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The Incidence of Neonatory Jaundice Reviewed From Low Birth Weight And Gestational Age In The Kenanga Room Of Kuala Pembuang Hospital

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ABSTRACT
More than 50% of newborns experience hyperbilirubinemia, both in full-term and premature babies. Jaundice is one of the contributors to infant morbidity in Indonesia with several causative factors that often occur, including gestational age and low birth weight (LBW). The purpose of this study was to analyze the relationship between infant birth weight and gestational age with the incidence of neonatal jaundice at Kuala Pembuang Regional Hospital . Research This use method study descriptive with approach *cross sectional*, sample study as many as 44 respondents, used Total sampling technique, Research instrument using Record data medical. Data analysis in the test use test statistics *chi-square. Chi square* test results on variable heavy body born to jaundice neonatum obtained results *p-value* of 0.0000 > α = 0.05 and variable age pregnancy to jaundice neonatorum obtained results *p-value* of 0.0001 > α = 0.05 so that can concluded that there is connection heavy body born low And age pregnancy to incident jaundice neonatorum in the room Remember Kuala Pembuang Regional Hospital. Part of it big Respondent No experience jaundice neonatorum as many as 33 (75%). Some big Respondent experience heavy body normal birth (BBLN) as many as 31 (70.5%). Most of them big Respondent as many as 33 (75%) with age pregnancy aterm.

Keyword: Gestational Age, Low Birth Weight, Neonatal Jaundice

INTRODUCTION

Jaundice neonatorum is incident biological on baby appears Because production cell blood red tall And low bilirubin excretion is characterized by with symptom skin colored yellowish until orange, baby seen weak, colored urine dark until until chocolate (Arin Ervita et al. , 2021). Jaundice become Wrong One contributor number pain babies in Indonesia with a number of factor common causes happen among them age pregnancy And heavy body born low birth weight (LBW).

Based on WHO data, the incidence jaundice in a country develop like Indonesia in number about 50% of babies new normal birth experience change color skin, mucosa And face experience yellowish (jaundice) and 80% in baby not enough months (premature) (WHO, 2019).

According to United Nations Children's Fund (UNICEF) report, there were 54 deaths neonatal babies (age 0-28 days) per 1000 births live all over world in 2020. Numbers highest neonatal mortality in 2020 found in the region Africa Sub-Saharan, which is 27 deaths per1,000 births alive. In order furthermore There is South Asia region with 23 deaths, Oceania (excluding Australia & New Zealand) New) 19 deaths, North Africa 15 deaths and Southeast Asia 12 deaths per 1000 births life (Wahyuni et al., 2023). In global scale of death neonate consequence hyperbilirubinemia Enough tall namely 1309 deaths per 100,000 births life And is reason seventh neonatal death (Zhang et all, 2023).

Based on Survey Demographics Indonesian Health Survey (SDKI) 2018 was 32 per 1000 births life death neonate the most in Indonesia due to by asphyxia (37%), infant heavy born low birth weight (LBW) and prematurity (34%), sepsis (12%), hypothermia (7%), jaundice neonatorum (6%), post -mature (3%), and abnormality congenital (1%) per 1000 births alive. (SDKI, 2022).

According to report Body Center Statistics (BPS) number death toddlers in Indonesia on in 2021 there will be 27,566 deaths toddlers. From all over death toddlers, 73.1% of whom happen in the neonatal period (20,154 deaths). From all over reported neonatal death, some big among them (79.1%) occurred on age 0-6 days, while death on age 7-28 days by 20.9%. Meanwhile that, death in the post neonatal period (age 29 days-11 months) Causes highest neonatal mortality is condition Heavy Body Born Low birth weight (LBW), asphyxia, abnormalities congenital, infection, COVID-19 and jaundice neonatorum (BPS, 2023).

Jaundice neonatorum due to by a number of factor among them that is incompatibility ABO blood, deficiency G6PD enzyme, delay passage meconium, lack of breast milk intake, and asphyxia . Based on factor risk jaundice differentiated into 3 factors namely, maternal factors include Race , complications pregnancy (DM , ABO and Rh incompatibility), use of infusion oxytocin in solution hypotonic , and breast milk. Perinatal factors include birth trauma (ephalhematoma, ecchymosis), and infections (bacteria , viruses, protozoa). Neonatal factors include prematurity, factors genetics, polycythemia, drugs, low breast milk intake, hypoglycemia , and hypoalbuminemia . (Auliasari et al. , 2019).

