

Description of breastfeeding on hyperbilirubinemia infants with light therapy in the perinatology room of Muhammadiyah Hospital Taman Puring

Mustikawati Mustikawati* , Wd Erti Hikma , Rani Pratiwi Fiandy, Vany Fitriani

Departement of Nursing, STIKES Pamentas Jakarta
Jalan Pertanian Raya No.1 10, RT.10/RW.4, Lb. Bulus, Kec. Cilandak, Jakarta, DKI Jakarta

*Coressponding author : alexika711@gmail.com

ABSTRACT

Background: Hyperbilirubinemia is a condition where excessive bilirubin builds up in the blood, causing yellowing of the skin, sclera, and nails. Hyperbilirubinemia is a common finding in newborns and will start appearing clinically in newborns when blood bilirubin levels are 5 – 7 mg/dl. hyperbilirubinemia can be caused by several factors, including gestational age, birth weight, blood type, breast milk intake, prematurity, and congenital diseases or disorders.

Objectives: to describe how breastfeeding could help reduce bilirubin levels in infants with hyperbilirubinemia receiving light therapy in the Perinatology Room at Muhammadiyah Hospital Taman Puring.

Methods: the research used a qualitative descriptive approach, collecting data through interviews, observations, and documentation. The inclusion criteria in this research are: hyperbilirubinemia infants with phototherapy, exclusive breastfeeding, no comorbidities and parents willing to have their infants become case study subjects. The study involved three infants aged 3-7 days with hyperbilirubinemia who were given breastfeeding and light therapy.

Results: showed that infants who underwent light therapy for 24 to 48 hours, combined with breastfeeding tailored to their fluid needs based on body weight (169 ml/day for a 2700-gram baby, 320 ml/day for a 3200-gram baby, and 465 ml/day for a 3150-gram baby), experienced a significant reduction in bilirubin levels.

Conclusions: breastfeeding and light therapy resulted in a notable decrease in serum bilirubin levels in hyperbilirubinemia infants. The study recommended that nurses promote exclusive breastfeeding and ensure the breastfeeding process was effective and met the infants' needs to help lower bilirubin levels.

KEYWORD : breastfeeding; light therapy; total bilirubin levels

Article Info :

Article submitted on October 17, 2024

Article revised on November 15, 2024

Article received on December 23, 2024

INTRODUCTION

Hyperbilirubinemia is a clinical phenomenon that is often found in newborns. Hyperbilirubinemia is the accumulation of excessive bilirubin in the blood, characterized by yellow discoloration of the skin, sclera, and nails. Hyperbilirubinemia is a common finding in newborns and in most cases is relatively harmless, but in extreme cases, it can indicate a pathological condition (1).

Hyperbilirubinemia will start appearing clinically in newborns when blood bilirubin levels are 5 – 7 mg/dl (2). This increase in bilirubin levels in the blood is caused by bilirubin that is not properly conjugated because the liver in these neonates can clear bilirubin from the blood quickly (3).

According to Nofenna, 2023 most newborns experience jaundice in the first week of life. Epidemiological data show that more than 50% of newborns suffer from clinically detectable jaundice in the first week of life (4). IMR refers to the number of infants who die in the phase between birth and before reaching 1 year of age per 1,000 live births (5-6). The infant mortality rate in Indonesia according to the results of the Indonesian Demographic and Health Survey (SDKI) in 2023 was 22 per 1,000 live births, almost half of the infant mortality rate in Indonesia occurred in the first month after birth (0-28 days/neonatal period) which was stated in 1,000 live births in the same year. The neonatal mortality rate in the last 5 years has not experienced much change (5).

According to Mexitalia in the journal

(Anjani, Widyaningsih, & Rohana, 2023) with the title, The Role of Breast Milk to Reduce the Degree of Jaundice in Babies with Physiological Hyperbilirubinemia in the Peristri room of RSI Sultan Agung Semarang stated that based on the cause there are two types of infant deaths, namely intrauterine death and extrauterine death, intrauterine death is death carried by infants since birth such as asphyxia (7). While extrauterine death or post-neonatal death is the death of a baby caused by factors related to the outside, one of the causes of extrauterine death is hyperbilirubinemia where hyperbilirubinemia is one of the clinical phenomena that often occurs in newborns in the first week of life (5,8). The incidence of hyperbilirubinemia in Malaysia is 75% in America 65% and in Indonesia 51.47% (5).

