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Relationship between Premature Birth and Asphyxia in Newborn Babies

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ABSTRACT: This study is to see whether relationship between babies born prematurely with the incidence of asphyxia. Premature birth refers to a newborn born alive before the third trimester of pregnancy and weighing less than 2500 grams. Asphyxia can occur immediately after birth because the placenta in the fetus is very important for oxygenation, nutrition, and waste disposal so that disturbances in umbilical and placental blood flow almost always cause asphyxia. Asphyxia is a condition in which newborns cannot breathe regularly and spontaneously. Asphyxia occurs due to the inability of the baby's respiratory organs to carry out their functions. The data were collected through questionnaire distributed to 20 respondents in Surabaya, Indonesia. The results of this study showed that there is a relationship between babies born prematurely with the incidence of asphyxia. Babies born with a gestational age of less than 37 weeks will experience organ immaturity, especially in the lungs which causes spontaneous breathing failure in the early minutes of birth. The lungs are formed and undergo a gradual maturation process.

KEYWORDS: Asphyxia, New-born baby, Premature birth.

INTRODUCTION

Premature birth refers to a newborn born alive before the third trimester of pregnancy and weighing less than 2500 grams. Asphyxia can occur immediately after birth because the placenta in the fetus is very important for oxygenation, nutrition, and waste disposal so that disturbances in umbilical and placental blood flow almost always cause asphyxia (Johariyah, 2017).

Asphyxia is a condition in which newborns cannot breathe regularly and spontaneously. Asphyxia occurs due to the inability of the baby's respiratory organs to carry out their functions (Aminah, 2016). Asphyxia can also cause lifelong disabilities such as brain defects, deafness, blindness, and death (Mayasari, Idayanti, Arismawati, and Wardani, 2018).

The causes of neonatal death according to Saridewi (2019) in the 0-7 day age group include respiratory disorders/difficulty breathing at birth 36.9%, premature 32.4%, sepsis 12%, hypothermia 6.8%, and blood disorders/jaundice. 6.6% (Mayasari et al., 2018). There are several risk factors that cause asphyxia, namely maternal factors, fetal factors and umbilical cord factors (Lestari and Putri, 2019).

In a study entitled "The Relationship of Premature Delivery with Asphyxia Incidence at the Jombang Hospital in 2019" it was stated that all respondents who gave birth to babies with asphyxia were cases with preterm gestational age (Mariam, 2017). Meanwhile, according to research conducted by Aminah (2016), babies born prematurely or preterm have organs and body organs that do not function normally. So that it can cause asphyxia in premature babies caused by imperfect organ function systems (Anabanu, Fatmawati, and Sumini, 2020).

RESEARCH METHODS

This current research on the relationship of prematurity with asphyxia incidence in newborns is descriptive in nature with data/information collection, analysis and problem solving through literature search (library review). There were 20 respondents in this study. Data were collected through questionnaires which were distributed to respondents.

The method of data collection and analysis follows the Helsinki Declaration which contains ethical principles, where the interests of the subject must be above other interests. This research procedure had obtained ethical approval from the ethics committee of the Faculty of Medicine, Wijaya Kususma University, Surabaya with the number 983/Ethics/UWK/2021.

RESULTS AND DISCUSSION

Several journals used in this study indicate that prematurity affects the incidence of asphyxia in newborns. Premature or preterm labor is labor at the age of less than 37 weeks with a fetal weight of less than 2500 grams which can be influenced by several factors

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such as fetal factors, maternal factors, and behavioral factors. Neonatal asphyxia is a spontaneous respiratory failure in infants at birth caused by fetal hypoxia in the uterus.

Babies who experience premature birth are usually associated with immaturity in the fetal organs where the respiratory system experiences a surfactant deficiency due to immature lung growth and development, respiratory muscles are still weak. Premature babies have not been able to adapt, causing perinatal depression. Respiratory Distress Syndrome or RDS can be caused by surfactant deficiency and apnea or respiratory arrest due to immaturity of the respiratory mechanism.

Almost all respondents who gave birth to asphyxia babies gave birth to preterm gestational age or less months. Meanwhile, at term pregnancy or at normal gestational age, asphyxia is usually caused by several factors, such as a disease suffered by the mother, abnormalities in the fetus, pre-eclampsia, prolonged labor or bleeding (Solama, 2020).

Babies born with asphyxia will also greatly affect the psychological condition of postpartum mothers. In addition, the care of babies with asphyxia requires quite a lot of funds and the possibility of disability or even death is quite high. To avoid death in infants with asphyxia, resuscitation methods are needed, as well as good and appropriate equipment. Premature infants have a number of characteristics that make neonatal resuscitation more difficult, including a lack of surfactant in the lungs, which causes difficulties in the ventilation membranes, thin skin and a lack of fatty tissue of the skin, which makes the infant more prone to heat loss, and infections and blood vessels.

Under stress, the brain is so vulnerable that it bleeds easily. Therefore, nurses, midwives, and doctors are encouraged to make efforts to prevent suffocation, especially in premature newborns, by providing counseling and support to mothers to breastfeed their babies 8-12 times per day in the first few months of life and increasing awareness of risk factors for asphyxia with regular monitoring of the development of asphyxia.

One of the factors of neonatal asphyxia is premature labor. Maternal factors, placental factors, fetal factors, and labor are the four main factors that play a role in the etiology of asphyxia neonatorum. Fetal factors include preterm labor. Due to the immaturity of organs, especially the lungs, preterm labor can result in asphyxia neonatorum in the newborn, leading to spontaneous respiratory failure in the first minutes of life. The lungs and lungs develop gradually. The lungs are the last organs to fully form at 37-38 weeks of gestation. Based on the classification of gestational age groups, there is a disparity in the degree of neonatal asphyxia suffered by premature infants in this study.

The newborn's lungs mature with increasing gestational age. The volume of lung surfactant decreases with gestational age, indicating that the expansion capacity of the lungs increases. All preterm infants born with preterm gestational age classification (32-36 weeks) had mild asphyxia (A-S 7-10) which could be treated with regular newborn care. On the other hand, the younger the gestational age, the more immature the lungs and the less surfactant they contain. Premature infants in the groups of gestational age of 28-32 weeks and gestational age of 20-27 weeks are more susceptible to respiratory failure at birth. This is evident in the findings of the study by Johariyah (2017) and Sa'danoer (2020) which showed that infants born in this gestational age range were more likely to have severe asphyxia (A-S 0-3), which required newborn resuscitation and strict additional assessment and treatment.

CONCLUSIONS

There is a relationship between babies born prematurely with the incidence of asphyxia. Babies born with a gestational age of less than 37 weeks will experience organ immaturity, especially in the lungs which causes spontaneous breathing failure in the early minutes of birth. The lungs are formed and undergo a gradual maturation process.

The airways (alveoli) in newborns must be able to fill with air and remain open at birth in order to breathe freely. Surfactant substance, which is produced by the lungs that serves to reduce surface tension, allows the alveoli to open wide. Because premature babies do not make enough surfactant, the alveoli does not stay open which causes the baby to experience respiratory failure or difficulty breathing soon after birth.

Thus, there is a need for further research on the relationship of prematurity with the incidence of asphyxia in newborns and improving the quality of health services in handling cases of preterm newborns with asphyxia.

And it is also expected for health workers to provide socialization to the community, especially pregnant women about the risk of premature birth and the incidence of asphyxia, prevention and treatment to prevent the high rate of premature delivery and the incidence of asphyxia neonatorum.

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