn	11	34.4%	1	3.1%	0.001	16.2/1.94 – 135.38
b. 20–35 T	21	65.6%	31	96.9%		
<i>Anemia (n = 64)</i>						
a. Anemia	26	81.3%	0	0%	0.001	6.3/3 – 13.198
b. Not anemia	6	18.7%	32	100%		

Shaded values: risk factors of low birthweight newborn.

Definition of significant is valued significantly if the p-value < 0.05.

Pregnancy at <20 years or > 35 years of age is indirectly at risk for low birthweight occurrence because it is influenced by the competition of nutritional needs between adolescents whose immature organs and the fetus they contain and unpreparedness physically and mentally can cause the baby to be born with low body weight.⁹ While maternal pregnancies over 35 years tends to lead to health problems such as hypertension, diabetes mellitus, anemia, etc., which tend to be an indicator of an unplanned pregnancy or unwanted pregnancy.¹⁰

B. Anemia

Based on the results of research that has been done to prove that there is a significant relationship between the amount of hemoglobin (Hb) with the occurrence of low birthweight it is evidenced by the value of p-value <0.05 is 0.0001. And OR: 6.3 with 95% CI: 3–13,198. This means that anemia mothers have a risk for their babies experiencing low birthweight incidence when compared to mothers with not anemia.

In contrast to previous research results indicate that the occurrence of low birthweight is related to the amount of hemoglobin (Hb) of pregnant women suffering from anemia disease during pregnancy until childbirth, this gives meaning of complication to the fetus and resulted in disturbance of gas exchange from mother of fetus, so that the absorption of O₂ and disrupted CO₂ expenditure in this case would be easy to occur hypoxic state in the fetus continues to asphyxia neonatorum in newborn.¹¹

In pregnancy, physiological changes result in increased volume of fluid and red blood cells and decreased nutritional binding proteins in the blood circulation, as well as decreased micronutrients.¹² Increased blood volume occurs earlier than the production of red blood cells so that this condition causes a decrease in hemoglobin and hematocrit levels in the first and second trimester so if this is not followed by adequate intake or diet containing iron, the condition of anemia in pregnant women will cause nutrient

disturbance and uterine oxygenation of the placenta resulting in impaired growth of conception results, so that fetal growth and development are inhibited and the fetus is born with low body weight.¹³

Anemia in pregnant women can also be caused by the intake of less nutritious foods, indigestion and malabsorption, iron deficiency in foods, increased iron demand during pregnancy, blood loss and complications during pregnancy and childbirth including chronic diseases.¹⁴ In addition, this situation can also be caused by the habits of pregnant women who consume traditional medicine or herbal medicine because it contains oxalic acid, thiamine and filtrate that can interfere with the absorption of iron by the body.¹¹ Lack of hemoglobin (Hb) amounts will result in infant growth because blood can not deliver enough oxygen to the entire tissue. So that the metabolic processes and the exchange of important nutrients in the network is disrupted. The important function of hemoglobin (Hb) is its ability to bind oxygen easily, resulting in oxygen directly bound to be transported as oxyhemoglobin in arterial blood, and directly decomposed from hemoglobin (Hb) in the tissue. In venous blood hemoglobin (Hb) combines with io hydrogen produced by cell metabolism, so it can support excess acid.¹⁵

Conclusion

Based on the results of this study, it can be concluded that there are affect the maternal age and anemia of low birthweight newborn, the low or high maternal age is slightly increased risk of low birthweight levels 16.2 times when compared with those produced maternal age. And anemia is slightly increased risk of low birthweight levels 6.3 times when compared with those not anemia.

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