



Preeclampsia in RSKD Ibu Anak Siti Fatima: effects of age risk factors and preeclampsia in pregnant women's past

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ABSTRACT

Preeclampsia is when a pregnant woman has blood pressure elevation beyond the average value determined by some organization, like Joint National Committee. Preeclampsia is a perilous threat to a pregnant woman and her child. Preeclampsia can be caused by some risk factors that can lead to the development of preeclampsia in a pregnant woman, like risky age and a history of previous preeclampsia. Knowing the risk factors for preeclampsia is a significant first step for evading preeclampsia occurrence in a pregnant woman to reduce the mortality of women during their pregnancy period. This research was an analytic observational study with a case-control approach. The sampling method was the total sampling technique and 182 samples which 91 case samples and 91 control samples were obtained through medical records. The research data was analyzed with a chi-square test. The result showed that of all the 182 samples, there were 31 pregnant women (34.1%) with risky age who had preeclampsia with a p-value of 0.000 and odd ratio (OR) of 4.185, 35 pregnant women (38.5%) with a history of previous preeclampsia who had preeclampsia with p-value 0.000 and bizarre ratio (OR) 56.250. In this research, risky age and history of previous preeclampsia were risk factors for preeclampsia at Siti Fatimah Makassar Woman and Children Regional Special Hospital in 2021.

Keywords: Preeclampsia; risky age; history of preeclampsia

1. INTRODUCTION

The high level of mortality of pregnant women is a health issue that is still very concerning in Indonesia and even the world. The maternal mortality rate, or can be abbreviated as MMR, is one of the benchmarks for assessment in assessing maternal and child health issues in an area. According to the World Health Organization (WHO) in its

latest update in 2017, maternal mortality rates reached 295,000 deaths per year and 810 maternal deaths every day worldwide. Most keratin comes from developing countries, with about 94% of the maternal mortality rate with a mortality ratio of 11 deaths per 100,000 population. Indonesia's Health Profile recorded that in 2021 maternal mortality reached 7,389 deaths, and deaths due to hypertension ranked fourth with a mortality rate of 1,077 cases of death and preeclampsia is one form of hypertension. The health profile of South Sulawesi Province also recorded 195 maternal deaths per year in 2021, with 41 deaths due to hypertension, which made South Sulawesi Province ranked seventh nationally in the order of Maternal Mortality Rate. Makassar City ranks fourth in South Sulawesi Province, with 14 maternal deaths yearly 2021 (Dinkes 2021; Ministry of Health of the Republic of Indonesia. 2021; WHO, UNICEF 2019)..

One of the most common causes of maternal death in the world is hypertension in pregnancy, such as preeclampsia which is a form of hypertension that occurs in mothers who appear after 20 weeks of gestation where systolic blood pressure ≥ 140 mmHg and diastolic blood pressure ≥ 90 mmHg in 2 times events lasting for at least 4 hours or for 2 hours with systolic blood pressure ≥ 160 mmHg and or diastolic blood pressure ≥ 110 mmHg and occurrence of organ damage or failure is usually characterized by the presence of protein in the urine or proteinuria. Preeclampsia has several risk factors, such as age at risk, age too young < 20 years or too old > 35 years, and a history of preeclampsia. If pregnant women were given some heads up about the risk factors for preeclampsia that would be undoubtedly a good step for mothers who plan to get pregnant to be able to avoid or at least minimize the possibility of preeclampsia so that this will reduce maternal mortality during pregnancy (Graham J Burton, Christopher W Redman, James M Roberts 2019; Ives et al. 2020; Karrar & Hong 2022; Khalil 2017; Primayanti et al. 2022).

Medical record data at RSKD Ibu Anak Siti Fatimah in 2021 showed a relatively high number of preeclampsia with 182 cases, making researchers feel it is necessary to research to determine for sure the risk factors for age and history of preeclampsia in pregnant women against the incidence of preeclampsia at RSKD Ibu Anak Siti Fatimah Makassar in 2021.

2. METHODS

The research design used was analytical observational research with a case-control design. The population of this study is all pregnant women at RSKD Ibu Anak Siti Fatimah Makassar in 2021 who had preeclampsia. The sampling method in this study uses the total sampling technique with a ratio of 1:1.

