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PERBANDINGAN JUMLAH TROMBOSIT PRIMIGRAVIDA DENGAN MULTIGRAVIDA PADA KEJADIAN PREEKLAMPSIA DI RUMAH SAKIT IBNU SINA GRESIK PERIODE TAHUN 2019 – 2021

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ABSTRAK

Latar belakang: Preeklampsia adalah suatu kondisi dimana ibu hamil dengan masa kehamilan lebih dari 20 minggu memiliki tanda utama hipertensi dan proteinuria. Penelitian ini bertujuan untuk menganalisis perbedaan jumlah trombosit antara primigravida dan multigravida pada kejadian preeklampsia. **Metode:** Penelitian ini merupakan penelitian cross-sectional. Pengumpulan data menggunakan probability sampling yaitu purposive sampling dengan 61 rekam medik ibu preeklampsia yang diambil sesuai kriteria inklusi di RS Ibnu Sina Gresik yang terdiri dari 14 primigravida dan 47 multigravida dari tahun 2019 sampai dengan 2021. **Hasil:** Pasien preeklampsia dengan jumlah trombosit terendah adalah 170 kelompok, terendah.000/L dan tertinggi 490.000/µL dengan rerata 282.066/µL. Pada primigravida jumlah trombosit 170.000/L dan tertinggi 342.000/L dengan rata-rata 277.857/µL, sedangkan pada kelompok multigravida memiliki jumlah trombosit terendah 173.000/µL dan tertinggi 490.000/µL dengan rata-rata 283.319/ L. Kedua kelompok dibandingkan dan hasilnya menunjukkan bahwa tidak ada perbedaan bermakna jumlah trombosit antara primigravida dan multigravida (p>0,05). **Simpulan:** Tidak terdapat perbedaan bermakna antara jumlah trombosit primigravida dan multigravida pada pasien preeklampsia.
Keywords: Gravida, Primigravida, Multigravida, Preeclampsia, Platelet.

ABSTRACT

Background: Preeclampsia is a condition in which pregnant women with a gestation period of more than 20 weeks have the main signs of hypertension and proteinuria. This study aims to analyze the difference in the number of platelets between primigravida and multigravida in the incidence of preeclampsia. **Methods**: This research was a cross-sectional study. Data collection used probability sampling, namely purposive sampling with 61 medical records of preeclampsia mothers taken according to the inclusion criteria at the Ibnu Sina Hospital Gresik consisting of 14 primigravidas and 47 multigravidas from 2019 to 2021. **Results**: Preeclampsia patients with the lowest platelet count was 170 group, the lowest.000/L and the highest was 490.000/µL with a mean of 282.066/µL. In the primigravida platelet count was 170.000 / L and the highest was 342.000 / L with a mean of 277.857 / µL, meanwhile the multigravida group had the lowest platelet count of 173.000 / µL and the highest was 490.000 / µL with a mean of 283.319 / L. The two groups were compared and the results showed that there was no significant difference in platelet count between primigravida and multigravida (p>0.05). **Conclusion**: There is no

significant difference between primigravida and multigravida platelet count in preeclampsia patients.
Keywords: Gravida, Primigravida, Multigravida, Preeclampsia, Platelet.

INTRODUCTION

Preeclampsia is one of the main problems that cause maternal and perinatal mortality and morbidity in the world.[1] The estimated prevalence of preeclampsia in the world is 4.6% of all pregnancies.[2] The prevalence of deaths caused by preeclampsia in Asia alone reaches 9%, including 70.000 maternal deaths and 500.000 fetal deaths in the world each year.[3] Preeclampsia is caused by various factors such as age, gravida status, history of high blood pressure, genetics and so on. Preeclampsia occurs due to endothelial dysfunction which in turn will lead to conditions of hypertension, proteinuria and decreased platelet count.[4]

Gravida status is a risk factor for preeclampsia. Gravida status is divided into two, namely primigravida or pregnant for the first time and multigravida, namely pregnant more than once. Gravida status can affect the number of human leukocyte antigen (HLA) in the placenta, which will cause placental ischemia and hypertension. In multigravida, gravida status is the safest for the incidence of preeclampsia.[5]

