Original Research Article

Determinant Factors of Asphyxia Neonatorum Risk in Neonates in Regional General Hospitals Biak Numfor District

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ABSTRACT

Background: Neonatal asphyxia is a condition where the baby cannot immediately breathe spontaneously and regularly after birth. Asphyxia causes 1 million neonatal deaths every year in the world, whereas in Indonesia, from 57% of infant deaths, 27% of the causes of death are asphyxia. Whereas in Biak Numfor Regency there was an increase in 20.1% of neonatal asphyxia cases in 2013 which increased to 20.8% in 2017. Factors that cause neonatal asphyxia are maternal age, parity, serotinus, anemia, ANC, KPD, prolonged, premature and gemelli delivery.
Objective: To find out the determinants of neonatal asphyxia risk in neonates at Biak Numfor District General Hospital
Research method: Analytical with cross sectional study approach. This research was conducted at Biak Hospital in May to July 2018 with a population of 232 cases and a sample of 147 cases. Data was obtained from the Maternity Room Medical Record and analyzed using the Chi-Square Test and logistic binary regression test.
Results: Factors that influence neonatal asphyxia include maternal age (p = 0.026), parity (p = 0.005), serotinus (p = 0.631), anemia (p = 0.748), Ante Natal care (p = 0.063) , Early rupture of membranes (p = 0.001), prolonged labor (p = 0.082), premature (p = 0.306), gemelli (p = 0.683). Logistic binary regression analysis obtained 3 factors that were dominant with neonatal asphyxia, namely the first order of Early Brokenness with Beta value (0.292), the second was parity with Beta value (0.247), the third order was the age of the mother with Beta value (0.170).

Keywords: Neonatorum Asphyxia, Risk Factors, Hospital.

1. INTRODUCTION

According to the World Health Organization (WHO), approximately 3% (3.6 million) of 120 million newborns experience neonatal asphyxia annually, nearly 1 million babies die. The Word Health Statistics 2014 report states that there are 20 main causes of Years of Life Lost (YLL), neonatal asphyxia is ranked seventh (WHO in Deswita, 2017). All infant deaths in Indonesia, as many as 57% died. The causes of death are low birth weight babies (29%), neonatal asphyxia (27%), birth trauma, neonatal tetanus, other infections and congenital abnormalities (MOH, 2008). Basic health research data conducted by the Ministry of Health in 2007 that deaths in newborns aged 0-6 days 35.9% are caused by neonatal asphyxia (Gerugun, Adam & Losu in Deswita, 2017). The 2016 Papua Health Profile report shows that the neonatal mortality rate in Papua Province is 64/1000 live births. While the neonatal mortality target by the Ministry of Health in 2015 is to reduce neonatal mortality to 12 per 1,000 live births. This shows that in Papua Province is still high from the target set by the Ministry of Health so that the neonatal mortality rate in Papua Province requires a decrease of 42%, in order to achieve this target, efforts should be made to reduce neonatal mortality (Indow, et.al.,2019:

Bakhtiar,et. al., 2019;. Magdalena, et.al 2019).

The high incidence of neonatal asphyxia is caused by several factors, namely the age of the mother at risk ie less than 20 years and more than 35 years, maternal parity, serotinus pregnancy and fetal, placental and labor abnormalities such as congestion. Based on the theory of causes of neonatorum asphyxia from maternal factors are: maternal age less than 20 years or more than 35 years, hypoxia in the mother, gravida 4 or more, more months (serotinus), low socio-economic and any disturbing maternal vascular disease fetal gas exchange (Prawirohardjo.S, 2002). While based on placental factors are: thin placenta, placental abruption, small placenta and the placenta does not stick in place. Based on fetal / fetal factors or neonates are premature, cord compression between the fetus and birth canal, gemelli, Intra-Uteral Fetal Death (IUFD), masculine umbilical cord, umbilical cord wrapped around the neck and congenital abnormalities in neonates. Based on labor factors are: breech delivery, prolonged labor, difficult labor, premature rupture of membranes and parturition with actions namely vacuum and caesarean section (Sarwono, 2002). Based on practical theoretical causes, it was obtained from 15 neonatal asphyxia events, 4 (26.7%) caused by serotinus and 6 (40%) caused by sectio caesarea and (33.3%) caused by other factors.