3. RESULTS AND DISCUSSION

Table 1 Characteristics of Research Samples at RSKD Ibu Anak Siti Fatimah Makassar in 2021

Variable		n (%)
Mother's Age	< 20 Year	11 (6.0%)
	20-35 Year	141 (77.5%)
	> 35 Year	30 (1.5%)
History of Preeclampsia	Yes	36 (19.8%)
	No	146 (80.2%)

The distribution of study sample characteristics based on age and history of preeclampsia is presented in Table 1. Based on the sample age group of the total sample, a median age of 27 (23-34) years, with a median age of 18 (17-19) years in the age group < 20 years, with a median age of 26 (23-31) years in the age group of 20-35 years, and with a median age of 40 (38-42) years in the age group > 35. While in the preeclampsia history group, as many as 36 people (19.8%) had a history of preeclampsia, and as many as 146 people (80.2%) did not have a history of preeclampsia

Table 2 Risk Analysis of Maternal Age on the Incidence Rate of Preeclampsia at RSKD Ibu Anak Siti Fatimah Makassar

Mother's Age	Preeclampsia		Total	p value	OR	95% CI
	Case %	Control %				
<20 or >35 years	31 (34.1%)	59 (24.7%)	41 (22.5%)	0.000	4.185	1.905-9.194
20-35 years	60 (65.1%)	7 (2.9%)	141 (77.5%)			
Total	91 (100.0%)	91 (100.0%)	182 (100.0%)			

Table 2 presents an analysis of maternal age risk to the incidence of preeclampsia. In the case group, 31 people (34.1%) were mothers of at-risk age, and 60 people (65.1%) were mothers of non-risk age, while in the control group, ten people (11.0%) were mothers of at-risk age, and 81 people (89.0%) were mothers of non-risk age. From the results of bivariate chi-square analysis, a p-value of 0.000 was obtained, showing a significant difference between the case and control groups. An odd ratio (OR) of 4.185 with a CI of 95% (1,905-9,194) indicates that mothers with age at risk of <20 or >35 years have a four times greater risk of developing preeclampsia than mothers who have an age not at risk of 20-35 years.

Table 3 Risk Analysis of Preeclampsia History on the Incidence Rate of Preeclampsia at RSKD Ibu Anak Siti Fatimah Makassar

History of Preeclampsia	Preeclampsia		Total	p value	OR	95% CI
	Case %	Control %				
Yes	35 (38.5%)	1 (1.1%)	36 (19.8%)	0.000	56.250	7.495- 422.154
No	56 (61.5%)	90 (98.9%)	146 (80.2%)			
Total	91 (100.0%)	91 (100.0%)	182 (100.0%)			

Table 3 presents a risk analysis of preeclampsia history on the incidence of preeclampsia. In the case group, 35 people (38.5%) were mothers with a history of preeclampsia, and 56 people (61.5%) were mothers without a history of preeclampsia. In contrast, in the control group, one person (1.1%) was found to be a mother with a history of preeclampsia, and 90 people (98.9%) were mothers without a history of preeclampsia. From the results of bivariate chi-square analysis, a p-value of 0.000 was obtained, showing a significant difference between the case and control groups. An odd ratio (OR) of 56,250 with a CI of 95% (7,495-422,154) showed that mothers with a history of preeclampsia had a 56 times greater risk of developing preeclampsia than mothers without a history of preeclampsia.

