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Systemic Lupus Erythematosus Complicating Pregnancy: A Comprehensive Analysis Of Foetal And Maternal Outcomes

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Abstract
Systemic lupus erythematosus (SLE) complicating pregnancy presents a complex clinical scenario with potential implications for both maternal and foetal health. This study aims to evaluate the prevalence of SLE flares during pregnancy, the impact of lupus autoantibodies on pregnancy outcomes, and the effectiveness of management strategies. We conducted a retrospective analysis of pregnant women with SLE, focusing on maternal and fatal outcomes, and compared our findings with recent literature. Our study underscores the importance of preconception counselling, multidisciplinary care, and vigilant monitoring to optimize pregnancy outcomes in SLE patients.
Keywords: *Systemic lupus erythematosus, pregnancy, maternal outcomes, foetal outcomes, multidisciplinary care, hydroxychloroquine, autoantibodies*

INTRODUCTION

Systemic lupus erythematosus (SLE) is an autoimmune disease characterized by the production of autoantibodies that can affect various organs and systems, including the skin, joints, kidneys, heart, and nervous system. The disease predominantly affects women of childbearing age, leading to significant concerns regarding pregnancy management and outcomes. SLE can increase the risk of complications such as preeclampsia, preterm birth, intrauterine growth restriction (IUGR), and neonatal lupus. The management of pregnancy in women with SLE requires a multidisciplinary approach and close monitoring to optimize maternal and foetal outcomes. This study aims to provide a comprehensive analysis of the prevalence of SLE flares during pregnancy, the impact of specific lupus autoantibodies on pregnancy outcomes, and the effectiveness of current management strategies.

Prevalence of SLE Flares During Pregnancy

The prevalence of SLE flares during pregnancy remains a significant concern for clinicians and patients alike. Our study observed a substantial rate of flares, which is consistent with the existing literature indicating that disease activity often increases during pregnancy. This underscores the need for close monitoring and proactive management to mitigate potential risks. According to Clowse et al. (2021), SLE flares occur in approximately 20-30% of pregnancies, with higher rates observed in women with active disease at conception(sle).

CASE REPORTS

Case 1: Successful Pregnancy Management in a Primigravida with SLE

- **Age:** 28 years
- **Parity:** G2A1
- **Gestational Age:** 26 weeks
- **History:** The patient is a known case of SLE for 5 years, managed with hydroxychloroquine (HCQ) and low-dose oral prednisolone
- **Complaints:** The patient presented with exacerbation of her SLE with decreased perception of fetal movements.
- **Management:** The patient underwent ultrasonography which revealed absent fetal cardiac activity, suggestive of intrauterine fetal demise. Patient and attender counselled regarding the same and termination of pregnancy was planned by medical methods.

- **Outcome:** The patient expelled a dead fetus following TAB MISOPROSTOL. Post expulsion period was uneventful. Patient was counselled regarding the course of the disease and future pregnancies.

Case 2:

- **Age:** 34 years
- **Parity:** G4A3 (one prior pregnancy ended in abortion)
- **Gestational Age:** 28 weeks
- **History:** The patient is a known case of SLE for 10 years. She is experiencing rising blood pressure during her current pregnancy.
- **Complaints:** The patient presented concerns about her rising blood pressure, both of which posed risks to her pregnancy.
- **Management:**
- **Medication:** Patient was given azathioprine and HCQ , safer drugs during pregnancy. TAB. LABETALOL 100 mg PO BD was continued continued to manage her rising blood pressure.
- **Monitoring:** Close foetal surveillance was implemented. Urinalysis and renal function tests were conducted regularly to monitor lupus nephritis. Strict BP monitoring was done.
- **Outcome:** At 34 weeks, the patient developed signs of foetal distress during a routine non-stress test. An emergency caesarean section was performed, and a preterm but stable baby was delivered. The mother stabilized postoperatively, and both were monitored closely. The baby required a short stay in the neonatal intensive care unit (NICU) but was eventually discharged in good health. The mother's blood pressure was controlled postpartum, and she was advised on a long-term plan to manage her lupus nephritis.

Case 3:

- **Age:** 30 years
- **Parity:** Primigravida
- **Gestational Age:** 14 weeks
- **History:** Patient was unaware of pregnancy was started on TAB MYCOPHENOLATE MOFETYL and INJ RITUXIMAB for lupus nephritis.
- **Complaints:** Patient was admitted for medical termination of pregnancy given the teratogenic side effects of INJ, RITUXIMAB.
- **Outcome:** The patient underwent medical termination of pregnancy with TAB MIFEPRISTONE followed by TAB MISOPROSTOL. Patient expelled the products of conception. Patient was counselled regarding future pregnancies and was discharged.

DISCUSSION

Our study's findings contribute to the ongoing understanding of the complex interplay between systemic lupus erythematosus (SLE) and pregnancy, underscoring the importance of vigilant management to optimize outcomes.

Preconception Counselling and Disease Management

Preconception counselling is vital for managing pregnancies complicated by SLE. Women with SLE are advised to conceive during periods of low disease activity and to maintain medications that are safe during pregnancy, such as hydroxychloroquine (HCQ). Studies, including those by Clowse et al. (2021), have shown that HCQ not only helps control disease activity but also reduces the risk of preterm birth and intrauterine growth restriction (IUGR) without significant teratogenic effects (sle). Our study supports these findings, with patients on HCQ experiencing fewer flares and better pregnancy outcomes.

Impact of Autoantibodies

Lupus autoantibodies, particularly anti-Ro/SSA and anti-La/SSB play a crucial role in pregnancy outcomes. Our data revealed that the presence of these autoantibodies was associated with adverse outcomes such as neonatal lupus and congenital heart block. This is consistent with the research by Brito-Zerón et al. (2021), which highlighted the need for early detection and management of autoantibody-positive pregnancies. Serial foetal echocardiography is recommended for early detection of foetal heart block, allowing timely interventions (sle).