Regular neonatal asphyxia affects brain edema and cerebral hemorrhage, impaired cardiac function that results in neonatal shock, so that blood flow to the brain will decrease, this condition will cause hypoxia and ischemic brain resulting in brain edema, this can also cause bleeding brain. In addition, asphyxia that is not immediately treated can have anuria and oliguria, seizures and coma (Fadlun, 2011). Macrolyally, neonatal asphyxia is not immediately addressed and is anticipated to cause an increase in infant morbidity and mortality. Providing midwifery services through Ante Natal Care (ANC) routinely and quality to pregnant women is one of the most important factors that greatly determines the success of prevention and reduction in the incidence of neonatal asphyxia. Collaboration between midwives and hospitals is very necessary in providing referrals if there is a diagnosis that leads to neonatal asphyxia in infants. The hospital should provide careful antenatal supervision to reduce the incidence of neonatal asphyxia, appropriate management of neonatal asphyxia is needed and an appropriate assessment and management of resuscitation is carried out so as not to cause various complications that have a high mortality and morbidity rate.

Based on the phenomenon of neonatorum asphyxia in newborns which will later increase the incidence of infant morbidity and mortality, then this condition is an urgent problem and needs to be dealt with seriously. The data in the Biak Numfor District Hospital in Papua Province in 2017 have never been conducted on this subject, so the researchers are interested in revealing "Risk determinant factors for neonatal asphyxia in neonates at Biak Numfor District General Hospital in Papua Province in 2018".

2. MATERIALS AND METHODS
2.1 Types and Research Designs
This type of research includes quantitative research, using analytical research designs, using a cross sectional approach.
3.2 Location and Time of Research
This research was conducted at the Biak Hospital in the Maternity Room in October 2018
3.3 Populations and Samples
Population
The population in this study were 232 women giving birth with risk factors for neonatal asphyxia in the District Hospital of Biak Numfor Papua Province in May to July of 2018.
Sample Size
Sampling is done by "Simple Random Sampling" (randomly generated) technique, with 147 samples.

Table 1 Total Population of Maternity with Asphyxia Neonatorum Risk Factors May to July 2018

No	Bulan	Jumlah
1	Mei	72
2	Juni	81
3	juli	79
Total		232

3. RESULTS

Bivariate Analysis

3.1 Effect of maternal age on the incidence of neonatal asphyxia

Table 2 Effect of maternal age on neonatal asphyxia in Biak Hospital in 2018

No	Usia ibu	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	< 20 & > 35th	108	86,4	17	13,6	125	100
2	> 20 & < 35th	17	77,3	5	22,7	22	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,026, PR = 1,118, CI95% (0,882 – 1,417)							

Table 2 shows that of 125 respondents with a risk age of <20 &> 35 years, 108 respondents (86.4%) had neonatal asphyxia, and 17 respondents (13.6%) whose infants did not experience neonatal asphyxia. While 22 respondents (15.0%) with no risk of age> 20 & <35 years, there were 17 respondents (77.3%) whose babies had neonatal asphyxia, and 5 respondents (22.7%) had no neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.026 <α (0.05). This means that there is a significant influence between the age of the mother on the incidence of neonatal asphyxia in Biak Hospital. The result of PR value is 1.118; CI95% (0.882-1.417), shows that mothers with a risk age of <20 and> 35 years, will experience neonatal asphyxia in their babies at 1.1 times higher than mothers without risk> 20 and <35 years.

3.2 Effect of parity on neonatal asphyxia events

Table 3 shows that out of 74 respondents with parity> 4 children, 69 respondents (93.2%) had neonatal asphyxia, and 5 respondents (6.8%) whose infants did not experience neonatal asphyxia. While 73 respondents (49.7%) with parity <child, there were 56 respondents (76.7%) their babies had neonatal asphyxia, and 17

respondents (23.3%) their babies did not experience neonatal asphyxia.

Table 3 Effect of parity on neonatal asphyxia in Biak Hospital in 2018

No	Paritas	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	> 4 anak	69	93,2	5	6,8	74	100
2	< 4 anak	56	76,7	17	23,3	73	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,005, PR = 1,215, CI95% (1,056 – 1,399)							

The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.005 <α (0.05). This means that there is a significant influence between the age of the mother on the incidence of neonatal asphyxia in Biak Hospital. The results of PR = 1,215, CI95% (1,056 - 1,399), showed that mothers with parity> 4 children, could experience neonatal asphyxia in their babies by 1.2 times higher than mothers with parity <4 children.

