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The Relationship between Preeclampsia and Premature Incidence Rates

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Abstract:
Preeclampsia and eclampsia are causes of death in mothers whose incidence rates progressively increase yearly. Premature birth is one of the complications that can occur in pregnant women who suffer from preeclampsia, where premature birth is one of the causes of morbidity and mortality in infants. This study aims to analyze the relationship between preeclampsia and the incidence of prematurity. This research is an analytical observational study with a cross-sectional. The sample in this study was 35 samples of mothers who had preeclampsia and then analyzed using the Chi-square. The proportion of preeclampsia cases resulting in preterm labor was 13 (2.6%), with p=0.000. Conclusion. There is a relationship between preeclampsia and the number of premature events at the Paiton Health Center in 2021. It is hoped that the Paiton Health Center in Probolinggo Regency will evaluate the completeness of medical record filing and conduct early education for patients who are at risk or who do not have a risk for preeclampsia or premature events so that education can be carried out. early prevention and follow-up of patients who have been diagnosed with preeclampsia or in patients who are predicted to have preterm labor in order to receive early treatment to increase survival rates and quality of life of patients and fetuses.

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INTRODUCTION

More than one million babies die due to preterm labor every year in the world or 1 (one) baby every 30 seconds. The incidence of preterm labor is different in each country, in developed countries like Europe the figure is around 5-11%, while in the USA it is 11. 5%, whereas in developing countries the incidence is still much higher, for example in Sudan it is around 31%, India is 30%, and South Africa is 15%. Around 675,700 babies are born prematurely in Indonesia (Sijuang et al., 2023).

The Ministry of Health is carrying out several programs to improve public health status (impact or outcome) with several indicators, of the 5 (five) indicators on Infant Mortality Rate and Low Birth Weight which will be achieved, namely reducing Infant Mortality Rate from 32 to 24/1000 Live Births and reducing the percentage of Low Birth Weight from 10.2% to 8%. This means that the factors of the mother's condition before and during pregnancy greatly determine the condition of her baby, so the challenge ahead is to prepare prospective mothers so that they are ready for pregnancy, childbirth and care and are able to protect babies from infection (Ministry of Health of the Republic of Indonesia, 2018).

Based on a preliminary study conducted in the working area of the Paiton Health Center on April 27, 2022, by looking at the LB3 KIA data report at the Paiton Health Center in 2021, it was

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found that the incidence of preeclampsia in 2021 was quite high, namely, 35 mothers giving birth (7%) and the incidence of premature birth in 2021, namely 17 babies premature (3.4%). From these data, preeclampsia and abortion are still high in the Paiton Health Center working area in 2021, so several solutions are expected to reduce these incident rates. Prevention steps include comprehensive counseling, avoiding risky lifestyles, proper nutrition for weight gain, routine pregnancy checks (ANC), and ultrasound. Antenatal care has a real positive impact on reducing maternal and infant mortality because pregnant women can find out the growth of the fetus and its health (Novelia et al., 2021).

Pregnant women's nutrition greatly affects the fetus's health and development of the fetus so growth disturbances in the uterus can cause low birth weight (Novelia et al., 2021). Premature is defined as a baby born alive before 37 weeks of gestation. Globally, prematurity is the leading cause of perinatal and neonatal mortality and morbidity. Premature birth occurs for various reasons. Most preterm births occur spontaneously, but some cases of preterm birth are caused by induction of labor or cesarean delivery, whether for medical or non-medical reasons. Common causes of preterm birth include multiple pregnancies, infections, and chronic conditions such as diabetes and high blood pressure that occur in the mother during pregnancy. The existence of a genetic relationship can also be one of the causes of premature birth. However, the cause of preterm birth is often not identified (WHO, 2015). Anemia during pregnancy is one of the main causes of maternal and infant mortality. Iron deficiency can cause low birth weight (LBW), developmental disorders and obstructions in the fetus, fetal death in the womb, birth defects, miscarriages, and anemia in infants (Laiskodat et al., 2021; Putri et al., 2021). Poor living conditions during pregnancy can also cause LBW, such as radiation, high altitudes, and toxic substances such as pesticides (Kurniyawan et al., 2023).

