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Analysis of Type of Delivery and Birth Weight with the Occurrence of Neonatal Jaundice in the Regional Hospital of Merauke Regency

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ABSTRACT
Neonatal jaundice is caused by maternal, perinatal and neonatal factors. The high incidence of jaundice in the Merauke Regency Regional Hospital is of concern to researchers to determine the relationship Type of Delivery and Birth Weight with Neonatal Jaundice. This research method uses this type of research *analytical observational* using register measuring instruments in the Perinatal and Medical Records Room with research design *cross-sectional* and techniques *total sampling.* The population of this study is Babies aged 0-28 days who experience neonatal jaundice and are treated in the Perinatal Room of the Merauke District Hospital from January to October 2023 as many as 91 respondents, the sample is the same as the population. Statistical test using *chi square* to find out the relationship between 2 variables. Research results from 91 respondents were obtained The majority of respondents' birth types were at risk of developing neonatal jaundice, 54 respondents (59.3%), the majority of respondents' birth weight was LBW, 58 respondents (63.7%), and the majority of respondents experienced neonatal jaundice, 84 respondents (92, 3%). Analysis using tests *Chi-Square* for the type of delivery the results were obtained $p = 0.003$ (< 0.05) and for birth weight the value obtained $p = 0.001$ (< 0.05) so it can be concluded that there is a relationship between type of delivery and birth weight with the incidence of neonatal jaundice in the Merauke Regency Hospital. It is recommended that delivery and care of newborns is very important by providing motivation or counseling to the mother *post caesarean section* and *vaginal* to immediately breastfeed the baby intensively so that these risk factors do not occur which result in neonatal jaundice.

Keywords **:** Baby Birth Weight, Jaundice, Type of Delivery, Neonatorum

INTRODUCTION

The figure in Indonesia from the 2018 Indonesian Demographic Health Survey was 32 per 1000 live births. Most neonatal deaths in Indonesia are caused by asphyxia (37%), low birth weight (LBW) and prematurity (34%), sepsis (12%), hypothermia (7%), neonatal jaundice (6%), post maturity (3 %), and congenital abnormalities (1%) per 1000 live births. (Nur and Yulia, 2022). According to reports from *World Health Organization* (WHO) that every year approximately 3% (3.6 million) of 120 million newborn babies experience jaundice and almost 1 million babies who experience jaundice later die. Based on the 2019 Papua Province Health Profile, the Maternal Mortality Rate (MMR) was 24 people, while the Infant Mortality Rate (IMR) was 6 per 1,000 live births.

Jaundice is still a frequently encountered problem in newborn babies. About 25% - 50% of newborns suffer from jaundice in the first week. Jaundice itself is a problem that often

appears in neonates which occurs due to excessive accumulation of bilirubin in the blood and tissues (Indonesian Ministry of Health, 2019).

Jaundice itself is a yellow color that can be seen on the sclera, mucous membranes, skin or other organs due to a buildup of bilirubin. If the blood bilirubin level exceeds 2 mg%, then jaundice will be visible, but in neonates jaundice is still not visible even though the blood bilirubin level has exceeded 5 mg%. This jaundice occurs due to elevated levels of indirect bilirubin (*unconjugated*) and/or direct bilirubin levels (*conjugated*). An increase in bilirubin levels in the blood that is more than normal is called jaundice. Normal values for indirect bilirubin are 0.3-1.1 mg/dl and direct bilirubin 0.1-0.4 mg/dl (Indonesian Ministry of Health, 2019).

Jaundice in newborns can be a physiological symptom or it can be pathological. Physiological jaundice is jaundice that appears on the second-third day or after the first 48 hours of a baby's life and has no pathological basis, the levels do not exceed dangerous levels or have the potential to become kernicterus. Pathological jaundice is jaundice that has a pathological basis (appears within the first 24 hours to 48 hours of a baby's life) or the bilirubin level reaches a value called hyperbilirubinemia which can cause permanent problems or cause death, so every baby with jaundice must receive attention.

