

Correlation Between Preeclampsia and Preterm Labor with The Incidence of Asphyxia Neonatorum

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ABSTRACT

Background: Factors that cause perinatal mortality are asphyxia neonatorum, birth trauma, infection, prematurity, congenital abnormalities, and other causes. The leading causes of neonatal mortality are intrinsically related to maternal health and care received before, during, and after childbirth.

Aim: This study is a case-control analytic survey is to analyze how a situation can occur through the retrospective approach.

Method: Data collection is done within one year (1 January 2016 to 31 December 2016) by looking at the register book perinatology space Madun City Hospital. Samples were taken by systematic sampling. Criteria for inclusion in this study were birth asphyxia with vaginal delivery or Sectio Caesarea (SC), abnormal bleeding (placenta previa or placental abruption), and amniotic rupture. Exclusion criteria in this study were asphyxiated infants with congenital disorders and IUFD. The testing subset of the statistics used in this study using the contingency coefficient and calculations performed by a computerized application using SPSS version 16.0.

Results: The result states that the probability value of 0 and a value of significance at the cross tabulations > 0,05 means there is no significant correlation between preeclampsia and incidence of asphyxia neonatorum in the public district hospitals of the Madiun city in 2016. In the cross-tabulation, preterm labor correlates with asphyxia neonatorum, resulting in the probability value of 1.676 and the significant value in the cross-tabulation of 0.195.

Conclusion: There is a significant association between preterm labor and asphyxia neonatorum in the public district hospitals of Madiun city in 2016.

Keyword: Preeclampsia, Preterm Labor, Asphyxia neonatorum.

INTRODUCTION

Factors that cause perinatal mortality are asphyxia neonatorum, birth trauma, infection, prematurity, congenital abnormalities, and other causes. The leading causes of neonatal mortality are intrinsically related to maternal health and care received before, during, and after childbirth—the highest neonatal mortality due to neonatal asphyxia by 49%. Because of less precise treatment of asphyxia neonatorum, newborn resuscitation efforts are less effective and efficient due to poor management of labor and lack of access to obstetric care.

Neonatal asphyxia: Neonatal asphyxia is when the baby cannot breathe spontaneously and regularly soon after birth [1]. Some of the factors that cause asphyxia neonatorum in infants include: 1) maternal factors include: preeclampsia and eclampsia, abnormal bleeding (placenta previa or placental abruption), prolonged labor or obstructed, fever during labor, severe infection (malaria, syphilis, tuberculosis, HIV), postmature pregnancy (after 42 weeks of pregnancy); 2) The umbilical cord factors include: nuchal cord, short umbilical cord, knot the cord prolapse of the umbilical cord; 3) The infant factors include baby prematurely (before 37 weeks gestation), difficult delivery (breech, twins, dystocia, vacuum extraction, forceps), congenital disorders, meconium-stained amniotic fluid mixes (greenish color) [2].

Preeclampsia: Preeclampsia is a syndrome that often occurs and causes many associated with multiple factors is an on-going challenge. Risks related to preeclampsia, among others nulliparous, history of diseases such as hypertension, diabetes mellitus, antiphospholipid syndrome, pluralistic, ancient maternal age, and obesity [3]. There is a decrease of angiotensin, renin, and

aldosterone in preeclampsia, but encountered edema, hypertension, and proteinuria. Based on the theory of ischemic placental implantation, the trophoblast material will be absorbed into the circulation, increasing sensitivity to angiotensin II, renin, and aldosterone, spasm of blood vessels retention of saltwater arterioles. Arterioles spasm of blood vessels to the most critical organ in the body can lead to a network of metabolic disorders, circulatory disorders, and narrowing the blood flow to uteroplacental circulation causing interference exchange of nutrients, CO₂ and O₂, which can cause neonatal asphyxia and death.

Preterm: Preterm labor is always associated with the maturity of gestation. Infections that occur during pregnancy will result in a specific immunologic response through B and T lymphocytes' activity with the result of substances that initiate contraction of the uterus. Infections are the most common cause of preterm labor is an infection of the membranes korioamnion. Infection and inflammation due to these microorganisms ultimately affect the formation of the enzyme phospholipase A₂ to release arachidonic acid from the fetal membrane, forming arachidonic acid-free. Free arachidonic enzyme prostaglandin biosynthesis is an essential ingredient that may induce uterine contractions, so the risk of preterm labor is enormous.

METHOD

This study is a case-control analytic survey. The purpose of this study is to analyze how a situation can occur through the retrospective approach.

Time and research location: Data collection was done within one year (1 January 2016 to 31 December 2016) by

looking at the register book perinatology space Madun City Hospital.

