COVID-19 is associated with early emergence of preeclampsia: results from a large regional collaborative

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OBJECTIVE: To examine the relationship between COVID-19 and preeclampsia (PreE) in a large, diverse population.
STUDY DESIGN: The COVID-19 in Pregnancy and The Newborn: State of Michigan Collaborative established a database of pregnant patients admitted to 14 institutions in Southern Michigan. Patients with COVID-19 (cases) were matched to 2 or 3 non-COVID patients (controls) on the same unit within 30 days of each case. Relative Risks (RR) were calculated using robust Poisson regression models with adjustment for covariates. Chi-squared test for trend was used to assess the increase in risk with the severity of disease.

RESULTS: 369 cases and 1,090 controls were delivered between March - October 2020. An increased risk of PreE (RR=1.8), driven almost entirely by an increase in preterm PreE (pretermPreE) (RR=2.85) was observed in COVID pregnancies (Table 1), with a dose-response relationship with symptomatology and severity (Table 2). The associations between COVID-19 disease and PreE or pretermPreE were independent of other risk factors, as demonstrated by the minimal changes in RR after adjustment for confounders (Table 1). However, African American (AA) COVID patients experienced pretermPreE 1.9 times more than COVID patients of other races (10.1 vs 5.3), an increase not observed in control patients. The strength of the association for COVID with PreE was comparable to the association of PreE with chronic hypertension and nulliparity (data not shown). Increasing symptoms and severity of COVID-19 were associated with an increased risk for PreE with placental lesions, even after adjustment for relevant covariates (Tables 1 & 2). Non-PreE COVID patients had an increased trend of placental lesions compared to non-COVID patients, reaching significance for intravillous thrombin.

CONCLUSION: COVID-19 is significantly associated with early emergence of PreE, independent of known risk factors other than AA race. Our study shows that among patients predisposed to PreE, COVID-19 impacts PreE severity in that it leads to pretermPreE. Further studies on COVID-19 and PreE, with a focus on racial disparities, is warranted.