



## Relationship Between Adequacy of Breastfeeding and The Incidence of Neonatal Jaundice in The NICU at Darus Syifa' Islamic Hospital

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### ABSTRACT

Inappropriate early breastfeeding is associated with reduced caloric intake and increased serum bilirubin. It occurs due to a lack of caloric intake to increase enterohepatic circulation. Early breastfeeding for neonates can reduce the occurrence of jaundice. This study aimed to determine the relationship between adequacy breastfeeding and the incidence of neonatal jaundice at the Darus Shifa Islamic Hospital Surabaya. This study used an analytical research design with a cross-sectional approach and a purposive sampling method. The population of this study was 35 respondents. The sample in this study was 32 respondents, and there were two variables. The dependent variable was the adequacy of breastfeeding using an instrument on an observation sheet. The independent variable was the incidence of jaundice using a checklist instrument. Data analysis used Spearman rho. The results of the statistical analysis test using the Spearman rho statistic test with the help of SPSS obtained a significance value of  $p = 0.000$  which means there is a relationship between the adequacy of breastfeeding. The incidence of neonatal jaundice is  $r = 0.912$ , meaning there is a solid correlation between the adequacy of breastfeeding and the incidence of it. Adequacy breastfeeding is one way to prevent neonatal jaundice with the support of professional health workers' information to mothers about breastfeeding and its benefits. Thereby affecting the continuity of mothers in breastfeeding so that babies do not experience neonatal jaundice.

**Keyword:** ASI, Breastfeeding, Neonatal jaundice

## 1. Introduction

Jaundice is a condition that often occurs in neonates. One of the causes of mortality in newborns is bilirubin encephalopathy, the most severe complication of neonatal jaundice. Neonatal jaundice is one of the causes of neonatal death (Okta, 2014). It is a clinical condition in newborns characterized by yellow staining of the skin and sclera due to excessive accumulation of unconjugated bilirubin. Clinical jaundice will appear in newborns when the blood bilirubin level is 5-7 mg/dl (F.B. Monika, 2014). The causes of increased bilirubin levels in the blood are hemolysis, rhesus disease, ABO incompatibility, G6PD deficiency, breastfeeding, gestational age, birth weight, and asphyxia (Rahmawati, 2013). Based on the World Health Organization (WHO), Maternal Mortality Rate (MMR) is the Infant Mortality Rate of 19 per 1000 live births globally. This figure is still quite far from the SDGs (Sustainable Development Goals) target which is targeted in 2030, namely IMR 12 per 1000 live births (WHO, 2017).

The results of the 2015 Ministry of Health report stated that the causes of death for newborns 0–6 days in Indonesia were respiratory disorders 36.9%, prematurity 32.4%, sepsis 12%, hypothermia 6.8%, blood disorders/icterus 6.6%, etc. There are various causes of Indonesia's high Infant Mortality Rate (IMR). 6.6%

of them result from jaundice, which can potentially become bilirubin encephalopathy (better known as Kern Jaundice). Indonesia is now ranked fifth in the country with the highest infant mortality rate in the world. One of Indonesia's highest causes of infant mortality is jaundice, which is 660,000 per year, and the estimated incidence is 230,000 new cases per year. The number of deaths due to jaundice is 61,000 yearly (Kemenkes, 2016). In Indonesia, according to data from RSUD. Dr. Soetomo, it showed an increase in the incidence of neonatal jaundice. In 2012, there were 380 cases. In 2013, there were 392 cases of neonatal jaundice. In 2018, there were 395 cases of neonatal jaundice, Newborns (LBW about 50% in term infants and 75% in preterm infants (LBW)). It is evident from the data obtained at RSUD Ibnu Sina Gresik in 2018 that from 417 babies born, 151 babies (34%) had light weight. Of the 151 LBW, 86 babies (57%) had jaundice. The incidence of jaundice in Dr. Sarjito Hospital is around 23.8% of cases, and Dr. Soetomo's Hospital is 13% and 30% (N, 2018).

The results of a preliminary study that was carried out at Darus Syifa' RSI Surabaya in March-May 2021 showed that 55 babies were treated, and 40 babies were treated in the NICU with neonatal jaundice.

