

## Pregnancy Outcomes in Patients with Rheumatoid Arthritis and Lupus

Summarized by Jon Giles, M.D.

Changes in disease activity during pregnancy and the peri-partum period have long been recognized features of systemic autoimmune disease. Moreover, as certain autoimmune diseases, such as systemic lupus erythematosus (SLE) and rheumatoid arthritis (RA), frequently affect women of childbearing age, there is the potential for the disease to affect pregnancy outcomes. However, despite the frequency of pregnancy in women affected by these disorders, pregnancy outcomes are understudied. Here, Chakravarty et al (*Arthritis Rheum* 2006; 54: 899) examine pregnancy outcomes in SLE and RA utilizing a large, nationwide administrative dataset.

**Methods** Pregnancy outcomes from all hospitalizations attributed to patients coded for the diagnoses of SLE, RA, antiphospholipid antibody syndrome (APS), or gestational diabetes (GDM) were collected from the 2002 Nationwide Inpatient Sample of the Healthcare Cost and Utilization Project. This administrative database contains discharge data from all of the inpatient hospitalizations of 995 hospitals in 35 geographically diverse states, representing 20% of non-federal hospitals in the U.S. Pregnancy outcomes of interest included antenatal hospitalization, hypertensive disorders (including preeclampsia), cesarean section, and intra-uterine growth retardation (IUGR).

**Results** of the 976,527 total obstetric hospitalizations, 943 were in patients with a diagnosis of SLE, 360 with RA, 719 with APS, and 8338 with GDM. Most (95%) of the women with a diagnosis of APS did not carry an additional diagnosis of SLE or RA. Sampling weights were used to estimate the total number of obstetric hospitalizations, total deliveries, and cesarean deliveries in the U.S. in 2002 by diagnosis:

*Point estimates for total obstetric hospitalizations, deliveries, and cesarean deliveries in the U.S. for 2002 by diagnosis*

	SLE	RA	APS	GDM
All obstetric hospitalizations	4425	1685	3398	38713
Deliveries	3264	1425	2884	24427
Cesarean deliveries	1266	516	1285	13574

Non-delivery hospitalizations were statistically significantly higher in women with SLE (26.3%;  $p < 0.001$ ), RA (15.6%;  $p = 0.006$ ), APS (15.2%;  $p = 0.006$ ), and GDM (38.1%;  $p < 0.001$ ), compared to women without one of these diagnoses (11.2%)

Pregnancy outcomes in SLE At delivery, women with SLE tender to be older than non-SLE control patients (mean age 29.6 vs. 27.5 years, respectively). In SLE patients compared to controls, the rates of hypertensive disorders (23.2% vs. 7.8%, respectively), IUGR (5.3% vs. 1.6%, respectively), and cesarean section (39.4% vs. 26.5%, respectively) were significantly higher in the SLE group ( $p < 0.001$  for all three outcomes). Age adjusted odds ratios are presented in the table below.

Pregnancy outcomes in RA At delivery, women with RA tender to be older than non-RA control patients (mean age 29.8 vs. 27.5 years, respectively). In RA patients compared to controls, the rates of hypertensive disorders (11.1% vs. 7.8%, respectively), IUGR (3.4% vs. 1.6%,

respectively), and cesarean section (37.2% vs. 26.5%, respectively) were significantly higher in the RA group ( $p < 0.01$  for all three outcomes). Age adjusted odds ratios are presented in the table below.

**Pregnancy outcomes in APS** At delivery, women with APS tender to be older than non-APS control patients (mean age 31.3 vs. 27.5 years, respectively). In APS patients compared to controls, the rates of hypertensive disorders (13.0% vs. 7.8%, respectively), IUGR (5.1% vs. 1.6%, respectively), and cesarean section (44.6% vs. 26.5%, respectively) were significantly higher in the APS group ( $p < 0.001$  for all three outcomes). Age adjusted odds ratios are presented in the table below.

*Age adjusted risk of adverse pregnancy outcomes compared to control patients according to diagnosis*

	SLE	RA	APS	GDM
Hypertensive disorders	3.3 (2.8 – 4.0)	1.4 (0.9 – 1.9)	1.6 (1.3 – 2.0)	4.4 (4.2 – 4.7)
IUGR	3.5 (2.5 – 4.9)	2.2 (1.2 – 4.1)	3.4 (2.4 – 4.9)	1.1 (0.9 – 1.5)
Cesarean section	1.6 (1.4 – 1.9)	1.5 (1.2 – 1.9)	1.9 (1.6 – 2.2)	3.2 (3.0 – 3.4)

African-American race was associated with an increased risk of all adverse pregnancy outcomes examined.

**Conclusions** To varying degrees, adverse pregnancy outcomes are significantly more frequent in women with SLE, RA, and APS than in women who do not carry these diagnoses.

**Editorial Comment** The primary advantage of this study derives from the size and scope of the dataset utilized, by far the largest and most geographically diverse analysis to date devoted to pregnancy outcomes in women with autoimmune disease. However, whenever administrative databases of this sort are utilized, issues of misclassification may result; particularly as the data was not collected with the aims of this investigation in mind but primarily for reimbursement purposes. Thus, patients with mild or inactive disease may not be diagnostically coded if their autoimmune disease was not thought to impact their hospitalization. The patients left with more active or severe disease may also be those more prone to adverse outcomes, with the ultimate result of adverse outcome rates being overestimated.

In addition, because no clinical data was examined it is impossible in this analysis to determine the individual risk factors for the adverse pregnancy outcomes within the diagnostic groups. In particular, understanding the impact of disease activity during pregnancy, and the effect of medications used to control disease activity, are important understudied questions that frequently face women with autoimmune disease contemplating pregnancy and their caregivers. However, investigations such as the one presented here suggest that interest in this challenging area of clinical investigation is increasing.