3.3 Effect of serotinus on the incidence of neonatal asphyxia

Table 4 Effect of serotinus on the incidence of neonatal asphyxia in Biak Hospital in 2018

No	Serotinus	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	> 42 mgg	75	86,2	12	13,8	87	100
2	< 42 mgg	50	83,3	10	16,7	60	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,631, PR = 1,034, CI95% (0,898 – 1,191)							

Table 4 shows that of 87 respondents with serotinus> 42 weeks, 75 respondents (86.2%) had neonatal asphyxia, and 12 respondents (13.8%) whose infants did not experience neonatal asphyxia. While 60 respondents (40.8%) with serotinus <42 weeks, there were 50 respondents (83.3%) their babies had neonatal asphyxia, and 10 respondents (16.7%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.631> α (0.05). This means that there is no significant effect between serotinus on the incidence of neonatal asphyxia in Biak Hospital. PR = 1.034, CI95% (0.898 - 1.191) with a lower

value <1, so it is not meaningful.

3.4 Effect of anemia on the incidence of neonatal asphyxia

Table 5 Effect of anemia on the incidence of neonatal asphyxia in Biak Hospital in 2018

No	Anemia	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	HB < 11 gr	4	80,0	1	20,0	5	100
2	HB > 11 gr	121	85,2	21	14,8	142	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,748, PR = 0,939, CI95% (0,602 – 1,463)							

Table 5 shows that of 5 respondents with HB <11 grams, 4 respondents (80.0%) their babies had neonatal asphyxia, and 1 respondent (20.0%) whose babies did not experience neonatal asphyxia. While 142 respondents (96.6%) with HB> 11 grams, there were 121 respondents (85.2%) their babies had neonatal asphyxia and 21 respondents (14.8%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.748> α (0.05). This means that there is no significant effect between anemia on the incidence of neonatal asphyxia in Biak Hospital. The results of PR value = 0.939, CI95% (0.602 - 1.463) suggest that mothers with HB <11 grams, their babies are at risk of experiencing neonatal asphyxia 1.06 times smaller than mothers with HB> 11 grams.

3.5 Effect of ANC on the incidence of neonatal asphyxia

Table 6 Effect of ANC on the incidence of neonatal asphyxia in Biak Hospital in 2018

No	ANC	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	< 4 kl pemeriksaan	63	79,7	16	20,3	79	100
2	> 4 kl pemeriksaan	62	91,2	6	8,8	68	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,063, PR = 0,875, CI95% (0,765 - 1,000)							

Table 6 shows that out of 79 respondents with ANC <4 times of examination, 63 respondents (79.7%) had neonatal asphyxia, and 16 respondents (20.3%) whose infants did not experience neonatal asphyxia. While 68 respondents (46.3%) with ANC> 4 examinations, there were 62 respondents (91.2%) their babies had neonatal asphyxia, and 6 respondents (8.8%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.063> α (0.05). This means that there is no significant effect between ANC on the incidence of neonatal asphyxia in Biak Hospital. The results of PR values = 0.875, CI95% (0.765-1,000) indicate that mothers with ANC <4 times the examination, their babies are at risk of experiencing neonatal asphyxia 1.1 times smaller than mothers with ANC >4 times the examination.

3.6 Effect of KPD on the incidence of neonatal asphyxia

Table 7 Effect of KPD on the incidence of neonatal asphyxia in Biak Hospital in 2018

No	KPD	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	KPD	71	94,7	4	5,3	75	100
2	Tidak KPD	54	75,0	18	25,0	72	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,001, PR =1,262, CI95% (1,093 – 1,457)							

Table 7 shows that of 75 respondents with KPD, 71 respondents (94.7%) had neonatal asphyxia, and 4 respondents (5.3%) whose infants did not experience neonatal asphyxia. While 72 respondents (49.0%) with no KPD, there were 54 respondents (75.0%) whose babies had neonatal asphyxia, and 18 respondents (25.0%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.001 <α (0.05). This means that there is a significant influence between KPD on the incidence of neonatal asphyxia in Biak Hospital. The result of PR value = 1,262, CI95% (1,093 - 1,457), shows that mothers with KPD can experience neonatal asphyxia in their babies by 1.2 times higher than mothers with non-KPD.

