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ANALYSIS OF RISK FACTORS FOR THE INCIDENT OF EARLY ONWARD NEONATAL SEPSIS REVIEWED FROM THE APGAR SCORES AND WEIGHT AT BIRTH AT KUDUNGGA HOSPITAL

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ABSTRACT

Neonatal sepsis is one of the most common causes of death in neonates.. The aim of this study was to analyze the relationship between early onset neonatal sepsis in terms of the score. APGAR and birth weight infants

The research design used was correlational analytic with a cross sectional time approach with a total sample of 52 respondents. The sampling method in this study used the Accidental Sampling technique. Data were collected using medical record data .Test the analysis using the Chi Square Test.

The APGAR score in newborns is known to be mostly in the APGAR score category 7-10 (no asphyxia) (73.1%). Almost all of the birth weights of newborns were found to be in the birth weight category ≥2500 grams (77%). The incidence of early-onset neonatal sepsis in newborns is known to be mostly in the category of no early-onset neonatal sepsis (69.2%). There is a significant relationship with the incidence of early-onset neonatal sepsis in terms of APGAR scores in newborns at Kudungga Regional Hospital with statistical test results of p=0.000.

There is a significant relationship with the incidence of early-onset neonatal sepsis in terms of birth weight and birth weight in newborns at Kudungga Regional Hospital with statistical test results of p=0.000.

Maximizing resuscitation efforts quickly, well and correctly in unfit babies as well as clinical observation and blood culture examinations in babies born with cloudy amniotic fluid and suspicion of sepsis are still absolutely necessary to minimize the risk of sepsis

Keywords : APGAR Score, Birth Weight Infants, Early Onset Neonatal Sepsis

1. INTRODUCTION

Neonatal sepsis is one of the most common causes of death in neonates. Approximately 20% of neonates suffer from sepsis and this causes 30% - 50% of total neonatal deaths in developing countries. Neonatal sepsis is a term often used to describe the systemic response to infection in newborn babies. Neonatal sepsis is a clinical syndrome of bacteremia characterized by systemic symptoms and signs, especially in the first month of life. From the onset of symptoms, neonatal sepsis is divided into two types, namely early-onset sepsis (SAD) that occurs within the first 72 hours of life and late-onset sepsis (SAL) that occurs after 72 hours of life. Early onset sepsis occurs in the first hour of life, 90% of symptoms in babies appear within the first 24 hours. Symptoms in most babies include respiratory distress or fever within 12 hours of birth. Meanwhile, disseminated intravascular coagulation and thrombocytopenia are the most common complications of sepsis (RD. Roeslani, 2016).

Data from the World Health Organization (WHO), it is estimated that 3 million newborns and 1.2 million children suffer from sepsis globally every year. Neonatal infection in the form of sepsis is still one of the main causes of morbidity and mortality in neonates in the world today. Neonatal infections claim 1.4 million neonatal lives every year throughout the world, while in developing countries it causes 1.6 million deaths every year and neonatal sepsis is one of the main causes (WHO, 2018). The incidence of sepsis in Indonesia is still high, namely 8.7 to 30.29% with a mortality rate of 1.56 to 49.9%. Sepsis is the main cause of death in infants, the incidence of sepsis in developing countries is quite high, namely 1.8 to 18 per 1000 live births with a mortality rate of 12 to 68%. Nationally, in 2021, the most common cause of neonatal death is low birth weight (LBW). Other causes of death include asphyxia, infection, congenital abnormalities, neonatal tetanus, and others. (Indonesia Health Profile, 2021). Data in East Kalimantan Province, based on data obtained from the medical records of Abdul Wahab Sjahranie Hospital for the 2018-2020 period, there were a total of 312 sepsis patients, and 69 of them occurred in children. Based on data obtained from the profile of RSUD Abdul Wahab Sjahranie Samarinda (2017), sepsis is included in the top 10 diseases that cause death in East Kalimantan Province.