According to Lamdayani, hyperbilirubinemia can be caused by several factors, including gestational age, birth weight, blood type, breast milk intake, prematurity, and congenital diseases or disorders (3). In general, incidents of hyperbilirubinemia in infants are a physiological condition if they occur on the 3rd to 7th day, more than 80% occur in premature infants and more than 50% occur in full-term newborns (9).

Infants with hyperbilirubinemia, breast milk is still given to both infants who undergo phototherapy and infants who do not undergo phototherapy (10-2). If the baby does not breastfeed optimally 8 or 12 times per day, it can increase bilirubin that cannot be excreted through the digestive tract (11). Breast milk is

effective in reducing bilirubin levels in infants with hyperbilirubinemia. Newborns who receive colostrum and are breastfed during the first week of life tend not to experience hyperbilirubinemia (12).

The study of (Setiawati, Kurniawan, Awal, & Kharismala, 2023) stated that the total bilirubin level after phototherapy and breast milk management decreased by an average of 6.076 mg/dl with a significant level of 5% (3). Phototherapy and periodic breastfeeding within 24 hours can effectively reduce serum bilirubin levels in infants in the Muhammadiyah Bandung Perinatology Room (13). Phototherapy is the only method to reduce unconjugated bilirubin levels. Phototherapy has standard (10 microwaves/cm²/nm) and intensive (>30 microwaves/cm²/nm) intensity in reducing bilirubin levels (6,14,15).

According to Wong & Bhutani (2023) complications of hyperbilirubinemia that often occur in newborns include acute bilirubin encephalopathy, athetoid cerebral palsy, hearing loss, and kernicterus or chronic bilirubin encephalopathy (8). Complications of hyperbilirubinemia have an impact on the quality of growth and development of infants in the next stage. This pathological condition requires proper management of hyperbilirubinemia. Among them are phototherapy, exchange transfusion, and breastfeeding (15).

Hyperbilirubinemia therapy management aims to reduce the level of indirect bilirubin in the blood so that it does not reach a

level that is toxic to the nervous system (neurotoxic)(14). The recommended hyperbilirubinemia therapy management is phototherapy. The duration of phototherapy depends on the bilirubin level and the device used. Another therapy for hyperbilirubinemia is proper breastfeeding (3).

Nurses have an important role in providing nursing care, namely in the promotive, preventive, curative, and rehabilitative aspects (16). The promotive role is carried out by providing health education about hyperbilirubinemia and phototherapy management (17). The preventive role is carried out by providing information to parents on how to breastfeed as often as possible, 8 to 12 times a day so that it can encourage infants to defecate and urinate more often and to sunbathe infants under morning sunlight (18). The curative role is carried out by collaborating with the medical team for phototherapy, drug administration, and exchange transfusion (19). The rehabilitative role can be carried out by teaching mothers to see symptoms of jaundice in infants and encouraging breastfeeding as often as possible (20).

Hyperbilirubinemia is one of the most common cases in infants at Muhammadiyah Hospital, Taman Puring. The incidence of hyperbilirubinemia from medical records was 34.56% or 216 cases out of 630 births from January to December 2023. Based on the description above, the author is interested in conducting a case study on the description of breastfeeding for hyperbilirubinemia infants

with Light Therapy in the Perinatology Room of Muhammadiyah Hospital Taman Puring. The purposes of this study is to determine the effect of breastfeeding on reducing bilirubin levels in hyperbilirubinemia infants with light therapy in the Perinatology Room of Muhammadiyah Hospital, Taman Puring.

MATERIALS AND METHODS

In this case study, the author uses a descriptive research strategy with a qualitative approach (21). The data obtained by the author from interviews, observations, and documentation so that the author can see and describe the picture of breastfeeding in hyperbilirubinemia infants with light therapy.