Many newborn babies, especially small babies (babies with birth weight <2500 grams or gestational age <37 weeks) experience jaundice in the first week of life. Babies born at term have a risk of developing neonatal jaundice reaching 60% and an increased risk for babies born prematurely by 80%. Clinically, jaundice will begin to appear in newborn babies when the blood bilirubin level is 5-7 mg/dL.

The cause of neonatal jaundice can be influenced by several factors, including maternal, perinatal and neonatal factors. Maternal factors consist of certain races or ethnic groups (Asian, Native American, Greek), pregnancy complications (Diabetes Mellitus, ABO and Rh incompatibility), use of oxytocin infusion in hypotonic solutions, gestation period, and type of delivery. Perinatal factors are birth trauma (cephalhematoma) and infection (bacteria, viruses). Neonatal factors include prematurity, genetic factors, polysthemia, low breast milk intake, influence of drugs, hypoglycemia, hypoalbuminemia, and birth weight of the baby.

Based on research conducted by Roselina, the type of delivery is the most dominant variable, neonates born with a non-spontaneous type of delivery are 50,193 times more likely to experience hyperbilirubinemia than those born spontaneously. However, in research conducted by Siti Rohani, the type of delivery had no relationship with the incidence of jaundice with a p-value of 0.607 > 0.05 and an OR of 0.821.

Jaundice is often found in babies with Low Birth Weight (LBW) because it is a cause of morbidity and death during the neonatal period. Causes of pain or direct complications that occur in low birth weight babies include: hypothermia, hypoglycemia, fluid and electrolyte disorders, hyperbilirubinemia (jaundice), respiratory distress syndrome, patent ductus arteriosus, infection, intravascular bleeding, *apnea of premature*, and anemia. LBW is associated with hyperbilirubin because it is related to liver maturity factors, so that the conjugation of indirect bilirubin to direct bilirubin is not perfect or it could also be caused by impaired liver growth in dysmature babies who weigh less than normal babies.

LBW which is related to the incidence of jaundice is in accordance with research by Riyanti Imron and Diana Metti (2015). In this study it was discovered that of the 315 babies there were 105 babies with low birth weight (33.3%) and 111 babies with hyperbilirubinemia (35.2%). There is a relationship between low birth weight and hyperbilirubinemia (*p-value*=0.000), with an OR value of 2.182, which means that babies with LBW are 2.182 times more likely to experience hyperbilirubinemia than babies who are not LBW.

However, the theory and these two studies contradict research conducted by Mariah Ulfah (2015) which stated that the incidence of jaundice was mostly found in neonates who

were not LBW (>2500 grams) as many as 60 neonates (60%) and normal babies with a gestational age of 37- 42 weeks as many as 64 neonates (64%). So the results state that there is no relationship between LBW and neonatal jaundice and value *p-value*=0.447 and there is no relationship between prematurity and neonates experiencing jaundice with the value *p-value*=0,380.

Based on the existing problems, researchers conducted a preliminary study to determine the incidence of jaundice in the Merauke Regency Regional Hospital. The results of the preliminary study showed that the incidence of neonatal jaundice in the Merauke Regency Regional Hospital in 2022 was 55 cases of babies experiencing jaundice, whereas in January to In October 2023, there were 91 cases of babies experiencing jaundice. Based on the results of interviews conducted by researchers on August 25 2023 with mothers whose babies had jaundice, the mother said that one of the causes of the baby having jaundice was because the baby was born preterm and the baby's birth weight was low and the mother gave birth *sectio caesarea*.

Based on the description above, the incidence of Neonatal Jaundice is still one of the problems in the Merauke Regency Regional Hospital, maternal and neonatal factors are one of the possible factors that provide opportunities for the occurrence of Neonatal Jaundice. From several studies that have been conducted, inconsistent results have been obtained regarding the relationship between type of delivery and birth weight with the incidence of neonatal jaundice.

