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Maternal and Neonatal Outcome of Early Onset Preeclampsia with or Without Systemic Lupus Erythematosus (SLE): An Ambispective Study

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ABSTRACT

Background: Systemic lupus erythematosus (SLE) is a chronic systemic autoimmune disease that occurs during childbearing years and has been associated with preeclampsia. Pre-eclampsia, a leading hypertensive disorder in pregnancy, significantly contributes to maternal and neonatal morbidity and mortality.
Aims and Objective: This study aims to conduct a comparative analysis between maternal and neonatal outcome of early onset preeclampsia with or without systemic lupus erythematosus. **Material and Methods:** Baseline data Clinical data of 32 pregnant women complicated with SLE admitted to Madhubani Medical College and Hospital between April 1, 2024 to March 31, 2026 were retrospectively collected and analyzed. Six SLE patients were also complicated with APS. Baseline data including name, age, time of pregnancy, time of labor and delivery mode were recorded. The course of SLE and pregestational SLE status were evaluated. **Results:** Effect of SLE on pregnancy outcomes among 32 patients, 4(12.5%) suffered from pregnancy loss and 28(87.5%) obtained natural pregnancy including 13 (40.62%) preterm labor and 19 (59.37%) full-term labor. In group A, 2 (6.25%) women had pregnancy loss, 10 (31.25%) had preterm labor and 20 (62.5%) full-term labor. In group B, 5 (15.62%) women had pregnancy loss, 11 (34.37%) had preterm labor and 16(50%) full-term labor. In this study, 11 among 32 women (34.37%) with pregestational stable SLE presented with active SLE during pregnancy, suggesting that pregnancy exerts a certain effect upon the recurrence of SLE. **Conclusion:** SLE pregnant women have a high risk of adverse pregnancy outcomes and SLE recurrence. The status of SLE (active or stable) is intimately correlated with maternal and neonatal outcomes. SLE patients are recommended to prepare for conception during stable SLE stage to enhance the success rate of pregnancy and decrease the risk of obstetrics complications.

Keywords*: Neonatal outcome; pregnancy and systemic lupus erythematous.*

INTRODUCTION

Systemic lupus erythematosus (SLE) is an autoimmune disease. In this disease, the body's immune system mistakenly attacks healthy tissue. It primarily affects the kidney, skin, joints, brain, and alternative vital organs. SLE is more common in women than men. It may occur at any age, whereas it most frequently appears most often in women between the ages of 20 and 40. SLE affects African Americans and Asians more often than people from other races. Globally, pre-eclampsia affects 2- 8% of pregnancies and is responsible for severe obstetric complications and over 50,000 maternal deaths annually. In developing countries like India, it accounts for approximately 10-15% of maternal deaths. Given its widespread prevalence and potentially life-threatening consequences, early detection and effective management of pre-eclampsia are critical in mitigating its impact on maternal and neonatal health [1-6]. Recent advancements have refined the classification of pre-eclampsia based on gestational age at onset: Early Onset Pre-Eclampsia (EOPE), occurring before 34 weeks of gestation, and Late-Onset Pre-Eclampsia (LOPE), occurring at or after 34 weeks of gestation. This classification goes

beyond mere timing; it reflects distinct differences in pathophysiology, clinical manifestations and outcomes. EOPE is often linked to impaired placentation, resulting in severe maternal and fetal complications. In contrast, LOPE is more commonly associated with predisposing maternal factors, such as metabolic disorders, and typically manifests as a milder form of the disease. Understanding these distinctions is essential for predicting disease progression and planning appropriate interventions [7-12]. SLE pregnant women have a higher risk of neonatal heart disease than their healthy counterparts. Neonatal lupus (NL) is caused by the migration of the anti-Sjogren syndrome A (SSA) antibody and SSB antibody from the maternal blood into the fetus through placental circulation. The incidence of heart abnormality complicated with NL is 1-2% and 18% for women who have a history of delivery of neonatal heart defects. In addition, rash and heart block are the major clinical manifestations of NL. Previous research has revealed that the mean age of rash onset is 6 weeks after labor (Llanos et al., 2009).