In pregnant women, the hemodilution effect and increased utilization of platelets in the maternal circulation can reduce the platelet count. Conditions where the number of platelets has decreased significantly can be said to be thrombocytopenia. Thrombocytopenia is defined as a platelet count of less than 150.000 µ/L. Thrombocytopenia is the second most common cause of blood disorders in pregnancy after anemia. Thrombocytopenia occurs with a prevalence of 7-10% of all pregnancies. A low platelet count can increase the risk of developing an epidural hematoma. In addition, new bleeding conditions can occur if the platelet count is below 20.000 µ/L and internal bleeding is below 10.000 µ/L.[6] Therefore, platelet count has a significant impact on primigravida and multigravida pregnancies.Incidence of thrombocytopenia in pregnancy occurs in 8-9% of all deliveries.[7] The presence of thrombocytopenia in pregnancy does not necessarily result in preeclampsia.[8] Thus, this study aims to analyse the differences in the number of platelets between primigravida and multigravida in the incidence of preeclampsia
Gravida status is a risk factor for preeclampsia. Gravida status is divided into two, namely primigravida or pregnant for the first time and multigravida, namely pregnant more than once. Gravida status can affect the number of human leukocyte antigen (HLA) in the placenta, which will cause placental ischemia and hypertension. In multigravida, gravida status is the safest for the incidence of preeclampsia.[5]

METHODS

This is a cross-sectional study conducted in Ibnu Sina Regional Hospital in Gresik East Java. The hospital is a 316-beds hospital with a multi-specialistic service, located in an urban setting, around one hour drive from Surabaya, the capital of the province.

We conducted a simple random sampling to select 61 medical records from the list of patients with preeclamsia admitted to the inpatient wards in Ibnu Sina Hospital in 2019-2021. The eligibility criteria were patients with the gestation age of 20 weeks or more and had obtained blood test for platelet count. Patients with Immune Thrombocytopenic Purpura (ITP), infection disorders, smoking, and platelet count < 100.000 / µL were excluded from the study. The sample size was determined based on the sample size calculation using the alpha of 5 and the power of 95.

We collected these following data from the medical record: age, past medical history including pregnancy, blood pressure, the level of protein in the urine, and the platelet count.

Based on their pregnancy history, we categorized the patients into primigravida and multigravida. When patients underwent multiple blood tests, we recorded the newest data for the platelet count for the analysis. The data collecting process was carried out for 1 week.

As the data were normally distributed, we conducted an independent T-test to compare the platelet count between the groups of primipara and multipara.

We obtained the Ethical Clearance from the Ethical Committee of Universitas Surabaya (no 45a / KE / IV / 2022).

To ensure the confidentiality of the patients, all data that can refer to the identity of the patients had been omitted during the data collection, the analysis, and in the report and publication.

RESULT

There are two groups of classification in this study, advanced maternal age – AMA (>35 Years old) and reproductive age – RA (20 – 34 years old).

Table 1. Age distribution from each group of multigravida and primigravida

Age	Frecuency (n)	Percentage (%)
Multigravida		
Reproductive Age (20-34 Years old)	35	74,4
Advanced Maternal Age (>35 Years old)	12	25,6
Total	47	100
Primigravida		
Reproductive Age (20-34 Years old)	13	92,8
Advanced Maternal Age (>35 Years old)	1	7,2
Total	14	100

Table 2 shows that there are 35 patients on the RA group while for AMA, there are only 12 patients in the multigravida group. The same thing occurred in the primigravida group where there are 13 RA patients and only 1 AMA patient. Most of the patients in this study are in the RA group, which consists of 48 patients while AMA only has 13 patients in total.

The normality test (Kolmogorov-Smirnov) is conducted in this study and the result is sig. 0,2 on both multigravida or primigravida which means the data is distributed normally (>Sig 0,05).

Table 2. Platelet Count distribution from each group of multigravida and primigravida

	Multigravida (Mean ± SD)	Primigravida (Mean ± SD)	p-value
Frequency	47	14	
Platelet Count	283.319 ± 71.312,57	277.857 ± 55.801,65	0.263
p-values	0,263		

Based on the data that were shown on the table 2. There is a slight difference of platelet count in multigravida and primigravida. Analysis of data comparing platelet count between primigravidas and multigravidas obtained using the independent T Test, resulted in sig.(2-tailed) 0.263, thus it can be concluded that there was no significant difference in the comparison of platelet count between primigravidas and multigravidas.