Based on the background above, researchers are interested in conducting research about Analysis of Type of Delivery and Birth Weight with the Occurrence of Neonatal Jaundice in Merauke Regency Regional Hospital.

METHOD

This research uses a research design *Observational Analytics* with approach *cross sectional*. With technique *total sampling* namely the sample is the same as the population of 91 respondents, the independent variables are type of delivery and birth weight and the dependent variable is the incidence of jaundice. Statistical tests are used *Chi-Square* to find out the relationship between the two variables. Analysis uses statistical tests *Chi-Square* obtained mark p = 0.003 (< 0.05) then it can be concluded that there is a relationship between the type of delivery and the incidence of neonatal jaundice in the Perinatal Room of the Merauke District Hospital and the value p = 0.001 (< 0.05) so it can be concluded that there is a relationship between Birth Weight and the incidence of neonatal jaundice in the Perinatal Room of the Merauke District Hospital.

RESULTS

Univariate Analysis Results

Table 1. Frequency Distribution of Types of Childbirth in the Perinatal Room of Merauke District Hospital

TYPE OF LABOR					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	RISKY	54	59,3	59,3	59,3
	NO RISK	37	40,7	40,7	100,0
	Total	91	100,0	100,0	

Source: Research Checklist, 2 February 2024

Based on table 1 above, it can be seen that the majority of respondents' types of delivery are at risk of developing neonatal jaundice, namely 54 respondents (59.3%).

Table 2. Frequency Distribution of Birth Weight in the Perinatal Room of Merauke District Hospital

BIRTH WEIGHT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	LBW	58	63,7	63,7	63,7
	BBLN	33	36,3	36,3	100,0
	Total	91	100,0	100,0	

Source: Research Checklist, 2 February 2024

Based on table 2 above, it can be seen that the majority of respondents' birth weight was LBW, namely 58 respondents (63.7%).

Table 3. Frequency Distribution of Neonatal Jaundice in the Perinatal Room of Merauke District Hospital

NEONATORY ICTERUS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	NEONATORY ICTERUS	84	92,3	92,3	92,3
	NO NEONATORY ICTERUS	7	7,7	7,7	100,0
	Total	91	100,0	100,0	

Source: Research Checklist, 2 February 2024

Based on table 3 above, it can be seen that the majority of respondents experienced Neonatal Jaundice, namely 84 respondents (92.3%).

Bivariate Analysis Results

Table 4. Analysis of the relationship between type of delivery and the incidence of neonatal jaundice in the perinatal room of Merauke Regency Regional Hospital

Crosstab

			NEONATORY ICTERUS		Total
			NEONATORY ICTERUS	NO NEONATORY ICTERUS	
TYPE OF LABOR	RISKY	Count	54	0	54
		Expected Count	49,8	4,2	54,0
	NO RISK	Count	30	7	37
		Expected Count	34,2	2,8	37,0
Total		Count	84	7	91
		Expected Count	84,0	7,0	91,0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	11,068[a]	1	,001		
Continuity Correction[b]	8,564	1	,003		
Likelihood Ratio	13,463	1	,000		
Fisher's Exact Test				,001	,001
Linear-by-Linear Association	10,946	1	,001		
N of Valid Cases	91				

Based on table 4.above, all 54 respondents with risky types of delivery experienced neonatal jaundice. Of the 37 respondents whose births were not at risk, 30 respondents experienced neonatal jaundice and 7 respondents did not experience neonatal jaundice. Based on test results *Chi square* value is obtained $p = 0.003$ (< 0.05) so it can be concluded that there is a relationship between the type of delivery and the incidence of neonatal jaundice in the Perinatal Room of the Merauke District Hospital.

Table 5. Prevalence Ratio of Types of Delivery in the Occurrence of Neonatal Jaundice in the Perinatal Room of Merauke District Hospital

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
For cohort NEONATORY ICTERUS = NEONATORY ICTERUS	1,233	1,056	1,441
N of Valid Cases	91		

Based on Table 5 the prevalence ratio is 1.233 (RP > 1), which means that babies with risky types of delivery have a 1.233 times greater chance of experiencing neonatal jaundice than babies with non-risk types of delivery.