The factors for the occurrence of low birth weight are a history of preeclampsia due to parity, maternal age, premature birth, premature rupture of membranes, twin pregnancies, history of previous low birth weight, environment, and fetus (congenital abnormalities) (Rahmawati et al., 2021). Preeclampsia is characterized by increased blood pressure after 20 (twenty) weeks of pregnancy, accompanied by proteinuria and generalized edema (Sohlberg et al., 2012). Symptoms of preeclampsia can occur in pregnant women, during childbirth, and during the puerperium, characterized by hypertension, edema, and increased proteinuria (Pusparini et al., 2021). Meanwhile, eclampsia is a condition where seizures occur in pregnant women with preeclampsia that is not accompanied by other causes (Cunninghanm et al., 2012). This study aims to analyze the relationship between preeclampsia and the incidence of prematurity.

METHOD

The research design is a quantitative correlational design using a cross-sectional study approach. In a cross-sectional study, the subject was observed only once through measurements or observations simultaneously with the aim of seeing the independent and related variables. The independent variable in this study is the dependent variable is the incidence of premature birth. The population in this study were all women who gave birth to preeclampsia in the Paiton Health Center working area in January - December 2021; 35 mothers gave birth.

The sampling technique used in this research is total sampling. The samples were all women giving birth to preeclampsia in the Paiton Health Center working area in January - December 2021. A total of 35 mothers gave birth. The primary data in this study were answers to a questionnaire about the relationship between preeclampsia and the incidence of prematurity at the Paiton Health Center, Probolinggo, East Java, Indonesia. The data collection used a questionnaire. The data

analysis technique used was Univariate Analysis with Frequency Distribution and Bivariate Analysis with Chi-Square Test.

RESULT

Respondents' Characteristics

Table 1. Frequency Distribution of Respondents' Characteristics based on Age, Education, and Occupation (n=35)

Variables	Frequency	Percentage
Age		
<20 years	1	2.8
20-35 years	22	62.8
>35 years	12	34.4
Educational background		
Elementary School	4	11.4
Junior High School	10	28.6
Senior High School	17	48.6
University	4	11.4
Occupation		
Housewife	25	71.5
Farmer	6	17.1
Entrepeneur	4	11.4

Based on table 1, most respondents are in the 20-35 years old range (62.8%), the largest number of respondents is junior high school education, with 17 people (50%), the largest number of respondents are housewives (71.5%).

Bivariate Analysis Results

Table 2. The Relationship between Preeclampsia and the Incidence of Premature Labor

Preeclampsia incident	Prematurity				Total		p-value
	Yes		No				
	n	%	n	%	f	%	
Preeclampsia	17	48.6	18	51.4	35	100	0.000
No preeclampsia	0	0	0	0	0	0	
Total	17	48.6	18	51.4	35	100	

Based on table 2, it shows that most of the mothers did not experience preeclampsia is zero (0%) and most of those who did not experience premature birth were 18 mothers (51.4%). There is a significant relationship between preeclampsia and premature labor (p=0.000≤0,05) at the Paiton Health Center, Probolinggo Regency.

DISCUSSION

From the result, 17 patients at the Paiton Health Center were diagnosed with preeclampsia and then gave birth to premature babies with a percentage of 48.6%. For patients diagnosed with preeclampsia and then gave birth to babies normally (not premature), there were 18 cases with a

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percentage of 51.4%. There is a significant relationship between preeclampsia and premature labor (p=0.000≤0,05) at the Paiton Health Center, Probolinggo Regency.

