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RISK FACTORS OF PREECLAMPSIA

Eni Yuliasuti^{1✉}, Rita Yulifah², Herawati Mansur³

¹ RSUD Kanjuruhan Kabupaten Malang ^{2,3} Poltekkes
 Kemenkes Malang, Indonesia
eniperisti69@gmail.com

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* Corresponding Author:

Eni Yuliasuti, RSUD Kanjuruhan
 Kab Malang Jl Panji No 100
 Kepanjen Malang
 E-mail: eniperisti69@gmail.com,
 Phone: +62 822-3023-7246



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ABSTRACT

Pre-eclampsia is a pregnancy complication characterized by high blood pressure. Many risk factors can influence the incidence of pre-eclampsia, including maternal age, parity, gestational age, number of fetuses, number of ANC visits and history of hypertension. This study aims to find out the risk factors that are correlated with the incidence of pre-eclampsia. The design used in this study is analytic with a retrospective approach. The population in this study were all pregnant women in the third trimester with a diagnosis of pre-eclampsia in RSUD "Kanjuruhan" Kepanjen with a sample of 231 respondents selected using saturated sampling. Collecting data using data collection sheets, registers and patient status. From the results of multiple linear regression with 0.05, the probability is $0.333 - 0.923 > 0.05$, so there is no relationship between maternal age, parity, multiple pregnancies, history of hypertension, history of pre-eclampsia and obesity on the incidence of pre-eclampsia.

Keywords:

Risk factors, incidence of pre-eclampsia

INTRODUCTION

Mortality and morbidity in pregnant and maternity women is a big problem in developing countries (Girum & Wasie, 2017). The results of the Indonesian Demographic and Health Survey (IDHS) in 2017 stated that the maternal mortality rate decreased from 2012 from 359 per 100,000 live births to 205 per live birth. Based on the Routine Report of the Maternal Health Program of the Provincial Health Office in Indonesia in 2015, the causes of maternal death in Indonesia are still dominated by bleeding (28%), eclampsia 13%, sepsis 10%, abortion 11%, obstructed labor or late labor 9%, unplanned pregnancies. unwanted 7%, others 22%. Hypertension is the most common medical disease in pregnancy, approximately 10% of all pregnancies (Ying, Catoc, & Ouyang, 2018). Careful observation of this condition indicates that the incidence of hypertension varies according to geographic location and race (Plante et al., 2021). Hypertensive disorders tend not to be prevented so that early detection

and appropriate management can minimize the severity of the disease (Altorjay, Nyari, Suranyi, & Nemeth, 2017). Hypertensive disorders in pregnancy form one of the three deadly triads along with bleeding and infection, which are the most common causes of pregnancy morbidity and mortality (Gbala & Adegoke, 2021).

The incidence of pre-eclampsia is influenced by several factors, including parity with nulliparous women having a greater risk when compared to multiparous women (Pogačnik et al., 2020). Other risk factors associated with pre-eclampsia include multiple pregnancies, history of chronic hypertension, maternal age over 35 years, excessive maternal weight and African-American ethnicity (Daso et al., 2019). The role of midwives in relation to high blood pressure disorders during pregnancy lies in their thoroughness in conducting examinations, early identification and consulting or collaborating with doctors. Therefore, avoiding overly assuming that the findings obtained indicate normal conditions will help establish a correct diagnosis (Millinton, Magarey, Dekker, & Clark, 2019).

Pre-eclampsia is a specific syndrome in pregnancy. Pre-eclampsia is a condition where there is hypoperfusion to organs due to vasospasm and endothelial activation characterized by hypertension, proteinuria and edema. The cause of pre-eclampsia is not yet known (Phipps, Thadani, Benzing, & Karumanchi, 2019). There is much speculation about the cause of pre-eclampsia so it is called the disease theory. Many theories have been put forward by experts but three hypotheses currently occupy the main investigation, namely immunological factors, prostaglandin syndrome and uteroplacental ischemia (Burton, Redman, Roberts, & Moffett, 2019). Pre-eclampsia in pregnant women does not occur by itself, there are many risk factors that can affect the incidence of severe pre-eclampsia such as: maternal age, parity, gestational age, number of fetuses, number of ANC visits and history of hypertension (Cunningham, 2013).

Based on 2015 report data at RSUD "Kanjuruhan" Kepanjen showed that of 1,142 mothers who entered through the delivery room, 6.65% were diagnosed with mild preeclampsia, 13.57% severe preeclampsia, and 1.31% eclampsia. While the highest maternal mortality rate is due to preeclampsia, of which 60% of maternal deaths are due to preeclampsia, 20% is heart disease, 10% is HPP, and 10% is diagnosed with KET. So that researchers are interested in conducting more specific research on "Risk factors that correlate with the incidence of preeclampsia.

