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RESEARCH ARTICLE

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Bilirubin Levels in Cases of Neonatal Jaundice Treated with Phototherapy at Kalisat Hospital

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ABSTRACT

Physiological jaundice is jaundice arising on the second or third day and will disappear within the first ten days. This study aimed to analyze the decrease in the level of billirubin in the case of neonatal jaundice undergoing phototherapy at Kalisat Hospital, using a retrospective design. The sample size was 35 people who were selected by simple random sampling technique. Data obtained from medical record and observation. The collected data were analyzed using T test. The result of data analysis showed that there was a decrease of bilirubin levels after the administration of phototherapy.

Keywords: Bilirubin, Jaundice, Phototherapy

INTRODUCTION

Infant Mortality Rate (IMR) in Indonesia is 34 per 1,000 live births and is sixth in Southeast Asia. One cause of neonatal mortality is neonatal jaundice at 0-6 days, ie 6% of deaths(1). Jaundice is a clinical symptom that is often seen in neonates due to the accumulation of bilirubin in the blood that causes color changes in tissues that get a lot of blood flow(2).

Jaundice neonatorum is a biological phenomenon that occurs due to high production of bilirubin, while its excretion is low, during the transitional period in neonates. Physiological jaundice occurs on the second or third day, the total serum bilirubin level usually peaks on day 3 to 5 and jaundice will disappear within the first 10 days. Neonates produce bilirubin 2 to 3 times higher than normal adults. This can occur because the number of erythrocytes in the neonate more with a shorter age(3).

According to the National Collaborating Center for Women's and Children's Health in 2010, there are three risk factors that trigger the incidence of neonatal jaundice. The first is the maternal factor of pregnancy complications such as diabetes mellitus, ABO and Rhesus blood group incompatibility and gestational age at the time the baby is born. Second is the perinatal factors of birth trauma such as cephalhematom and infection. Third is the factor of neonatal prematurity, genetic factors, low intake of breast milk, the incidence of hypoglycemia, and the incidence of asphyxia.

Based on the results of research conducted in Kalisat hospital, the number of newborns who have jaundice in 2016 is 35 babies. Based on the description above, it is important to do research on the decrease in bilirubin levels after phototherapy was done in cases of neonatal jaundice.

METHODS

This study used a retrospective design and conducted in Kalisat Hospital in 2017. The sample size was 35 people who were selected by simple random sampling technique. Data obtained from medical record and observation. The collected data were analyzed using Paired Sample T-test. The result of data analysis showed that there was a decrease of bilirubin levels after the administration of phototherapy.

RESULTS

Table 1 describes the mean of decrease in direct bilirubin and total bilirubin levels after phototherapy in Kalisat Hospital.

Table 1. The mean of decrease in direct bilirubin and total bilirubin levels after phototherapy

Category	The decreasing level of bilirubin (mg/dl)
The level of Billirubin Direk	1.61
The total of Billirubin	9.29
Total	10.9

DISCUSSION

Neonates who have a buildup of billirubin or high levels of billirubin in the bloodstream will experience a yellow pigmentation in the plasma that will appear on elastin-rich tissues, skin, mucosa and sclera and other organs. High levels of bilirubin in the blood are referred to as hyperbilirubinemia.

In this study found increased levels of direct billirubin from normal should be less than 1 mg / dl up with an average of 2 mg / dl. While the total amount of billirubin which is normally 10 mg / dl has increased with an average of 11.79 mg / dl. Such conditions require phototherapy.

This is consistent with Nelson's assertion that in newborns, the common jaundice is physiological jaundice, with a direct bilirubin level of less than 1 mg / dl and a total total of billirubin less than 10 mg / dl[(4)].

Health Technology Asessment says that to overcome jaundice in healthy infants, one way that can be done is by phototherapy in accordance with guidelines issued by WHO[(5)].

The results showed that direct bilirubin and total bilirubin levels after administration of phototherapy were decreased by an average of 1.61 mg / dl for direct bilirubin and 9.29 mg / dL for total bilirubin.

Phototherapy is given if total bilirubin levels> 13 mg / dl within 24 hours after birth. The duration of phototherapy was determined on the basis of neonatal bilirubin levels and phototherapy was performed for 24 h and repeated until the bilirubin level returned to normal. During the phototherapy process, the condition of the infant should always be monitored because phototeraoi can cause hyperpigmentation and elevated temperature.

Neonates with physiological jaundice at Kalisat Hospital are given 2 x 24 hour phototherapy. This is in line with the statement of HTA that to overcome neonates with physiological jaundice, one of the best management can be done is phototherapy[(5)].

Saifudin explains that serum total bilirubin usually peaks on day 3 to day 5 with bilirubin 5-6 mg / dl, then decreases again within the first week after birth. The level of billirubin is erratic after 2 x 24 hours, not exceeding 12 mg / dl in nenonatus who was born with adequate gestational age, and not exceeding 10 mg / dl in neonates who were born with gestational age. Jaundice will disappear within the first 10 days. Jaundice usually occurs on the 3rd day and peaks on the third day until the fifth day[(6)].

Phototherapy to treat serum bilirubin levels in neonates was performed for mild to moderate hyperbilirubinemia. Light intensity using photometric radiometrics. Research in San Francisco with 8-10 μW / cm / nm light for standard phototherapy while for intensive phototherapy using ≥30 μW / cm / nm was significant in removing bilirubin levels[(5)]. Phototherapy used in Kalisat Hospital is a single phototherapy with bilirubin levels of about 5 mg / dl only.

The decrease in bilirubin levels is determined by several factors, including irradiation, the extent of exposed body surface, the cause of jaundice and serum bilirubin levels at the time of phototherapy. Decreases of less than 0.5 to 1 mg / dl per hour can occur within the first 4 to 8 hours. Phototherapy can remove bilirubin which is excreted through urine and bile. Intravenous fluid (dextrose) in infants of adequate or near enough age at birth when phototherapy is not so important unless dehydration is detected[(5)].

CONCLUSION

Based on the results of this study it can be concluded that bilirubin levels in infants with neonatal jaundice at Kalisat Hospital can be effectively reduced using phototherapy.

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