AIMS AND OBJECTIVE

This study aims to conduct a comparative analysis between maternal and neonatal outcome of early onset preeclampsia with or without systemic lupus erythematosus.

MATERIAL AND METHODS

This ambispective study was conducted in the Department of Obstetrics and Gynecology of Madhubani Medical College and Hospital, Madhubani; Bihar, India who met the inclusion criteria was studied April 1, 2024 to March 31, 2026. The study included antenatal women diagnosed with pre-eclampsia, meeting the American College of Obstetricians and Gynecologists (ACOG) 2020 diagnostic criteria. Study population Pregnant women with confirmed gestational age and a diagnosis of pre-eclampsia were recruited according to the following criteria and subsequently categorized into two groups: Group A (EOPE): Pre-eclampsia diagnosed at <34 weeks of gestation, And Group B (LOPE): Pre-eclampsia diagnosed ≥34 weeks of gestation. Data collected included the age, sex, clinical presentation, risk factors, diagnostic modalities, and their clinical outcomes. Descriptive analysis was carried out by mean and standard deviation for quantitative variables; frequency and proportion for the categorical variables.

Baseline data

Clinical data of 32 pregnant women complicated with SLE admitted to OBG Dept. of Madhubani Medical College & Hospital from April 1, 2024 to March 31, 2026. Were retrospectively collected and analyzed. Five SLE patients were also complicated with APS. Baseline data including name, age, time of pregnancy, time of labor and delivery mode were recorded. The course of SLE and pregestational SLE status were evaluated.

Diagnostic criteria for SLE

According to the American College of Rheumatology revised criteria for the classification of SLE (Wagner et al., 2009), 11 parameters were included for comprehensive assessment including malar rash, discoid rash, photosensitivity, oral ulcers, non-erosive arthritis, pleuritis or pericarditis, renal disorder, neurologic disorder, hematologic disorder, immunologic disorder (positive findings of anti-DNA, anti-Sm and anti-phospholipid antibodies) and positive anti-nuclear antibody. The diagnosis of SLE can be validated if 4 or above parameters are identified.

Patient grouping

According to the pregestational status of SLE, all patients were divided into the pregestational stable (group A, n=18) and active SLE groups (group B, n=14) Based upon the status of SLE during pregnancy, all women were assigned into the gestational stable (group C, n=16) and active SLE groups (group D, n=16)

Laboratory and immune parameters

Laboratory parameters included red blood cell, white blood cell, hemoglobin and platelet count; D-dimer; qualitative assessment of urinary protein, 24-h quantitative analysis of urinary protein, urine creatinine, glutamic-pyruvic transaminase, glutamic oxalacetictransaminase, albumin, serum creatinine; immune parameters consisted of antinuclear antibody (ANA), anti-double-stranded DNA, dsDNA antibody, anti-Sm antibody, complement C3, complement C4, anti-SSA antibody, anti-SSB antibody, anti-phospholipid antibody, anticardiolipin antibody.

Clinical parameters

Clinical parameters included blood pressure, subjective symptom, such as headache, dizziness, blurry visual acuity, joint pain, photosensitivity, skin rash, recurrent oral ulcers, dry mouth, dry eye and fever. Obstetrics and obstetrics complications consisted of PIH, FGR and fetal distress.

Pregnancy outcomes

Pregnancy outcomes included pregnancy loss, such as abortion, still birth, death birth, neonatal death and pregnancy success consisting of preterm labor and full-term labor.

INCLUSION CRITERIA:
Pregnant women with confirmed gestational age based on last menstrual period (LMP) or first-trimester Level II ultrasound. And patients diagnosed, monitored and delivered in the Department of Obstetrics and Gynecology (OBG) at the study center was included.

EXCLUSION CRITERIA:
Women with pre-existing cardiac disease, women having severe anemia, women having history of substance abuse, patients having history of epilepsy were excluded.
Diagnostic Criteria for Pre-Eclampsia (ACOG 2020)

Blood pressure (BP)
Systolic BP of 140 mm Hg or more or diastolic BP of 90 mm Hg or more after 20 weeks of gestation on two occasions at least four hours apart in previously normotensive women
Systolic BP of 160 mm Hg or more or diastolic BP of 110mm Hg or more (severe hypertension can be confirmed within a short interval (minutes) to facilitate timely antihypertensive therapy).

