

Research Article

The Characteristics of Preeclampsia and Eclampsia Patients at Dr. T.C. Hillers Regional Hospital Maumere

Karakteristik Pasien Preeklampsia dan Eklamsia di RSUD Dr. T.C. Hillers Maumere

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ABSTRACT

Preeclampsia can occur from the time the mother is pregnant until 48 hours to 6 weeks after giving birth and is associated with an increased complication rate of 2-8% during pregnancy, contributing to 9 - 26% of maternal deaths. This condition can have significant prolonged effects on both the mother and the baby. Considering the high rates of morbidity and mortality in mothers and babies due to preeclampsia, this study aims to understand the characteristics of patients with preeclampsia at T.C. Hillers Regional Hospital of Maumere within the period of January 1st to December 31st, 2022. This study is a retrospective descriptive study using secondary data. The data collection was performed on patients diagnosed with preeclampsia and eclampsia during the study period. The results showed that most participants were between 20-34 years old, had a body mass index (BMI) of ≥ 25 , multigravida (had multiple pregnancies), housewives, High School graduates, and had a history of chronic hypertension. Based on risk factors, 35.5% of the subjects were ≥ 35 years old, 31% were primigravida (first-time pregnant), 26% were obese, 21% had a history of hypertension in previous pregnancies, 10,5% had chronic hypertension, 3% had multiple gestations, 1% of the subjects had a pregnancy interval >10 years, and 0.5% had diabetes mellitus. This study provides an overview of the characteristics and risk factors of pregnant women with preeclampsia in Maumere.

Keywords: *Eclampsia, preeclampsia, risk factor*

ABSTRAK

Preeklampsia dapat terjadi sejak ibu mengandung hingga 48 jam - 6 minggu paska melahirkan dan berhubungan dengan peningkatan komplikasi kehamilan sebesar 2-8%, serta berkontribusi terhadap 9-26% kematian maternal. Kondisi ini dapat menyebabkan efek berkepanjangan yang signifikan terhadap ibu dan bayi. Melihat tingginya angka morbiditas dan mortalitas ibu dan bayi akibat preeklampsia, penelitian ini bertujuan untuk mengetahui karakteristik pasien dengan preeklampsia di RSUD T.C. Hillers di Maumere selama periode 1 Januari–31 Desember 2022. Penelitian ini merupakan studi deskriptif retrospektif dengan menggunakan data sekunder. Pengambilan data dilakukan pada pasien yang terdiagnosis preeklampsia dan eklamsia dalam periode studi. Hasil studi menunjukkan mayoritas subjek berusia 20-34 tahun, memiliki IMT ≥ 25 , multigravida, bekerja sebagai ibu rumah tangga, memiliki pendidikan terakhir pada jenjang SMA, dan memiliki riwayat hipertensi kronis. Berdasarkan faktor risiko, subjek yang berusia ≥ 35 tahun sebanyak 35.5%, 31% merupakan primigravida, 26% memiliki obesitas, 21% memiliki riwayat hipertensi pada kehamilan sebelumnya, 10,5% memiliki HT kronis, 3% memiliki kehamilan multigestasi, 1% subjek memiliki jarak kehamilan >10 tahun, dan 0.5% memiliki diabetes melitus. Studi ini memberikan gambaran terkait karakteristik dan faktor risiko ibu hamil dengan penderita preeklampsia di Maumere.

Kata Kunci: Eklamsia, faktor risiko, preeklamsia

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INTRODUCTION

Preeclampsia is defined as a new onset of hypertension during pregnancy. The diagnosis parameter includes systolic blood pressure of 140mm Hg or higher or diastolic blood pressure of 90 mm Hg or higher occurring on two occasions in at least 4 hours apart, accompanied by either the finding of dipstick proteinuria +2 or 300 mg per 24 hours, creatinine serum >1.1, creatinine and urinary protein ration >0.3, more than twice elevation of transaminase enzymes and thrombocyte count < 100.000 at more than 20 weeks of gestation. If a systolic blood pressure of 160mmHg or higher or diastolic blood pressure of 110 mm Hg or higher were found on two occasions within a short interval, or there were symptoms of headache, epigastric pain, and blurry vision, the diagnosis of severe preeclampsia is made (1).

