SARS-CoV-2 Positive Pregnant Women Delivering in a Hospital From March 2020 – February 2021 in Three California Counties

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Background

Research on pregnant women during the beginning of the pandemic focused on comparing COVID-19 positive and COVID-19 negative women rather than comparing asymptomatic with symptomatic COVID-19 disease and health outcomes.

Comparing outcomes of symptomatic and asymptomatic hospitalized pregnant women with COVID-19 can inform both the prognosis during hospitalization and the relationship of symptomatic COVID-19 to pregnancy outcomes.

Methods

Data: Using population-based surveillance data from the Center for Disease Control and Prevention's COVID-19 Associated Hospitalization Surveillance Network (COVID-NET), SARS-CoV-2 positive pregnant patients, ages 15 to 49 years, were identified, and chart reviews were conducted for residents of Alameda, Contra Costa, and San Francisco Counties in California who delivered in a hospital between March 1st 2020 and February 28th 2021.

Cases: Patients were included in our analysis if they had a positive COVID-19 test while hospitalized or within 14 days prior to admission and delivered during that admission. We placed patients that had experienced any new or worsening symptoms within two weeks prior to admission in the Symptomatic group and placed all other patients in the Asymptomatic group.

Analysis: Multivariate analysis was used to describe demographic characteristics, underlying medical conditions, and pregnancy outcomes by presence or absence of symptoms upon hospitalization. Chi-square tests were used to assess significance with p -values <0.05 considered statistically significant. We calculated Odds Ratios(OR) and 95% CIs to measure associations between the presence of symptoms and pregnancy complications/outcomes. All analyses done in SAS 9.4.

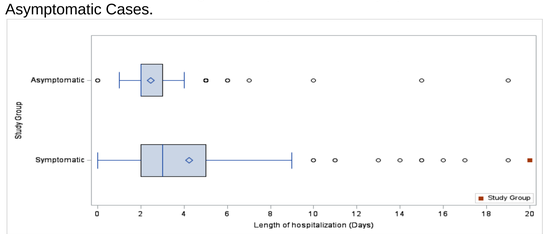
Tables and Figures

Figure 1: Among the 330 SARS-CoV-2 positive cases in this study, 221 (67%) were asymptomatic while 109 (33%) were symptomatic.

Table 1: Patient Demographic Characteristics

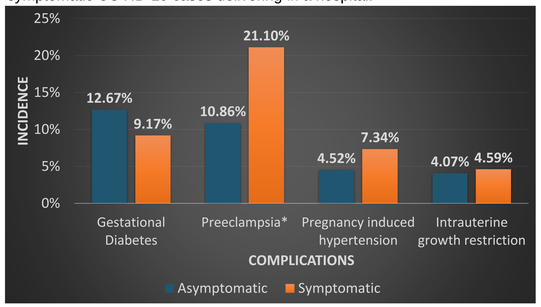
Characteristic		Asymptomatic	Symptomatic	P-Value
		N=221 (%)	N=109 (%)	
Age				0.67
	<35 years	176 (79.64%)	89 (81.65%)	
	≥35 years	45 (20.36%)	20 (18.35%)	
Race/Ethnicity				0.12
	Hispanic	143 (64.71%)	56 (51.38%)	
	Non-Hispanic White	10 (4.52%)	6 (5.50%)	
	Non-Hispanic Black	11 (4.98%)	10 (9.17%)	
	Asian/Pacific Islander	11 (4.98%)	11 (10.09%)	
	American Indian/ Alaska Native	0 (0%)	0 (0%)	
	Multiracial	1 (0.45%)	2 (1.83%)	
	Not specified	45 (20.36%)	24 (22.02%)	

Figure 2: Distribution of Length of Hospitalization for Symptomatic and Asymptomatic Cases.



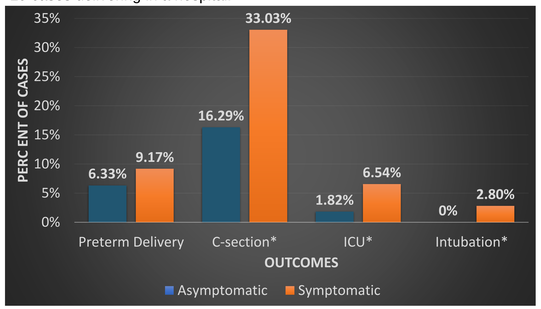
Outliers over 20 days clipped for better visualization. There were 3 clipped values equal to 25, 31, and 37 days for the symptomatic group.

Figure 3: Incidence of pregnancy complications in asymptomatic and symptomatic COVID-19 cases delivering in a hospital.



*P-value<0.05

Figure 4: Incidence of outcomes in asymptomatic and symptomatic COVID-19 cases delivering in a hospital.



Other outcomes that were included in the analysis but had 0 incidence in either group were stillbirth, newborn death, and maternal death.

*P-value<0.05

Results

Among the 330 SARS-CoV-2 positive women that delivered in a hospital, 60.3% were Hispanic or Latino, 4.9% were White (Non-Hispanic), 6.4% were Black (Non-Hispanic), 6.7% were Asian or Pacific Islander, 0.9% were multiracial, and 20.9% were unknown race or ethnicity.

Symptomatic cases spent a median of 3 days in the hospital while asymptomatic cases spent a median of 2 days in the hospital.

Symptomatic women were more likely to have a **Caesarian-section (OR 2.49, 95% CI: 1.45, 4.28)**, have **preeclampsia (OR 2.20, 95% CI: 1.17, 4.10)**, and be admitted to the **ICU (OR 3.78, 95% CI: 1.09, 13.21)** than asymptomatic women.

Intubation was required for 3 of the 109 symptomatic women and none of the 221 asymptomatic women (P=0.03).

Future Directions

Limitations:

- Our data were limited to women who delivered in the hospital and do not include follow-up data of the parent or child after discharge.
- Our sample size was too small to capture more rare events such as maternal death, stillbirth, and newborn death.
- We do not know the distributions of emergency vs. elective C-sections

Future directions: Future studies following up on the outcomes of parent and child after discharge would provide valuable insight into the long-term affects of symptomatic COVID-19 during birth. More research should also be done on the rare but more serious outcomes that could be higher risk for symptomatic COVID-19 cases.

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