Appropriate normal delivery is described if the fetus expulsions occur at term (37 - 42 weeks) pregnancies born spontaneously with a back of the head presentation without complications for both mother and fetus. So that if the mother gives birth accompanied by preeclampsia, this is an abnormal delivery (pathophysiology). This can also cause complications for both the mother and the baby to be expelled. Several factors are thought to cause pregnant women to suffer from preeclampsia, namely nulliparity (pregnancy of the first child). Mother's age during pregnancy over 40 years, assisted reproduction pregnancy, the interval between pregnancies > 7 years, family history of preeclampsia, obesity, pregestational diabetes mellitus, multifetal pregnancy (twins), had suffered from preeclampsia in a previous pregnancy, the poor baby outcome in pregnancy previously, history of stunted fetal growth, history of placental abruption, history of fetal death, pre-existing medical or genetic factors.

Pregnant women over 40 are at double the risk of preeclampsia. The ideal age for pregnant women is 20-35 years due to physical and mental maturity. The reproductive organs are said to be not ready when they are <20 years old. Whereas at the age of > 35, it is not recommended for the process of pregnancy because considering that starting at this age, it is susceptible to disease. It is better for pregnant women to routinely check their pregnancies, namely at least 4x to the midwife and 2x to the DSOG. Preeclampsia screening carried out at 12-28 weeks of gestation is expected to detect the occurrence of preeclampsia early and precisely, know the mother and fetus's condition, and prepare for a normal, safe, and healthy delivery process.

A normal delivery that is right is illustrated if the process of expulsion of the fetus occurs at term (37 - 42 weeks) pregnancies born spontaneously with a back of the head presentation without complications for both mother and fetus. Preterm labor is thought to be a syndrome triggered by multiple mechanisms, including infection or inflammation, uteroplacental ischemia or bleeding, uterine overdistention, stress, and other immunological processes. Various factors are associated with preterm labor, but the mechanism is still being sought.

In general, the causes of preterm labor can be grouped into 4 groups: premature activation of the trigger for labor, inflammation/infection, placental bleeding, and excessive stretching of the uterus (Musdalifah, 2018). Various simple ways, through history and physical examination, have been carried out to detect early and predict the incidence of preterm labor. Looking for risk factors, screening for urogenital tract infections, monitoring uterine contractions, vaginal bleeding, and cervical examination (both digitally and sonographically) have been used as standard examinations which are expected to be an early screening for preterm birth, but these tests have not been able to diagnose early premature events (Gondo, 2012).

From table 6. above it can be seen that 13 patients at the Paiton Health Center were diagnosed with preeclampsia and then gave birth to premature babies with a percentage of 2.6%. For patients diagnosed with preeclampsia and then gave birth to babies normally (not premature) there were 22 cases with a percentage of 4.4%. From the table above, data can also be obtained that the incidence of preterm labor in patients not diagnosed with preeclampsia was 4 cases with a percentage of 0.8%.

The incidence of preeclampsia caused by endothelial dysfunction in blood vessels which functions as a medium for distributing nutrients and a medium for exchanging oxygen and carbon dioxide from mother to fetus (vasoconstriction), can interfere with the ongoing process of exchanging nutrients, oxygen, and carbon dioxide to the fetus, so it is feared that this condition If left for a long time, things can happen that can harm the mother, such as eclampsia and also harm the fetus, such as asphyxia, intrauterine growth restriction (IUGR) and fetal death (Septputri,

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2020). So, with this, the doctors from the Obstetrics and Gynecology department decided to indicate the expulsion of the fetus before the due time of delivery. This action aims to prevent things that can endanger the mother and fetus, as mentioned above if the fetus is still maintained in the mother's stomach and waiting for the due delivery time. Premature babies born after birth indications will then receive life support externally from related medical personnel in the form of resuscitation, stabilization, and other efforts made to increase life expectancy and improve the quality of life of these babies.

CONCLUSION

Based on research that has been conducted, the incidence of preeclampsia at the Paiton Health Center in 2021 is 35 cases, the incidence of prematurity due to preeclampsia is 13 cases, and 4 other cases are not caused by preeclampsia, and there is a relationship between preeclampsia and the incidence of premature delivery at the Paiton Health Center in 2021.

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