Population and Sample: This study's population were all newborns who were born with asphyxia neonatorum in hospitals Madun 2016 with. The number of comparison samples is 1:1, as many as 219 babies. Samples were taken by systematic sampling. Criteria for inclusion in this study were birth asphyxia with vaginal delivery or Sectio Caesarea (SC), abnormal bleeding (placenta previa or placental abruption), and amniotic rupture. Exclusion criteria in this study were asphyxiated infants with congenital disorders and IUFD.

Statistic test: The testing subjects of the statistics used in this study using the contingency coefficient to see the relationship between preeclampsia and preterm labor with asphyxia neonatorum. Calculations are analyzed by a computerized application using SPSS version 16.0.

RESULTS

In Table 1, the Distribution of frequency characteristics of the mother birthing in Madiun hospitals from January to December 2016 was 219 women giving birth. Mothers with preeclampsia are 98 people (44.7%) and mothers with asphyxiating 121 (55.3%). Gestational age at birth mothers obtained three categories, preterm 121 (55.2%), a

term to 79 (36.1%), and post-term 19 (8.7%). Based on the type of delivery, two vaginal delivery was 93 (42.5%), and section cesarean was 126 (57.5%).

Table 1 Distribution of frequency characteristics of the mother birthing in hospitals Madiun January to December 2016.

No.	Characteristics	Amount	
		F	%
1	Preeclampsia		
	a. Mother Not Preeclampsia	121	55.3
	b. Mothers With Preeclampsia	98	44.7
2	Gestational Age		
	a. Preterm	121	55.2
	b. Term	79	36.1
	c. Postterm	19	8.7
3	Type Of Delivery		
	a. Vaginal	93	42.5
	b. Sectio Caesarea	126	57.5
4	Circumstances Babies Born		
	a. No Asphyxia	126	57.5
	b. Asphyxiated	93	42.5
TOTAL		219	100

Table 2 cross-tabulation of preeclampsia relationship with asphyxia neonatorum

The control group	The sample group				P-Value	coefficient of contingency
	not asphyxia		asphyxia			
	n	%	N	%		
not preeclampsia	46	36.5	75	80.6	42.16	0.179
preeclampsia	80	63.5	18	19.4		
Total	126	100	93	100		

Table 3 cross-tabulation of preterm labor relationship with the incidence of asphyxia neonatorum

The control group	The sample group				P-Value	coefficient of contingency
	not asphyxia		asphyxia			
	n	%	N	%		
not preterm	50	65.8	48	34.2	1.67	0.087
preterm	26	34.2	44	8,21		
Total	76	100	92	100		

In the cross-tabulation table 2, preeclampsia correlation between asphyxia neonatorum, the test results obtained from the contingency coefficient's statistical analysis. The product states that the probability value of 0 and a value of significance at the cross tabulations > 0,05. It means that there is no significant correlation between preeclampsia and incidence of asphyxia neonatorum in the public district hospitals of Madiun city in 2016.

In the cross-tabulation table 3, preterm labor correlates with asphyxia neonatorum, resulting in the probability value of 1.676 and the significant value in the cross-tabulation of 0.195. This means a significant association between preterm labor and asphyxia neonatorum in the public district hospitals of Madiun city in 2016.

DISCUSSION

Asphyxia neonatorum an urgency in the newborn, therefore, should immediately get help resuscitation. Asphyxia is a medical condition where gas exchange occurs from the

placenta to the lungs and breathing, or not at all, which resulted in the combination of hypoxemia and hyperpnea [4]. The impact on the fetus is born, among others, the occurrence of disturbances in the central nervous system (brain edema, bleeding of the brain), heart failure (necrotic muscle papillary-tricuspid transient, cardiogenic shock), lung (SUDS aspiration meconium as well as a clear liquid, surfactant deficiency, persistent pulmonary hypertension), kidney (necrosis of renal tubules), adrenal (bleeding with adrenal insufficiency), liver (liver failure, elevated levels of the enzyme), gastrointestinal (necrotizing enterocolitis), metabolism (hypoglycemia, hypokalemia), blood system (interference freezing blood).

Such an occurrence is higher in developing countries due to the limited availability of facilities perinatology. Hypoxia due to asphyxia is characterized by a low pulse oxygen saturation (Spon) which cannot be monitored by the necessary care facilities [5]. General aid measures neonates were conducted: 1) the baby's head is placed in a lower position; 2) clear the airway of lenders (mouth and

throat and upper respiratory tract); 3) reducing the loss of breath babies with infant wrap and bathe with warm water; 4) giving excitatory cry (beating the soles of the feet or pressing on the baby's heel tendon); 5) in the emergency room is always available suction ladders infant baby and O2 with a mask.

