

THE CORRELATION OF THE QUALITY OF ANTENATAL CARE VISITS WITH THE INCIDENT OF ASPHYXIA NEONATORUM AT PHC HOSPITAL SURABAYA

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ABSTRACT

Introduction: Birth asphyxia is the most common problem in newborn care. The incidence of these conditions is very high in developing countries where medical facilities are limited to urban areas, and they can be prevented through standard antenatal care (ANC) visits. ANC is medical care provided by healthcare professionals to mothers during pregnancy, administered by medical personnel and conducted according to established standards. This ANC monitors the health and development of both the mother and the fetus for early detection of risks and health issues during pregnancy. **Objective:** To determine the relationship between the quality of ANC visits and the occurrence of Asphyxia Neonatorum at PHC Hospital Surabaya. **Method:** This study is an observational analytical study with a case-control study design using a retrospective approach. **The sampling in the study utilized probability sampling, specifically employing the simple random sampling technique.** The statistical method used to examine the relationship between the quality of ANC visits and Asphyxia (APGAR Score $\leq 3-6$) through the analysis of odds ratio comparison using the Chi-square statistical test. **Result:** The statistical analysis of the relationship between the quality of ANC visits and the occurrence of Asphyxia shows significant results with a p-value of 0.001 ($p < 0.05$). **Conclusion:** The compliance of pregnant women in adhering to standard ANC visits ensures the health of both the mother and the baby during pregnancy.

Keywords: Antenatal Care (ANC), Asphyxia Neonatorum, Maternal and Child Health (MCH)

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INTRODUCTION

Birth asphyxia is the most common problem in neonatal care. Asphyxia can cause high morbidity and mortality due to brain damage. The incidence of prenatal asphyxia is around 1-1.5% in most centers in developed countries and 3.3% in Pakistan. In developing countries where health facilities are limited to urban areas, the incidence is much higher.¹⁻³

Antenatal Care (ANC) is medical care provided by healthcare professionals to mothers during pregnancy.⁴ One of the objectives of ANC is to have a baby with normal growth and development.^{5,6} The issue with ANC is that mothers do not adhere to the recommended number of ANC visits, leading to an increase risk factor of asphyxia in neonates.

Several studies have attempted to determine the prevalence of asphyxia and its risk factors^{1-3,7,8}. Risk factors can be categorized into maternal risk factors, neonatal risk factors, and mode of delivery. Maternal risk factors (preeclampsia, young or old maternal age, antenatal bleeding) can be identified during antenatal care, leading to better prevention of asphyxia.^{1-3,9}

There is no doubt that birth asphyxia can lead to delayed neurological development. However, there is growing indirect evidence that hypoxic and ischemic phenomena affecting the fetus in antenatal care may play an important role in the

development of brain damage leading to childhood disabilities. However, to identify prenatal risk factors, patients must visit the antenatal clinic. Although most of the study subjects attended school on time, with appointments, it was difficult to consistently identify prenatal risk factors.¹⁰

Previous studies found that preterm birth and low birth weight increased the risk of asphyxia by 4-5.8 times.¹¹⁻¹⁴ Premature and low birth weight infants usually have immature lungs and impaired respiratory muscles. Preterm infants require ventilatory support or resuscitation for birth.¹⁵ In contrast to preterm birth, postterm infants are 3.8 times more likely to develop asphyxia. Previous studies have shown similar results.^{8,12,16} In postmaturity, some infection and fibrosis of the placenta occurs, which reduces blood flow from the placenta to the fetus.¹⁷ There is no general agreement or consensus on what constitutes postmaturity.¹⁸

The most commonly used indicator of the fetal condition at birth is the APGAR score. These criteria were used because in our population it is not always possible to accurately determine the gestational age. The APGAR score was developed to identify infants who need resuscitation, but a high late APGAR score is associated with mortality in the first year of life.¹⁹

The neonatal period is the period

when a child has the best chance of survival. According to the WHO, the neonatal period begins at birth and ends 28 days after birth. Pediatric health care begins during pregnancy and continues into childhood. A mother is an inseparable part of her child. Infant mortality rate is an indicator of the quality of a country's child health care.

Infant mortality is a fatal event that occurs from the birth of a baby to almost the first year of life. Neonatal mortality can be caused by various factors such as maternal factors, socio-cultural, services and health facilities. Causes of neonatal mortality include preterm birth. 58%, birth asphyxia. 45%, neonatal infection 18. 36%, meconium aspiration syndrome 9. 18%, respiratory distress syndrome 7. 14% and congenital malformation 4.08%.²⁰⁻²⁸

Therefore, our study was designed to investigate prenatal management. The objective was to identify potential maternal risk factors during delivery that are likely to cause birth asphyxia.

METHOD

The research design employed is an analytical observational method using a case-control study with a retrospective approach. The research population consists of all children born in the year 2023 with a

RESULT

Tabel 1. The frequency of Antenatal Care visits

history of birth asphyxia for the case population, and neonates without a history of birth asphyxia for the control population, recorded at PHC Hospital Surabaya. The sample size is determined using the analytical formula for unmatched categorical comparative analysis (Lemeshow formula) with a total of 16 control samples and 16 case samples. The sampling technique used is simple random sampling. Inclusion criteria include (1) All mothers who gave birth/neonates born around year 2023, (2) Mother had at least six ANC visits according to the national standard in Indonesia and PHC Hospital Surabaya, recorded in the Maternal and Child Health (KIA) book managed by Community Health Center or etc., and exclusion criteria (1) Pregnant women above 40 years of age. The independent variable in this research is the quality of ANC visits, and the dependent variable is asphyxia neonatorum during labor.

