

Analysis Of The Incidence Asphyxia Neonatorum At Ansari Saleh General Hospital Banjarmasin

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ABSTRACT

Background: According to Research and Development Center Health Ecology in 2001, the pattern of maternal deaths in early neonatal infants (newborns - 7 days) is more due to birth asphyxia, 48 per 1,000 live births (33.6%). Based on preliminary study results conducted on December 23, 2016, data that have been obtained by researchers about the number of asphyxia cases at Ansari Saleh General Hospital Banjarmasin in 2016 that is as many as 941 babies and who died as many as 25 caused by asphyxia.

Objective: To analyze factors related to the incidence of asphyxia in Ansari Saleh General Hospital Banjarmasin period November 2016 until March 2017.

Method: Descriptive Analytical Research with a Cross-Sectional approach. Sampling is 1,251. A sample of 923 infants, taken by Simple Random Sampling technique. Data were analyzed using chi-square test

Results: The results of this study showed that there was a correlation between maternal age and asphyxia cases p-value = 0,000, there was a relationship between mother parity with asphyxia p-value = 0,008, no mother preeclampsia relationship with asphyxia p-value = 0,911, there was relationship between maternal anemia incidence of asphyxia p-value = 0,007, there is correlation between per abdominal labor incidence of p-value = 0,002, there is relationship of birth weight with incidence of asphyxia p-value = 0,001

Conclusion: There was a significant relationship between age, parity, per abdominal delivery and birth weight and no association between maternal preeclampsia and asphyxia.

Keywords: Infant Mortality Rate, Newborn Infant, Early Neonatal Infant, Asphyxia Neonatorum

BACKGROUND

The degree of public health can be measured with various health indicators such as perinatal mortality, infant mortality rate and under-five mortality rate. The infant mortality rate (IMR) is the number of deaths that occur after the birth of a baby until the infant is not one year old per 1,000 live births (MOH, 2008).

According to the World Health Organization (WHO), it is stated that infant mortality is largely due to asphyxia (20-60%), infections (25-30%), low birth weight (25-30%), and labor trauma (5- 10%) (MOH, 2008). According to the Indonesia Demographic Health Survey (IDHS), the perinatal mortality rate in 2012 amounted to 26 deaths per 1,000 pregnancies. This shows that perinatal rates in 2012 are still very high compared to 2002-2003 and 2007, 25 and 24 deaths per 1,000 pregnancies respectively (SDKI, 2012).

According to the Indonesian Health Profile, the neonatal mortality rate for the last 5 years has stagnated, based on 2007 and 2012 IDHS reports of 19 deaths per 1,000 live births. Neonatal mortality accounts for more than half of infant deaths of 47.5% (Indonesia Health Profile, 2012).

According to Research and Development Center Health Ecology, the pattern of the cause of death in early neonatal infants (newborns - 7 days) is mostly caused by one of them is birth asphyxia, which is 48 per 1,000 live births (33.6%) (Research and

Development Center Health Ecology, 2001). According to Manuaba (2007), asphyxia is a state of emergency that cannot breathe spontaneously and regularly, so it can decrease oxygen and the increasing carbon dioxide that cause bad effects in life further.

The cause of the occurrence of asphyxia is Impaired oxygenated blood supply through the umbilical vein may occur at the time of antepartum, intrapartum, and postpartum when the umbilical cord is cut. This is followed by a series of events that can be estimated when asphyxia gains weight. Factors that influence it include maternal factors, neonatal factors, placental factors, infant factors and labor factors.

According to MOH (2012), infant mortality rate in South Kalimantan Province shows that infant mortality rate is still very high. From data obtained infant mortality rate of 44 per 1,000 live births in South Kalimantan, MDGs targets to reduce mortality in 2015 as much as ≤ 23 per 1,000 live births are considered unsuccessful due to the still high infant mortality rate in Indonesia, especially in the province South Kalimantan. In addition, according to Indonesia Health Profile (2012), shows that South Kalimantan has a high rate of neonatal mortality, see in 2012 neonatal mortality of 30 per 1,000 live births (Indonesia Health Profile, 2012). This could be a benchmark for poor health care. In rural areas, infant mortality is still very high due to lack of interest in pregnant women to check pregnancy so that no detection of

complications that will occur later at the time of delivery. This will cause the infant mortality rate to be very high due to unknown causes and causes of the disease acquired by infants.