The inclusion criteria in this research are: hyperbilirubinemia infants with phototherapy, exclusive breastfeeding, no comorbidities and parents willing to have their infants become case study subjects. The exclusion criteria, are: infant age more than 7 days, hyperbilirubinemia infants forced home, have comorbidities such as: asphyxia and mothers with diabetes mellitus.

The subjects in this case study took 3 newborn subjects with hyperbilirubinemia at the Muhammadiyah Hospital, Taman Puring with using purposive technique sampling. The data analysis method is one of the important parts of the data analysis process. The data analysis method is part of the analysis process where data is collected and processed to conclude decision making (22). The data analysis used in this study is descriptive. Descriptive analysis is a research

method by collecting data according to the actual data, then the data is arranged, processed, and analyzed to provide an overview of the existing problems (23).

RESULTS AND DISCUSSION

RESULTS

Based on the results of a study conducted at the Muhammadiyah Hospital, Taman Puring from May 7, 2024, to May 17, 2024. The subjects of this study were infants aged 3 days to 7 days with hyperbilirubinemia who were given breast milk and light therapy as many as 3 respondents, male gender, with total serum bilirubin results before light therapy between 13.8 mg/dl - 15.0 mg/dl to 9.0 mg/dl - 10.3 mg/dl after light therapy.

The results of the interview with Mrs. S (respondent 1) said that during pregnancy, she did ANC at the nearest midwife clinic and twice did an ultrasound examination at the Muhammadiyah hospital, Mrs. S during pregnancy did not have a history of hypertension or other diseases, Mrs. S always routinely controlled and took medicine according to the obstetrician's recommendations, during pregnancy there were never any significant complaints. According to the mother, after birth the baby was initiated early breastfeeding and the baby was cared for by the mother during treatment the baby was healthy even though the milk was still small. On May 7, 2024 at 15:15 WIB the baby's age was 48 hours, the baby was carried out laboratory examinations including total bilirubin, H2TL, blood type and neonate TSH.

the results obtained were 14.5mg/dl baby's total bilirubin, baby's blood type O with positive rhesus, mother's blood type O with positive rhesus. The baby looked yellow in the face, sclera and body. Management is in accordance with the doctor's instructions, namely the baby is carried out light therapy, breastfeeding 10 x 30 ml, and checking the total bilirubin again after 1 x 24 hours of light therapy. Breast milk is given every 2.5 hours about 45 ml but if the baby has asked to drink breast milk before 2.5 hours, it is still given according to the baby's needs.

The results of the interview with Mrs. E (respondent 2) said that during pregnancy, she did ANC at the Muhammadiyah hospital routinely and only took medicines only given by the obstetrician, during the first trimester of pregnancy Mrs. E was treated for 3 days due to lack of fluid caused by severe hyperemesis, Mrs. S did not have a history of hypertension, DM or other diseases. On May 14, 2024 the baby was brought for control and a repeat bilirubin test was performed, the results obtained were 13.8 mg/dl total bilirubin, and the baby was advised to be treated. Management is in accordance with the doctor's instructions, namely the baby is carried out light therapy, breastfeeding 10 x 40 - 45 ml, and rechecking bilirubin after 1 x 24 hours of light therapy. Breast milk was obtained 30 ml - 45 ml each time, breast milk was given using a feeding bottle, and given every 2.5 hours the baby remained in the therapy light. The results of the interview with Mrs. N (respondent 3) during pregnancy the

mother routinely controlled at the midwife clinic and had done an ultrasound 2x at the Muhammadiyah hospital, during pregnancy the mother did not have hypertension, DM or other diseases and the mother was never treated during pregnancy, the mother only took medicines given by the midwife, never took medicine from the stall or herbal medicine, the mother and baby were treated at the midwife for 2 days and at the time of discharge the baby was not subjected to laboratory tests, the midwife recommended that if the baby appeared yellow and was lazy to breastfeed it was immediately taken to the nearest hospital. During the treatment at home the baby was only given breast milk and dried in the morning sun as recommended by the midwife. Breastfeeding 10 x 45 - 50 ml orally if suction reflex is strong, repeat total bilirubin test after 1 x 24 hours of light therapy.