The research location is in the PHC Hospital Surabaya from July to August 2023. The data collection procedure involves secondary data obtained from the KIA book managed Community Health Center and Hospital. The research data is then processed and analyzed using the SPSS 29 version application with Chi-square test.

ANC visit	Frequenc y (n)	Percenta ge (%)	
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history			
Standard	17	53,1%	
Not Standard	15	46,9%	an effort for early detection of symptoms
Total	32	100	

Based on the data obtained, in the table above, there are a total of 17 mothers (53.1%) with standard ANC visit quality, while there are 15 mothers (46.9%) with non-standard ANC visit quality.

Table 2. The correlation between the quality of Antenatal Care visits and the incidence of Asphyxia Neonatorum at PHC Hospital Surabaya

ANC Visit	Asphyxia Occurrence				Total	p-value	OR	
	Normal		Asphyxia (APGAR Score ≤ 3–6)					
	n	(%)	n	(%)				
Standard	13	76,5	4	23,5	17	53,125	0,001	13,000
Non- Standard	3	20	12	80	15	46,875		
Total	16	50	16	50	32	100		

Based on the bivariate analysis results in the table above, it is known that in the case group (asphyxia neonatorum) with a history of non-standard ANC visit quality, there were 12 children (80%). In the control group (non-asphyxia neonatorum) with a history of standard ANC visit

In the research, for the age group over 35 years, there were four respondents (12.5%), and for the age group below 20 years, there was one respondent (3.125%).

Based on the bivariate analysis results in the table above, it is known that in the case group (asphyxia neonatorum) with a history of non-standard ANC visit quality, there were 12 children (80%). In the control group (non-asphyxia neonatorum) with a history of standard ANC visit quality, there were 13 children

(76.5%). The result of the odds ratio comparison analysis using the Chi-square test yielded a p-value of 0.001 and OR of 13.000.

DISCUSSION

The quality of ANC visits influences the occurrence of Asphyxia Neonatorum. A non-standard quality of ANC visits makes pregnancy monitoring inadequate, so problems that arise cannot be prevented and addressed early before they affect pregnancy conditions. ANC serve signs of danger to prevent serious disruptions to pregnancy or the safety of pregnant mothers.²¹

Standard ANC aims to trace even the smallest details related to anything that may affect the health of both the mother and the baby, especially those related to nutritional

issues and nutrition related to the fetal development during pregnancy.²²

Non-standard ANC is one of the risk factors for the occurrence of asphyxia neonatorum because complications, nutrition, and the health of the mother and fetus are not adequately monitored during pregnancy, thus disrupting fetal growth and leading to the birth of a baby with asphyxia.

Based on the research results obtained, there is a significant relationship between the quality of ANC visits and the occurrence of asphyxia. The statistical test used is Chi-square, and using the SPSS application, the result obtained a significant value of $p = 0.001$; $\alpha = 0.05$, indicating $p < \alpha$, therefore, there is a significant relationship between the quality of ANC visits and the occurrence of asphyxia. The Odds Ratio (OR) obtained is 13.000, indicating that mothers with non-standard ANC have a 13 times greater risk of having a child with asphyxia.

The results of this study confirm those reported by David R. et al. In a study conducted by, the analysis of obstetric history of multiparous patients revealed few common risk factors. There appeared to be a high rate of anemia in the prenatal period (28 percent), but it was comparable to the rate of anemia in the general obstetric population (25 percent). Hypertension (7 percent), preeclampsia (4 percent),

eclampsia (4 percent), urinary tract infection (6 percent), and antepartum hemorrhage of unknown etiology were examined, but no significant symptoms were found for the individual conditions. However, 10% of patients showed abnormal fetal heart rate patterns before birth.

This could be an indication for concern. This is because early detection of symptoms and signs of danger during pregnancy is the best effort to prevent serious disruptions to pregnancy or the safety of pregnant mothers. ANC visits serve as a crucial indicator in increasing awareness and monitoring the nutritional health of pregnant mothers and the fetus. During ANC visits, explanations about complications, blood pressure checks, maternal nutrition, and early detection of complications are provided, thus influencing the weight of the baby to be born. In this research, the latest ANC guidelines from 2020 were used, with a minimum of six ANC visits, distributed as follows: two visits in the first trimester, one visit in the second trimester, and three visits in the third trimester.^{6,21,23}

Mothers who undergo regular ANC examinations still have the possibility of giving birth to asphyxia. This is influenced by several factors, including economic factors, education, and daily habits.²⁴

CONCLUSION

Low compliance of pregnant women to undergo standard ANC visits, as prescribed, leads to an increase in the incidence of Asphyxia Neonatorum, which is currently a matter of urgency for the government. The results of this study indicate a significant relationship between the quality of ANC visits and the occurrence of Asphyxia. This relationship provides important information in the field of maternal and child health services that the health of newborns is better ensured through integrated ANC visits.

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