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ORIGINAL RESEARCH

GESTATIONAL AGE FACTORS WITH NEONATAL ASPHYXIA LEVELS IN NEWBORN BABIES

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ABSTRACT

Asphyxia neonatorum is a newborn emergency in the form of respiratory depression that continues, causing various complications. Neonatal asphyxia is caused by several factors, namely, intrauterine factors (mother's condition factors, uterine factors, placental factors, umbilical cord factors and fetal factors), gestational age factors and labor factors. This study aims to determine the factor analysis of gestational age and the level of neonatal asphyxia in the Nusa Indah Room at Nganjuk Regional Hospital. The research design uses a correlational design with a retrospective approach, this research was carried out on June 1 2023 in the Nusa Indah Room, Nganjuk Hospital. The population in this study was all 68 newborn babies. The sample was taken using a total sampling technique with a total of 68 respondents. The independent variable is the gestational age factor, the dependent variable is the level of neonatal asphyxia. The data collection instrument uses medical record data and statistical tests use the Contingency Coefficient with $\alpha = 0.05$. The results of this study showed that almost half had a premature gestational age, namely 33 respondents (48.5%). Experiencing moderate asphyxia was 32 respondents (47.1%). And the results of the Coefficient Contingency test show p-value = $0.000 \leq \alpha$ (0.05), so Ha is accepted and Ho is rejected, which means there is a relationship between gestational age and the level of neonatal asphyxia in the Nusa Indah Room at Nganjuk Regional Hospital. Newborn babies with a history of premature gestational age are at risk of experiencing neonatal asphyxia. Nurses as implementers of curative measures are required to carry out nursing care appropriately to provide optimal assistance so that the incidence of neonatal asphyxia can be minimized

Keywords

Gestational Age, Asphyxia Neonatorum, Newborn

INTRODUCTION

Asphyxia neonatorum is a newborn emergency in the form of respiratory depression that continues, causing various complications. Increasing human resources begins during intrauterine life, therefore the condition of asphyxia, which is the same as fetal distress or fetal distress in the womb, is very important to avoid and find the cause. Several factors that cause neonatal asphyxia are intrauterine factors (condition of the mother, uterus, placenta, umbilical cord and

fetus), gestational age factors (premature pregnancy, term pregnancy, postmature pregnancy), labor factors (prolonged labor, operative delivery, labor with induction, labor with anesthesia, bleeding) and artificial factors (hypotension-supination syndrome, intrauterine asphyxia in labor induction, intrauterine asphyxia in labor with anesthesia) (Manuaba, 1998).

WHO reports that asphyxia occurs in 1-4 per 1000 live births in developed countries and 4 - 9 per 1000 live births in developing countries. This situation is estimated to cause 21% of infant deaths, especially in developing countries (Kemenkes, 2019). In 2021, the second most common cause of neonatal death in Indonesia is asphyxia (28%). Based on the data obtained, it shows that the number of neonatal deaths (0-28 days) in Indonesia in 2021 was 40,308 deaths. Some of these neonatal deaths were caused by neonatal asphyxia, amounting to 5,599 cases. Meanwhile, the total number of neonatal deaths on the island of Java reached 19,360 with 2,652 cases caused by asphyxia (Jatim, 2021). The proportion of infant deaths in East Java in 2021 still occurs mostly in neonates (0 - 28 days), namely 2,658 with 757 cases caused by neonatal asphyxia. However, the mortality rate for neonates, infants and toddlers is expected to continue to decline. Data shows that the neonatal death rate in Nganjuk Regency in 2021 was 59 with 18 cases caused by asphyxia (Jatim, 2021). According to medical record data in the Nusa Indah ward at Nganjuk Regional Hospital, from January 2022 to January 2023, there were 280 cases of neonatal asphyxia with a total of 43 neonatal deaths.

Neonatal asphyxia is spontaneous respiratory failure at birth or some time after birth due to hypoxia or lack of nutrition. If there is a disruption in gas exchange/oxygen transport during pregnancy and childbirth, more severe asphyxia will occur. Acidosis and cardiovascular disorders that occur in the baby's body have a negative impact on brain cells (Maryunani, 2009). If immediate treatment is not carried out in cases of neonatal asphyxia, it will have an impact on the growth and development and quality of life of the baby in the future and even the death of the baby (Kemenkes, 2019). Asphyxia that may arise during pregnancy can be overcome/prevented by carrying out adequate prenatal care or antenatal care (ANC). Antenatal and postnatal supervision is very important in efforts to reduce maternal and perinatal morbidity and mortality. Schedule 12 to 13 antenatal care checks during pregnancy. In developing countries, antenatal examinations are carried out four times, which is sufficient for recorded cases, namely in each trimester, while in the last trimester twice (Manuaba, 1998). If it is expected that the baby will face an emergency, then during delivery the necessary assistance must be prepared. Asphyxia is a condition that must be treated immediately or, if necessary, immediately end labor. If the fetus experiences respiratory problems during or after birth, resuscitation of the newborn must be carried out immediately. With this action, it is hoped that the pressure on the fetus will end and the baby can be saved (Manuaba, 1998).