DISCUSSION

Based on the results of the study showed that in respondent 1, the provision of breast milk was 300 ml/24 hours with bilirubin before light therapy of 14.5 mg/dl and after light therapy of 10.7 mg/dl with a total number of light therapy hours of 24 hours. In respondent 2, the provision of breast milk was 800 ml/48 with bilirubin before light therapy of 13.8 mg/dl and after light therapy of 10.3 mg/dl with a total number of light therapy hours of 48 hours. In respondent 3, the provision of breast milk was 900 ml/24 hours with bilirubin before light therapy of 15.0 mg/dl and after light therapy was 9.0 mg/dl with a

total number of light therapy hours of 24 hours. In Respondent 1, hyperbilirubinemia occurred on the third day of birth with still little breast milk production. This is following the theory of Hockenbery the physiological hyperbilirubinemia is jaundice that occurs on the second and third days and has no pathological basis or does not have the potential to become kernicterus (1). According to Siantar, hyperbilirubinemia is caused by insufficient breast milk production on the first day (11). Infants experience a lack of food intake so that unconjugated bilirubin that has reached the intestines is not bound by food is not excreted through the feces and is reabsorbed into the blood (8).

In Respondents 1, 2, and 3, the total bilirubin results were between 13.8 mg/dl - 15.0 mg/dl with signs and symptoms of yellow staining in the face, sclera, and body of the baby, this is following the theory of Dante which states that hyperbilirubinemia is a condition of bilirubin values in the blood > 13 mg/dl which is indicated by a clinical picture in the form of yellow staining of the skin and mucosa due to deposition of end products of catabolism (15).

Based on the results of the study, the gender of the three respondents was male in line with the theory which states that men have a higher risk of jaundice compared to female neonates, including the prevalence of Gilbert's syndrome (a genetic disorder of bilirubin conjugation) is reported to be more than 2x higher in men than in women (24). This is related to the sex chromosome (X-

linked) which generally only manifests in men (24). In respondent 3, it is known that there is blood type incompatibility where the blood type of respondent 3 is blood type O rhesus positive while the mother with blood type A rhesus positive causes excessive bilirubin production beyond the ability to excrete it. This is following Sembiring's theory that the cause of hyperbilirubinemia can also be caused by hemolysis, namely ABO blood type incompatibility, other blood types, or G6PD deficiency, this hemolysis can occur due to closed bleeding (cephalic hematoma, subaponeuratic bleeding) or Rh blood type incompatibility (24).

It can be concluded that with the provision of maximum breast milk and light therapy, total bilirubin levels can be reduced faster. This is following research from Setiawati, et al (2023) on the Effectiveness of Phototherapy and Breastfeeding Management on Reducing Bilirubin Levels in Hyperbilirubinemia Infants which showed that infants who were still given exclusive breastfeeding during phototherapy experienced a significant decrease in bilirubin levels (3). According to Siantar, et al (2022), the fluid requirements for infants with full-term gestation are 60 ml/kgbb/day on the first day, 80 ml/kgbb/day on the second day, 100 ml/kgbb/day on the third day, 120 ml/kgbb/day on the fourth day and then 150 ml/kgbb/day on the fifth day (11).

This is following the results of the study on the three respondents who obtained infants with full-term gestation with a weight

according to gestational age so that the fluid requirement for respondent 1 with a weight of 2700 grams is 169 ml/day, while for respondent 2 the fluid requirement with a weight of 3200 grams is 320 ml/day, and respondent 3 the fluid requirement with a weight of 3150 grams is 465 ml/day (3,8). From the results of the study, it can be concluded that the fluid requirement for respondents 1,2, and 3 follows the gestational age of the three respondents, namely full-term gestational age. By carrying out light therapy, the fluid requirement for the three respondents must be increased to avoid dehydration due to exposure to light therapy rays (19).