Neonates born with asphyxia are at greater risk of developing sepsis compared to neonates born without asphyxia (Getabelew, Aman, Fantaye, & Yeheyis, 2018). Asphyxia may cause immunological insults and resuscitation procedures after birth asphyxia tend to expose newborns to pathogenic microbes (Gebremedhin, Berhe, & Gebrekirstos, 2016). Low birth weight babies have a 3 to 10 times higher incidence of infection than babies with normal birth weight (Shane, Sanchez, & Stoll, 2017). The increased risk of infection in LBW can occur due to deficient transfer of maternal IgG through the placenta during the third trimester, impaired phagocytosis and decreased complement factors (Damanik, 2014). Early onset neonatal sepsis is one of the emergency problems in neonates. and is the main cause of death in neonates, especially premature babies. This is due to the condition of neonates who are still vulnerable and immature, so they are susceptible to various risk factors during the perinatal period. Infection is the main cause of early-onset neonatal sepsis which can be acquired vertically through bacterial colonization of the mother during pregnancy or through delivery procedures. It can be concluded that neonatal and maternal factors play an important role in the development of early-onset neonatal sepsis. Considering that early-onset neonatal sepsis is a condition that can be prevented or treated, prevention through prophylactic antibiotics and understanding risk factors is important to identify groups that are susceptible to this disease so that it is hoped that it can help reduce the death rate due to neonatal sepsis (Stoll BJ, 2014). The causes of neonatal sepsis can be seen from several risk factors, namely maternal factors, baby factors and other factors. Maternal risk factors can include Premature Rupture of Membranes (KPD) >18 hours, maternal fever

>38°C during the intrapartum period or maternal infections such as chorioamnionitis, Urinary Tract Infection (UTI), green, cloudy and smelly amniotic fluid and type of delivery. Meanwhile, infant factors include premature birth, LBW, male baby gender, and low Apgar score. Another risk factor is nosocomial infections acquired due to resuscitation actions on newborn babies or the installation of supporting equipment on babies, for example babies with oxygen, catheters, IV drips and endotracheal tubes. Nasocomial infections acquired due to treatment in the Neonatal Intensive Care Unit (NICU) being too long, for example when a baby is placed in an incubator and given parenteral nutrition and then a birth attendant/attendant, are also risk factors for neonatal sepsis (Hapsari, 2016).

Asphyxia is a risk factor for death in infants, including infants with neonatal sepsis. Previous research shows that mortality will increase in septic newborn babies with asphyxia and prematurity, compared to babies who suffer from sepsis alone (OR 3.3), asphyxia alone (OR 4.9) or prematurity alone (OR 3.5). Neonatal sepsis accompanied by asphyxia and prematurity causes brain damage associated with dysregulation of chemokines and cytokines and can cause ischemic hypoxia (Christian, et al., 2016). Low birth weight (LBW) is also a risk factor for neonatal sepsis, where birth weight plays an important role in the occurrence of neonatal sepsis. It is reported that babies with a low birth weight have a 3 times higher risk of developing sepsis than babies with a birth weight of more than 2500 grams. Shows that LBW and prematurity are 4.85 times the risk of developing neonatal sepsis. Low birth weight (restricted fetal growth) and prematurity are predictor factors for mortality in neonates with neonatal sepsis (Kumalasari, 2017). In other studies, the most babies with neonatal sepsis had a low APGAR score (0-3), namely 8 samples (16%) followed by a moderate APGAR score (4-6) with 7 samples (14%) and the least were those who had APGAR score was normal (7-10), namely 5 samples (10%). This is in line with research conducted by Leal (2014) which states that babies born with an APGAR score ≤5 have a 1.4 times greater chance of experiencing neonatal sepsis compared to babies born with an APGAR score >5. Based on a

preliminary study of secondary data from the medical records of the Kudungga Regional Hospital's neonate room on August 29 2023, of the 10 newborns in the Kudungga Regional Hospital's neonatal room, it was found that 4 of them had early onset neonatal sepsis (1 of the newborns had a history of birth with low birth weight, 3 babies Newborns include a history of birth with neonatal asphyxia.