Observations showed an increase in the incidence of neonatal jaundice. The average rate of the incidence occurred with pathological mothers giving birth. The separation of care in postpartum pathology cases triggered the disruption of adequate breastfeeding for infants. Infants with pathological conditions requiring treatment in the NICU also experienced problems with the adequacy of breastfeeding. Jaundice risk factors are divided into three factors, namely, race, pregnancy complications (DM, ABO, and Rh incompatibility), use of oxytocin infusion in a hypotonic solution, and breast milk. Perinatal factors include birth trauma (cephalhematoma, ecchymosis) and infection (bacteria, viruses, protozoa). Neonatal factors include prematurity, genetic factors, polycythemia, drugs, low milk intake, hypoglycemia, and hypoalbuminemia.

In most cases, the level of bilirubin that causes jaundice is harmless and does not require treatment. However, pathological jaundice is a jaundice that occurs when the total bilirubin level exceeds 12 mg/dl. If not treated properly, it will cause dangerous complications because bilirubin can accumulate in the brain, causing kernicterus (Ira, M. S. & Dasnur, 2018).

Early breastfeeding in neonates can reduce the occurrence of physiological jaundice. There is an urge to move the intestines and accelerate the expulsion of meconium so that enterohepatic bilirubin is reduced. It is caused by the inhibition of uridine diphosphoglucuronic acid glucuronyltransferase by the product of progesterone metabolism, namely pregnan-3-alpha 20 beta-diol, found in breast milk (IDAI, 2013). One of the factors that cause jaundice in newborns is the function of the intestines and liver that have not worked perfectly so that much-unconjugated bilirubin is not wasted from the body. In addition, jaundice can occur due to a lack of milk in the first 2-3 days after birth (D, S, 2016). One way to expel meconium more quickly is through breastfeeding. Ideally, the frequency of breastfeeding is 8 to 12 times a day, so the frequency of defecation in infants will be more than 4 times a day. Breast milk (ASI) is crucial for optimal growth, physical and mental development, and the baby's intelligence.

Therefore, breastfeeding needs to get the attention of mothers and health workers so that the breastfeeding process can be carried out correctly. In addition, breastfeeding can reduce the risk of infant mortality. Breastfed babies have a 25 times lower chance of dying in the first month of birth compared to babies fed other than breast milk. Babies will also avoid the risk of ear infections, food allergies, anaemia, and obesity in the future (Sukadi, 2015). Research conducted by Nurlatifah N. Yusuf (2020) entitled *the Relationship between the Frequency of Breastfeeding and the Incidence of Jaundice Neonatorum at the NTB Provincial General Hospital 2020* showed that the higher the frequency of breastfeeding in new babies' birth, the lower the risk of jaundice.

One of the recommended primary treatments for jaundice is early breastfeeding initiation (IMD) (Prasetyono, 2012). Giving Breast Milk (ASI) immediately after birth or commonly called IMD, and exclusive breastfeeding is one of the actions that are relatively inexpensive and easy to implement by the government to improve the health and survival of newborns. This is supported by the statement of the United Nations Children's Fund (UNICEF) stating that as many as 30,000 infant deaths in Indonesia and 10 million deaths of children under five in the world each year can be prevented through exclusive breastfeeding for six months from the date of birth, without having to provide food as well as additional drinks for babies. Colostrum will make a lining that protects the intestines of babies who are still immature at once mature intestinal wall. Bilirubin will quickly be normal and excrete meconium faster, reducing the incidence of neonatal jaundice born (Ira, M. S. & Dasnur, 2018).

## 2. Method

The research design used was analytic with the cross-sectional method. The population is babies cared for in the NICU Room of RSI Darus Syifa' Surabaya, with as many as 35 neonates for two months. The sample used was some infants aged 0-14 days who were treated in the NICU room as many as 32 neonates by non-probability sampling, namely, purposive sampling with inclusion criteria: 1) Infants aged 0-14 days, 2) Infants who received Breastfeeding, 3) Babies with gestational age 35 -40 weeks, 4) Infants with BW 2000 –4000 g, 5) Infants with physiological jaundice starting to appear on the second or third day after the baby is born. Indirect bilirubin level does not exceed 12 mg/dL, and in premature infants, the level is 10 mg/dL; 6) Infants with hospitalization days 1-14 days; 7) babies with a diagnosis of physiological jaundice; 8) babies who receive breast milk directly from the mother and pacifier milk.