Table 6. Analysis of the Relationship between Birth Weight and the Incidence of Neonatal Jaundice in the Perinatal Room of Merauke Regency Regional Hospital

Crosstab

			NEONATORY ICTERUS		Total
			NEONATORY ICTERUS	NO NEONATORY ICTERUS	
BIRTH WEIGHT	LBW	Count	58	0	58
		Expected Count	53,5	4,5	58,0
	BBLN	Count	26	7	33
		Expected Count	30,5	2,5	33,0
Total		Count	84	7	91

	Expected Count	84,0	7,0	91,0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	13,328[a]	1	,000		
Continuity Correction[b]	10,508	1	,001		
Likelihood Ratio	15,251	1	,000		
Fisher's Exact Test				,001	,001
Linear-by-Linear Association	13,182	1	,000		
N of Valid Cases	91				

Based on table 6 above, all 58 respondents with Low Birth Weight experienced neonatal jaundice. Of the 33 respondents with normal birth weight, 26 respondents experienced neonatal jaundice and 7 respondents did not experience neonatal jaundice. Based on test results *Chi square* value is obtained $p = 0.001$ (< 0.05) so it can be concluded that there is a relationship between Birth Weight and the incidence of neonatal jaundice in the Perinatal Room of the Merauke District Hospital.

Table 7. Prevalence Ratio of Birth Weight in the Occurrence of Neonatal Jaundice in the Perinatal Room of Merauke District Hospital

Risk Estimate

	Value	95% Confidence Interval	
		Lower	Upper
For cohort NEONATORY ICTERUS = NEONATORY ICTERUS	1,269	1,063	1,515
N of Valid Cases	91		

Based on Table 7, the Prevalence Ratio is 1.269 (RP > 1), which means that babies with Low Birth Weight have a 1.269 times greater chance of experiencing neonatal jaundice than babies with Normal Birth Weight.

DISCUSSION

Identification of Types of Childbirth in the Perinatal Room of Merauke District Hospital

Based on the research results, there were 54 (59.3%) respondents whose mothers gave birth at risk. Babies born through labor are at risk *caesarean section* not getting the beneficial bacteria found in the mother's birth canal which has an influence on the mother's birth canal which has an influence on the maturation of the body's immune system so that the baby is more susceptible to infection than mothers who give birth without risk. Meanwhile, one of the conditions in neonates that causes neonatal jaundice is the result of a lack of breast milk, which is usually called *breast feeding jaundice.*

Mothers who give birth with risky labor *caesarean section* usually rarely breastfeed their babies because of postpartum discomfort *caesarean section*, the mother only focuses on the pain of the stitching wound so that breastfeeding to her baby is delayed, where it is known that breast milk (breast milk) also inhibits the occurrence of enteroherpatic circulation of

bilirubin in neonates, indirectly jaundice is caused by delaying breast milk due to risky childbirth (*caesarean section*).

Identification of Baby's Birth Weight in the Perinatal Room of Merauke District Hospital

Based on the research results, there were 58 (63.7%) respondents with low birth weight (< 2500 grams). Birth weight is the weight of the neonate at the time of birth which is weighed within 1 hour or after birth. The causes of neonatal jaundice are maternal factors, fetal factors, and placental factors. Body weight is used to diagnose normal or low birth weight (LBW) babies. Low birth weight is a baby born with a body weight of less than 2500 grams regardless of the gestational age.

Low birth weight babies are high risk babies because they have greater morbidity and mortality related to birth and adjustment after birth. High risk babies are born to mothers with high risk pregnancies. A high-risk pregnancy is a pregnancy in which the life or health of the mother and fetus is in danger due to pregnancy disorders.