Preeclampsia can happen when the woman is pregnant until up to 48 hours -6 weeks post labor and is associated with higher pregnancy complications of 2-8%, contributing to 9-26% maternal death in developing countries and 16% in developed countries (1,2). There are approximately 8,5 million women diagnosed with preeclampsia annually (3). This condition can have a long-term significant effect on mothers and babies. A preeclampsia mother has a 2-4 times higher risk of developing hypertension, 2 times higher risk of dying from cardiovascular events, and 1,5 times higher risk of experiencing a stroke (4). Fetus from a preeclampsia mother has a risk of intrauterine growth restriction (IGT), premature labor, oligohydramnios, abruptio placenta, fetal distress, and intrauterine death (5,6).

Efforts to reduce preeclampsia morbidity and mortality are made through early management and prevention of high-risk mothers. The predisposing preeclampsia factors are divided into high and moderate. Preeclampsia screening categorizes a mother as high risk if there is at least one preeclampsia history in a previous pregnancy, multi-gestation pregnancy, history of chronic hypertension, kidney disease, diabetes in pregnancy, and autoimmune. A pregnant mother is classified in the moderate risk group if there are two identified risk factors from the previous pregnancy such as primigravida, pregnancy interval of more than 10 years, body mass index (BMI) higher than 30kg/m², aged more than 35 years old, history of preeclampsia in family, in-vivo fertilization (IVF) or below-average income. In Indonesia, preeclampsia screening developed based on NICE and ACOG guidelines is routinely performed during the first visit (4). Other than the predisposing factors, socio-demographic factors such as education level and occupation contribute to preeclampsia incidence. The education level is linked to how knowledgeable the mother is regarding preeclampsia prevention and risk factors. The low socio-economic status is related with providing and maintaining good nutritional status that can influence overall health during pregnancy.

Considering the high morbidity and mortality of mother and baby due to preeclampsia, we aim to identify preeclampsia patients' characteristics in Dr. T.C Hillers regional hospital of Maumere within the period of 1 January-31 December 2022.

METHOD

This is a descriptive retrospective study. The data was collected secondarily from the patient registry at Angrek Ward at Dr. T.C Hillers regional hospital of Maumere and patients' health records. All patients with preeclampsia and eclampsia from 1 January-31 December 2022 were collected from the registry. Then, more data were collected from patients' health records. Each preeclampsia and eclampsia case were analyzed descriptively.

RESULTS

Out of all pregnant mothers diagnosed with preeclampsia and eclampsia by ob-gyn between 1 January-31 December 2022, 200 (8%) recruited pregnant mothers fulfilled the inclusion criteria while excluding pregnant mothers with repeated visits from a total of 2320 births. The variables investigated in this study are age, body mass index (BMI), pregnancy history, history of maternal preeclampsia or female siblings, prior hypertension during pregnancy, chronic hypertension, kidney disease, and history of diabetes and autoimmune. As presented in Table 1, the distribution of study subjects based on age showed that most preeclampsia cases happened among respondents aged 20-34 years old, accounting for 121 women (60,5%), and the least among respondents younger than 20 years old as many as 8 women (4%).

Tabel 1. Age distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

Age	Frequency	Percentage
< 20	8	4
20 - 34	121	60.5
≥ 35	71	35.5
Total	200	100

Based on the BMI categorization presented in Table 2, preeclampsia and eclampsia occurred in mostly pregnant mothers with BMI ≥25-29,9, accounting for 86 women (43%), and the least among women with BMI <18.5, amounting to 16 women (8%).

