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Comparison of the Incidence of Preterm Labor Between Pregnant Woman with Systemic Lupus Erythematosus Mild and Moderate-Savere

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ABSTRACT

Background: Systemic Lupus Erythematosus (SLE) is an autoimmune disease that can affect pregnancy, particularly by increasing the risk of preterm birth. This condition can be influenced by various factors, including the level of SLE activity. Therefore, this study aims to analyze the relationship between preterm birth and the activity level of SLE categorized as mild and moderate-to-severe.
Subjects and Method: This study used an analytical observational technique with a cross-sectional research design based on medical record data of pregnant women with SLE at Dr. Moewardi Hospital in the 2021-2023 period, selected through consecutive sampling This study involved 77 pregnant patients with SLE. The dependent variable is preterm labor. The independent variable in this study is pregnant women with SLE. The data were collected by medical record. The data were analyzed by Fisher's exact test.
Results: There was no significant association between the degree of systemic lupus erythematosus activity and preterm labor (p= 0.759).
Conclusion: This study shows that there is no significant relationship between the incidence of preterm labor and the degree of systemic lupus erythematosus activity (mild and moderate-to-severe)

Keywords: systemic lupus erythematosus, pregnancy, preterm labor.

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BACKGROUND

Systemic lupus erythematosus (SLE) is a systemic autoimmune disease with multi-system involvement and is associated with significant morbidity and mortality (Vaillant et al., 2023). Systemic Lupus Erythematosus (SLE) is an autoimmune disease that attacks multiple organs caused by tissue

damage due to the formation of auto-antibodies and complement from the body's immune complex reactions, so that auto-antibodies attack the body's own cells. Characteristics that often appear in the form of weakness, joint pain, and repeated damage to blood vessels throughout the body so that it affects various organ systems (Suparman, 2021).

Based on the intensity of its activity, SLE can be categorized into three levels, namely mild, moderate and severe. SLE included in the mild category tends to be stable and does not threaten life or organs, while SLE in the moderate category shows clinical manifestations that are more serious than those in the moderate category. SLE in the severe category is life threatening and involves organs (Sumariyono et al., 2019).

According to the World Health Organization (WHO), there are approximately five million individuals with SLE worldwide, the majority of whom are women between the ages of 15-40. Every year, more than 100,000 new cases of SLE are detected. In Indonesia, the prevalence of SLE reaches 1,250,000 people (Ministry of Health, 2017).

Pregnancy in women with SLE has a high risk of experiencing several complications in pregnancy that occur in the mother and fetus, one of which is preterm labor. According to Roziana et al (2020) around 30-50% of pregnancies with SLE experience preterm labor which is often caused by preeclampsia and fetal distress. Some of the SLE patients have antiphospholipid antibodies. These antibodies target phospholipids, which are fatty groups in cell membranes. The presence of antiphospholipid can increase the risk of blood clots and play a role in narrowing blood vessels and reducing the number of blood cells. So that it can cause the risk of preterm labor (Roziana et al., 2020).

This study aims to analyze the risk of preterm delivery in pregnant women with SLE at Dr. Moewardi Surakarta Hospital in 2021-2023 to update the case data of this study. The author is interested in conducting this study because there is still little information about the risk of prematurity in pregnant women with SLE based on the category of SLE disease activity level, namely mild, and moderate-heavy, especially at Dr. Moewardi Surakarta Hospital in the period 2021-2023.

SUBJECTS AND METHOD

1. Study Design

The research to be carried out is analytical observational with a cross-sectional approach. The study will be conducted at departement of obstetrics and gynecology Dr. Moewardi Hospital Surakarta from August 2024 to December 2024.

2. Population and Sample

The study population ware pregnant women with SLE patients hospitalized at Dr. Moewardi Hospital from January 2021 to December 2024. The sampling technique used was a non-random sampling technique, namely consecutive sampling with inclusion and exclusion criteria that have been determined and obtained from medical record data. The minimum sample size required is 39 subjects.

3. Study Variables

The dependent variable was preterm labor. The independent variable was pragnant woman with SLE.

4. Operational Definition of Variables

Preterm labor that occurs at 20 weeks to <37 weeks gestation in the patient's medical record. The scale used is an nominal categorical variables. Measurement results into preterm labor and aterm labor.

Pregnant woman with SLE was who have confirmed SLE in the patient's medical

record. The scale used is an ordinal categorical variable. The measurement results were divided into mild and moderate-severe degrees.

5. Study Instruments

All variables were obtained from medical record.

6. Data analysis

This study used bivariate analysis. Bivariate analysis was conducted to find the relationship between 2 variables, namely pregnant women with SLE as the independent variable and the incidence of preterm labor as the dependent variable using the Chi-Square analysis technique. If Chi-Square cannot be used, an alternative statistical can be used in the form of Fisher's Exact Test. The level of significance was p=0.05.

7. Research Ethics

The research ethical clearance approval letter was obtained from the Research Ethics Committee at Dr. Moewardi Hospital, Surakarta, Indonesia, No. 2.022/VIII/-HREC/2024, on August 26, 2024.