METHOD

This research design uses correlational with a retrospective approach. This research was carried out on June 1 2023 in the Nusa Indah Room at Nganjuk Regional Hospital. The population in this study were all 68 babies who experienced neonatal asphyxia. The sampling technique used was total sampling. The sample used was 68 respondents. In collecting data using research ethics with anonymity. The statistical test uses the Contingency Coefficient test with a significant $\alpha = 0.05$. The independent variable in this study is

Gestational Age, and the dependent variable in this study is the Level of Neonatal Asphyxia. The measuring tool in this research uses medical record data.

RESULTS

Table 1. Cross Tabulation of the Relationship between Gestational Age and Rates of Neonatal Asphyxia in Newborns

Gestational Age	Neonatal Asphyxia Levels						Among	
	Light Asphyxia /Normal		Currently Asphyxia		Heavy Asphyxia			
	f	%	f	%	f	%	∑	%
Prematur	17	25	13	19,1	3	4,4	33	48,5
Matur	10	14,7	18	26,4	1	1,5	29	42,7
Postmatur	0	0	1	1,5	5	7,4	6	8,8
Amount	27	39,7	32	47	9	13,3	68	100

Uji *Coefficient Contingency*, *p value* = 0,000 ≤ α = 0,05

In Table 1 it is known that of the 68 newborn respondents in the Nusa Indah Room at Nganjuk Regional Hospital, almost half, namely 18 respondents (26.4%) had a mature gestational age and the baby experienced moderate asphyxia. The results of the Coefficient Contingency test showed p value = 0.000 ≤ α = 0.05 so that Ha was accepted, which means there is a relationship between gestational age and the level of neonatal asphyxia in the Nusa Indah Room at Nganjuk Regional Hospital.

DISCUSSION

Gestational age is divided into premature, mature and postmature. Pregnancy generally lasts 40 weeks or 280 days calculated from the first day of the last menstruation (Manuaba I. , 2007). Pregnancy generally lasts 40 weeks or 280 days. According to WHO, 70% of perinatal deaths are caused by premature pregnancy (<37 weeks) because the immature growth and development of vital organs means that babies are not yet able to live outside the womb, so they often experience failure in adaptation which can causes high morbidity and even mortality (Manuaba I. , 2007). One of the factors causing premature pregnancy is delayed fetal growth, resulting in "Small Gestational Age" where the baby's birth weight is less than 2500 grams. Newborn babies weighing less than or around 2500 grams are signs and symptoms of premature babies. The shorter the gestational age, the less perfect the growth of the baby's vital organs, which affects the baby's birth weight. The results of this study are in accordance with research (Apriani, 2021) which states that gestational age in the premature category is 20,213 times more likely to experience LBW compared to maternal parity (Apriani, 2021)

A newborn with a body weight of 2500 – 4000 grams is one of the characteristics of a normal newborn, where the growth of the baby's vital organs should be perfect so there is little risk of neonatal asphyxia (Kristiyanasari, 2010). Birth weight is part of the neonatal factors that can cause neonatal asphyxia and is an indicator of the health of newborn babies. Low birth weight babies and higher birth weight babies are included in the high risk group. However, birth weight alone cannot have a direct effect on the occurrence of neonatal asphyxia, because asphyxia is a multifactorial event (Fajarwati, 2016). The results of this study are in line with research (Mutiara et al., 2020) which states that of the 33 groups of cases of asphyxia babies there were 11 babies born with normal weight, this is because there are many factors that cause babies to be born with asphyxia, namely premature rupture of membranes. by the mother, there has been a bad obstetric record in the mother, as well as intrauterine infections, and low placental function (Mutiara, 2020).

Babies born to mothers with a premature gestational age (<37 weeks) have a 5.647 times risk of experiencing severe asphyxia compared to babies born to

mothers with a gestational age of ≥37 weeks, because at a premature gestational age the vital organs are not yet optimal, causing the baby to not yet optimally able to live outside the womb (Alfitri, 2021). However, around 3.4 - 14% or an average of 10% of pregnancies last until 42 weeks or more. Postmature pregnancies have a higher risk than term pregnancies, especially for perinatal deaths related to meconium aspiration and asphyxia (Prawirohardjo, 2010). As for babies born at sufficient gestational age but experiencing respiratory problems or mild asphyxia, this is due to other factors that disrupt lung development (Sadanoer & Tyas, 2020) . From research (Masruroh et al., 2020) it has been proven that newborn asphyxia occurs not only from mothers with high-risk gestational age, even at mature gestational age babies can also experience asphyxia (Masruroh, 2020).

CONCLUSIONS

There is a relationship between gestational age and the level of neonatal asphyxia in newborn babies in the Nusa Indah Room at Nganjuk Regional Hospital. This is based on the results of the Contingency Coefficient statistical test with $\alpha = 0.05$ and the result is ρ value = 0.000.

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