Other factors include LBW and age gestation . Some study show that BBLR is more easy experience jaundice compared to with baby who has heavy body normal birth . Maturity in the organs of LBW babies not yet maximum compared to with baby who has heavy body normal birth . The process of excreting bilirubin through the immature liver organ ripe cause the occurrence jaundice on baby . So that happen accumulation of bilirubin and cause color yellow on surface skin . (Auliasari et al. , 2019)

More from 50% of babies new born experience hyperbilirubinemia Good on baby born with Enough month and baby premature . Approximately 8%-9% of babies diagnosed with hyperbilirubinemia heavy on Sunday First life . Approximately 1.1 million baby new born every year experience hyperbilirubinemia weight (Yan et al., 2022).

Based on existing problems researcher do studies introduction For know number incident jaundice neonatorum, from the recorded data medical at Kuala Pembuang Regional Hospital from January 2022 – November 2023, events jaundice experience fluctuation number case . On 2022 numbers incident jaundice neonatorum as many as 23 (15%) cases of 149 babies new born and in 2023 there were 39 (27%) cases of 144 babies new born . The increase that occurred as much as 12% compared to with year previously. However, the increase number incident jaundice neonatorum is followed with increase number LBW incidents and prematurity which is factor risk. On In 2022, the incidence of LBW was 28 cases (19%) and incident prematurity as many as 119 cases (80%). Meanwhile, in 2023, the incidence of LBW and Prematurity as many as 41 cases (39%) and 56 cases (39%).

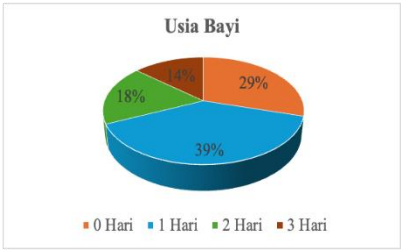
Based on background behind the so researcher interested For do study about connection heavy body born baby and age pregnancy with incident jaundice neonatorum at Kuala Pembuang Regional Hospital.

METHODS

This study is a quantitative study with a descriptive design with a cross-sectional design where data collection is only carried out in one particular period without looking at the history and future impacts. The population is 44 babies, with the Total Sampling technique a sample of 44 respondents was obtained, the independent variables are birth weight and gestational age, the dependent variable is the incidence of neonatal jaundice. To determine the influence between variables, a *Chi Square statistical test was carried out* using *the Statistical Product and Solution Service (SPSS)* . Interpretation of the results by looking at the p-value where if the p-value <0.05 means there is a relationship between birth weight and gestational age with the incidence of neonatal jaundice. If the significant value> 0.05 then H0 is accepted or Ha is rejected, if the significant value <0.05 then Ho is rejected or ha is accepted .

RESULT

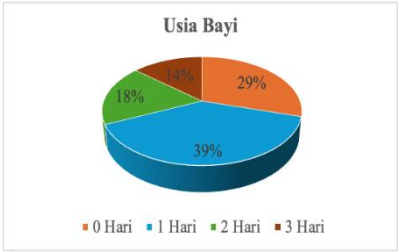
Figure 4.1 Respondent Characteristics According to Age of Respondents aged 0-3 days in the Kenanga Room, Kuala Pembuang Regional Hospital, Seruyan Regency in 2023 .



Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on Figure 4.1, it is known that almost half of the respondents are 1 day old, namely 17 respondents (39%).

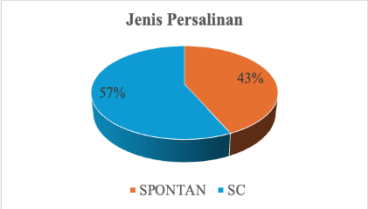
Picture 4.2 Respondent Characteristics According to Respondent Gender age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023



Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on Figure 4.2, it is known that the majority of respondents were female, namely 27 respondents (61%).

Figure 4.3 Respondent Characteristics According to Type of Delivery in Respondents Aged 0-3 Days in the Kenanga Room, Kuala Pembuang Regional Hospital, Seruyan Regency in 2023



Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on Figure 4.3, it is known that the majority of respondents had a CS delivery, namely 25 respondents (57%).

Table 4.1 Frequency distribution of respondents based on the incidence of neonatal jaundice in infants aged 0-3 days in the Kenanga room, Kuala Pembuang Regional Hospital, Seruyan Regency in 2023.

