Comparison of Pregnancy Outcomes with Autoimmune Rheumatic Disease and Without Autoimmune Rheumatic Disease

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Abstract

Introduction : It is known that pregnancies with autoimmunity have a higher risk of complications in the mother and fetus compared to pregnancies without autoimmunity. The purpose of this study was to determine the comparison between pregnancy outcomes with autoimmune rheumatic disease and without autoimmune rheumatic disease.

Methods: This study is an observational analytic with a retrospective cross-sectional design. Data were obtained from all patients with pregnancy outcomes with autoimmune rheumatic disease and without autoimmune rheumatic disease at Hasan Sadikin Hospital Bandung 1 January - 31 December 2021-2023.

Results: During this period, 71 pregnant women were found to be accompanied by autoimmune rheumatic diseases and then data on pregnant women without autoimmune rheumatic diseases were randomly taken as controls. In this study, it was found that pregnant women with autoimmune diseases experienced more neonatal outcomes of stunted fetal growth, namely 11(15.5%) compared to pregnant women without autoimmune rheumatic diseases, namely 2(2.8%) with a p-value of 0.009.

Conclusion: This study found that pregnant women with autoimmune rheumatic disease experienced more neonatal outcomes of FGR compared to pregnant women without autoimmune rheumatism.

Keywords : Maternal Outcome, Neonatal Outcome, Autoimumne

Perbandingan Antara Luaran Kehamilan Dengan Penyakit Rhematik Autoimun Dan Tanpa Penyakit Rematik Autoimun

Abstrak

Pendahuluan : Diketahui bahwa kehamilan dengan autoimun memiliki risiko komplikasi pada ibu maupun janin lebih tinggi dibandingkan dengan kehamilan tanpa autoimun. Tujuan penelitian ini untuk mengetahui perbandingan antara luaran kehamilan dengan penyakit rematik autoimun dan tanpa penyakit rematik autoimun

Metode : Penelitian ini bersifat analitik observasional dengan desain potong lintang retrospektif. Data diperoleh dari seluruh pasien luaran kehamilan dengan penyakit rematik autoimun dan tanpa penyakit rematik autoimun di Rumah Sakit Hasan Sadikin Bandung 1 Januari – 31 Desember 2021-2023

Hasil : Dalam periode tersebut ditemukan 71 orang ibu hamil yang disertai dengan penyakit rematik autoimun kemudian diambil data ibu hamil tanpa penyakit rematik autoimun secara random sebagai kontrol. Pada penelitian ini didapatkan ibu hamil dengan penyakit autoimun lebih banyak mengalami luaran neonatal pertumbuhan janin terhambat yaitu 11(15.5%) dibandingkan ibu hamil tanpa penyakit rematik autoimun yaitu 2(2.8%) dengan *p-value*0.009.

Kesimpulan : Penelitian ini menemukan bahwa ibu hamil dengan penyakit rematik autoimun lebih banyak mengalami luaran neonatal pertumbuhan janin terhambat dibandingkan dengan ibu hamil tanpa rematik autoimun.

Kata Kunci : Luaran Maternal, Luaran Neonatal, Autoimun

Introduction

Pregnancy is a period of fetal development in the womb that lasts about 9 months or about 40 weeks measured from the last menstrual period to delivery.[1] Pregnancy, labor, and birth are physiological processes, and can also cause several factors that can appear at any time, and can have a serious impact on the mother and fetus. Pregnancy in women with autoimmunity has a higher risk than pregnancy in healthy women.[2]

Autoimmune disease is a disease caused by a disorder of the body's defense system caused by a person's immune system not functioning properly so that it attacks the body's own cells, causing organ damage. Autoimmune diseases are characterized by excessive production of antibodies against the body's own tissues (autoantibodies), causing inflammation and tissue damage.[3] Pregnancy in women with autoimmunity has a higher risk to the mother and fetus than pregnancy in women without autoimmunity.[4] Autoimmune diseases predominantly affect women of reproductive age. A ratio of women to men with autoimmunity of 9:1 has been reported with the peak onset of the disease between the ages of 15 and 40 years.[5] According to the World Health Organization (WHO) 2019, every day about 808 women die from pregnancy complications or complications during childbirth, which is 295,000 maternal and fetal deaths.[6] Detection of autoimmune diseases during pregnancy can be done by conducting Antenatal Care (ANC) examinations. Antenatal examination is an examination aimed at pregnant women to ensure that the mother and fetus are in a healthy condition during pregnancy and can also find out any complications during pregnancy that can threaten the life of the mother and fetus.[7-8-9]

Based on research at Dr. Hasan Sadikin Hospital in 2018 conducted by Erica et al., stated that Systemic Lupus Erythematosus (SLE) is the most common autoimmune disease found during pregnancy. Pregnancy accompanied by SLE has a high risk of complications, especially in the postpartum period, namely 61 patients or (43.0%).[5]

Based on this explanation, there is no recent data describing the comparison of pregnancy outcomes with autoimmune rheumatic disease and without autoimmune rheumatic disease at Dr. Hasan Sadikin Hospital, so the authors are interested in examining the comparison of pregnancy outcomes with autoimmune rheumatic disease and without autoimmune rheumatic disease at Dr. Hasan Sadikin Hospital Bandung in 2021-2023.

