Comparison of Pregnancy Loss Proportions Between Pregnant Women with Mild and Moderate-Severe Systemic Lupus Erythematosus

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ABSTRACT

Background: Pregnancy in systemic lupus erythematosus (SLE) patients is considered high-risk due to potential negative impacts on both the mother and fetus, such as pregnancy loss. One of the factors influencing pregnancy loss in SLE patients is increased lupus activity and antiphospholipid syndrome (APS). This study aimed to evaluate the relationship between pregnancy loss and SLE disease activity levels.

Subjects and Method: This cross-sectional study conducted at Dr. Moewardi Hospital. The population consisted of pregnant women with SLE treated at RSUD Dr. Moewardi between 2021 and 2023. A total of 81 pregnant patients with SLE selected through purposive sampling. The dependent variable was pregnancy loss. The independent variable was pregnant women with SLE. This study utilized tools and materials in the form of medical record data from the Obstetrics and Gynecology Department at Dr. Moewardi Hospital, Surakarta. Data were analyzed using bivariate analysis with SPSS software and Fisher's exact test tests.

Results: A total of 81 respondents meeting the inclusion criteria were included, consisting of 66 pregnant women with mild SLE activity and 15 pregnant women with moderate-to-severe SLE activity. There was no significant relationship between the degree of systemic lupus erythematosus activity and pregnancy loss (p =0.723).

Conclusion: There is no significant association between pregnancy loss and the degree of systemic lupus erythematosus activity, whether mild or moderate-severe.

Keywords: systemic lupus erythematosus, pregnancy loss, pregnant women

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BACKGROUND

Systemic lupus erythematosus (SLE) is a chronic inflammatory disease caused by a multisystem autoimmune condition, where immune complexes and tissue-binding autoantibodies mediate damage to cells,

tissues, and organs (Muthusamy, 2017). The clinical manifestations of SLE are highly varied, depending on the organs targeted by the body's autoantibodies. These manifestations can include joint and muscle pain, fever, rash, chest pain, hair loss, mouth sores, kidney disorders, and many more (Octavia et al., 2022).

Based on its activity level, SLE is classified into mild, moderate, and severe. Mild SLE tends to be stable and non-life or organ-threatening, moderate SLE presents with more serious clinical manifestations than mild cases, and severe SLE is life- or organ-threatening (Indonesian Rheumatology Association, 2019).

According to the World Health Organization (WHO), the global prevalence of SLE is approximately five million people, with 100,000 new cases reported annually. In Indonesia, the prevalence of SLE reached 1,250,000 people in 2007, with an incidence rate of 0.5% of the total population. Additionally, the Hospital Information System (SIRS) Online recorded 2,166 hospitalized SLE cases in 2016 (Tanzilia et al. 2021). The majority of SLE patients are women of reproductive age, making pregnancies among women with SLE relatively common (Ministry of Health, 2017).

Pregnancy in women with SLE is considered high-risk due to potential adverse impacts on both the mother and the fetus. About 75% of pregnancies in women with SLE progress to delivery, with 25% resulting in pregnancy loss and another 25% in premature births (Khairani et al. 2018). Additionally, pregnancies in women with SLE carry an increased risk of complications such as fetal growth restriction (FGR), hypertension, thrombosis, and infections (Octavia et al. 2022).

Pregnancy loss is defined as the death of an unborn fetus. Based on gestational age,

pregnancy loss is categorized into miscarriages and stillbirths. Miscarriage refers to fetal death before 28 weeks of gestation, while stillbirth refers to fetal death after 28 weeks (World Health Organization, 2019). Various factors can contribute to pregnancy loss, including genetic abnormalities, infectious diseases, environmental factors, lifestyle, natural aging processes, and autoimmune diseases (Fussman and McKane, 2014).

One factor influencing pregnancy loss in SLE patients is increased lupus activity and antiphospholipid syndrome (APS) (Clowse, 2007). A study conducted in 2015 revealed an 11% pregnancy loss rate among 202 pregnancies in women with SLE, with 55% occurring in the first trimester, 40% in the second trimester, and 5% in the third trimester (Octavia et al., 2022).

Considering the above information and the limited data on the comparison of pregnancy loss rates among pregnant women with mild versus moderate-to-severe SLE, particularly in Solo, the author is interested in conducting a study. This research focuses on comparing the proportion of pregnancy loss risk in women with mild SLE versus moderate-to-severe SLE at Dr. Moewardi General Hospital during 2021–2023.

SUBJECTS AND METHOD

1. Study Design
This was an analytic observational study with a cross-sectional. The study carried out by collecting data from medical records of SLE patients at Dr. Moewardi Hospital, Surakarta, from 2021 to 2023.

2. Population and Sample
The study population was SLE patients at Dr. Moewardi Hospital. The sample for this study consists of pregnant women with SLE who experienced pregnancy loss, selected based on the following criteria:

a. Inclusion Criteria:

The medical record data of patients, which included patient identity, examination results, treatments, procedures, and other healthcare services provided, were reviewed and considered for inclusion.

b. Exclusion Criteria:

Pregnant women with SLE whose degree of disease activity is unknown. In this study, the author used a consecutive sampling method with predefined inclusion and exclusion criteria. The researcher calculated the sample size using the Lameshow formula, and it was determined that the minimum required sample size was 59 samples.

3. Study Variables

The independent variable was pregnant women with SLE. The dependent variable was incidence of pregnancy loss. The confounding variable was maternal age.

4. Operational Definition of Variables

Pregnant women with SLE in this study refers to pregnant women who have been diagnosed with SLE. The scale used is an ordinal variable categorized into distinct levels. The measurement results were divided into Mild and Moderate-Severe.