The American Academy of Pediatrics (2024) explains that the more breast milk is given, the lower the baby's bilirubin levels. Newborns should be breastfed eight or more times a day, it is recommended to breastfeed their infants regularly for 24 hours (13). One of the causes of hyperbilirubinemia is infection, especially urinary tract infection (UTI) in the results of the study on respondents 1, 2, and 3 the cause of hyperbilirubinemia was not caused by infection because no data on signs and symptoms of infection were found from the three respondents.

According to Hockenbery, et al (2017) about the classification of hyperbilirubinemia, one of which is pathological hyperbilirubinemia where the signs and symptoms are the baby looks yellow in the first 24 hours after birth, yellow persists for more than 2 weeks in full-term infants, increased serum

bilirubin 5 mg/dl/day (1). According to the results of the study conducted on respondents 1,2 and 3, it is known that the signs and symptoms that arise are not signs and symptoms of pathological hyperbilirubinemia.

CONCLUSION AND RECOMMENDATION

Conclusion from the results of this study that it was known that the three respondents were male infants aged 3-7 days with hyperbilirubinemia who received breast-feeding and light therapy with total bilirubin levels > 12 mg/dl. Decrease in total serum bilirubin levels after light therapy in the three respondents, namely from total serum bilirubin 13.8 mg/dl - 15.0 mg/dl to 9.0 mg/dl - 10.3 mg/dl with a total light therapy of 24 hours - 48 hours.

There was a decrease in total serum bilirubin levels in the three respondents who had a full-term gestational age between 38 weeks - 39 weeks with breastfeeding according to needs where the weight according to gestational age was 2700 grams - 3200 grams with fluid requirements in respondent 1 weighing 2700 grams around 169 ml/day, in respondent 2 weighing 3200 grams the fluid requirement was 320 ml/day and in respondent 3 weighing 3150 grams the fluid requirement was 465 ml/day.

Based on the research conclusions above, the recommendations that the researcher can convey are:

In order to run the exclusive breast-feeding program, a breastfeeding support

group was formed starting from families, nurses, and hospital management, always involving the role of families in education. The results of this study are expected to provide additional information regarding the effectiveness of providing breast milk and light therapy to infants with hyperbilirubinemia. Encouraging to provide breast milk because breast milk is an important nutrient for infants. The following researcher this research can be continued in a wider area in various perinatology units and hospitals with a larger sample size to obtain more generalizable results.

REFERENCES

1. Hockenbery, M. J., Wilson, D., & Rogers, C. C. *Essential Of Pediatric Nursing*. Philadelphia, Mosby Elsevier. 2017
2. Kemenkes. (2019, Oktober 15). *Tata Laksana Hiperbilirubinemia*. Retrieved from Kemenkes: <https://www.kemkes.go.id/id/pnpk-2019-tata-laksana-hiperbilirubinemia>
3. Setiawati, T., Kurniawan, H., Awal, D. S., & Kharismala, N. Efektivitas fototerapi dan manajemen ASI terhadap penurunan kadar bilirubin pada bayi hiperbilirubinemia. *Jurnal Keperawatan Aisyah*, 2023;10(2): 161 – 168. <https://doi.org/10.33867/jka.v10i2.427>
4. Nofenna, S. A., Handayani, S., Srininta, & Harahap, R. F. Hubungan Pemberian ASI Dini dengan Kejadian Ikterus Bayi Baru Lahir di Klinik Pratama Serasi Tahun 2022. *Jurnal Ilmiah Universitas Batanghari Jambi*. 2023;23(1): 439-448. <http://dx.doi.org/10.33087/jiubj.v23i1.3155>
5. Depkes, R. (2023). *Departemen Kesehatan Republik Indonesia*. Retrieved from Kementrian Kesehatan RI. <https://kemkes.go.id/id/indonesia-health-profile-2023>
6. Kemper, et al, *Clicinal practice guideline revision management of hiperbilirubinemia in the new born infant 35 or more weeks of gestation*. *Pediatric*. 2022; 150(3). <https://doi.org/10.1542/peds.2022-058859>
7. Anjani, S. R., Widyaningsih, T. S., & Rohana, N. Peran Air Susu Ibu Untuk Mengurangi Derajat Ikterik Pada Bayi Hiperbilirubinemia Fisiologis di Ruang Peristi RSI Sultan Agung Semarang. *Jurnal Persada Husada Indonesia*. 2023; 10(36): 57-65. <https://doi.org/10.56014/jphi.v10i36.364>
8. Susilahayati, N., Damanik, L. P., Munthe, J., & Sinaga, P. Hubungan Pemberian ASI Dengan Kejadian Ikterus Neonatorum Pada Bayi Baru Lahir 0-7 Hari di Desa Baru Titi Besi Kecamatan Galang, Kab Deli Sirdang Tahun 2021. *Jurnal Rumpun Ilmu Kesehatan*, 2022;2(3): 60-65. <https://doi.org/10.55606/jrik.v2i3.575>
9. Sampurna, M. T. *Modul Tata Laksana Hiperbilirubinemia*. Jakarta: Airlangga University Press. 2020
10. Physician, A. F. (2014, Januari 15). *American Academy of Family Physician*. Retrieved from American Family

