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Increasing severity of COVID-19 in pregnancy with Delta (B.1.617.2) variant surge

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Objective

The Delta (B.1.617.2) variant became the predominant SARS-CoV-2 virus circulating in the United States beginning June-July 2021.¹ We report illness severity trends among obstetric patients with COVID-19 in a background of Delta variant predominance and describe COVID-19 vaccinations in this cohort at Parkland Hospital, a public county hospital.

Study Design

We prospectively studied pregnant patients diagnosed with SARS-CoV-2 by nasal or nasopharyngeal PCR in a large prenatal system encompassing a centralized acute care hospital and 10 community-based prenatal clinics, all with an integrated electronic health record. In mid-May 2020, universal SARS-CoV-2 screening was implemented for obstetric patients on hospital admission, with symptom-based testing at outpatient clinics and the emergency department. Positive tests were grouped into weekly epochs by date of diagnosis and maximum symptom severity. Severe or critical illness was defined as requiring supplemental oxygen, high-flow nasal cannula, ICU admission, or mechanical ventilation. Management of asymptomatic or mild to moderate illness in pregnancy included symptom treatment with isolation precautions and virtual or in-person follow up. Routine management of severe or critical illness included administration of dexamethasone or other therapies according to NIH guidance.² The association between severe or critical illness and week was evaluated for trend using the Mantel-Haenszel chi-squared test for trend. Local SARS-CoV-2 Delta variant (B.1.617.2) sequencing was performed and variant predominance tracked weekly. COVID-19 vaccines were offered from December 2020, and vaccination rates in pregnancy or immediately postpartum are described.

Results

From May 17, 2020 through September 4, 2021, 1,515 pregnant patients were diagnosed with COVID-19, and 7(0.5%) had reinfection >90 days after initial infection during pregnancy. Infections included 690(45%) from Labor and Delivery or inpatient units, 383(25%) outpatient, 167(11%) emergency department, and 282(19%) external tests. Included are 82(5.4%) with severe or critical illness during pregnancy, with 10(0.7%) requiring mechanical ventilation, 2(0.1%) maternal deaths whose neonates survived, and 2(0.1%) fetal-neonatal deaths associated with maternal critical illness.

The proportion of pregnant patients with severe to critical illness increased in April 2021 although total case numbers remained low (Figure). As Delta (B.1.617.2) variant predominated locally, both the case volume and the proportion of severe or critical illness increased significantly ($p=0.001$ for trend), with over a quarter of pregnant patients diagnosed between August 29-September 4 admitted for severe or critical illness.

COVID-19 vaccine administration with any vaccine authorized for emergency use was examined in this cohort. Among 665 patients still pregnant or immediately postpartum when vaccines were available, 142(21.4%) received at least one dose of an available vaccine, including 39 before infection, 99 after, and 4 between repeat infections. One infected patient was hospitalized for severe COVID-19 after being vaccinated; this patient had a BMI of 61kg/m^2 .

Conclusion

There is increased morbidity seen in pregnancy with COVID-19 during the recent surge associated with the Delta variant, particularly in an underserved pregnant population where vaccine acceptance is low.³ Overall rates of severe or critical illness in this cohort are consistent

with previously published data from our institution.⁴ However, recent trends demonstrate that along with increasing case volume, the proportion requiring hospitalization is rising. Potential pathophysiologic mechanisms for increased severity of illness with B.1.617.2 in pregnancy are unclear. Our results highlight the urgency of prevention measures including COVID-19 vaccination during pregnancy.

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Figure Legend

Figure 1. Panel A, Weekly cases and percent severe or critical COVID-19 illness in pregnancy at an Parkland Hospital, May 17, 2020 - September 4, 2021. Data after dotted line considered preliminary. Delta (B.1.617.2) variant predominance shown in blue; the last week includes sequencing through August 30. **Panel B,** Locally weighted smoothing scatterplot (LOESS) of percent severe or critical COVID-19 illness in pregnancy with 95% confidence interval (CI) shown ($p=0.001$ for trend), May 17, 2020 – September 4, 2021.