According to Manuaba (2010), one of the first causes of perinatal mortality is asphyxia (50-60%), BBLR (25-30%), infection (25 - 30%), and labor trauma (5-10%). It can be seen that asphyxia is the largest contributor to the number one cause of perinatal death. Based on preliminary study results conducted on December 23, 2016, data that have been obtained by researchers about the number of asphyxia events at Ansari Saleh General Hospital Banjarmasin in 2016 that is as many as 941 babies and who died as many as 25 caused by asphyxia.

MATERIALS AND METHODS

This research method uses descriptive analytic with the cross-sectional approach. The population in this study were all babies born and treated at Ansari Saleh General Hospital period November 2016 to March 2017 as many as 1225 babies and the number of samples as many as 93 babies by simple random sampling.

RESULTS

Univariate Analysis

1. Age

Table 1 Age Frequency Distribution

No	Ages	Frequency	Percentage (%)
1	≤ 19	28	30,1
2	20 - 35	48	51,6
3	> 35	17	18,3

Total	93	100
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Based on table 1 shows the age of mothers aged > 35 years as many as 17 people (18.3%), age 20-35 years as many as 48 people (51.6%) and who <19 years old as many as 28 people (30.1%)

2. Parity

Table 2. Parity Frequency Distribution

No	Parity	Frequency	Percentage (%)
1	Primipara	33	35,5
2	Multipara	39	41,9
3	Grand multipara	21	22,6
Total		93	100

Based on table 2 shows that most of the parity of the mother are multiparas as many as 39 people (41.9%), primipara 33 people (35.5%) and grand multipara as many as 21 people (22.6%).

3. Preeclampsia

Table 3. Preeclampsia Frequency Distribution

No	Preeclampsia	Frekuensi	Presentase (%)
1	Preeclampsia	50	53,8
2	No Preeclampsia	43	46,2
Total		93	100

Table 3 shows that mothers who experienced preeclampsia as many as 50 people (53.8%) and who did not experience preeclampsia as many as 43 people (46.2%).

Age	Asfiksia				Total		P Value
	Asfiksia		Not Asfiksia		n	%	
	n	%	n	%			
≤ 19	27	29	1	1,1	28	30,1	0,000
20 - 35	7	7,5	41	44,1	48	51,6	
> 35	12	12,9	5	5,4	17	18,3	
Total	46	49,5	47	50,5	93	100	

Based on Table 4 can be seen that the mother who experienced anemia as much 67 people (72%) and who did not have anemia as much 26 people (28%).

5. Perabdominal labor

Table 5. Perabdominal Labor Frequency Distribution

Based on table 5 it can be seen that women who perform per abdominal labor as many as 27 people (29%) and who do not do per abdominal labor 66 people (71%).

6. Baby Weight Born

Table 6. Baby Weight Born Frequency Distribution

Based on table 6 it can be seen that babies born with weight <2500 grams as many as 45 babies (48.4%), 2500 - 4000 grams of 29 infants (31.2%) and > 4000 grams of 19 infants (20.4%)

Bivariate Analysis

1. Maternal Age Relation with Asphyxia Neonatorum Occurrence

Table 7. Maternal Age Relation Analysis with Asphyxia Neonatorum Occurrence

In this study, chi-square test results obtained $p = 0,000$ means $p \leq 0.05$. So H_0 rejected and H_a accepted so that there is a significant relationship between mother's age with the incidence of asphyxia

2. Maternal Parity Relation with the Event of Asphyxia Neonatorum

Table 8. Analysis of Parity Relationship with Asphyxia Neonatorum Occurrence

Parity	Asfiksia Neonatorum				Total		P Value
	Asphyxia		Not Asphyxia		n	%	
	n	%	n	%			
Primipara	20	21,5	13	14,0	33	35,5	0,008
Multipara	12	12,9	27	29	39	41,9	
Grandemulti para	14	15,1	7	7,5	21	22,6	
Total	46	49,5	47	50,5	93	100	
Labor					(%)		
1	Caesar		27		29		
2	Normal		66		71		
Total			93		100		

significant relationship between parity of the mother with the incidence of asphyxia in

