NAPGO

North American Proceedings in Gynecology & Obstetrics

Special Issue
CAOG Conference Abstracts
Winter 2022

Obstetrical and neonatal outcomes of pregnancies complicated by sarcoidosis

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Abstract

PURPOSE: Sarcoidosis is a systemic disease of immune dysfunction that most commonly presents as obstructive or restrictive lung disease. Sarcoidosis, while rare, disproportionately affects African American women of childbearing age, and there is a paucity of data on sarcoidosis in pregnancy. The few existing studies present conflicting data on both the maternal and neonatal outcomes of sarcoidosis in pregnancy. The purpose of this study is to evaluate maternal and neonatal outcomes in women with sarcoidosis. We examined outcomes of pregnancies complicated by sarcoidosis compared to those with systemic lupus erythematous (SLE), a systemic autoimmune disease for which increased perinatal risks are established. We hypothesized that sarcoidosis poses increased adverse obstetrical and neonatal outcomes, similar to SLE.

METHODS: We assessed the perinatal outcomes of pregnant women with sarcoidosis (n=24) and SLE (n=28) compared to controls (n=31) matched by age, race, and year of delivery from 2000-2021 at a single tertiary hospital. Subjects were identified retrospectively by ICD 9 and 10 codes. Perinatal outcomes examined included preeclampsia, maternal cardio-pulmonary complications, venous thromboembolism (VTE), gestational hypertension, gestational diabetes, spontaneous preterm delivery (sPTD), C-section, medically indicated preterm delivery, gestational age (GA) at delivery, birth weight, fetal anomalies, neonatal respiratory distress (RDS), and NICU admission. Exclusion criteria included pregnancies in women not diagnosed with sarcoidosis until after delivery and those who delivered or received their obstetric care at an outside facility. Data analysis included Kruskal Wallis (KW) test for continuous data or $\chi 2$-test for categorical data, with significance at $p < 0.05$.

RESULTS: Pregnancies complicated by sarcoidosis and SLE compared to controls resulted in neonates born at significantly earlier mean gestational age (37w0d, 36w1d, and 38w5d respectively; p =0.0077), significantly higher total sPTD ≤ 36 weeks (20.8%, 42.9% and 3.23% respectively; p= 0.011), including very premature spontaneous delivery ≤ 32 weeks (4.2%, 25%, and 0%, p=0.049) and lower mean birth weight (2870 ± 646 g in sarcoidosis, 2356 ± 848 g in SLE, and 3181 ± 464 g control subjects; p =0.0003). There was no significant difference in neonatal need for positive pressure ventilation, or NICU admission, although a trend toward longer NICU length of stay was observed in neonates within the sarcoidosis and SLE groups compared to controls (mean 11.8 ± 10 days, 26.1 ± 23.1 days, and 4.3 ± 1.7 days respectively; p =.0512). We found a significantly higher number of fetal anomalies in the sarcoidosis and SLE groups compared to controls (n=5 in sarcoidosis group, 10 in SLE, and 2 in controls; p= 0.021.) Neonates of pregnant women with sarcoidosis were found to have odds ratio (OR) 9.33 for hyperbilirubinemia compared to controls (p =0.0034, 95% CI 2.22-39.18), and incidence was comparable to SLE subjects. No significant differences were found for maternal outcomes including preeclampsia, gestational hypertension, gestational diabetes, C-section, VTE, and medically indicated induction of labor.

CONCLUSION: Our study found sarcoidosis in pregnancy was associated with an increased incidence of sPTD, lower birth weight, fetal anomalies, and longer NICU stay, similar to the those in the SLE group. Although these increased neonatal

risks of SLE and sarcoidosis are similar, our findings suggest the higher risk was seen in the SLE group. Our data suggests sarcoidosis is associated with increased incidence of PTD, fetal anomalies, and neonatal complications which clinicians should be aware of. Increased risk of hyperbilirubinemia and lower birth weight correspond to prematurity and NICU admission, though the etiology of increased spontaneous preterm delivery requires further investigation. While our data did not find increased risk of maternal adverse outcomes, this investigation adds to the limited studies and conflicting data on sarcoidosis in pregnancy. Maternal risk factors that may contribute to adverse perinatal events like sPTD, such as sarcoidosis clinical phenotype, incidence of lymphopenia, and disease modifying medications, should be elucidated in further studies. The rare nature of sarcoidosis in pregnancy continues to be a challenge in generating robust analysis of perinatal outcomes, but ongoing investigation is essential for optimizing pregnancy outcomes for women with sarcoidosis and reducing perinatal morbidity and mortality for African American women.