The outcomes of pregnancy complicated with systemic lupus erythematosus

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Abstract: To investigate the management and outcomes of pregnancy complicated by systemic lupus erythematosus (SLE), a retrospective analysis was performed based on the clinical information from 51 pregnant women with SLE，in which 29 patients were at the remission phase, and 22 patients were at the active phase. The results show that women with active SLE had more pregnancy complications including pre-eclampsia, preterm delivery, thrombocytopenia, and postpartum hemorrhage. The rates of fetal loss, premature delivery, and cesarean section were also higher in the women with active SLE. The data indicates that conception should be planned in the remission phase, and that once pregnant, patients with SLE should remain under intensive medical care and the collaborative supervision of rheumatologists and obstetricians.
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Key words: Pregnancy, systemic lupus erythematosus，outcome

Introduction

Systemic lupus erythematosus (SLE) is a chronic inflammatory disease involving the connective tissues. There are multiple pathogenic factors for SLE, and the autoimmune response plays critical role, which leads to damaging vital organs [1]. The disease occurs more often in women, especially during child-bearing years. Pregnancy complicated by SLE presents more challenges and adverse effects for both mother and child. SLE patients have benefited from advances in obstetrics and rheumatology so pregnancy is no longer contraindicated. In the current study, a retrospective analysis was performed based on the clinical information from 51 pregnant women with SLE to summarize the outcomes of both mother and child and share our experience of clinical management.

Material and methods

Patients

51 pregnant women with SLE admitted to our hospital between January 2003 and December 2012 were enrolled in the current study, ranging from 23 to 32 years of age. One of the patients gave birth to twins, 30 patients were pluripara, and the other 21 were primipara. The courses of the disease ranged from three months to nine years. 39 patients were diagnosed before pregnancy (with the courses of disease ranging from two to nine years) and the other 12 patients were initially diagnosed during their first or second trimester. An SLE diagnosis was made according to the revised criteria from the American College of Rheumatology (1997) [2]. There were 29 and 22 patients at the remission and active phases, respectively. For those who were at the active phase, 10 patients were in remission phase before pregnancy and had increased SLE activity after pregnancy; the other 12 patients had the initial onset of SLE and were diagnosed during the pregnancy. Sixteen out of 51 patients underwent regular prenatal examination in our hospital throughout pregnancy. The remaining patients were transferred from other hospitals, some presenting to the dermatology department for a rash.

The management of pregnancy and delivery

Prednisone was administrated to the patients in the remission phase with the dose of 5 to 10 mg/day. The prednisone dose increased to 25 to 60 mg/day for the patients with active SLE. In some active cases，an increased dose of prednisone was administrated to the patients on the day of cesarean section and the subsequent three consecutive days to withstand the stress of surgical.

Results

Maternal complications

In general, there were more complications in the 22 patients with active SLE. Pre-eclampsia occurred in four patients and was complicated with functional damage to the liver and kidney, myocardial injury, and fetal distress *in utero*. Additionally, thrombocytopenia, anemia, and postpartum hemorrhage occurred in six, six, and two patients, respectively. One patient underwent subtotal hysterectomy due to uncontrollable postpartum hemorrhage. Complications for the patients at the remission phase were much less severe; only four cases underwent mild anemia and thrombocytopenia.

Outcomes of pregnancy

Table 1. pregnancy outcome and SLE activity

cases（n）	fetal lose	term birth	preterm delivery	delivery style		low birth weight
				cesarean/vaginal delivery		
Active (22)	5	11	6	12	5	5
Remission(29)	2	23	4	6	21	1

Pregnancy was terminated at the second trimester for five patients with active SLE due to the progress of the disease. Six pre-mature deliveries occurred and 11 term births in the patients with active SLE. Among all 17 newborns, there were five with low birth weight, one with neonatal asphyxia, and one with skin erythema and decreased platelet counts. This newborn was later transferred to the pediatric department because of suspected neonatal lupus. Overall in the current study, the rate of fetal loss was 22.72%, the premature delivery rate was 27.27%, and the cesarean section rate was 54.55% for the patients with active SLE.