Tabel 2. BMI distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

BMI	Frequency	Percentage
Underweight <18.5	16	8
Normal 18.5–24.99	46	23
Overweight ≥25–29.9	86	43
Obesitas ≥30	52	26
Total	200	100

Based on gravid status in Table 3, preeclampsia and eclampsia cases were dominant in multigravida women, as many as 138 women (69%).

Tabel 3. Gravid distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C. Dr. T.C Hillers regional hospital of Maumere

Gravid	Frequency	Percentage
Primigravid (First Pregnancy)	62	31%
Multigravid	138	69%
Total	200	100

Table 4 presents subject distribution based on parity and shows that the multiparity group dominates preeclampsia and eclampsia cases in 82 women (41%) and the least among primipara women, as many as 55 women (27.5%).

Tabel 4. Parity distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

Parity	Frequency	Percentage
Nulipara (Parity 0)	63	31.5
Primipara (Parity 1)	55	27.5
Multipara (Parity ≥2)	82	41
Total	200	100

Table 5 and 6 show preeclampsia and eclampsia risk distribution among respondents. Both tables are separated due to the proportion of risk factors for preeclampsia history in a previous pregnancy that can be applied to the multigravida group. Based on our observation, almost all patients understand hypertension but not preeclampsia, leading us to categorize respondents with a history of preeclampsia on the last pregnancy into the group of people with prior pregnancy hypertension. Table 5 shows the respondents' distribution based on their history of hypertension during pregnancy. Out of 138 multigravida women, there are 29 women with previous hypertension pregnancy history (21%). Table 6 shows that out of 200 pregnant mothers with hypertension, there are 6 multi-gestation pregnancies (3%), 21 women with chronic hypertension (10.5%), 1 with Diabetes Mellitus (0,5%), 62 primigravida (31%), 2 pregnancy intervals of more than 10 years (1%) and 52 with obesity (26%).

Tabel 5. Hypertension history distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

Prior Hypertension in Pregnancy	Usia		Total (Multigravida)
	<35 th	≥35 th	
Yes	11	18	29 (21%)
No	61	48	109 (79%)
Total	72	66	138

Tabel 6. Preeclampsia risk factor distribution of pregnant women with preeclampsia and eclampsia from 1 January-31

December 2022 at Dr. T.C Hillers regional hospital of Maumere

Faktor risiko	Usia		Total (Kasus Preeklampsia)
	<35 th	≥35 th	
High Risk			
Multi-gestastion	4	2	6 (3%)
Chronic HT	12	9	21(10.5%)
Kidney Disease	0	0	0
Prior Diabetes	1	0	1 (0.5%)
Anti-phospholipid syndrome	0	0	0
Autoimmune	0	0	0
Moderate Risk			
Primigravid	57	5	62 (31%)
Pregnancy Interval ≥ 10 years	0	2	2 (1%)
BMI > 30	38	14	52 (26%)

Table 7 presents the respondents' distribution according to their educational background. The result shows that 73 women were High School graduates (36.5%).

Tabel 7. Educational background distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

No	Pendidikan	Frequency	Percentage
1	Uneducated	9	4.5
2	Elementary School	59	29.5
3	Junior High School	44	22
4	High School	73	36.5
5	University	15	7.5
	Total	200	100

Table 8 shows the respondents' distribution based on their occupation, dominated by housewives, amounting to 165 women (82.5%).