The operational of breast milk adequacy is assessing the adequacy of Breastfeeding babies with signs of enough breast milk (Azzahida, 2015): 1. Babies drink breast milk every 2-3 hours or a minimum of 8 times in 24 hours; 2. Baby urinating 6-8 times/ day (20-40 cc); 3. Urine is clear; 4. The baby poops 2-5 times/day with a good score: 76%-100% Enough:56%-75%, Not enough <56% (Sugiyono, 2016).

The independent variable is the adequacy of breastfeeding which is measured using an observation sheet in the form of a checklist of signs of the adequacy of breastfeeding, quoted from Dr. Taufiq. This study used an observation sheet with four statements. Including: 1. Drinking breast milk at least eight times in 24 hours; 2. Urinating > 6 times/day; 3. Urine colour is clear yellow; 4. Defecating 2-5 times/day with the rating Yes = 1, No = 0. Then, add up using the criteria: Score 76% - 100%: Good, Score 56% - 76%: Enough, Score < 56%, Less. The instrument has been tested for reliability and validity.

The dependent variable was the incidence of neonatal jaundice which was measured using an observation sheet in the form of a checklist of laboratory results for blood bilirubin levels with a checklist assessment, namely Jaundice if Bilirubin > 5 mg/dl = 1, No jaundice if Bilirubin 5 mg/dl = 2. This study was conducted by assessing signs of the adequacy of breastfeeding for 24 hours. To assess the adequacy of breast milk in infants, it is the weight gain of more than 500 grams in a month and has exceeded birth weight at two weeks old.

The statistical test in this study is Spearman's Rank. The level of significance used is 0.05, and the confidence interval is 95%. The test provisions of the Spearman hypothesis test are said to be Ho rejected if the p-value < 0.05.

## 3. Result and Discussion

Table 1. Distribution of Respondent Characteristics

Category	Frequency	Percentage (%)
<b>Age</b>		
1 day	1	3.1
2 days	8	25
3 days	13	40.6
4 days	3	9.4
5 days	3	9.4
6 days	1	3.1
10 days	2	6.3
14 days	1	3.1
<b>Birth Weight</b>		
Low < 2500 gr	2	6.3
Enough 2500 – 4000 gr	30	93.75
<b>Gender</b>		
Boy	15	46.9
Girls	17	53.1
<b>Gestational Age</b>		
< 37 week	10	31.3
37- 40 week	21	65.63
>40 week	1	3.1

Table 1 shows that 13 respondents are three days old (40.6%). Thirty respondents are in the category of birth weight 2500 – 4000 grams (93.75%). There are seventeen female respondents (53.1%) with a gestational age of 37-40 weeks, as many as 21 babies (65.63%).

Table 2. Frequency Distribution of Adequacy of Breastfeeding and The Incidence of Jaundice in Infants

Category	Frequency	Percentage (%)
<b>Breastfeeding</b>		
Well	19	59.4
Enough	1	3.1
Not Enough	12	37.5
<b>Jaundice Incidence</b>		
No jaundice	20	62.5
Jaundice	12	37.5

Table 2 shows that 19 respondents (59.4%) are in the Well category in terms of adequacy of breastfeeding. Also, twenty respondents (62.5%) do not have jaundice.

Table 3. The Relationship Between the Adequacy of Breastfeeding and The Incidence of Infant Jaundice

Breastfeeding	Jaundice Incidence				Total	
	No jaundice		Jaundice		N	%
	N	%	N	%		
Good	0	0	19	62.5	19	62.5
Enough	0	0	1	3.1	1	3.1
Not Good	12	37.5	0	0	12	37.5
<b>Total</b>	<b>12</b>		<b>20</b>		<b>32</b>	<b>100</b>
	<i>Spearman Rho</i>		<i>p = 0,00</i>		<i>r = 0,912</i>	

From Table 3, the cross-tabulation results show that respondents who stated the adequacy of breastfeeding in the good category 19 (62.5%) respondents did not experience jaundice. From the results of the SPSS analysis test using the Spearman rho correlation statistical test, it was known that the significance value or sig. (2-tailed) was 0.000 because of the sig. (2-tailed)  $0.000 < 0.05$  or  $0.01$  means there is a significant (mean) relationship between the variable of breastfeeding adequacy and the incidence of jaundice. While  $r$  correlation =  $0.912^{**}$ , the level of strength of the relationship (correlation) between the adequacy of breastfeeding and the incidence of neonatal jaundice is 0.912 or very strong. The correlation coefficient in the variable above is positive, namely, 0.912, so the relationship between the two variables is unidirectional (type of unidirectional relationship). Thus, it can be concluded that the better the adequacy of breastfeeding, the baby does not have jaundice.