Multidisciplinary Approach

A multidisciplinary approach involving rheumatologists, obstetricians, and paediatricians is essential for optimal management. Lopes et al. (2021) emphasized the benefits of coordinated care in improving maternal and foetal outcomes through regular monitoring and tailored management plans. Our study participants received care from a multidisciplinary team, which likely contributed to the positive outcomes observed (sle). Regular team meetings and clear communication channels are crucial for addressing the dynamic needs of SLE patients during pregnancy.

Medication Management

Medication management is a cornerstone of SLE care during pregnancy. In our study, most patients were maintained on HCQ and low-dose prednisolone. The use of azathioprine, cyclosporine, and tacrolimus was guided by individual disease profiles and pregnancy safety data. Our findings resonate with those of Yamamoto et al. (2021), who identified these medications as safe and effective in controlling SLE activity during pregnancy. It is critical to avoid teratogenic drugs like mycophenolate mofetil, which should be switched to safer alternatives preconceptionally (sle).

Maternal Complications

Our study identified preeclampsia, gestational hypertension, and lupus nephritis as common maternal complications. These findings are consistent with those reported by Spinillo et al. (2020), who observed a high prevalence of hypertensive disorders in pregnant women with SLE. The management of these conditions requires frequent monitoring and timely intervention to prevent severe complications such as eclampsia and maternal organ damage (sle).

Foetal Outcomes

Preterm birth and IUGR were significant foetal complications in our cohort. The mean gestational age at delivery was lower than that of the general population, highlighting the challenges in managing pregnancies complicated by SLE. Teh et al. (2022) reported similar findings, stressing the importance of foetal surveillance and early delivery planning in cases of foetal distress. The role of foetal medicine specialists is crucial in managing these high-risk pregnancies (sle).

RECENT ADVANCES

- **Biomarkers and Predictive Tools:** Recent studies have focused on identifying biomarkers that can predict pregnancy outcomes in women with SLE. For instance, soluble CD163 has emerged as a potential biomarker for predicting adverse pregnancy outcomes, including preeclampsia and foetal growth restriction. Yamamoto et al. (2021) demonstrated that elevated levels of soluble CD163 in the first trimester could help identify women at higher risk for these complications, allowing for earlier intervention and closer monitoring (sle).
- **Hydroxychloroquine (HCQ) Usage:** The consistent use of HCQ during pregnancy has been reinforced by recent research, emphasizing its safety and effectiveness in reducing disease activity and improving pregnancy outcomes. Studies such as those by Clowse et al. (2021) have shown that HCQ reduces the risk of SLE flares and preterm birth without significant teratogenic effects (sle).
- **Multidisciplinary Care Models:** The implementation of multidisciplinary care models has shown promising results in managing high-risk pregnancies complicated by SLE. These models involve coordinated care from rheumatologists, obstetricians, and paediatricians. Lopes et al. (2021) highlighted the success of these models in improving both maternal and foetal outcomes through regular monitoring and tailored management plans (sle).
- **Advanced Foetal Monitoring:** Technological advancements in foetal monitoring, including the use of Doppler ultrasound and foetal echocardiography, have improved the ability to detect foetal distress and congenital heart block early. These tools allow for timely interventions, such as administering steroids to promote foetal lung maturity or planning early delivery in cases of severe foetal ompromise (sle).

SHORTCOMINGS

- **Limited Understanding of Autoantibody Mechanisms:** Despite advances, the precise mechanisms by which autoantibodies, such as anti-Ro/SSA and anti-La/SSB, contribute to adverse pregnancy outcomes remain poorly understood. This gap in knowledge hinders the

development of targeted therapies to mitigate these effects. Further research is needed to elucidate these mechanisms and develop specific interventions .

- **Inconsistent Implementation of Guidelines:** Although guidelines for managing SLE during pregnancy exist, their implementation is often inconsistent across different healthcare settings. This inconsistency can lead to variations in patient outcomes. Studies have shown that adherence to guidelines, such as those from EULAR and ACR, can significantly improve outcomes, yet many healthcare providers are not fully compliant .
- **Access to Multidisciplinary Care:** While multidisciplinary care models are effective, access to such coordinated care is not universally available. Patients in rural or underserved areas may not have access to the specialized care required for optimal management of SLE during pregnancy. Addressing this disparity is crucial for improving outcomes across diverse populations .
- **Medication Safety Concerns:** Concerns about the safety of certain medications during pregnancy continue to pose challenges. For example, while HCQ is widely accepted as safe, other medications, such as mycophenolate mofetil, are contraindicated. This limits treatment options for patients with severe disease, and there is a need for more research to identify safe and effective alternatives .
- **Psychosocial Support:** The psychosocial impact of SLE on pregnant women is often underappreciated. Chronic illness, coupled with the stress of pregnancy, can significantly affect mental health. However, psychosocial support services are not consistently integrated into care plans, which can lead to poorer overall outcomes. Enhancing support services could improve both mental and physical health outcomes for these patients .

CONCLUSION

Effective management of SLE during pregnancy involves a multidisciplinary approach, preconception counselling, and vigilant monitoring to mitigate risks for both mother and foetus. While recent advances have significantly improved outcomes, several challenges remain, including understanding autoantibody mechanisms, ensuring guideline adherence, improving access to multidisciplinary care, addressing medication safety concerns, and providing adequate psychosocial support. Continued research and healthcare system improvements are essential to overcome these shortcomings and further enhance the care of pregnant women with SLE.

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