Early diagnosis of sepsis is a determining factor in the successful management of neonatal sepsis, therefore it is necessary to immediately identify potential risk factors for early onset neonatal sepsis.

2. METHODS

The research design used was correlational analytics with a cross sectional time approach with a sample size of 52 respondents, the sampling method used the Accidental Sampling technique. Data collection uses medical record data. Analysis tests use the Chi Square Test.

3. RESULTS

Tabel.1 Distribution of Respondent Characteristics and Variables

Research result	Frequency (f)	Percent (%)
Gestasi		
<37 Weeks	12	23,0
>37 Weeks	40	77,0
Skor APGAR		
<7 (asphyxia)	14	26,9
7-10 (No Asphyxia)	38	73,1
Birth Weight		
<2500 gr	12	23,0
≥2500 gr	40	77,0
SNAD		
SNAD	16	30,8
Tidak SNAD	36	69,2
Jumlah	**52**	**100**

Tabel.2 Cross Tabulation Between Variables
1. Skor APGAR with SNAD

Skor APGAR	SNAD	%	Tidak SNAD	%	F	%
<7	14	26,9	0	0	14	26,9
7-10	2	3,9	36	69,2	38	73,1
Total	16	30,8	36	69,2	52	100

2. Birth Weight With SNAD

Berat Badan Lahir	SNAD	%	Tidak SNAD	%	F	%
<2500 gr	12	23	0	0	12	23
≥2500 gr	4	7,8	36	69,2	40	77
Total	16	30,8	36	69,2	52	100

Based on table 2 above, of the 52 respondents (100%), 16 respondents were in the early onset neonatal sepsis category (30.8%), it was found that 14 respondents were in the APGAR score category <7 (Asphyxia) (26.9%) and 2 respondents were in the score category APGAR 7-10 (no asphyxia) (3.9%) while of the 36 respondents in the category of no early onset neonatal sepsis (69.2%) it was found that 36 respondents had an APGAR score of 7-10 (no asphyxia) (69.2%). So it can be concluded that most of the newborns in the Kudungga Regional Hospital in the category of no early onset neonatal sepsis are known to have an APGAR score of 7-10 (no asphyxia). Furthermore, based on the results of the chi-square test, it shows that the significance value = 0.000, which means the α value <0.05. This proves that there is a relationship between early onset neonatal sepsis in terms of APGAR scores in newborns at Kudungga Regional Hospital.

Based on table 2 above, out of 52 respondents (100%), 16 respondents were in the category of early onset neonatal sepsis (30.8%), it was found that 12 respondents were in the category of body and birth weight <2500 gr (23%) and 4 respondents were in the category of body and birth weight ≥ 2500 gr (7.8%) while of the 36 respondents in the category of no early onset neonatal sepsis (69.2%), it was found that 36 respondents were in the birth weight category ≥2500 gr (69.2%). So it can be concluded that most of the newborns in the Kudungga Regional Hospital in the category of no early onset neonatal sepsis are known to be mostly in the birth weight category ≥2500 gr. Furthermore, based on the results of the chi-square test, it shows that the significance value = 0.000, which means the α value <0.05. This proves that there is a relationship between early onset neonatal sepsis in terms of low birth weight in newborns at Kudungga Regional Hospital.