No	Baby Weight Born	Frequency	Percentage (%)
1	< 2500	45	48,4
2	2500 - 4000	29	31,2
3	> 4000	19	20,4
Total		93	100

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3. Relationship of Preeclampsia in Mothers with Asphyxia Neonatorum Occurrence

Table 9. Analysis of the Relation of Preeclampsia to the Occurrence of Asphyxia

Preeclampsia	Asphyxia Neonatorum				Total		P Value
	Asphyxia		Not Asphyxia		n	%	
	n	%	n	%			
Preeclampsia	25	26,9	25	29,6	50	53,8	0.911
Not Preeclampsia	21	22,6	22	23,7	43	46,2	
Total	46	49,5	47	50,5	93	100	

In this study, chi square test results obtained $p = 0.911$ means $p > 0.05$ so that H_0 is accepted and H_a is rejected so there is no significant relationship between preeclampsia in the mother with the incidence of asphyxia neonatorum in Ansari Saleh General Hospital Banjarmasin.

4. Relationship of Anemia with Asphyxia Neonatorum Occurrence

Table 10. Analysis of Anemia Relation with Asphyxia Neonatorum Occurrence

Anemia	Asphyxia				Total		P Value
	Asphyxia		Not Asphyxia		n	%	
	n	%	n	%			
Anemia	39	41,9	28	30,1	67	72	0.007
Not Anemia	7	7,5	19	20,4	26	28	
Total	46	49,5	47	50,5	93	100	

In this study, chi-square test results obtained $p = 0.007$ means $p < 0.05$, so there is a significant relationship between anemia in the mother with the incidence of asphyxia neonatorum in Ansari Saleh General Hospital Banjarmasin.

5. Relation of Per abdominal Labor to the Occurrence of Asphyxia Neonatorum

Table 11. Analysis of Per abdominal Labor Relation with Asphyxia Neonatorum

C Perabdominal	Asphyxia				Total		P Value
	Asphyxia		Not Asphyxia		n	%	
	n	%	n	%			
Caesar	20	21,5	7	7,5	27	29	0.002
Normal	26	28	40	43	66	71	
Total	46	49,5	47	50,5	93	100	

In this study, chi-square test results obtained $p = 0.002$ means $p \leq 0.05$ so H_0 rejected and H_a accepted so there is a significant relationship between per abdominal labor (SC) with the incidence of asphyxia in Ansari Saleh General Hospital Banjarmasin.

6. Relationship of Birth Weight Born with Occurrence of Asphyxia

Table 12. Analysis of Birth Weight Relationships Born with Asphyxia Occurrence

Baby Weight Born	Asphyxia				Total		P Value
	Not Asphyxia		Not Asphyxia		n	%	
	n	%	n	%			
< 2500	31	33,3	14	15,1	45	48,4	0.001
2500 - 4000	10	10,8	19	20,4	29	31,2	
> 4000	5	5,4	14	15,1	19	20,4	
Total	46	49,5	47	50,5	93	100	

In this study, chi-square test results obtained $p = 0.001$ means $p \leq 0.05$ so H_0 rejected and H_a accepted so that there is a significant relationship between birth weight with the

incidence of asphyxia in dr. H. Moch. Ansari Saleh Banjarmasin.

DISCUSSION

1. Maternal Age Relation with Asphyxia Neonatorum Occurrence

Based on the analysis result obtained Chi-Square test that from 93 respondents got \leq 19 years old mother whose baby had asphyxia as many as 27 mothers (29%), while those who did not have asphyxia as much as 1 mother (1,1%). Mothers aged $>$ 35 years whose babies had asphyxia as many as 12 mothers (12.9%) and who did not have asphyxia as many as 47 mothers (50.5%). Mothers aged 20-35 years whose babies had asphyxia as many as 7 mothers (7.5%), and who did not have asphyxia as many as 41 mothers (44.1%). The result of Chi-Square statistic test shows that there is a significant correlation between maternal age with asphyxia neonatorum seen from $p = 0.000$ means $p \leq 0.05$.

Researchers argue that maternal age greatly affects the welfare of the fetus in the birth, for mothers younger reproductive organs are still not perfect so that during pregnancy will cause various complications that will be experienced for mother and fetus.