Proteinuria
Protein excretion ≥300 mg in a 24-hour urine collection, protein/creatinine ratio ≥0.3, or urine dipstick reading of 2+. In the absence of proteinuria: Diagnosis requires the presence of one or more of the following: Thrombocytopenia (platelet count 1.1 mg/dl or doubling of baseline). Hepatic dysfunction (elevated liver enzymes level twice the normal range). Pulmonary edema. Visual disturbances or new-onset headache.

STATISTICAL ANALYSIS
Data was entered in MS excel and analyzed using SPSS version 17. Descriptive studies of mortality and complications were analyzed and presented in terms of Percentages. Chi-Square Test was used to compare the proportion of death and complications between the groups.

RESULTS
Effect of SLE on pregnancy outcomes among 32 patients, 4(12.5%) suffered from pregnancy loss and 28(87.5%) obtained natural pregnancy including 13 (40.62%) preterm labor and 19 (59.37%) full-term labor. In group A, 2 (6.25%) women had pregnancy loss, 10 (31.25%) had preterm labor and 20 (62.5%) full-term labor. In group B, 5 (15.62%) women had pregnancy loss, 11 (34.37%) had preterm labor and 16(50%) full-term labor. Eleven women with pregestational active SLE all had active SLE during pregnancy, suggesting that pregnancy exerts a certain effect upon the recurrence of SLE. Among women with stable SLE, the active rate of SLE attained to 35% after conception and 83% for those with active SLE. For pregnant women with active LN, the kidney disease was further aggravated in approximately 50%-60% of patients after conception.

DISCUSSION
Multiple studies have demonstrated that the conception probability does not significantly differ between SLE women and their healthy counterparts (Yang et al., 2014). The status of status exerts effect upon the maternal and neonatal outcomes. Alternative researches have indicated that the prevalence of preterm labor and pregnancy loss in SLE women is significantly higher compared with that of normal counterparts.

The prevalence of preterm labor in SLE pregnant woman fluctuates between 12.1% and 54% (Saito et al., 2010; Moroni & Ponticelli, 2014), and 3%-36% for the incidence of fetal lose (Aluvihare et al., 2004; Dardalhon et al., 2010). In this study, the incidence of PIH, pregnancy loss and preterm labor significantly differs between the pregestational active and stable SLE groups, suggesting that pregestational active status of SLE probably increases the incidence of PIH, pregnancy loss and preterm labor. In addition, the incidence of PIH, FGR, pregnancy loss and preterm labor also considerably varies between the gestational active and stable SLE groups, indicating that gestational active SLE status could enhance the risk of PIH, FGR, pregnancy loss and preterm labor.

For patients with pregestational stable SLE for 3-6 months, merely 7%-10% of them suffered from the recurrence or exacerbation of SLE after conception (Ruiz-Irastorza & Khamashta, 2004; Sarter et al., 2013).

In this study, 11 among 32 women (34.37%) with pregestational stable SLE presented with active SLE during pregnancy, suggesting that pregnancy exerts a certain effect upon the recurrence of SLE.

CONCLUSION:
SLE pregnant women have a high risk of adverse pregnancy outcomes and SLE recurrence. Nevertheless, they can obtain high pregnancy rate if joint intervention and treatment are delivered from multi-disciplinary departments. The status of SLE (active or stable) is intimately correlated with maternal and neonatal outcomes. SLE patients are recommended to

prepare for conception during stable SLE stage to enhance the success rate of pregnancy and decrease the risk of obstetrics complications. PIH is a major complication of active SLE, and significantly associated with adverse pregnancy outcomes. SLE can lead to congenital embryo damage, especially heart block. Early screening and timely intervention should be implemented. Taken together, multi-disciplinary department coordination should be performed for SLE pregnant women, aiming to improve the maternal and neonatal outcomes.

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