ICASH-A049

THE CORRELATION BETWEEN GESTATION PERIOD AND ICTERUS NEONATORUM AT DR. H. ABDUL MOELOEK HOSPITAL, LAMPUNG, INDONESIA

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ABSTRACT

Background: One of the causes of perinatal or neonatal mortality is icterus neonatorum, which is the main cause of neonatal mortality of 20-40% of all deliveries. The emergency neonatal condition becomes the cause of occurrence of neonatal mortality is the increased levels of bilirubin in blood or icterus neonatorum, which 50% occur in infants with <36 weeks gestation (preterm).
Aims: To analyze the correlation between the gestation period and icterus neonatorum, so it is supposed to reduce the incidence of icterus neonatorum.
Methods: This research is quantitative approach with cross sectional design and analyses hypothesis used chi-square test. The sample of this study is 289 infants used simple random sampling technique and the lottery system. Data used secondary data from the medical record that collected through the checklist.
Results: Most of the infants with gestation period <36 weeks experienced the icterus neonatorum (62.5%) and the result of the chi-square test is p-value = 0.000. Odd Ratio (OR) of this research is 7.805 it means that gestation period <36 weeks have risked eight times than infants with gestation period ≥36 weeks.
Conclusion: Pregnancy with gestation period <36 weeks has more changes to deliver newborn with icterus neonatorum. Routinely and regularly Antenatal Care (ANC) expected to detect early preterm birth.

Keywords: Jaundice, Icterus Neonatorum, Gestation Period

INTRODUCTION

World Health Organization (WHO) reported that the world's Infant Mortality Rate (IMR) in 2013 amounted to 49/1000 live births[1]. High risk or factors that increase the risk of perinatal or neonatal mortality is the neonatal jaundice, which is responsible for approximately 20-40% of all infant death cases. Indonesia Demographic and Health Survey counted the IMR 32/1000, which is higher than the target of 23/1000 live births[2]. Neonatal emergency condition to become the cause of neonatal mortality represents an increase of bilirubin blood levels or jaundice. Neonatal jaundice is more common in male infants 30 (69.8%), pre-term infants 22 (51.2%), normal birth weight infants 30 (69.8%), infants without perinatal complications 27 (62.8 %), and infants who were breastfed less than eight times per day 31 (72.1%) [3].In a published research, 25.5% pre-term infants suffer from significant hyperbilirubinemia and require phototherapy[4].

Neonatal Jaundice, a clinical state in infants, is characterized by staining of the skin and sclera jaundice due to unconsecrated bilirubin accumulation of excess. Clinical jaundice will begin to appear in the newborn when the levels of blood bilirubin is 5-7mg / Dl [5]. The symptoms are the presence of jaundice in the first 24 hours; an increase in serum bilirubin concentration of 10 mg% or more every 24 hours, serum bilirubin concentrations is 10 mg% in neonates and 12.5 mg% in neonates pre-term, jaundice accompanied by hemolytic process state and jaundice with low birth weight <2500 grams [6]. Infants who are prematurely born, where gestation period is less than 36 weeks, are usually associated with unconsecrated hyperbilirubinemia in neonates. Activity Uridine Diphosphate graciously transferase hepatic clearly decreased in premature infants, so that conjugation of unconsummated bilirubin decline. The increase in hemolysis occurs owing to the shortened age of red blood cells in premature infants[7, 8].

Prematurely born babies are eight times at risk of jaundice compared to infants born at term[9]. The shorter the gestational period, the lack of growth in fetal organs; therefore, the organs are not yet functioning properly and cause the baby to have trouble living outside the uterus and prone to complications and higher infant mortality. The effects of jaundice are Rh disease, ABO incompatibility, G6PD deficiency, spherocytosis heredity, infection, jaundice due to breast-feed, gestational age, birth weight and asphyxia [6, 10]. Albumin levels of less than 2.8 gm/dl is not enough to bind with high level of bilirubin produced in neonates, leading to hyperbilirubinemia that causes neonatal jaundice [11]. The impact of jaundice is Kern icterus (biliary encephalopathy), which is a brain damage as a result of bilirubin indirect in the brain. dr. H. Abdul Moeloek Hospital is a community referral hospital located in Bandar Lampung, Indonesia - the type of service in accordance with the public hospital service standards. According to the Hospital, the number of neonatal jaundice in Lampung province in 2015 amounted to 352 cases (33.8%) from 1,041 live births (dr. H. Abdul Moeloek Hospital Lampung, 2015).

METHODS

This research was a quantitative study with cross-sectional design, which is designed to study the dynamics of the correlation between risk factors with effects, used documentation or data collection at one time (time point approach). In this research, the risk factor is gestation factor and the effect is icterus neonatorum. The population of this study was 1,041 infants younger than four weeks old who were treated at dr. H. Abdul Moeloek Hospital in 2015. This research also used secondary data from the medical record of dr. H. Abdul Moeloek Hospital in 2015. The sample was 289 infants, obtained using simple random sampling method with the lottery system. Subsequently, the data was collected by using checklist. The checklist is filled with infants data based on icterus neonatorum or not and gestation period <36 weeks or ≥36 weeks. Diagnosis for icterus neonatorum was obtained from the laboratories results written on the medical record. Hypothesis analysis in this research was done by using Chi-square test to analyze the correlation between the gestation period and icterus neonatorum.