Based on the theory of Sinclair (2010), says that As we get older, the risk of women for congenital abnormalities in pregnancy increases. Complications of pregnancy and birth for gravida at older age include hypertension, diabetes, spontaneous abortion, twin fetus, vaginal delivery with tool aid,

cesarean delivery, lower birth weight, asphyxia and lower gestational age.

2. Parity Relationships with Asphyxia Neonatorum Occurrence

Based on the result of the analysis, Chi-Square test shows that from 93 respondents, there are paraphrases of a primiparous mother whose baby has asphyxia as many as 20 mothers (21.5%), and those without asphyxia as many as 13 mothers (14%). Grandemultipara mother whose baby had asphyxia as many as 14 mothers (15.1%), and who did not have asphyxia as much as 7 mothers (7.5%). Mothers with asphyxia as many as 12 mothers (12.9%) and those without asphyxia were 27 (29%). The result of Chi-Square statistic test shows that there is a significant correlation between mother parity with the incidence of asphyxia neonatorum seen from $p = 0.008$ means $p \leq 0.05$.

Researchers argue that the higher the parity of the mother will be increasingly at risk for both mother and baby. Problems that will arise in pregnancy and childbirth will adversely affect the baby at birth, basically the more often pregnant or giving birth mother the less good function of the uterus as a result of too often convey the results of the conception that causes various complications that will arise in infants such as infant weight low birth, asphyxia, and congenital abnormalities.

Based on Lee's (2006) theory, saying that parity 1 and young age ($<$ 20 years) are at risk because the mother is not medically ready

(reproductive organs) nor mentally. The results showed that primiparity was a risk factor having a strong association with asphyxia mortality, while parity above 4 and old age (> 35 years), physically mothers decline to undergo pregnancy. It predisposes to hemorrhage, placenta previa, uterine rupture, placental abruption which may result in the onset of newborn asphyxia.

3. Relationship of Preeclampsia in Mothers with Asphyxia Neonatorum Occurrence

Based on the analysis result obtained Chi-Square test that from 93 respondents got a mother who experienced preeclampsia with asphyxia baby as much as 25 mothers (26,9%), and who did not have asphyxia counted 25 mothers (26,9%). Mothers who did not have preeclampsia but their infants had asphyxia as many as 21 mothers (22.6%), and mothers whose infants did not have asphyxia as many as 22 mothers (23.7%). The classification of women with preeclampsia was divided into 2, ie, mild and severe. Mothers with severe preeclampsia were 37 mothers and those with mild preeclampsia were 13 mothers. Chi-Square statistic test shows that there is no significant relationship between preeclampsia in a mother with asphyxia neonatorum seen from $p = 0.911$ means $p > 0.05$.

Researchers argue in this study found that basically, the theory says that if the mother who experienced preeclampsia at the time of pregnancy will potentially have asphyxia due to the arterial infant shrink due to excessive

pressure from the heart to pump blood so that the supply of oxygen received by the baby is reduced.

Based on the theory of Candra (2007), incomplete spiral artery remodeling in preeclampsia leads to a high uteroplacental circulation of resistance, perfusion to the placenta decreases oxidative stress, increases in lipid peroxide and isoprostane levels in the placenta and decidua. While the levels of antioxidant superoxide dismutase, beta-carotene, alpha-tocopherol and glutathione in the placenta decreased.

Based on the theory of Mellembakken *et al* (2001), ischemic-reperfusion disorder is a malperfusion of some organ systems. In severe preeclampsia, there are decidual spherical arteriole spots resulting in decreased blood flow to the placenta. Decreased blood flow to the placenta results in impaired placental perfusion. Thus, by decreasing the perfusion of blood through the placenta to the fetus, there is fetal hypoxia resulting in asphyxia in infants when after birth.

4. Anemia in Mother's Relationship with Asphyxia Neonatorum Occurrence

Based on the results obtained Chi-Square test results that of 93 respondents found mothers who have anemia but the baby had asphyxia as many as 39 mothers (41.9%), and who did not have asphyxia as many as 28 mothers (30.1%). While mothers who did not have anemia but the baby had asphyxia as much as 7 mothers (7.5%), and who did not

have asphyxia as much as 19 mothers (20.4%). The result of chi-square statistic test showed that there was a significant correlation between anemia in a mother with the incidence of asphyxia neonatorum seen from $p\text{-value} = 0.007$ means $p \leq 0.05$.