Methods

This study was approved by the Research Ethics Committee of Padjadjaran University No. 388/UN6.C.6.1/TU.00/2024. Data were collected from medical records of pregnancies accompanied by autoimmune rheumatic diseases and overall pregnancy data at Dr. Hasan Sadikin Hospital Bandung from January 1 to December 31, 2021-2023. The number of samples used was 71 patients recorded from medical records diagnosed with pregnancy with autoimmune rheumatic disease, and 71 patients diagnosed with pregnancy without autoimmune rheumatic disease who were randomly selected. This study was conducted with observational analytic method, retrospective cross-sectional design. Using Chi Square statistical test and alternative Fisher's Exact test. Inclusion criteria were medical record data of pregnant women accompanied by autoimmune rheumatic diseases (Systemic Lupus Erythematosus (SLE), Rheumatoid Arthritis (RA), Sjogren's Syndrome (SS), Systemic Scleorosis (SSc)) at Dr. Hasan Sadikin Hospital Bandung. Exclusion criteria in this study were pregnant women accompanied by autoimmune rheumatic diseases other than

Table 1 Comparison of Patient Characteristics and Maternal Outcomes Based on Autoimmune Pregnancy History

Variables	Pregnancy History		P-value
	Autoimmune	Non Autoimmune	
	N=71	N=71	
Age			
20-35 years	59(83.1%)	54(76.1%)	0.298
>35 years old	12(16.9%)	17(23.9%)	
Gestational age			
≥ 37 weeks	29(40.8%)	35(49.3%)	0.312
≤ 37 weeks	42(59.2%)	36(50.7%)	
Type of labor			
Cesarean Section	36(50.7%)	30(42.3%)	0.313
Vaginal	35(49.3%)	41(57.7%)	
Maternal Outcomes			
Eclampsia	0(0.0%)	5(7.0%)	0.058
Preeclampsia	11(15.5)	20(28.2%)	0.068
Early rupture of membranes	6(8.5%)	4(5.6%)	0.512
Bleeding	4(5.6%)	2(2.8%)	0.681

Notes: For categorical data, the p value was calculated based on the *Chi-Square* test with alternative *KolmogorovSmirnov* and *Exact Fisher* tests if the conditions of *Chi-Square were* not met. The significance value is based on the p value <0.05.

SLE, RA, SS, SSc and incomplete patient data.

Categorical analysis in the table above was tested using the Chi Square statistical test and Fisher's Exact test alternative, namely Age, gestational age, type of labor and maternal outcomes. The results of statistical tests on the above research groups obtained information on the P value on the variables of Age, gestational age, type of labor, and maternal outcomes greater than 0.05 (P value>0.05) which means insignificant or not statistically meaningful, thus it can be explained that there is no statistically significant difference in proportion between the variables of Age, gestational age, type of labor and maternal outcomes in autoimmune and non- autoimmune pregnancy history groups. Categorical data analysis in the table above was tested using the Chi Square statistical test, namely FGR and alternative Fisher's Exact test, namely abortion, stillbirth, and Intrauterine Fetal Death (IUFD) and Kolmogorov Smirnov test, namely asphyxia. The results of statistical tests on the above research groups obtained information on the P value on the variable condition of fetal abnormalities, namely abortion, stillbirth, IUFD and asphyxia greater than 0.05 (P value>0.05) which means insignificant or not statistically meaningful, thus it can be explained that there is no statistically significant difference in proportion between the variable condition of fetal abnormalities, namely abortion, stillbirth, and IUFD and asphyxia, in autoimmune and non-autoimmune pregnancy history groups. While the P value on the variable of FGR is smaller than 0.05 (P value <0.05) which means statistically significant or meaningful, thus it can be explained that there is a statistically significant difference in proportion between the variables of stunted fetal growth in the autoimmune and non- autoimmune pregnancy history groups.

Table 2 Comparison of Neonatal Outcome Results Based on Autoimmune Pregnancy History

Variables	Pregnancy History		P-value
	Autoimmne N=71	Non Autoimmune N=71	
Abnormal conditions in the fetus			
Abortion	2(2.8%)	0(0.0%)	0.496
Still birth	3(4.2%)	5(7.0%)	0.719
IUFD	2(2.8%)	2(2.8%)	1.000
FGR	11(15.5%)	2(2.8%)	0.009*
Asphyxia			
Weight	1(1.4%)	2(2.8%)	
Medium	8(11.3%)	17(23.9%)	0.482
Lightweight	62(87.3%)	52(73.2%)	

Notes: For categorical data, the p value was calculated based on the *Chi-Square* test with alternative *KolmogorovSmirnov* and *Exact Fisher* tests if the conditions of *Chi-Square were* not met. The significance value is based on the p value <0.05.

Results

During this period, 71 pregnant women were found to be accompanied by autoimmune rheumatic diseases and then data on pregnant women without autoimmune rheumatic diseases were randomly taken as controls. In this study, it was found that pregnant women with autoimmune diseases experienced more neonatal outcomes of stunted fetal growth, namely 11(15.5%) compared to pregnant women without autoimmune rheumatic diseases, namely 2(2.8%) with a p-value of 0.009.