Based on the results presented in Table 2 states that the age at risk of < 20 or > 35 years is a risk factor for the incidence of preeclampsia at RSKD Ibu Anak Siti Fatimah Makassar. The results of this study are in line with the study of Utari Deshinta and Hardy Hasibuan (2022) at the Haji Medan General Hospital with a sample of 42 case groups and 42 control groups, obtaining a p-value of 0.000, which means that the age of pregnant women has a significant relationship with the incidence rate of preeclampsia at the Haji Medan General Hospital. From the study's conclusion, mothers with a risk of pregnancy under 20 years and over 50 years have a greater chance of experiencing preeclampsia. The results of this study are also in line with research conducted by Darmawan Alifia Nurdani et al. (2021) at RSIA Siti Khadijah 1 with a sample of 45 samples; this study also explained the significant relationship between the age of pregnant women and the incidence rate of preeclampsia at RSIA Siti Khadijah 1. In pregnant women who have the age of under 20 years, the body still needs to adapt to the drastic changes that will occur when being pregnant at an early age; this is because the reproductive function is not too mature, so changes in regulation due to sudden pregnancy will make the mother's body tend to be unprepared including in the process of remodeling the spiral arteries and if this process is disrupted it will result in preeclampsia. Meanwhile, mothers over the age of 35 years, the body has regressed or degenerative in its normal function so that body regulations that should be able to follow the process changes needed during pregnancy

can no longer be followed by the mother's body. It is also found that estrogen production is decreasing in the case of 35 years old mothers, while according to the theory, estrogen dramatically affects the heart's function in working. Estrogen affects the contractility of the heart, so the lack of estrogen will reduce the contractility function of the heart and result in inefficient left ventricular diastole function; this will lead to a lack of blood removed from the heart so that there will be an accumulation of blood in the left ventricle which triggers obstruction of blood flow entering from the lungs to the left part of the heart and will result in pulmonary hypertension if this continues to happen, it will cause systemic hypertension in the body, and if this happens in pregnant women, it can undoubtedly affect the uteroplacental flow, therefore in the results of the study presented age at risk has a significant relationship with the incidence of preeclampsia (Arwan & Sriyanti, 2020; Brosens et al., 2015; Dewie et al., 2020; Li et al., 2017; Weissgerber & Mudd, 2015).

Based on the results presented in Table 3 state that a history of preeclampsia is a risk factor for the incidence of preeclampsia at RSKD Ibu Anak Siti Fatimah Makassar. The results of this study are in line with research conducted by Eny Susanti (2021) at the Ummi Talango Primary Clinic with a sample of 46 p-values of 0.000, which means that a history of preeclampsia for pregnant women has a significant relationship with the incidence of preeclampsia at the Ummi Talango Primary Clinic. The study's conclusion revealed that mothers with preeclampsia have a greater chance of experiencing preeclampsia. Pregnant women with a history of preeclampsia also tend to experience preeclampsia again; this is because pregnant women with a history of preeclampsia usually have risk factors that still exist in it and tend to get worse. People with a history of preeclampsia usually have previous risk factors, such as excessive immune reactions. Hence, this tends to happen again in the future when the mother is pregnant again, also with chronic diseases predisposing factors to preeclampsia in previous pregnancies. Therefore, the results of the study presented a history of experiencing preeclampsia previously had a significant relationship with the incidence of preeclampsia (English et al., 2015; Setyorini et al., 2017; Galaviz-Hernandez et al. 2019; Harutyunyan et al. 2013; Weinstock et al. 2020)

CONCLUSION

In conclusion, the findings from this study shed light on critical factors contributing to the incidence of preeclampsia. Table 3 illustrates that a history of preeclampsia significantly increases the risk of developing preeclampsia in pregnant women. Mothers with a history of preeclampsia were found to have a 56-fold higher risk of experiencing preeclampsia compared to those without such a history. These results emphasize the importance of monitoring and providing specialized care for pregnant women with a prior history of preeclampsia to reduce the risk of recurrence.

Additionally, Table 2 highlights that maternal age is a crucial factor in the occurrence of preeclampsia. Mothers under 20 years of age and those over 35 years of age are at a higher risk of developing preeclampsia. This study aligns with previous research, emphasizing that younger pregnant women face challenges in adapting to the

physiological changes associated with pregnancy, while older mothers may experience degenerative changes that affect their ability to adapt. The role of estrogen and its impact on cardiovascular function further underscores the significance of age as a risk factor.

In summary, this research underscores the importance of considering both a history of preeclampsia and maternal age when assessing the risk of preeclampsia in pregnant women. Identifying and managing these risk factors early in pregnancy is crucial for reducing the incidence and complications of preeclampsia. These findings also corroborate similar research, strengthening the body of evidence supporting the need for targeted preventive and care strategies in high-risk pregnancies.

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