METHOD

This study is a *correlational analytic* study using a *retrospective* approach. The population in this study is secondary data in 2015 all third trimester pregnant women with a diagnosis of pre-eclampsia as many as 231 respondents. The sampling technique used is *saturated sampling*. This research was conducted at Kanjuruhan Hospital, Malang Regency. The criteria for the samples taken are as follows (1) Period of visit January 1 to December 31, 2015 (2) The identity of the respondent is recorded in the Maternity Room register at RSUD Kanjuruhan. Data collection uses data collection sheets, registers and patient status. Researchers used secondary data, namely medical records of pregnant patients in the third trimester with a diagnosis of pre-eclampsia by assessing maternal age, parity, multiple pregnancies, history of hypertension, history of pre-eclampsia, and pre-pregnancy weight. Maternal age is the mother's age based on the last birthday. Parity is the number of maternal births. Twin pregnancies are pregnancies with fetuses > than 1. A history of hypertension is a time before pregnancy systolic blood pressure > 140 mm Hg, and diastolic > 90 mmHg. A history of preeclampsia is a history of preeclampsia in a previous pregnancy. Obesity is a body mass index > 35 kg/m² before pregnancy. The data analyst used in this study used multiple regression test to determine the relationship of more than one variable with a significance of 0.05.

RESULTS

Table 1. Characteristics of Respondents

Variable (n=231)	f (%)
Mother's Age	
<20 Years	18 (7,8)
20-35 Years	154 (66.7)
>35 Years	59 (25.5)
Parity	
1	120 (51.9)
2	96 (41.6)
3	14 (6.1)
≥ 4	1 (0.4)
Twin Pregnancy	
Yes	4 (1.7)
No	227 (98.3)
History of Hypertension	
Yes	55 (23.8)
No	176 (76.2)
History of Pre-Eclampsia	
Yes	55 (23.8)
No	176 (76.2)

Variable (n=231)	f (%)
Obesity	
Yes	76 (32.9)
No	155 (67.1)
Pre-eclampsia	
Light	76 (32.9)
Heavy	155 (67.1)

Table 1 shows that most of the respondents aged 20-35 years (66.7%), had parity 1 (51.9%), did not experience multiple pregnancies (98.3%), did not have a history of hypertension before pregnancy (76.2 %), did not have a history of preeclampsia in a previous pregnancy (76.2%), was not obese (67.1%) and had severe pre-eclampsia 67.1 (%).

Table 2. Analysis of Multiple Linear Regression Statistical Test Results

Variabel (n=231)	Pre-Eclampsia		Regresion Coefficen b	p
	Mild f (%)	Severed f (%)		
Age				
<20 Years	3 (16.7)	15 (83.3)	0.024	0.721
20-35 Years	56 (36.36)	98 (63.63)		
>35 Years	17 (23.73)	42 (76.27)		
Parity				
1	34 (28.33)	86 (71.67)	0.058	0.337
2	38 (36.48)	58 (55.52)		
3	4 (28.57)	10 (71.47)		
≥ 4	0 (0)	1 (100)		
Twin Pregnancy				
Yes	1 (25)	3 (75)	0.102	0.676
No	152 (66.96)	125 (55.06)		
History of Hypertension				
Yes	19 (34.55)	36 (65.45)	0.012	0.873
No	57 (32.39)	119 (67.61)		
History of Pre-Eclampsia				
Yes	19 (34.55)	36 (65.45)	0.115	0.923
No	57 (32.39)	119 (67.61)		
Obesity				
Yes	8 (10.53)	68 (89.47)	0.067	0.752
No	14 (9.03)	141 (90.97)		

Table 2 shows that there is a statistically insignificant effect between maternal age, parity, multiple pregnancies, history of hypertension and obesity, history of pre-eclampsia, on the incidence of pre-eclampsia. Maternal age >35 years (b=0.024; p= 0.721), primigravida mother (b=0.058; p= 0.337), multiple pregnancies (b=0.102; p= 0.676), history of hypertension (b=0.012; p= 0.873), History of pre-eclampsia (b=0.115; p= 0.923) and obesity

($b=0.067$; $p= 0.752$) increased the likelihood of pre-eclampsia in third trimester pregnant women.

DISCUSSION

Maternal age has an influence on the incidence of pre-eclampsia but not statistically significant ($0.721 > 0.05$). Third trimester pregnant women who are >35 years old affect the occurrence of preeclampsia as much as 0.024 units higher than women aged <35 years. Based on the results of research that has been carried out by researchers, it is found that the majority (67%) of third trimester pregnant women who experience pre-eclampsia in RSUD "Kanjuruhan" Kepanjen Malang Regency are of reproductive age (20-35 years). This is not in accordance with research (Nafida, 2021) that the age of pregnant women >35 years will increase the incidence of preeclampsia, also supported by research (Daso et al., 2019) that preeclampsia often affects young women, while the maternal age is more than 35. Over the years, changes have occurred in the body due to the aging of the organs. That way, the possibility of getting diseases during pregnancy related to age will increase, such as high blood pressure (hypertension), pregnancy poisoning (pre-eclampsia/eclampsia), diabetes, heart and blood vessel disease.