DISCUSSION

From the gravida status, it shows that most of the patients were in the multigravida group with as many as 47 patients and a percentage of 77.1%, while the primigravida group only had 14 patients with a percentage of 22.9%. From the data available from 2019 to 2021 at the Ibnu Sina Hospital Gresik, the number of primigravida preeclampsia patients is less when compared to multigravida. This is in line with a study conducted at the Surabaya Muhammadiyah Hospital that states there are fewer primigravida patients than multigravida

patients with a total of 43 primigravida patients with a percentage of 41% while multigravida patients are 62 patients with a percentage of 59%.[10]

The pathomechanism underlying gravida status is related to the immunologic theory. The theoretical basis for what occurs comes from the imperfect formation of human leukocyte antigen (HLA), which causes a rejection of placentation. The trophoblast implantation process into the maternal decidual tissue will also be disrupted, causing interference with the spiral arteries. Furthermore, the spiral arteries will narrow and be inelastic which can cause placental ischemia.[11] Stress occuring in pregnant women can cause an increase in corticotropic-releasing hormone (CRH) by the hypothalamus, resulting in the increase of cortisol levels. Cortisol can increase the vascular concentration of angiotensin II, which in turn causes vasoconstriction of blood vessels and hypertension.[12]

Based on the results of this study, the incidence of preeclampsia in both the primigravida and multigravida groups have the same risk. This result is because the number of multigravidas was more than primigravidas, while in another study primigravidas were more likely to cause preeclampsia than multigravidas.[13]

Mean platelet count in the multigravida group was 283.319 / µL, consisting of platelet counts ranging from 173.000 / µL to 490.000 / µL. While the average number of platelets in the primigravida group was 277.857/µL, ranging from 170.000/µL to 342.000/µL. The result of the Unpaired T-test showed a p-value of 0.263, thus it can be concluded that there was no significant difference between the two groups because the p-value was more than 0.05. This study showed no significant difference in platelet count between primigravida and multigravida preeclampsia patients, although multigravida platelet levels were slightly higher than primigravidas.

Number of platelets decreased during pregnancy and will continue to decrease during pregnancy. Where, 9.9% have a platelet count lower than 150.000 / µL[14] Likewise, a study stated there was no significant difference in the platelet count of preeclampsia patients and the results of the study concluded that the change in platelet count was not due to preeclampsia, but due to the pregnancy itself. These two studies prove that the decrease in platelet count is not affected by the incidence of preeclampsia, but changes that occur due to pregnancy itself. [15] There is also a study which compared the number of platelets in mild preeclampsia and severe preeclampsia and looked at the patient's gestational period. This study showed that platelet count in severe preeclampsia was much lower than in mild preeclampsia. Gestation period in preeclampsia patients also has an influence on the patient's platelet count. From this study, it was concluded that one of the factors that affect platelet count in preeclampsia patients is the condition of severity of the preeclampsia itself and the patient's gestation period, where it is found that early gestation period does not show significant changes, but the patient will experience changes in a longer gestation period.[16]

In this study, there was no significant difference in platelet count between primigravidas and multigravidas. Platelet count was not affected by gravida status because in this study the patient had preeclampsia. This is in line with a study which said that preeclampsia patients did experience changes in their platelet counts even though they had varying gravida status.[17] The pathomechanism underlying the platelet count in preeclampsia is imperfect vascular development of the placenta.[18] This development involves the trophoblast which will produce proangiogenic and antiangiogenic factors in preeclampsia.[19] Proangiogenic factors function to maintain blood vessels while antiangiogenic factors work the opposite, namely damaging blood vessels. Antiangiogenic factors consist of soluble Fms-like tyrosine kinase1 (sFlt-1) and soluble endglin (sEng). sFlt-1 will bind to vascular endothelial growth factor (VEGF) thereby inhibiting VEGF from binding to the endothelium causing endothelial dysfunction.

sEng binds to TGF-β thereby inhibiting TGF-β to bind to endothelial receptors and causes a decrease in nitric oxide which functions as a vascular vasodilator. Increased antiangiogenic factors causes maternal endothelial dysfunction. This endothelial dysfunction leads to platelet activation and increased use of platelets, as well as thrombus formation.[20] From the explanation above, it can be concluded that gravida status does not affect the platelet count. The decrease in platelet count in this study was caused by preeclampsia. In addition, there are other factors that can affect the platelet count such as the pregnancy itself, the severity of preeclampsia and the patient's gestational period.[21]

There are some limitation that may affect the result of this study. Currently, Gresik is the only city in which the research is being conducted which is classified as a small city, where many other factors affect the respondents. Only 61 medical record included in this study as responses, more participants in future studies should be looked for to improve research outcomes. Further research should notice other additional factors, such as antenatal check-up history and dietary intake, which can raise the risk of preeclampsia.

CONCLUSION

To conclude this study, there is no significant difference between platelet count from the preeclampsia patients, whether they were primigravida or multigravida. Improving patient outcome should be the first priority, and medical staff should be expected to understand the platelet count between primigravidas and multigravidas. Trombositopenia can occurs in preeclampsia patient and should be given corticosteroid dexamethasone 40mg/d oral to the patient.

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