Neonatal Jaundice	Frequency (*f*)	Percentage (%)
Jaundice	11	25%
No Jaundice	33	75%
Total	44	100%

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Table 4.2 Distribution frequency Respondent Based on Body Weight Born on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Birth Weight	Frequency (*f*)	Percentage (%)
LBW	13	29.5%
BBLN	31	70.5%
Total	44	100%

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on table 4.2, it is known that the majority of respondents have a normal birth weight (BBLN) category of 31 babies (70.5%) from a total of 44 samples.

Table 4.3 Distribution frequency Respondent based on Age Pregnancy Mother on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Gestational Age	Frequency (*f*)	Percentage (%)
Premature	11	25%
Aterm	33	75%
Total	44	100%

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on table 4.3, it is known that the majority of respondents were in the aterm gestational age category, namely 33 babies (75%) out of a total of 44 respondents.

Table 4.4 Tabulation Cross Heavy Body Born Baby with Incident Jaundice Neonatal on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Baby Birth Weight	Jaundice		No Jaundice		Amount
	f	*%*	*f*	*%*	
LBW	9	69	4	31	13
BBLN	2	6	29	94	31

Total	11	25	33	175	44

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on table 4.4, it shows that the majority of respondents were babies with low birth weight (LBW), there were 13 babies, of which 9 (69%) babies experienced neonatal jaundice and 4 (31%) did not experience neonatal jaundice. Meanwhile , almost all respondents were babies with normal birth weight (BBLN), 29 (94%) of the 31 babies did not experience neonatal jaundice and 2 (6%) babies experienced neonatal jaundice.

Table 4.5 Connection Age Pregnancy with Incident Jaundice Neonatal on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Gestational Age	Jaundice		No Jaundice		Amount
	f	*%*	*f*	*%*	
Premature	7	64	4	36	11
Aterm	4	12	29	88	33
Total	11	25	33	75	44

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on table 4.5 shows that the number of samples in this study was 44 babies. There were 11 babies with preterm gestational age where most of the respondents 7 (64%) babies experienced neonatal jaundice and 4 (36%) did not experience neonatal jaundice. While there were 33 babies with term gestational age. Almost all respondents did not experience neonatal jaundice as many as 29 (88%) and 4 (12%) babies experienced neonatal jaundice.

Table 4.6 Results test Chi Square Statistics Relationship Heavy Body Born with Incident Jaundice Neonatorum on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Variables	*Sig*
Birth Weight	0.000

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on the results of the Chi Square analysis, it shows that the p-value is 0.000 <0.05, so H1 is accepted, so it is concluded that there is a relationship between birth weight and the incidence of neonatal jaundice in the Kenanga Room, Kuala Pembuang Regional General Hospital.

Table 4.7 Results test Chi Square Statistics Relationship Age Pregnancy with Incident Jaundice Neonatorum on baby age 0 – 3 days in the room Remembering Kuala Pembuang Regional Hospital Regency Seruyan Year 2023

Variables	*Sig*
Age Pregnancy	0.001

Source data : Results secondary data processing study Asriyana Scientific Date 1 to by December 31, 2023.

Based on the results of the Chi Square analysis, it shows that the p-value is 0.001 <0.05, so H1 is accepted, so it is concluded that there is a relationship between gestational age and the incidence of neonatal jaundice in the Kenanga Room, Kuala Pembuang Regional General Hospital.

DISCUSSION

Analysis Incident Jaundice Neonatum

Based on the results of the study, it is known that most babies do not experience neonatal jaundice as many as 33 babies (75%) and there are still 11 babies (25%) who experience neonatal jaundice from a total of 44 respondents. From the results of the analysis based on the age of babies 0-3 days, most babies do not experience neonatal jaundice. This happens because during the first 24 hours of birth, babies are immediately given adequate breast milk so that data is obtained that most babies do not experience neonatal jaundice.

The results of this study are in line with research conducted by Rahmadani & Sutrisna (2022) at UMMI Hospital. The study stated that the majority of respondents were in the category of experiencing non-jaundice as many as 34 (61.8%). To control bilirubin levels in newborns, breastfeeding can be done as early as possible. Babies who are given drinks early effectively and colostrum can reduce the incidence of physiological hyperbilirubinemia. This effectiveness includes the frequency, duration, and correct procedure for breastfeeding. Breastfeeding is recommended for babies every 2-3 hours or 8-12 times a day for the first few days.