Discussion

Based on the results of data analysis, it can be seen that the characteristics of age 20-35 of 71 pregnant women are mostly occurring in pregnant women with pregnancy outcomes accompanied by autoimmune as many as 59 (83.1%) with gestational age ≤ 37 weeks, 42 (59.2%) with cesarean section delivery, 36 (50.7%). This is in accordance with research conducted by Valeria Arturi et al., found that as many as 132 (34.8%) premature births from mothers accompanied by SLE. Pregnancy in women with SLE can increase the risk of complications, one of which is preterm birth. One of these factors can be caused by the effects of drugs, such as the use of immunosuppressive drugs to control SLE which can affect pregnancy so that it can increase the risk of preterm pregnancy. [10] Another study conducted by Juathi et al. stated that preterm birth can cause the risk of cesarean delivery. in some cases of cesarean delivery with pregnancy ≤ 37 weeks as much as 37.2%, the action was taken to save the lives of mothers and fetuses.[11]

The results of the study of 20-35 pregnant women who were not accompanied by autoimmunity were 54 (76.1%) with gestational age ≤37 weeks found the most, namely 36 (50.7%) and the results of the study of the type of delivery found the most, namely vaginal 41 (57.7%). This is in accordance with research conducted by Umi hidayati et al., preeclampsia pregnancy with labour ≤37 weeks found as many as 36 (81.8%). The incidence of preterm birth is influenced by

preeclampsia or eclampsia due to spasmus of blood vessels and decreased blood flow to the placenta which results in impaired placental function. An increase in uterine tone is often found in pregnant women with preeclampsia and eclampsia, making it easy for partus prematurus to occur. [12]

In this study it was found that SLE was a characteristic of the type of autoimmune disease that occurred most during pregnancy, namely 61 patients or (85.9%). The number of autoimmune diseases experienced by pregnant women with autoimmune diseases on average experienced 1 autoimmune disease, namely SLE as many as 61 (85.9%). This is in line with a study conducted by Erica et al., stated that SLE is the most common autoimmune disease found during pregnancy. Pregnancy accompanied by SLE has a high risk of complications, especially in the postpartum period, as many as 61 (43.0%).[5]

Based on the results of data analysis of maternal outcomes in pregnancy with autoimmune diseases, the most common is premature rupture of membranes as many as 6 (8.5%). This is in accordance with research conducted by Nazila et al., which states that premature rupture of membranes occurs mostly at productive age, which was found to be 193 (77.8%). At that age women are at the peak of the reproductive period so that many incidents of premature rupture of membranes occur. The use of medications to manage SLE, such as corticosteroids or immunosuppressants have the side effect of affecting placental health or amniotic membrane integrity. Some of these drugs can affect the elasticity and strength of the amniotic membrane which increases the risk of premature rupture. [13] Maternal outcomes in pregnancies without autoimmune disease were found to be eclampsia 5(7.0%) and preeclampsia 20(28.2%). This is in accordance with research conducted by Diniyati et al. that there were 68 (55.7%) pregnant women with preeclampsia. Mothers who have a history of hypertension will be at risk of 3.4 times greater to experience preeclampsia and eclampsia compared to mothers who do not have a history of hypertension. [14]

Based on the results of data analysis on neonatal outcomes, the most inhibited fetal growth is experienced by pregnant women with the age category 20-35 accompanied by SLE, namely 11 (15.5%). From the results of the chis-quare statistical test, the p-value of inhibited fetal growth is 0.009 ($p<0.05$), thus it can be concluded that there is a significant relationship between pregnancies accompanied by autoimmunity and pregnancies without autoimmunity. This is in accordance with research conducted by Giritama Irwantoro et al., that of the 185 pregnant patients with obstructed fetal growth, the most occurred in the maternal age category of 20-35 years with SLE, which was found in 119 cases (64.32)%, maternal age affects fetal growth, if the mother's age is getting younger, the blood flow to the cervix and uterus is still not perfect so that the distribution of nutrients from the mother to the fetus is inadequate. The older the mother's age, there will be changes in blood vessels and reduce the function of hormones that regulate the process of the reproductive cycle (endometrium) which will also affect the process of channeling maternal nutrients to the fetus. SLE can affect the health of the mother and foetus through autoimmune effects that cause inflammation and disruption of the placenta. This can disrupt the flow of blood and nutrients to the foetus, potentially leading to stunted foetal growth. Close and regular monitoring during pregnancy with SLE is essential for early detection of potential neonatal stunted fetal growth with the aim of timely prevention and treatment to minimise the risk of further complications. [15]

The limitation of this study is the small number of patients with pregnancies accompanied by autoimmune rheumatic diseases at RSHS in January-December 2022,

so that the duration range is longer, namely January-December 2021-2023, besides that the data in medical records that show maternal outcomes and neonatal outcomes are incomplete.

Conclusion

This study found that pregnant women with autoimmune rheumatic diseases had more neonatal outcomes of FGR compared to pregnant women without autoimmune rheumatism.

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