- Physician: <https://www.aafp.org/pubs/afp/issues/2014/0115.html>
11. Siantar, R., Rostianingsih, D., Ismiati, T., & Bunga, R. Buku Ajaran Asuhan Kebidanan Kegawat Daruratan Maternal dan Neonatal. Jakarta, Rena Cipta Mandiri. 2022. <https://penerbit.renaciptamandiri.org/index.php/omp/catalog/book/71>
 12. Gomella, T. L., Eyal, F. G., & Bany-Mo, F. Gomella's Neonatology: Management, Procedures, On-Call Problems, Diseases, and Drugs. California, McGraw-Hill Education LLC. 2020 <https://accesspediatrics.mhmedical.com/book.aspx?bookid=2762>
 13. Kemper, et al, Clincinal practice guideline revision management of hiperbilirubinemia in the new born infant 35 or more weeks of gestation. *Pediatric*. 2022; 150(3). <https://doi.org/10.1542/peds.2022-058859>
 14. Maryam. Tatalaksana Bayi Baru Lahir. (M. Martini, Ed.) Jakarta: Media Sains Indonesia. 2022
 15. Dante, M., Karen, R. M., & Kliegman. Ilmu Kesehatan Anak Edisi 8. Singapur: Elsevier. Depkes, R. (2021, Juli 11). Departemen Kesehatan Republik Indonesia. Retrieved from Kementrian Kesehatan RI. 2021 <https://www.kemkes.go.id/id/profil-kesehatan-indonesia-2021>
 16. Probowati, R. Asuhan Keperawatan Anak. Jombang, Media Nusa Creative. 2022
 17. Marmi & Raharjo, K. Asuhan neonatus bayi, balita dan anak pra sekolah . Yogyakarta :Pustaka Pelajar. 2015
 18. Nur, A., Hendra, K., & Indri, L. P. Faktor – faktor yang berhubungan dengan kejadian hiperbilirubinemiadi ruangan neonatus. *Jurnal Penelitian Perawat Profesional*. 2023; 5(2): 529-538. <https://doi.org/10.37287/jppp.v5i2.1493>
 19. Blair, P. S., McKenna, J. J., Winter, L. F., & Ball, H. L. Bedsharing and breast feeding: The academy of breastfeeding protocol. United Kingdom, Mary Ann Liebert. 2019 <https://doi.org/10.1089/bfm.2019.29144.psb>
 20. Novidha, D. H., Manik, R., & Wijayanti, I. T. Ajaran Asuhan Kebidanan dan BBL Fisiologis dan Patologis S1 Kebidanan. Jakarta, Maha Karya Citra Utama Group. 2023
 21. Harahap, D. N. Buku Metodologi Penelitian Kualitatif. (D. H. Sazali, Ed.) Sumatera Utara, Wal ashri Publishing. 2020
 22. Hermawan, I. Metodologi Penelitian Pendidikan (Kualitatif, Kuantitatif dan Mixed Method). Karawang, Hidayatul Quran. 2019
 23. Notoatmodjo, S. Metodologi penelitian kesehatan. Jakarta, Rineka Cipta. 2019