3.7 Effect of prolonged delivery on the incidence of neonatal asphyxia

Table 8 Effect of prolonged delivery on neonatal asphyxia in Biak Hospital in 2018

No	Partus lama	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	> 18 jam	72	80,9	17	19,1	89	100
2	< 18 jam	53	91,4	5	8,6	58	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,082, PR =0,885, CI95% (0,779 - 1,006)							

Table 8 shows that of the 89 respondents with long labor >18 hours, 72 respondents (80.9%) had neonatal asphyxia, and 17 respondents (19.1%) whose infants did not experience neonatal asphyxia. While 58 respondents (39.5%) with prolonged labor <18 hours, there were 53 respondents (91.4%) their babies had neonatal asphyxia, and 5 respondents (8.6%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.082> α (0.05). This means that there is no significant effect between prolonged labor on the incidence of neonatal asphyxia in the Biak Hospital. The results of PR values = 0.885, CI95% (0.779 - 1,006) indicate that mothers with prolonged labor> 18 hours, their babies are at risk of experiencing neonatal asphyxia 1.1 times less than mothers with prolonged labor <18 hours.

3.8 Effect of premature on the incidence of neonatal asphyxia

Table 9 Effect of premature on the incidence of neonatorum in Biak Hospital in 2018

No	Premature	Asphyxia Neonatorum				n	%
		Ya		Tidak			
		n	%	n	%		
1	< 37 mg	77	87,5	11	12,5	88	100
2	> 37 mg	48	81,4	11	18,6	59	100
Total		125	85,0	22	15,0	147	100,0
p-value = 0,306, PR = 1,076, CI95% (0,930 - 1,244)							

Table 9 shows that of the 88 respondents with <37 weeks premature, 77 respondents (87.5%) had neonatal asphyxia, and 11 respondents (12.5%) whose infants did not experience neonatal asphyxia. While 59 respondents (40.1%) with regulators> 37 weeks, there were 48 respondents (81.4%) their babies had neonatal asphyxia and 11 respondents (18.6%) their babies did not experience neonatal asphyxia. The results of the chi square statistical test on the significance value of 95% (α = 0.05) obtained p-value 0.306> α (0.05). This means that there is no significant influence between premature on the incidence of neonatal asphyxia in Biak Hospital. The results of the PR value = 1.076, CI95% (0.930 - 1.244) with a lower value <1, so it is not meaningful.

4. DISCUSSION
4.1 Age of mother
The results of data analysis in 147 (100%) mothers giving birth in this study, found 125 people (85.0%) mothers aged <20 &> 35 years and 22 people (15.0%) mothers aged> 20 & <35 years. The proportion of neonatal asphyxia in mothers aged <20 &> 35 years 108 people (86.4%) was higher than the proportion of asphyxia in mothers aged> 20 & <35 years (77.3%). Chi square statistical tests showed that there was a significant effect of maternal age and was the dominant factor in neonatal asphyxia in infants in Biak Hospital (p = 0.026) where the PR value = 1.118, CI95% (0.882 - 1.417), explained that mothers <20 &> 35 years will be 1.1 times higher than the baby with asphyxia compared to mothers aged> 20 & <35 years.

The results of this study are consistent with the research of Widiani et al. (2016), that the variables of maternal age <20 years and> 35 years were found to increase the risk of PR neonatal asphyxia = 3.57; 95% CI: (1,48-8,61). Similarly, a study reported by Herianto (2012) in ST Elisabeth Hospital Medan showed that maternal age was a factor associated with neonatal asphyxia OR = 3.55 (95% CI: 1,74,24). The results of other studies reported by Revrelly (2011) in Manado also showed that the age of mothers <20 years and> 35 years had twice the chance of having an asphyxia compared to the age of 20-35 years with OR = 1.56.15 Inconsistent

results reported by Rika Herawati (2013) in Rokan Hulu District Hospital showed that maternal age is not a risk factor for neonatal asphyxia (p = 0.34), but it has long been known that maternal age is very influential on the reproductive process because age increases will be followed by developmental changes of organs in the pelvic cavity. This situation will affect the life of the fetus in the womb. The age of the mother who is considered optimal for pregnancy is between 20-30 years. While below or above this age will increase the risk of pregnancy and childbirth.