RESULTS

1. Sample Characteristics

The study was conducted on patients who fit the criteria of the study subjects, namely pregnant women with SLE from January 2021 to December 2023, totaling 77 patients (Table 1).

Table.1 Characteristics of Responden by Degree of SLE

Variables	Degree of SLE			
	Mild		Moderate-Savere	
	N	%	N	%
Labor Status				
Preterm	23	36.6	4	28.6
Aterm	40	63.4	10	71.4
Pregnancy Age				
20-36 weeks	23	36.6	4	28.6
37-40 weeks	40	63.4	10	71.4
Mother's Age				
20-35 years	47	61	10	13
36-45 years	16	21	4	5
Flare History				
Yes	1	1.5	1	1.5
No	62	80.5	13	16.5
Preeclampsia				
Yes	13	16.8	4	5.2
No	50	65	10	13

Based on Table 1. Based on table 4.1. a total of 77 patients were grouped based on the degree of SLE activity. namely mild degree and moderate-severe degree. In the mild degree of activity. the majority experienced aterm labor with a total of 40 patients (63.4%). gestational age 37-40 weeks as many as 40 patients (63.4%). maternal age 20-35 years as many as 47 patients (74%). pregnant women were not diagnosed with preeeclampsia as many as 50 patients (65%). and did not have a history of flares as many as 62 patients (80.5%). Meanwhile. in the moderate-severe degree of SLE activity. the majority experienced aterm labor with a total of 10 patients (71.4%). gestational age 37-40 weeks as many as 10 patients (71.4%). maternal age 20-35 years as many as 10 patients (13%). pregnant women were not diagnosed with preeeclampsia as many as 10

patients (13%). and did not have a history of flares as many as 13 patients (16.5%).

Table.2 Bivariate analysis Degree Status of SLE and

Degree Status of SLE	Labor Status				Total		p
	Preterm		Aterm				
	n	%	n	%	n	%	
Moderate-Savere	4	28.6	10	71.4	14	100	0.759
Mild	23	36.6	40	63.4	63	100	

2. Bivariate Analysis

This study found that among pregnant women with moderate-to-severe SLE, 4 patients (28.5%) experienced preterm labor, while 10 patients (71.4%) had full-term labor. In contrast, among pregnant women with mild SLE, 23 patients (36.6%) had preterm labor, and 40 patients (63.4%) had full-term labor.

Table 2 presents the results of the relationship between preeclampsia status and the degree of SLE, analyzed using chi-square and Fisher's exact test. The results show no significant association between the degree of SLE activity and preterm labor, with a p-value of 0.759.

DISCUSSION

Systemic lupus erythematosus is one of the conditions that can complicate pregnancy. because it can cause several complications. one of which is preterm labor. One of the predictors for preterm labor is an increase in the degree of SLE activity which is divided into mild and moderate-severe (Clowse et al., 2013).

Based on Table 2 the results showed that there were 14 pregnant women with moderate-heavy SLE and 63 pregnant women with mild SLE. In the group of pregnant women with moderate-heavy SLE. 28.6% experienced preterm labor. while 71.4% experienced aterm labor. While in the group of pregnant women with mild degree of SLE experiencing preterm labor 36.6% while those experiencing aterm labor 63.4%. After the analysis test using Chi- square showed that there was no significant relationship between the degree of SLE activity and the incidence of preterm labor in pregnant women with SLE at Dr. Moewardi Hospital (p= 0.759). This shows that pregnant women with moderate-severe SLE have a risk of preterm labor of 0.75 or 0.75 times greater than pregnant women with mild SLE. So, the results showed that there was no tendency for the degree of SLE activity in pregnant women to be associated with an increased risk or likelihood of preterm labor (OR< 1).

The results of this study are in line with research conducted by Zhu et al. (2024) which states that there is no significant relationship between SLE and preterm labor with the results of research data p = 0.940 (p> 0.05) and OR = 1.02 using the MR-Egger and Weighted Median methods. There is also another study conducted by Sangah et al. (2023) which showed that the rate of preterm labor in pregnant women with SLE was significantly higher at 39.4% with 95% Confidence Interval (CI = 32.4 to 46.4) among live births.

In addition to SLE, several other risk factors can increase the incidence of preterm labor. Research by Carolin et al. (2019) identified factors that influence preterm labor, one of which is maternal age. Their findings (OR= 9.04; p= 0.003) show a significant relationship between age and the incidence of preterm labor. Additionally, pre-eclampsia was found to have a significant

association with preterm labor. These findings highlight that other risk factors may contribute more significantly to the incidence of preterm labor.

AUTHOR CONTRIBUTION

All authors contributed to the conceptualization and design of the study. The preparation of materials. data collection. and analysis were carried out by Yulistiya Kusuma Pradani. Muhammad Adrianes Bachnas. Lukman Aryoseto. and Abdurahman Laqif. The initial draft of the manuscript was written by Yulistiya Kusuma Pradani. with all authors providing feedback on earlier versions. All authors reviewed and approved the final manuscript.

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CONFLICT OF INTEREST

There are no conflicts of interest.

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