RESULTS

Table 1. Cross tabulation of correlation between gestational period and icterus neonatorum

Gestational period	Icterus Neonatorum				P-value	OR
	Yes		No			
	N	Percentage (%)	N	Percentage (%)		
Gestation period <36 weeks	35	62.5	21	37.5	0.000	7.805

Gestation period ≥36 weeks	41	17.6	192	82.4		(4.126-
Total	76		213			14.765)

Table 1 shows that 233 (80.6%) of the infants were born with gestation period ≥36 weeks, while 56 (19.4%) were born with gestational period <36 weeks. From all the samples, infants with icterus neonatorum are 76 (26.3%) and without icterus neonatorum are 213 (73.7%). Most of the infants with icterus neonatorum (35; 62.5%) are born with gestation period <36 weeks while 41 (17.6%) infants with gestation period ≥36 were born without icterus neonatorum. Infants without icterus neonatorum, most (192; 82.4%) were born with gestation period ≥36 weeks, while those who were born with gestation period <36 weeks are 21 (37.5%).The result of correlation between gestational period and icterus neonatorum with *chi-square* test is *p*<0.05; which means that there is a correlation between gestation period and icterus neonatorum.

DISCUSSION

From the result, it is noted that out of 56 babies who were delivered in less than 36 weeks at dr. H. Abdul Moeloek Hospital Lampung, there are 35 (62.5%) babies who are diagnosed with icterus neonatorum. The calculations of *Chi-square statistical* test produced *p-value* = 0.000 <0.05 and OR= 7.805. Hence, it means that the infants' gestation period of <36 weeks carry seven times more risk of jaundice. Jaundice is a yellow stain that appears on the sclera and skin was caused by the buildup of bilirubin. Jaundice generally starts to appear on the sclera and face, then extends chephalothin (from top to bottom) to the chest, abdomen and extremities [16].Infants born with prematurity are usually associated with unconsecrated hyperbilirubinemia in neonates [17]. Activity Uridine Diphosphate graciously transferase hepatic clearlydecreased in premature infants, that conjugation of unconsummated bilirubin decline. The increase in hemolysis occurs due to the shortened age of red blood cells in premature infants[7, 8].

Shorter pregnancy length affects the development of the fetus' organs function and is susceptible to complications and a higher mortality rate. Therefore, the majority of perinatal mortality are found in premature infants. Defective tools in both anatomic and physiological function easily lead to immature liver abnormalities - help with the occurrence of hyperbilirubinemia. In addition, more than 5% of premature infants are affected by intraventricular, which cause the infants to often suffer from apnea, severe asphyxia and respiratory distress syndrome. As a result, the baby may suffer from hypoxia, causing jaundice in infants and further damage[18].

Severe jaundice, and even *kern* icterus, can occur in some full-term healthy newborns with no apparent hemolytic, jaundice in the first 24 hours, or any causes other than breastfeeding hyperbilirubinemia [13]. Although most newborns with jaundice are otherwise healthy, they have to be monitored because bilirubin is potentially toxic to the central nervous system [14]. The American Academy of Pediatrics (AAP) in 2004 recommended that newborns discharged within 48 hours should have followed up visits after 2–3 days to detect significant jaundice [14]. Jaundice in the first week of life occurs at about 60% of infants born at term and 80% of infants born before term (pre-term) development [15].

Research in Surakarta Hospital resulted more icterus incidence of low birth weight baby (LBW) that is 32,2% [19]. This result of research at the Delivery Room (DR) and Neonatal Intensive Care Unit (NICU) of Ismailia General Hospital at Ismailia Governorate that mean total cord bilirubin was higher among males, pre-term, cesarean deliveries, and ABO and RH incompatibility positive newborns. Total serum bilirubin in cord blood was indicative of the jaundice severity developed by healthy FT (full-term) and late PT (pre-term) newborns without complications, during the first week of life [20]. Premature characteristics occur the highest in women with age 20-35 years with 72.73%, low education level

52.73%, not working 85.45%, and multipara 54.55% [21]. Exposure to morning sun exposure can decrease the level of jaundice skin in physiological jaundice. The effective timing of sun exposure is 30 minutes, and measurement of the jaundice skin color level can be compared digitally using computer program such as Corel Photo-Paint 12 [22].

CONCLUSION

There is a correlation between the gestation period and icterus neonatorum. This research shows that pregnancy with gestation period less than 36 weeks has more chances to deliver newborn with icterus neonatorum. Based on the results, routine Antenatal Care is needed to detect early preterm birth (less than 36 weeks) and subsequently perform the proper treatment or prevention. For future research, it is recommended to delve into characteristics of the infant, especially birth weight, breastfeeding or the mother's health background and history.

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