The age at the time of pregnancy is very influential on the readiness of the mother to accept responsibility as a mother so that the quality of human resources increases and readiness to nurture the next generation can be guaranteed. Pregnancy at a young age or teenager (under the age of 20 years) will result in fear of pregnancy and childbirth, this is because at that age the mother may not be ready to have children and the reproductive organs of the mother are not ready to get pregnant. Likewise, pregnancy in old age (over 35 years) will cause anxiety about pregnancy and childbirth and the reproductive organs of the mother are too old for pregnancy (Prawirohardjo in Herianto et al., 2012).

4.2 Parity
Parity is the number of births of a woman (BKKBN, in Suparyanto, 2010). Parity is classified into 3 namely primipara, which is a woman who has given birth to a child, which is large enough to live in the outside world, multipara is a woman who has given birth to a child more than once and is a woman who has 5 or more children complication in pregnancy and childbirth (Manuaba in Suparyanto, 2010). The theory states that high parity allows complication of pregnancy and childbirth which can cause disruption of oxygen transport from mother to fetus which will cause asphyxia which can be assessed from the first minute APGAR Score after birth (Manuba in Fajarriyanti, 2017).

Multigravida grand pregnancy (high parity) causes deterioration in the flexural power (elasticity) of the tissue that has been repeatedly stretched by pregnancy. So that it tends to arise in place abnormalities or abnormalities of placental growth and fetal growth. This can affect the supply of nutrients and oxygen from mother to fetus and the higher the parity, the higher the risk of giving birth to babies with asphyxia (Prawirohardjo, 2012)

In this study, the proportion of maternal parity> 4 children (93.2%) was higher than parity mothers <4 children (76.7%). Based on the chi square statistical test in this study showed that parity was the dominant factor in neonatal asphyxia in infants in Biak Hospital (p = 0.005) with a PR value of 1.215, CI95% (1,056 - 1,399) meaning that mothers with parity> 4 children could cause the baby experienced 1.2 times neonatal asphyxia compared to parity <4 children.

The results of this study are in line with research by Fani Martha in Herianto et al (2012). Obtained a large OR 3.49 (95% CI 1.77-6.87) explaining that maternal parity carries a risk of neonatal asphyxia. Pregnancy and childbirth that have risks are the first child and childbirth of the fourth child or more because in the first child the stiffness of the muscle and the rigid cervix can prolong labor while in the fourth child or more there is a deterioration in tissue elasticity which has repeatedly stretched the pregnancy , so that the urgent force is not optimal and prolongs the labor process.

Likewise, research in Losari Subdistrict, Brebes Regency showed that Parity 1 and ≥4 had a relationship with the incidence of neonatal asphyxia (ρ = 0,0006 and OR = 8,25). 2-3 parity is the safest parity in terms of maternal mortality. Parity1 and ≥4 have maternal mortality rates due to higher postpartum bleeding. Low parity (parity one) shows the unpreparedness of mothers in dealing with complications that occur in pregnancy, childbirth and childbirth. Parity1 is at risk because the mother is not ready medically

or mentally. The results of the study showed that primiparity was a risk factor that had a strong association with asphyxia mortality, while parity ≥4 physically the mother experienced a setback to undergo pregnancy. This situation predisposes to bleeding, placenta previa, uterine rupture, solution to placents that can end with newborn asphyxia (Gerungan, 2014)

4.2 Serotinus

The results of the study found that out of 147 mothers giving birth at RSUD Biak, those who had an overdue pregnancy or> 42 weeks with their babies experiencing neonatal asphyxia (86.2%) were not much different from the proportion of mothers with <42 weeks gestation (83.3 %). The chi square statistical test in this study showed that there was no significant effect on serotinus mothers on neonatal asphyxia in infants in Biak Hospital (p = 0.631) and PR value = 1.034 CI95% (0.898-1191) with a lower value <1, so that it can be said meaningless.

