A real-world assessment of tolerability and treatment outcomes of COVID-19 monoclonal antibodies administered in pregnancy

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Objectives

Monoclonal antibodies (mAb) for treatment of COVID-19, available under EUA, when given early, prevent disease progression and reduce risk of hospitalization and mortality.[1] Pregnancy is associated with increased rates of severe illness, ICU admission, mechanical ventilation, preterm birth, stillbirth, and death compared to nonpregnant women of reproductive age.[2-3] Despite a paucity of tolerability and outcomes data, the American College of Obstetricians and Gynecologists and the Society of Maternal Fetal Medicine support the recommendation from the National Institutes of Health to offer mAb to pregnant individuals with mild to moderate COVID-19 infections. To date, there are only two published studies on mAb treatment outcomes during pregnancy.[4-5] The objectives of this study were to evaluate the tolerability of mAb treatment during pregnancy and to assess subjective improvement in symptoms, admission within 30 days for COVID or non-COVID reasons, and pregnancy outcomes.

Study Design

A single-center retrospective observational chart review was conducted for all pregnant persons with mild-to-moderate COVID-19 treated with monoclonal antibodies (bamlanivimab, bamlanivimab/etesevimab, or casirivimab/imdevimab) at our medical center between December 2020 and October 2021. Tolerability, infusion-related reactions, and self-reported subjective improvement in symptoms 1 to 7 days post infusion, 30 days post-treatment admission for COVID or non-COVID reasons, and pregnancy outcomes where available were analyzed. Patients were considered fully vaccinated if presenting two weeks or more following receipt of 2 doses of mRNA COVID vaccines or 1 dose of adenoviral vector-based COVID vaccine.

Results

Of the 30 pregnant females treated, 25 (83%) reported a subjective improvement in symptoms within one to 7 days post infusion (Table). Ten (33%) patients were admitted within 30 days post-treatment. Two (7%) patients with COVID-related admissions within 30 days required supplemental oxygen, neither developed severe infections, and both subsequently delivered at full term by cesarean and discharged home. Eight were admitted for non-COVID-related issues, three for full term vaginal deliveries, one for management of urinary tract infection, two deliveries due to category II fetal heart rate tracing patterns prompting interventions (one vaginal preterm, one cesarean full term), and two additional preterm deliveries due to preterm premature rupture of membranes. Only one patient reported an infusion reaction with mild hypotension and dizziness, resolved with fluids. Twenty-two (73%) patients had delivered by November 2021, with 15 vaginal and 4 cesarean full-term deliveries, and two vaginal and one cesarean preterm deliveries. One preterm infant delivered due to preterm premature rupture of membrane required neonatal ICU admission. To date all 22 mother-baby pairs remain stable without abnormalities reported in infant growth and anatomy or postpartum COVID-related complications. Six (20%) remain pregnant, and two (7%) terminated their pregnancy by choice. No significant adverse pregnancy outcomes were reported.

Conclusion

Pregnancy is a risk factor for severe COVID-19 and meet EUA criteria for mAb treatment. Monoclonal antibodies are well tolerated, effective, may benefit the fetus, and should be considered in pregnancy. This study supports the favorable safety and tolerability profile

reported in earlier studies. Although two oral antivirals are now available, one is not indicated in pregnancy and the other is affected by limited supplies.

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Table 1: Characteristics of SARS-CoV2-Positive Pregnant Patients Treated with Monoclonal Antibodies, February 1, 2021–October 31, 2021

	Total n (%) n=30
Age, median (IQR)	31.5 (25.3-38.5)
Race/ethnicity	
Hispanic	4 (0.13%)
Non-Hispanic Black	19 (63.3%)
Non-Hispanic White	6 (0.2%)
Asian	1 (0.03%)
Other	0 (0%)
BMI	31 (26-35)
Fully vaccinated prior to treatment	1 (3%)
High-risk co-morbidities per EUA*	
BMI >=25	24 (80%)
Pregnancy	30 (100%)
Chronic lung disease	11 (37%)
Chronic kidney disease	0 (0%)
Diabetes mellitus	2 (7%)
Immunocompromised disease or immunosuppressive treatment	0 (0%)
Medical-related technological dependence	0 (0%)
Neurodevelopmental disorders	0 (0%)
Cardiovascular disease or hypertension	1 (3%)
Number of EUA criteria met, median	2
Symptom duration prior to treatment	
Days, median (IQR)	3 (2-6)
Asymptomatic, n (%)	1 (3%)

Monoclonal antibody product administered	
Bamlanivimab	9 (30%)
Bamlanivimab/etesevimab	1 (3%)
Casirivimab/imdevimab	20 (67%)
Outcomes	
All-cause 30-day admission	10 (33%)
COVID-related 30-day admission	2 (7%)
Infusion reactions	1 (3%)
Subjective symptom improvement	25 (83%)
Delivered	22 (73%)
Preterm	3 (14%)
Full term	19 (86%)
Cesarean	5 (23%)
Vaginal	17 (77%)
Remains pregnant	6 (20%)
Terminated pregnancy by choice	2 (7%)
Adverse pregnancy outcome	0 (0%)