Neonatal jaundice is a yellow discoloration of the skin, conjunctiva, and sclera of infants due to increased levels of toxic bilirubin in the blood causing kernicterus and death in infants. The liver plays a role in neutralizing unconjugated bilirubin into conjugated bilirubin so that it is easily absorbed by water. However, the function of some liver organs in neonates cannot function optimally to excrete unconjugated bilirubin. Jaundice consists of physiological and pathological. Physiological jaundice occurs at the age of ≥ 24 hours of life and disappears ≤ 14 days of life with bilirubin levels on the second to fourth day of 5-6 mg/dL and decreases to <2 mg/dL on the fifth to seventh day, while pathological jaundice occurs on the first day of life (<24 hours) or more than 14 days of life with bilirubin levels reaching 5-10 mg/dL (Nimas et al., 2019).

The causes of neonatal jaundice are the condition of babies being born with low birth weight (LBW), prematurity, male gender, and type of delivery (Mojtahedi, Izadi, Seirafi, Khedmat, & Tavakolizadeh, 2018).

Baby Birth Weight

Based on the results of the study, it is known that most respondents have normal birth weight (BBLN) as many as 31 babies (70.5%) where most of 29 (94%) babies did not experience neonatal jaundice and 2 (6%) babies experienced neonatal jaundice. While respondents with low birth weight (LBW) as many as 13 babies (29.5%) from a total of 44 samples, with most of 9 (69%) babies experiencing neonatal jaundice and 4 (31%) not experiencing neonatal jaundice. According to researchers, the factors that cause most babies with normal birth weight (BBLN) not to have jaundice are good antenatal care (ANC) to improve physical health in pregnant women and fetal growth and development, knowing about pregnancy complications early on. Likewise, most babies with low birth weight (LBW) but experience neonatal jaundice due to poor antenatal care (ANC).

This study is in line with the study of Porter & Dennis (2002) which stated that Jaundice can occur in babies with normal birth weight (BBLN), in this study it was found that babies with normal birth weight had jaundice as many as 31 babies, jaundice in babies with normal birth weight (BBLN) is usually called physiological jaundice, can occur because newborns have a shorter erythrocyte life span (80 days compared to adults 120 days). The process of red blood cell breakdown will produce bilirubin, when there is an increase in hemolysis in newborns, bilirubin will also increase so that bilirubin will accumulate and neonatal jaundice occurs (Porter & Dennis, 2002). According to Wama (2020) Birth weight is the weight of a neonate at birth which is weighed within one hour or after birth. Birth weight is the most

important anthropometric measurement and is often used in newborns (neonates). Birth weight is used to diagnose babies.

Age Pregnancy

Based on table 4.3 above, it is known that most respondents with a term gestational age category were 33 babies (75%) from a total of 44 respondent samples. According to researchers, the factors that cause babies with preterm gestational age not to have jaundice are good antenatal care (ANC) to improve physical health in pregnant women and fetal growth and development, knowing about pregnancy complications early on. Likewise, babies with a term age but experiencing neonatal jaundice due to poor antenatal care (ANC).

Hyperbilirubinemia or jaundice in infants can be divided into physiological and non-physiological. Physiological jaundice generally occurs in newborns when the level of unconjugated bilirubin in the first week is >2mg/dL. In full-term infants who receive formula milk, bilirubin levels will peak at around 6-8 mg/dL on the third day of life and then will decrease rapidly for 2-3 days followed by a slow decrease of 1 mg/dL for 1 to 2 weeks. The occurrence of physiological jaundice is not caused by a single factor but a combination of various factors related to the physiological maturity of the newborn.

According to Wama (2020) Gestational Age is the period from conception to birth calculated from the first day of the last menstruation. Classification of gestational age or gestational age, namely preterm babies are babies born with a gestational age of less than 37 weeks. Gestational age greatly affects the survival of the baby, the lower the gestational age and the smaller the baby born, the higher the morbidity and mortality. The shorter the gestational age, the less growth of the organs in the body, resulting in easier complications and higher mortality rates. This is due to the immaturity of the baby's liver function to process erythrocytes. At birth, the baby's liver is not good enough to do its job. The remaining breakdown of erythrocytes called bilirubin causes jaundice in babies and if the amount of bilirubin accumulates in the body, the baby will look yellow. This condition arises due to the accumulation of bilirubin pigment which is colored jaundice in the sclera and skin.

Connection heavy body born low with incident neonatal jaundice at Kuala Pembuang Regional Hospital

Based on table 4.4, the results of the chi-square statistical test show a ρ value = 0.000 (ρ <0.05). Thus, it can be concluded that there is a relationship between birth weight and the incidence of neonatal jaundice in the Perinatology Room of Kuala Pembuang Hospital in 2023.