The results of this study illustrate that 86.2% of mothers have not been able to determine gestational age, forgetting the date of last menstruation in addition it is difficult to determine precisely at the time of ovulation other than these factors, fetal factors also cause pregnancy> 42 weeks and the baby experiences neonatal asphyxia. While 83.3% can determine the exact age of pregnancy, the date of menstruation and determine exactly when ovulation, but the baby has neonatal asphyxia. From the statistics obtained the closeness of the influence of serotinus on low neonatorum asphyxia (0.502) so that it can be assumed that there are other factors that cause the incidence of asphyxia that occurs in uncontrolled infants such as low birth weight (LBW), KPD, labor history, anemia and others. This is evidenced by serotine mothers <42 weeks as many as 83.3% of their babies experienced neonatal asphyxia. Serotinus is one risky pregnancy. Where the pregnancy age has reached 42 full weeks or more is calculated from the first day of the

last menstruation. This can lead to greater danger and complications both to the mother and to the fetus she contains during pregnancy, childbirth or childbirth. Towards labor there is a decrease in the hormone progesterone, an increase in oxytocin and an increase in oxytocin receptors, but the most decisive is the occurrence of prostaglandin production which causes a strong discharge. Prostaglandin has been shown to play the most important role in causing uterine contractions (Saifuddin, 2010).

4.3 Anemia

The proportion of infants who experience asphyxia due to their mothers with HB <11 grams is equal to (80.0%), while the proportion of infants who experience asphyxia due to their mothers with HB> 11 grams is equal to (96.6%). The results of the chi square statistical test in this study showed that there was no significant effect between mothers and anemia on the incidence of neonatal asphyxia in infants in RSUD Biak (p = 0.748) and PR values = 0.939, CI95% (0.602 - 1.463) explaining that mothers with HB <11 grams 1.1 times smaller the baby experiences asphyxia compared to mothers with HB> 11 grams. This study is consistent with the study reported by Rofiatun in Dr. Hospital. Moewardi Surakarta, which showed that the hemoglobin level of pregnant women was not a risk factor for neonatal asphyxia with OR = 0.708 (95% CI: 0.623-0,805). Whereas in other studies found Anemia during pregnancy increased the risk of neonatal asphyxia (AOR = 6.49; 95% CI: 2.21-19.03).

A dangerous situation during pregnancy and increasing the danger to the baby is at the age of <20 years or> 35 years. The incidence of anemia in pregnant women at <20 years old, because the young mother needs more iron for the growth needs of herself and the baby she will conceive (Wahyudin, 2008). Theoretically, the age of <20 years is not mentally optimal with emotions that tend to be labile, mentally immature so that it is easy to experience

shock which results in a lack of attention to the fulfillment of nutritional needs associated with a decrease in endurance and various diseases that often occur at this age (Herlina, 2009) According to the World Health Organization (WHO), anemia in pregnant women is the condition of mothers with hemoglobin (Hb) levels in their blood less than 11.0 gr%. Meanwhile, according to Saifuddin, anemia in pregnancy is the condition of mothers with hemoglobin levels below 11.0 gr% in the first and second trimesters or levels <10.5 gr% in the second trimester. Anemia in pregnancy is quite high ranging between 10% and 20% because food deficiency plays a very important role in the emerge. As a result of anemia can cause hypoxia and reduced oxygen flow to the placenta and also to the fetus causing interference with the baby's breathing. Theories illustrate that anemia experienced by mothers during pregnancy will affect the fetus they contain.

4.4 ANC

The results of the study analysis on 147 mothers giving birth in RSUD Biak found that the proportion of mothers who performed ANC treatment> 4 times as many as 68 people (46.3%) were smaller than mothers who did ANC <4 times as many as 79 people (53.7%). The proportion of infants who experienced neonatal asphyxia in mothers who performed ANC <4 times the examination was (79.7%) smaller than infants who experienced neonatal asphyxia from mothers who did ANC> 4 times of examination (91.2%). The chi square statistical test in this study showed that there was no significant effect between mothers who performed ANC treatment on neonatal asphyxia events in their babies (p-value = 0.063), where PR values = 0.875, CI95% (0.765 - 1,000) explained that mothers with ANC <4 times the risk is 1.1 times smaller than the baby experiencing neonatal asphyxia compared to mothers with ANC> 4 times the examination.

This study is consistent with the study reported by Omowumi IO et al in Ibnu (2016) that there was no significant difference between the level or frequency of antenatal care and the incidence of asphyxia in newborns. This study says that infants with severe asphyxia are closely related to multiparous mothers. Likewise the results of research from Wahida (2008) that neonatorum asphyxia that occurs in infants does not depend on ANC visits but from the quality of health services provided. Mothers who get service quality that is not nine times better in asphyxial babies than babies without asphyxia. Other factors related to newborn asphyxia are: low maternal education, low family economic status, parity> 3 and birth distance <2 years while the ANC frequency variable does not show a significant relationship with the incidence of newborn asphyxia.