Incidence of pregnancy loss in this study refers to the death of a fetus at any stage during pregnancy. The measurement scale used nominal scale. The measurement outcomes consist of pregnancy loss and no pregnancy loss.

5. Study Instruments

This study utilized tools and materials in the form of medical record data from the Obstetrics and Gynecology Department at Dr. Moewardi Hospital, Surakarta, for the period of January 2021 to December 2023.

6. Data analysis

To examine the relationship between pregnant women with SLE as the independent variable and the occurrence of pregnancy loss as the dependent variable, the data obtained will be analyzed using bivariate analysis techniques. Subsequently, hypothesis testing will be conducted using the chi-square statistical test to evaluate the correlation between the two variables using nominal categorical data (Pinzon et al. 2021). However, if the data do not meet the assumptions for the chi-square test, an alternative test, Fisher's exact test, will be applied. Data analysis will be performed using the Statistical Product and Service Solution (SPSS) software for Windows.

7. Research Ethics

The ethical approval for this research was granted by the Research Ethics Committee of Dr. Moewardi Hospital, Surakarta, Indonesia. No. 2.019/VIII/HREC/2024, on August 23, 2024.

<div style="background:#7a4a1e;color:white;text-align:center">RESULTS</div>

1. Sample Characteristics of Pregnant Women with SLE

Table 1 showed that out of the total of 66 pregnant women with mild SLE activity. the majority did not experience pregnancy loss. with a total of 52 respondents (78.8%). were in the age range of 20-35 years with a total of 51 respondents (77.3%). and did not experience flare. with a total of 62 respondents (93.9%). Meanwhile. among the 15 pregnant women with moderate-to-severe disease activity. the majority also did not experience pregnancy loss, with a total of 13 respondents (86.7%). were in the age range of 20-35 years with a total of 10 respondents (66.7%). and did not experience flare. with a total of 13 respondents (86.7%).

2. Bivariate Analysis.

Table 2 showed that there was no significant relationship between degree of SLE activity and pregnancy loss (95% CI= 0.12 to 2.83; p= 0.723).

Table 1. Characteristics of Pregnant Women with SLE

| Variables | SLE Disease Activity | | | |
| | Mild | | Moderate-Severe | |
	n	%	n	%
Pregnancy loss status				
Yes	14	21.2	2	13.3
No	52	78.8	13	86.7
Age status				
<20 years	0	0	0	0
20-35 years	51	77.3	10	66.7
>35 years	15	22.7	5	33.3
Flare status				
Yes	4	6.1	2	13.3
No	62	93.9	13	86.7

Table 2. Fisher Exact test on the relationship between SLE and pregnancy loss

| SLE Disease Activity | Pregnancy Loss Status | | | | Total | | p |
| | Yes | | No | | | | |
	n	%	n	%	n	%	
Moderate-Severe	2	13.3	13	86.7	15	100	0.723
Mild	14	21.2	52	78.8	66	100	

DISCUSSION

Systemic Lupus Erythematosus (SLE) is a chronic inflammatory disease caused by a multisystem autoimmune response. where immune complexes and autoantibodies that bind to tissues mediate damage to cells. tissues and organs (Muthusamy. 2017). Pregnancy in women with SLE is considered high-risk. as it can have negative effects on both the mother and the fetus. Around 75% of pregnancies in women with SLE reach delivery. with 25% experiencing pregnancy loss and another 25% resulting in preterm birth (Khairani et al., 2018). One factor that influences the occurrence of pregnancy loss in SLE patients is an increase in lupus activity (Clowse, 2007).

This study analyzes the relationship between SLE disease activity and pregnancy loss in 81 respondents. consisting of 2 with moderate-to-severe SLE activity who experienced pregnancy loss. 13 with moderate-to-severe SLE activity who did not experience pregnancy loss. 14 with mild SLE activity who experienced pregnancy loss. and 52 with mild SLE activity who did not experience pregnancy loss.

This study found that degree of SLE activity has no significant association with the occurrence of pregnancy loss. These findings are consistent with the study by Ceccarelli (2020). which found that complications such as pregnancy loss have a weaker association with SLE activity compared to other studies. such as the Predictors of Pregnancy Outcome: biomarkers In Antiphospholipid Antibody Syndrome and Systemic Lupus Erythematosus (PROMISSE) study (2015). Although other studies suggest that SLE disease activity is a primary factor in pregnancy loss. Ceccarelli (2020) also identified other contributing factors such as the presence of lupus anticoagulant (LAC), antiphospholipid antibodies (aPS). and anti-dsDNA antibodies in pregnant women with SLE as well as improper disease management and pregnancy planning. Furthermore, other research suggests no significant difference in the prevalence of miscarriage between women with moderate-

to-severe SLE and those with mild SLE (Clowse et al. 2005). This is supported by a 40-year study that reported a decline in the prevalence of pregnancy loss in women with SLE. from an average of 43% to 17% at the turn of the century (Clark et al., 2005).

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 Dinda Husna Azalia Soesetyo. Muhammad Adrianes Bachnas. Lilik Wijayanti. and Abdurahman Laqif. The initial draft of the manuscript was written by Dinda Husna Azalia Soesetyo. with all authors providing feedback on earlier versions. All authors reviewed and approved the final manuscript.

FUNDING AND SPONSORSHIP
None.

ACKNOWLEDGEMENT
The authors wish to extend their sincere appreciation to all individuals who have contributed to this research whether indirectly or directly.

CONFLICT OF INTEREST
There are no conflicts of interest.

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