The cross-tabulation results show that the respondents who stated the adequacy of breastfeeding were in a good category, as many as 19 respondents (59.37%). The sufficient category was one respondent (3.1%). Twenty respondents (62.5%) showed that the baby did not experience jaundice. Meanwhile, 12 respondents (37.5%) fall into the category the less adequacy of breastfeeding.

In this study, 19 respondents who were in the adequacy of breastfeeding are in a good category. Breast milk is the best food source for babies besides containing sufficient composition as nutrition. Breast milk can also increase and strengthen the bond of love between mother and baby and increase immunity for the baby. The amount of bilirubin in the baby's blood decreases as colostrum is given, which can overcome the deficiency if the baby is given enough milk and is not given a breast milk substitute. The composition of breast milk will change according to the baby's needs, namely colostrum (early breast milk). On the fourth to seventh day, they were followed by transitional milk. From the third week to the fourth week, mature milk. The milk that comes out at the beginning of breastfeeding (foremilk = early milk) differs from the milk that comes out at the end of breastfeeding (hindmilk = late milk).

This is because adequate breastfeeding will increase intestinal motility and cause bacteria to be introduced into the intestine. These bacteria can convert direct bilirubin into urobilin, which cannot be reabsorbed so bilirubin levels will decrease, and the degree of jaundice will decrease (Prasetyono, 2012).

In this study, there were 12 respondents whose breastfeeding adequacy was in the less category. Infants who receive adequate breastfeeding have a 3.0 times greater chance of developing neonatal jaundice than infants who receive adequate breastfeeding babies who get inadequate milk tend to experience neonatal jaundice. In addition, maternal factors influence the incidence of jaundice because neonates who experience jaundice are mostly born at term gestational age because babies born at term have a risk of jaundice neonatorum reaching 60% (Okta, 2014). Breast milk is produced by mothers who gave birth prematurely / fewer months the Breast milk is produced by mothers who gave birth prematurely/fewer months. The composition contained in breast milk differs from that produced by mothers giving birth at

term. In addition, breast milk also contains protective substances that can protect babies from various infectious diseases (Raharjo Kukuh, 2012).

This study's results align with (Ira, M. S. & Dasnur, 2018) research entitled the relationship between Breastfeeding and the Incidence of neonatal jaundice in Infants at Assalam Gemolong General Hospital. The results of the chi-square relationship between Breastfeeding and the Incidence of neonatal jaundice at RSU Assalam Gemolong is 4.713. The p-value is 0.030, where the p-value obtained from the calculation is significant, or there is a relationship between Breastfeeding and the Incidence of neonatal jaundice at RSU Assalam Gemolong. One of the causes of jaundice is inadequate Breastfeeding for infants. This theory is in line with research conducted by (A. & Rahmawati, D., 2017) with the title of the relationship between the frequency of Breastfeeding and the Incidence of neonatal jaundice at the NTB Provincial General Hospital in 2020 with the results of the study that the higher the frequency of Breastfeeding for newborns, the higher the risk of Breastfeeding—less jaundice.

Based on the results of the analysis and discussion, it can be concluded that: The adequacy of Breastfeeding for infants who are cared for in the NICU room at RSI Darus Syifa Surabaya is mainly in the good category, as many as 19 respondents (59.37%) and infants who do not experience jaundice as many as 20 respondents (62, 5%). There is a relationship between Breastfeeding and the Incidence of neonatal jaundice at RSI Darus Syifa Surabaya.

#### 4. Conclusion

There is a relationship between the adequacy of breastfeeding with the incidence of jaundice. This study result can increase knowledge and information about the incidence of jaundice in infants given breast milk properly so it can prevent the occurrence of neonatal jaundice. It is necessary to research other factors that can affect the incidence of jaundice, such as Infant factors (LBW, 2500 gr, hemolysis, asphyxia), maternal factors (term pregnancy, multipara, mothers giving birth at a young age of 29-35 years, delivery interval > 2 years), born normally/spontaneously, other factors (hypoxia, dehydration, hypoglycemia, polycythemia) with other variables.

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#### Conflict of Interest

The authors declare that there is no conflict of interest.

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