Tabel 8. Occupation distribution of pregnant women with preeclampsia and eclampsia from 1 January-31 December 2022 at Dr. T.C Hillers regional hospital of Maumere

No	Pekerjaan	Jumlah	Presentase
1	Ibu rumah tangga	165	82.5
2	PNS	13	6.5
3	Swasta	11	5.5
4	Wirasaha	2	1
5	Mahasiswa	2	1
6	Petani	3	1.5
7	Tenaga Kesehatan	4	2
	Total	200	

DISCUSSION

Based on the acquired data, there are 200 reported preeclampsia and eclampsia cases (8,6%) at Dr. T.C Hillers regional hospital of Maumere from 1 January-31 December 2022 from a total of 2320 births. Based on age stratification, preeclampsia and eclampsia is commonly found within the age group of 20-34, with 121 patients (60.5%). This finding does not correspond to preeclampsia

theory claiming most cases happen in patients aged <20 years and ≥ 35 years (7,8). Pregnant mothers aged younger than 20 years old is prone to experience maternal complications, including preeclampsia, which is believed to have an impact on baby outcomes due to reproductive organs immaturity (9). Women older than 35 are also found to have a similar risk trend. In theory, women aged 35 or older undergo a degenerative process that influences peripheral vascularization, leading to functional and structural changes in blood pressure, making them vulnerable to preeclampsia (10). Our findings correspond with Hinelo, Sakung, and Gunarmi's studies at Banggai regional hospital that reported most preeclampsia cases (72.1%) in the age range of 20-34 years old (11). Similar findings were reported by Annafi, Jumsa, and Budoyoni at West Nusa Tenggara regional main hospital and Akbar, Wicaksono, and Dachlan at Dr. Soetomo Surabaya Hospital in which major cases happened in women aged 20-34, 51.7% and 70% respectively (12,13). The total pregnancy within the age group might cause different results.

The result showed that preeclampsia and eclampsia predominantly occurred in obese women (IMT ≥ 25 –29.9g/m²), accounting for around 86 patients (43%). This confirms preeclampsia theory (8,14,15). Overweight and obese women have a higher preeclampsia risk due to chronic inflammation, increased CRP and plasma cytokines, oxidative stress responses, and myeloperoxidase release. Those events lead to vasospasm and endothelium injury, causing preeclampsia. The finding of this study is supported by the result of Annafi, Jumsa, and Budoyono's study at West Nusa Tenggara Regional hospital with preeclampsia cases dominated by 42 women (48,3%) with IMT more than 25-29.9kg/m² (12).

Respondents of this study were mostly multigravida women, as many as 138 (69%). The result is supported by a previous study by Annafi, Jumsa, and Budoyono at West Nusa Tenggara regional hospital with 44 multigravida women (50,6%) experiencing preeclampsia. Based on parity amount, preeclampsia patient is mostly multipara (parity ≥ 2), as many as 82 (41%). Similar respondents' characteristic is also found in Makmulah and Sapparudin, and Laila studies with 60% and 51% multigravida women, respectively (16,17). However, it differs from Lombo's finding at Manado regional hospital. Lombo's study claimed that primigravida patients dominated the cases, as many as 37 out of 60 (61.6%) (18). Juliantari also reported more preeclampsia cases in nullipara women, 53 out of 108 cases (49.07%) (19). In theory, nullipara becomes a risk factor for preeclampsia, and more cases happen in primigravida due to the bigger diameter of the spiral and uterine arteries in nullipara, making invasion by the trophoblasts easier (20). Moreover, there is angiogenic imbalance during the first pregnancy, such as increased soluble fms-like tyrosine kinase 1 (sFlt1) and ratios of sFlt1/placental growth factor (PlGF) happening compared to multipara that causes nullipara to have a higher risk of preeclampsia (21).

Based on prior hypertension history in this study, there are 109 cases (70%) of preeclampsia and eclampsia in mothers without prior history of pregnancy hypertension and 179 preeclampsia cases (89.5%) without chronic hypertension. This finding goes along with the Lombo study that mentioned preeclampsia cases largely

happened in pregnant women without prior hypertension history, as many as 55 out of 60 reported cases (91.7%). Sutan and Djannah also reported the same trend, as many as 579 out of 641 cases and 99 out of 118 cases, respectively (22,23). Based on previous pregnancy hypertension history, Sutan also reported 693 cases with no preeclampsia history and 591 out of 641 cases (92.2%) with no prior gestational hypertension history (22). Theoretically, preeclampsia and chronic hypertension history affect the incidence of preeclampsia and eclampsia in the next pregnancy. Our findings contradict that theory in which more women with no prior preeclampsia and chronic hypertension had preeclampsia.