In cases of preeclampsia, the blood vessels spasm of arterioles to the most critical organ in the body can lead to a network of metabolic disorders, disruption blood circulation, as well as the narrowing of the blood flow to uteroplacental circulation causing interference exchange of nutrients, CO₂ and O₂, which can cause neonatal asphyxia and death.

The research that has been done above showed that there was no relationship between preeclampsia and neonatal asphyxia. This can occur because of the many other factors that affect the incidence of asphyxia neonatorum in Madiun hospital. Asphyxia neonatorum caused by factors both mother and fetus, including maternal age is too old and too young, premature rupture of membranes long enough, the amniotic fluid mixes meconium, email, did the ANC, LBW, malpresentation, augmentation of labor using oxytocin, antepartum hemorrhage, eclampsia, and severe preeclampsia, anemia in pregnancy, and childbirth [6]. In another study conducted by Lamminpaa R. et al., the cause of preeclampsia is caused by several factors such as smoking, maternal age, obesity, antepartum hemorrhage [3].

Figure 1 set out that in the public district hospitals of Madiun city in 2016, vaginal delivery is done as many as 93 (42.5) and abdominal labor/section cesarean many as 126 (57.5%). From 126 deliveries SC, as many as ten infants asphyxia and 116 infants asphyxiated. This is due to the more rapid treatment duration and the reduction tendency of baby infant birth trauma. In an article written by Warkentin, babies born with cesarean section did not experience weight loss than infants born spontaneously [7]. This happens because of reduced levels of amniotic fluid swallowed by the baby and placenta insufficiency relative. This can lead to a decrease in uterine volume, reducing the uterine wall's voltage, and cause incoordination to occur uterus and prolonged labor. In this study, deliveries and emergency actions are not carried out immediately, resulting in morbidity and mortality in infants.

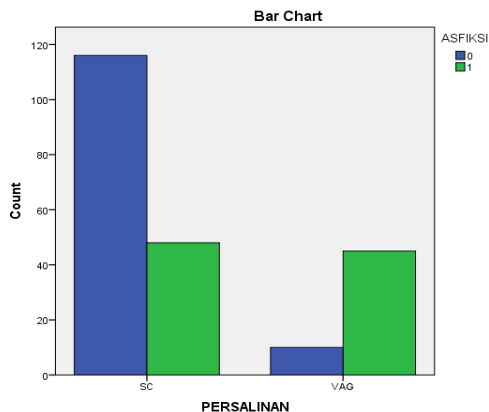


Figure 1: diagrams the type of delivery against asphyxia neonatorum

Preterm labor is the birth of a baby before 37 weeks' gestation complete. The cause of preterm labor is not a single, but a multi-complex such as an infection. Infections that occur during pregnancy will result in a specific immunologic response through B and T lymphocytes' activity with the result of substances that initiate contraction of the uterus. Infections are the most common cause of preterm labor is an infection of the membranes korioamnion. Infection and inflammation due to these microorganisms ultimately affect the formation of the enzyme phospholipase A2 to release arachidonic acid from the fetal membrane, forming arachidonic acid-free. Free arachidonic enzyme prostaglandin biosynthesis is an essential ingredient that may induce uterine contractions.

In this study, it was found that preterm birth is associated with asphyxia neonatorum and is quite susceptible to factors of asphyxia neonatorum. In a survey conducted by Ruben et al., premature labor can result in early pregnancy decidua shrinkage and may cause dysfunction or dysfunction of the placenta and uterus [8]. Placental dysfunction is closely related to the cardiovascular system and the transport of oxygen to the fetus. It can affect the fetus's worsening state, so it must be done with immediate delivery.

CONCLUSION

In the present study, due to the many factors of mother and fetus during pregnancy to delivery, the powerkesahatan needs to evaluate more in-depth in providing antenatal care. Government policies in antenatal care are doing the screening / early detection program risk pregnancies with antenatal care (ANC). The Integrated expected to contribute to the prevention of neonatal asphyxia during pregnancy. If caught early mothers who have risk factors for neonatal asphyxia, then do an immediate treatment to perform adequate treatment, either during pregnancy or childbirth. KIA handbook is The Maternal and Child Health (MCH) Book, which contains maternal health records (pregnant, maternity and delivery) and children (newborns to 6-year-olds) as well as various information on how to maintain and care for maternal and child health. KIA/ MCH handbook to guide health workers, cadres, even to his mother. There are various kinds of education health information in the book, either during pregnancy, childbirth, postpartum, and infants and toddlers. According to the contents of the KIA handbook, Counseling Award is expected to anticipate the occurrence of asphyxia neonatorum and a guide in managing activities and increasing knowledge for pregnant women pregnant with normal and high risk.

Statement Researcher: This article is original research that has been carried out by Dwi Ardani Rochmaniah and Nidatul Khofiyahon 2017 in Madiun hospitals. This research has not been done in any publication in the journal.

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