In patients at the remission phase, pregnancy termination was requested by two out of 29 patients in their first trimesters. The other 27 pregnancies were carried until delivery. Twenty-three patients were term births and four were premature deliveries. The fetal loss rate was 6.89%, the premature delivery rate was 13.79%, and the cesarean section rate was 20.69%, which were all lower than those in the patients of active SLE. And the low birth weight infants were also more from the patients with the active SLE.

Discussion

SLE is a connective tissue autoimmune disease that occurs more often in women at child-bearing ages. The immune system of the patient produces antibodies against self, such as antibodies against proteins in the cell nucleus, DNA, and phospholipid, which form immune complexes and deposit on the blood vessels and organs leading to damage in multiple systems. In our study, there were 29 patients at the remission phase of SLE and 22 patients at active phase according to the revised diagnostic criteria by the American College of Rheumatology (1997) [2]. Ten patients were in the remission phase before pregnancy and had increased SLE activity during the second and third trimesters. The major manifestations included: fever, rash, renal damage, decreased complement levels, and increased titers of anti-double stranded DNA antibodies. The aggravation of SLE during pregnancy is primarily ascribed to the increased levels of estrogen, prolactin, and the alteration of physiologies [3, 4]. It has been estimated that the risk of SLE flare-ups in pregnant women is around two to three fold higher than that in non-pregnant women.

SLE also leads to more pregnancy complications, even for those who have had SLE activity well controlled before pregnancy, and the risk of complications may increase in both mother and fetus. The common complications of SLE include the severe preeclampsia, damage to the kidneys, and complications related to the hematological system such as anemia, thrombocytopenia, and postpartum hemorrhage. Pregnancy induced hypertension is the most common complication for the women of SLE, with a significantly higher risk than healthy pregnant women [5]. In the current study, there were more complications in the patients with active SLE than those at remission phase, especially that of pre-eclampsia, functional damage of liver and kidney, thrombocytopenia, anemia, and postpartum hemorrhage. A previous study [6] shows that pregnancies should be delayed until the disease has been in remission for 6 months.

The decreased live birth rate in women with SLE was previously reported [7]. Miscarriage, stillbirth, premature birth, and fetal growth retardation may arise from placenta damage. The auto-immune complexes induced by SLE are the major cause of vascular wall thickening in placental villi, which leads to the lumen narrowing, intravascular thrombosis, and affects the material exchange function of placenta. A higher preterm delivery rate and early pre-eclampsia occur more often in patients with active SLE and lupus nephritis [8, 9]. In the current study, as shown in Table 1, a higher rate of fetal loss, preterm delivery, cesarean section, and low-birth weight infants was found in the patients with active SLE compared to those at remission phases. Except for two patients, who requested to terminate their pregnancy in the first trimester, most patients at remission phases had uneventful pregnancy courses and the outcomes of both mothers and newborns were satisfactory.

Pregnancy complicated by SLE is considered a high-risk pregnancy for both mother and child. Therefore, proper pregnancy management is critical. In the current study, there were 16 patients undergoing regular prenatal examination in the out-patient obstetrical department of our hospital throughout pregnancy. More frequent check-ups and regular rheumatology consultations were advised for the patients with SLE. A series of laboratory tests was performed at each check-up, including urine and

hematological tests, functional tests of liver and kidney, determination of the complement level, the titer of anti-double stranded DNA antibody, the erythrocyte sedimentation rate.

As for the fetal examinations, four-dimensional color Doppler ultrasound of fetus scanning and fetal echocardiography were carried out to exclude fetal abnormality at 22–26 weeks' gestation. Weekly electronic fetal heart rate monitoring is routine after 30 weeks' gestation and daily self-monitoring of fetal movements is advised. Ultrasonic examination every 3 or 4 weeks is helpful for monitoring fetal development. All 16 patients registered in our hospital throughout pregnancy had uneventful pregnancies and successful pregnancy outcomes under the joint supervision of the obstetrical and rheumatologic departments. All the patients had term births, including ten vaginal deliveries and six cesarean sections.

In summary, pregnancy can lead to the recurrence or aggravation of SLE, more complications may occur for both mother and child if SLE diseases are active. Once pregnant, women with SLE should be advised to obtain intensive prenatal care and regular consultation with rheumatologists. Most women with well-controlled SLE activity can have successful pregnancy outcomes.

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