Preeclampsia and eclampsia in this study occurred only in 6 twin pregnancy (3%) and mainly in singleton pregnancy, as indicated by 194 cases (97%). Sutan study also had a similar trend, with 619 singleton pregnancies dominating preeclampsia cases (24). In theory, multi-gestation increases hypertension risk by 2-3 folds of a singleton pregnancy. The risk of preeclampsia is also 3,5 times higher in dizygotic twin pregnancies and 2,61 times higher in monozygotic twin pregnancies due to bigger placenta size causing higher uterine-placenta peripheral resistance. The high angiogenic factor from the placenta hinders endothelial vascular function causing a higher probability of preeclampsia (25).

Almost all preeclampsia and eclampsia patient in this study has no Diabetes Mellitus (95%). Sutan's (2020) study found a similar result with a total of 629 non-diabetic women (98,1%) (22). Based on the theory, insulin resistance might contribute to preeclampsia pathophysiology. Compared to healthy women, preeclampsia women had higher insulin resistance before pregnancy during the first and second trimesters due to multiple interconnected factors other than diabetes, like obesity, older age, and chronic hypertension (26). Studies which link type 1 and 2 diabetes to preeclampsia is still scarce. One, few multicenter studies explore the link between the two for a long period and a limited sample size. Therefore, the respondents with type 1 and 2 diabetes were put in the same group along with other risk factors. This approach is not suggested as the new guideline states that its pathophysiology might differ in high-risk groups. Two, there have not yet been diagnostic criteria to differentiate women with proteinuria before pregnancy in diabetic patients (27).

Based on the pregnancy intervals, most preeclampsia and eclampsia happened in intervals of less than 10 years, with as many as 198 cases (99%). Based on the existing theory, pregnancy with intervals of 10 years is included as a preeclampsia risk factor. A study also mentioned higher risk in pregnancy intervals of 59 months after the previous one. The interval of more than 10 years is found to make the risk of preeclampsia three times higher (24).

Based on the education level and occupation, preeclampsia happened in 73 women of Senior High School graduates (36.5%), and as many as 165 are housewives (82.5%). A similar finding was also reported by Jannah, in which most preeclampsia cases happened in 47 High School graduate women (39.8%), in which as many as 75 women were housewives (63.5%) (23). Lombo's study also found more preeclampsia cases among housewives, up to 35 women (40%) (18). Theoretically, low education and income are preeclampsia risk factors as it correlates with low antenatal care and awareness about health during pregnancy. Below-average income is also linked to

poor nutritional status throughout pregnancy(28).

Based on the gained results, this study recommends enhancing awareness among high-risk pregnancy groups, especially regarding preeclampsia risk factors and how crucial hypertension classification on the last pregnancy is for future studies. In conclusion, this study reported 200 preeclampsia and eclampsia cases at Dr. T.C Hiller Maumere regional hospital within the period of 1 January-31 December 2022 with characteristics of respondents aged 20-34 years old, overweight body mass index, multigravida, multiparity, housewives with high school educational background. Based on the risk factors, 35.5% of preeclampsia patients in this study were 35 years or

older, 31% were primigravida, 26% obese, 21% had prior hypertension in pregnancy, 10.5% had chronic hypertension, 3% were multi-gestation pregnancy, 1% with pregnancy intervals of more than 10 years and 0.5% have diabetes. There are two limitations to this study. First, the history of prior pregnancy hypertension was not differentiated from gestational hypertension or preeclampsia. Second, the medical records did not record preeclampsia history in the family. Further research can be carried out by distinguishing the history of hypertension in previous pregnancies, whether it is gestational hypertension or preeclampsia. Including a family history of preeclampsia in the medical record is necessary to obtain further research data.

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