4. DISCUSSION

Based on the research results, it was found that of the 52 respondents (100%), 16 respondents were in the category of early onset neonatal sepsis (30.8%), 14 respondents were identified in the APGAR score category < 0.05. This proves that there is a relationship between early onset neonatal sepsis in terms of APGAR scores in newborns at Kudungga Regional Hospital. Neonates born with asphyxia are at greater risk of developing sepsis compared to neonates born without asphyxia (Getabelew, Aman, Fantaye, & Yeheyis, 2018). Asphyxia may cause immunological insults and resuscitation procedures after birth asphyxia tend to expose newborns to pathogenic microbes (Gebremedhin, Berhe, & Gebrekirstos, 2018). This research is in line with that carried out by Getabelew (2018) who found that one of the risk factors for neonatal sepsis studied was significantly related to newborn asphyxia neonatorum with a p value of 0.000. Babies with asphyxia result in reduced oxygen intake in the body, making it easier for anaerobic germs to develop into infections (Prawesti, Adistie, & Angeli, 2018). Resuscitation procedures for babies born with asphyxia neonatorum may possibly expose the newborn to pathogenic microbes that cause infection and neonatal sepsis (Gebremedhin, Berhe, & Gebrekirstos, 2018). The researchers assume that clinical observations and blood culture examinations in babies born with cloudy amniotic fluid and suspicion of sepsis are absolutely necessary to minimize the risk of sepsis.

Based on the research results, it was found that of the 52 respondents (100%), 16 respondents were in the category of early onset neonatal sepsis (30.8%), it was known that 12 respondents were in the birth weight category < 0.05. This proves that there is a relationship between early onset neonatal sepsis in terms of low birth weight in newborns at Kudungga Regional Hospital. Sepsis in neonates is one of the main causes of death in babies, especially in developing countries like Indonesia. Many factors influence the occurrence of neonatal sepsis, both from the baby's and mother's aspects. One of the influencing factors is the baby's birth weight which is measured a maximum of 1 hour after the baby is born and the gestational age when the baby is born. where a baby weighing less than 2500 grams or what is known as a low birth weight (LBW) baby and prematurity (a baby born < 37 weeks) is one of the risk factors for causing sepsis. This is in line with a study conducted by Junara (2018) where it is said LBW

has a 2.6 times greater risk of developing neonatal sepsis. This is because the maturation of the body's organs is not yet perfect, which can cause babies to be more susceptible to infections. Prematurity and LBW are related to sepsis which is caused by an immature immune system so that babies are more at risk of infection. The condition of LBW is related to neonatal sepsis because in LBW, weight loss can occur at any time, in contrast to babies born with sufficient weight, where weight loss usually only occurs in the first 58 weeks and the following week there is an increase in weight. LBW usually suffer from inadequate nutritional intake (ASI), so they are more at risk of infection due to inadequate nutrition and a lack of immunoglobulin from breast milk (Widiyanti, 2019). The ability of premature and LBW babies to respond to pathological agents due to an immature immune system means that there are no signs of local inflammatory reactions at the port of entry (the entry route for germs) to signal the presence of infection so that the signs that appear tend to be unclear and non-specific. This causes diagnosis and treatment to be delayed (Hockenberry M, 2018). The researcher's assumption is that babies born with a history of prematurity or low birth weight should be considered for sepsis screening, so that the prognosis of neonatal infection can be known early.

5. CONCLUSION

The APGAR score of newborns at Kudungga Regional Hospital is known to be mostly in the APGAR score category of 7-10 (no asphyxia) (73.1%). The birth weight of newborns at Kudungga Regional Hospital is known to be almost entirely in the birth weight category ≥2500 grams (77%). The incidence of early-onset neonatal sepsis in newborns at Kudungga Regional Hospital is known to be mostly in the category of no early-onset neonatal sepsis (69.2%). It was found that there was a significant relationship with the incidence of early-onset neonatal sepsis in terms of APGAR scores in newborns at Kudungga Regional Hospital with statistical test results of p=0.000. It was found that there was a significant relationship between the incidence of early-onset neonatal sepsis in terms of birth weight and birth weight in newborns at Kudungga Regional Hospital with statistical test results of p=0.000.

6. ACKNOWLEDGMENTS

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