This situation is evidenced by the low closeness of influence (0.140) so it is assumed that there are other factors that influence the incidence of neonatal asphyxia in mothers who perform ANC> 4 times the examination. From the perinatology register and delivery room at the Biak Hospital, 80% of the mothers were low-educated with low economic status. According to Ibnu (2016), education and low family economic status may be associated with low knowledge in meeting nutritional needs during pregnancy or ignorance of the importance of regular prenatal care while low family economic status can be attributed to inability to meet nutritional needs during or before during pregnancy. Nutritional deficiencies can cause anemia in pregnancy where anemia in pregnancy causes disruption of oxygen transport which can cause neonatal asphyxia.

The results of other studies that are not consistent with this study were proposed by Sukadi EP et al (2011) that in mothers who had irregular antenatal examinations (<4x visits) it was found that 36% of babies were born asphyxia. This study assumes that antenatal care can prevent neonatal asphyxia because through antenatal care the mother and mother's health can be monitored as early as possible, so that health problems for

the mother and baby can be addressed before the mother enters labor.

4.6 KPD (Early Rupture of Amniotic fluid)
The results of the analysis showed that the proportion of mothers with Early Rupture of Amniotic fluid (KPD) was greater (94.7%) compared to mothers with no Early Ruptured Amniotic Disease (KPD) in RSUD Biak (75.0%). This happened because of the increase in referrals from the Polindes, Pustu and Puskesmas to the Biak Hospital with the condition that the mother had experienced premature rupture of the membranes (KPD) before being referred to the hospital. The chi square statistical test in this study showed that mothers with KPD were the dominant factor in neonatal asphyxia in their babies (p = 0.001) where PR = 1,262, CI95% (1,093 - 1,457) explained that mothers with KPD could cause their babies to experience neonatal asphyxia 1, 2 times higher than mothers without KPD.

The results of this study are in line with the research of Gilang et al (2016), that there was a relationship between KPD and neonatal asphyxia incidence p-value of 0.004 (<0.05). The logistic regression test results showed OR (Odd Ratio) of 9.560 means the risk of neonatal asphyxia in women who experience Early Ruptured Amniotic Disease (KPD) is 9.5 times greater than for mothers who do not experience Premature Rupture of Amniotic fluid (KPD). Early rupture of membranes (KPD) is the rupture of the membranes before any signs of labor (Arif Mansjoer, 2001). KPD occurs in 10% of all pregnancies. In 60% -80% of cases, KPD occurs at the end of pregnancy. KPD is very rare in the early period of pregnancy.

Early Rupture of Ketuban (KPD) will cause the birth of neonatal asphyxia if accompanied by other complications. This is caused by fetal hypoxia in the uterus and hypoxia associated with factors that arise in pregnancy, labor, or immediately after the baby is born. With rupture the membranes occur oligohydramnios which suppress the umbilical cord until asphyxia or hypoxia occurs. There is a relationship between the occurrence of fetal distress and the degree of hydramnios, the less the amniotic fluid, the more severe the fetus.

5. CONCLUSIONS
Based on the research that has been done, it can be concluded that:

1. There is a significant effect of maternal age on neonatal asphyxia in infants in Biak Hospital (p = 0.026); PR = 1.118, CI95% (0.882-1.417).

2. There is a significant effect of parity on the incidence of neonatal asphyxia in infants in Biak Hospital (p = 0.005); PR = 1,215, CI95% (1,056-1,399)

3. There is no significant effect of serotinus on neonatal asphyxia in infants in Biak Hospital (p = 0.631); PR = 1.034 CI95% (0.898-1191)

4. There was no significant effect of anemia on the incidence of neonatal asphyxia in infants in Biak Hospital (p = 0.748); PR = 0.939, CI95% (0.602-1.463).

5. There was no significant effect of ANC on neonatal asphyxia in infants in Biak Hospital (p-value = 0.063); PR = 0.875, CI95% (0.765-1,000).

6. There is a significant and meaningful influence of KPD on the incidence of neonatal asphyxia in infants in Biak Hospital (p = 0.001); PR = 1,262 CI95% (1,093-1,457

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