Babies born with low birth weight (LBW) are at high risk of developing neonatal jaundice. This is because low birth weight (LBW) babies have immature liver function and are not functioning perfectly . Liver immaturity causes a lack of the enzyme uridine diphosphate glucuronyl transferase (UDPG-T) and disrupts the transport of indirect bilirubin from the tissue to the liver due to low albumin levels, albumin functions to bind indirect bilirubin and deliver it to the liver, reduced albumin disrupts the binding of indirect bilirubin so that it accumulates and causes jaundice. The enzyme uridine diphosphate glucuronyl transferase (UDPG-T) functions to help the conjugation process of indirect bilirubin into direct bilirubin, when this enzyme is reduced, the conjugation process of bilirubin in the liver will be disrupted and cause jaundice in infants (Melinda, Suryawan, & Sucipta, 2021) (Arya, 2021).

This study is in line with the study by Zulkarnaen et al. (2022) which stated that there is a relationship between low birth weight and the incidence of neonatal jaundice with a p value of 0.000. This study is also in line with the study conducted by Yasadipura et al. which stated that there is a relationship between low birth weight and the incidence of neonatal jaundice at Wangaya Hospital.

Factors that cause normal birth weight (BBLN) babies to not have jaundice and low birth weight (LBW) babies to not have jaundice are due to good antenatal care (ANC) with the aim of improving physical health in pregnant women and fetal growth and development,

knowing about pregnancy complications early on and preparing for the delivery process so that the baby can be delivered safely and minimizing and preventing trauma that can occur during the mother's delivery.

Connection Age Pregnancy Mother with Incident Jaundice Neonatal at Kuala Pembuang Regional Hospital

Based on table 4.4, the results of the chi-square statistical test show a ρ value = 0.001 (ρ <0.05). Thus, it can be concluded that there is a relationship between the mother's gestational age and the incidence of neonatal jaundice in the Perinatology Room of Kuala Pembuang Hospital in 2023. Based on table 4.5, the results of the study show that out of 44 samples in this study. There were 11 babies with preterm gestational age, of which 7 (64%) experienced neonatal jaundice and 4 (36%) did not experience neonatal jaundice. Meanwhile, there were 33 babies with a term gestational age, of which 4 (12%) experienced neonatal jaundice and 29 (88%) did not experience neonatal jaundice. At preterm gestational age, the growth of the baby's organs has not functioned perfectly, therefore, many preterm babies have difficulty living outside the mother's womb and complications and mortality are more likely to occur

Jaundice occurs in 50% of full-term babies and 80% in premature babies. Jaundice occurs in premature babies because the baby's liver function is not yet mature to process erythrocytes and there is increased hemolysis due to the short life of red blood cells, namely (80 days in babies while adults are 120 days) (Ahmić, 2020). The remaining breakdown of erythrocytes is called bilirubin, bilirubin that accumulates in the baby's body causes a yellow discoloration of the baby's skin and sclera or is called jaundice. Liver immaturity in premature babies causes the bilirubin uptake and conjugation process to be slower due to the lack of the glucuronyl transferase enzyme, disruption of the indirect conjugation process to direct causes jaundice in babies, in addition there can be a deficiency of proteins that play a role in bilirubin transport, namely albumin and protein Y or ligandin (Chen et al., 2019). Causes disruption of conjugation so that neonatal jaundice occurs.

This study is in line with the study by Sari (2023) which stated that there is a relationship between gestational age and the incidence of neonatal jaundice at Hospital X, Tangerang City with a p-value of 0.000. This study is also in line with the study conducted by Anita et al. which stated that there is a relationship between gestational age and the incidence of neonatal jaundice at Polewali Mandar Hospital with a p-value of 0.0178.

CONCLUSION

Conclusion

1. Based on the results study There were 11 babies (25%) who experienced neonatal jaundice while 33 babies (75%) did not experience neonatal jaundice.
2. Based on the research results, there were 13 babies (29.5%) with low birth weight (LBW), while in the normal birth weight (BBLN) category there were 31 babies (70.5%).
3. Based on the research results, there were 11 babies (25%) with preterm gestational age and there were 33 babies (75%) with term gestational age.
4. The results of the statistical test using chi-square showed a ρ value = 0.000 (ρ <0.05), which means that there is a relationship between birth weight and the incidence of neonatal jaundice in the Perinatology Room of Kuala Pembuang Regional Hospital in 2023.
5. The results of the statistical test using chi-square showed a ρ value = 0.001 (ρ <0.05), which means that there is a relationship between maternal gestational age and the incidence of neonatal jaundice in the Perinatology Room of Kuala Pembuang Regional Hospital in 2023.

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