Research argues that anemia experienced by the mother during pregnancy can cause asphyxia because during pregnancy mother experience hemolysis (dilution) of blood causing mother lack of blood. The function of blood in the body is as the introduction of O_2 to be passed throughout the body if the mother is anemic during pregnancy will cause O_2 supply disturbance given from mother to baby, so baby has hypoxia in the womb.

Based on the theory of Manuaba (2010), said that women who experience anemia during pregnancy will cause an influence on the fetus. Although it seems that the fetus is able to absorb the various needs of the mother, but with anemia will reduce the ability of the body's metabolism that interfere with the growth and development of the fetus in the womb. The result of anemia can occur in the form of abortion, intrauterine death, high preterm delivery, low birth weight, birth with anemia, congenital defects, infants are susceptible to infection, asphyxia (hypoxia due to lack of blood supply from mother to fetus when in the womb) to perinatal death, and low intelligence.

5. Relation of Per abdominal Labor to the Occurrence of Asphyxia Neonatorum

Based on the results of the analysis, Chi-Square test shows that from 93 respondents, it was found that the mother did not perform per abdominal labor but the baby had asphyxia as many as 26 mothers (28%), and the baby did not have asphyxia as many as 40 mothers (43%). The mother who performed per abdominal labor but the baby had asphyxia as many as 20 mothers (21.5%), and who did not have asphyxia as many as 7 mothers (7.5%). The result of chi-square statistic test showed that there was a significant correlation between anemia in a mother with an incidence of asphyxia neonatorum seen from $p\text{-value} = 0.002$ means $p \leq 0.05$.

The authors suggest that when the mother performed per abdominal labor (SC), the baby will experience breathing stops resulting from the absence of compression at the time of normal labor in general, causing the lungs can not release fluid causing the baby asphyxia.

Based on the theory of Straight (2014), Neonates born with Caesarea section, especially if there is no sign of labor, do not benefit from the release of pulmonary fluid and pressure on the thorax so that experiencing more persistent respiratory disorders. Fetal thoracic compression in the second stage of labor encourages the fluid to escape from the respiratory tract.¹⁴ The process of birth with cesarean section triggers the release of the stress hormone in the mother which is the key to the maturation of baby's filled lungs. The rather large pressure is accompanied by chest compression at vaginal delivery and it is

estimated that fluid-driven lung is equivalent to a quarter of functional residual capacity. Thus, in infants born with cesarean section, it contains more fluids and less air in the lungs for the first six hours after birth. The thoracic compression that accompanies vaginal delivery and expansion following delivery may be a contributing factor in the initiation of respiration.

6. Relationship of Birth Weight Born with Occurrence of Asphyxia Neonatorum

Based on the results obtained Chi-Square test results that of 93 respondents found infants born with weight <2500 grams but had asphyxia as 31 infants (33.3%), and who did not have asphyxia as many as 14 babies (15.1%). Infants born with weight 2500 - 4000 grams who had asphyxia as many as 10 babies (10.8%), and who did not have asphyxia as many as 19 babies (20.4%). Infants born with weight > 4000 grams who had asphyxia as many as 5 babies (5.4%), and who did not have asphyxia as many as 14 babies (15.1%). The result of chi-square statistic test showed that there was a significant correlation between anemia in a mother with asphyxia neonatorum incidence seen from $p = 0.001$ mean $p \leq 0.05$.

The authors suggest that, if babies born < 2500 grams of lung organs are still unable to function perfectly so that babies are susceptible to respiratory failure due to hypoxia, it does not rule out that normal-born infants do not have asphyxia.

Based on the theory of Manuaba (2010), said that the heavy difficulty of the baby is born low depends on several factors one of which is asphyxia can occur necrosis and bleed due to the center of the breathing is not perfect, causing the lung surfactant is still less resulting in imperfect, respiratory muscles and weak ribs. When the respiratory system is still not perfect, can lead to fragility of blood vessels premature babies and result in blood vessels break easily. As a result of frequent respiratory problems can make the baby bleeding easily in the brain, O₂ administration has not been able to set so easy to cause bleeding, necrosis and can cause infant death.

CONCLUSION

There was a significant correlation between age, parity, peradominal delivery and birth weight and no association between maternal preeclampsia and asphyxia

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