Low birth weight babies usually have immature organ functions compared to normal birth weight babies. All the organs in low birth weight babies are also not yet perfect, so neonatal jaundice often occurs where digestion is not yet perfect, which interferes with the proper excretion of bilirubin through defecation and urination. Handling of babies with low birth weight is carried out comprehensively from before birth, during delivery, until after birth, therefore babies with low birth weight require special treatment at the hospital.

Bivariate Analysis Results

Analysis of the relationship between type of delivery and the incidence of neonatal jaundice in the perinatal room of Merauke District Hospital

Based on the research results, respondents with risky types of delivery all experienced Neonatal Jaundice, namely 54 (59.3%). Statistical test results using *Chi Square* value is obtained $p = 0.003$ (< 0.05) which means that statistically there is a significant relationship between the type of delivery and the incidence of neonatal jaundice. And the results obtained were a prevalence ratio of 1.233 RP > 1, meaning that babies with risky types of delivery had a 1.233 times greater chance of experiencing neonatal jaundice than babies with non-risk types of delivery.

Mother who gave birth naturally *caesarean section* It takes a longer time for health recovery and the pain is higher compared to mothers who give birth vaginally so that breastfeeding is delayed for their babies, the mother's fear of surgical wounds and the pain felt by mothers who give birth by surgery causes mothers to be afraid to move so breastfeeding is delayed. the baby.

In the researcher's opinion, there is a gap between fact and theory, in fact, childbirth *caesarean section* larger than normal (vaginal) delivery, even though labor *caesarean section* not entirely the cause of neonatal jaundice, childbirth *caesarean section* other than the mother's wishes, childbirth *caesarean section* is an option to save the baby, one of the causes of jaundice is maternal factors such as pregnancy complications (DM, ABO and Rh in complications), use of oxytocin infusion in a hypotonic solution, gestation period, certain races or ethnic groups (Asian, Native American, Greek) but In fact, from the research results, there were still several respondents who had normal (vaginal) delivery who experienced neonatal jaundice.

Analysis of the Relationship between Birth Weight and the incidence of Neonatal Jaundice in the Perinatal Room of Merauke Regency Regional Hospital

Based on the research results, respondents with low birth weight all experienced Neonatal Jaundice, namely 58 (63.7%) The results of statistical tests using *Chi Square* value is obtained $p = 0.001$ (< 0.05) which means that statistically there is a significant relationship between birth weight and the incidence of neonatal jaundice. And the results obtained were a

Prevalence Ratio of 1.269 RP > 1, meaning that babies with Low Birth Weight had a 1.269 times greater chance of experiencing neonatal jaundice than babies with Normal Birth Weight.

For babies with a low birth weight, the maturity of the baby's organs is not optimal compared to babies who have a normal birth weight, so that the process of excreting bilirubin through the immature liver organ causes a buildup of bilirubin which causes neonatal jaundice.

In the opinion of researchers, there is a gap between facts and theory, in fact babies with Low Birth Weight (LBW) larger than babies with Normal Birth Weight (BBLN) but in fact from research results there are still some babies with Normal Birth Weight (BBLN) who experience jaundice, this is caused by low breast milk intake, infection and birth trauma (*cephalhematom*), mothers with inverted nipples, improper breastfeeding and babies not being sun-kissed in the morning.

CONCLUSION

1. The type of delivery of most respondents was at risk of developing neonatal jaundice, namely 54 respondents (59.3%).
2. The birth weight of most respondents was LBW, namely 58 respondents (63.7%).
3. Neonatorum Jaundice The majority of respondents experienced Neonatorum Jaundice, namely 84 respondents (92.3%).
4. Based on statistical tests using tests *Chi-Square* for the type of delivery the results were obtained $p = 0.003$ (< 0.05) and for birth weight the value obtained $p = 0.001$ (< 0.05) so it can be concluded that there is a relationship between type of delivery and birth weight with the incidence of neonatal jaundice in the Merauke Regency Hospital.

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