Primigravida mothers have an influence on the incidence of pre-eclampsia but not statistically significant ($0.337 > 0.05$). Mothers with Primigravida affect the occurrence of pre-eclampsia as much as 0.058 units higher than those with multigravida. Most of the third trimester pregnant women who experienced pre-eclampsia were parity one/first pregnancy as many as 123 respondents (53%). This contradicts the theory which states that in the first pregnancy the formation of *blocking antibodies* against placental antigens is not perfect (Pogačnik et al., 2020) nor is it consistent with research conducted by (Fitriani, Apriani, & Sari, 2019) that primigravida parity mothers often Pre-eclampsia occurs because the mother is pregnant for the first time and often experiences stress in the face of childbirth.

The statistical results showed that there was no relationship between twin pregnancies and the incidence of pre-eclampsia, with a probability of $0.676 > 0.05$. Mothers with multiple pregnancies affected the occurrence of pre-eclampsia by 0.102 units higher than those without. Twin pregnancies occur in a small proportion of third trimester pregnant women with pre-eclampsia, as many as 4 respondents (2%) but of the 4 twin pregnancies 75% experienced

severe pre-eclampsia, which in theory states that hypertension in pregnancy can arise in multiple pregnancies by due to exposure to large numbers of chorionic villi. In a study (Laine et al., 2019) that in women with twin pregnancies it was 4 times more likely than singleton pregnancies to develop pre-eclampsia.

There was no significant relationship between a history of hypertension and the incidence of pre-eclampsia ($0.873 > 0.05$). Mothers with a history of hypertension affect the occurrence of preeclampsia as much as 0.012 units higher. Most of the respondents did not have a history of hypertension, as many as 176 respondents (76%). This is contrary to the theory which states that pregnancy can trigger or worsen the condition of mothers with a history of hypertension, where hypertension is a very important problem and is an interesting and unsolved concern. As described by (Scantlebury et al., 2018) the tendency to have hypertension before pregnancy can increase the occurrence of pre-eclampsia/eclampsia in pregnancy.

The results of statistical tests in the study showed that there was no relationship between a history of pre-eclampsia and the incidence of pre-eclampsia with a probability of $0.923 > 0.05$. A history of preeclampsia has an effect of 0.115 units higher for preeclampsia. Only a small proportion of third trimester pregnant women with pre-eclampsia have a history of pre-eclampsia, namely as many as 22 respondents (10%), although the theory has stated that women with a history of pre-eclampsia in their first pregnancy have 5-8 times to experience pre-eclampsia again in their second pregnancy. . This is probably because most of the respondents did not have a history of pre-eclampsia. In women who were normotensive during their first pregnancy, the incidence of preeclampsia in subsequent pregnancies was lower than in their first pregnancy with preeclampsia. (Cunningham, 2013)

Obesity/having a body mass index >35 before pregnancy occurred in most of the third trimester pregnant women with pre-eclampsia as many as 156 respondents (68%). Mothers with obesity had a relationship with the occurrence of pre-eclampsia but not statistically significant (0.752) and gave an effect of 0.067 units higher. This is in accordance with research (Khader, Batieha, Al-njadat, & Hijazi, 2018) that obesity in addition to causing high cholesterol in the blood also causes the heart to work harder, because the amount of blood in the body is about 15% of body weight, so The fatter a person is, the more the amount of blood contained in the body, which means the heavier the pumping function of the heart. So that it can contribute to the occurrence of preeclampsia.

CONCLUSION

The characteristics of pregnant women with pre-eclampsia in RSUD Kanjuruhan Malang are mostly third trimester pregnant women aged 23-35 years (66.7%), first pregnancy (51.9%) and the tendency to occur in respondents who are not obese (67.1%). %, so that the multiple linear regression test results were $0.333-0.923 > 0.05$, meaning that there was no significant relationship between risk factors for maternal age, parity, multiple pregnancies, history of hypertension, history of pre-eclampsia and obesity. There is no significant relationship between risk factors and the incidence of preeclampsia because there are ages 23-35 years who are not a risk factor group for preeclampsia and the possibility of confusion in the diagnosis of preeclampsia.

ABBREVIATIONS

PE, Pre Eklampsia ; HELLP, Hemolysis Elevated liver enzymes Low Platelet; AKI, Angka Kematian Ibu; AKB, Angka Kematian Ibu, SUPAS, Survei Penduduk Antar Sensus; MDGs, Millenium Development Goals; UK, Usia Kehamilan; IRT, Ibu Rumah Tangga; SD, Standar Defisiensi; IUGR, intrauterine growth restriction

COMPETING INTEREST

No Interest

AUTHORS' CONTRIBUTION

Eni Yuliasstuti as the main researcher collects related articles, conducts research, analyzes data and writes research manuscripts. Herawati Mansur made material suggestions for research discussion materials. Rita Yulifa performs data analysis and represents the results of data analysis

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