Maternal and perinatal outcomes associated with SARS-CoV-2 infection during pregnancy, Florida, 2020–2021: A retrospective cohort study

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Abstract

Objective: To estimate risk of SARS-CoV-2 infection in pregnancy and assess adverse maternal and perinatal outcomes. Design: A population-based, retrospective cohort. Setting: Florida, USA. Population: All pregnancies with a live birth or fetal death from March 1, 2020 to April 30, 2021. Methods: COVID-19 case reports were matched to vital registries. Modified Poisson and multinomial logistic regression models were used to derive relative risk estimates. Main Outcome Measures: Infection in pregnancy, preterm birth, maternal or neonatal admission to and intensive care unit (ICU), fetal death. Results: Of 234,492 women with a live birth or fetal death during the study period, 12,976 (5.5%) were identified with COVID-19 during pregnancy. Risk factors for COVID-19 in pregnancy included Hispanic ethnicity (relative risk [RR]=1.89), Black race (RR=1.34), being unmarried (RR=1.04), and being overweight or obese pre-pregnancy (RR=1.08-1.32). COVID-19 during pregnancy was associated with preterm birth (RR=1.31), Cesarean delivery (RR=1.04), and neonatal (RR=1.17) and maternal (RR=3.10) ICU admission, but no association was found with increased risk of perinatal (RR=0.72) or fetal death (RR=0.86). Women infected during any trimester showed increased risk of preterm birth compared to women without COVID-19. Thirteen maternal deaths were identified among COVID-19 cases; of those who died, 11 were obese. The death rate was 20.53 per 10,000 among obese and 1.22 per 10,000 among non-obese gravida with COVID-19 during pregnancy (RR=16.88, P=0.001). Conclusions: Obesity is a risk factor for SARS-CoV-2 infection in pregnancy and for more severe COVID-19 illness among pregnant women. SARS-CoV-2 infection is associated with preterm birth.

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	Trimester	n	aRR	Lower 95%	Upper 95%	P-value
Premature birth <37 vs ≥ 37 weeks	T1	247	1.2056	1.0751	1.3520	0.0014
	T2	521	1.2320	1.1376	1.3343	<.0001
	T3	745	1.4104	1.3155	1.5122	<.0001
≥32 to <37 vs ≥ 37 weeks	T1	199	1.1729	1.0311	1.3343	0.0153
	T2	404	1.1601	1.0586	1.2712	0.0015
	T3	683	1.5213	1.4138	1.6369	<.0001
≥28 to <32 vs ≥ 37 weeks	T1	20	1.2565	0.8139	1.9397	0.3027
	T2	72	2.1829	1.7120	2.7834	<.0001
	T3	60	1.2731	0.9567	1.6941	0.0976
<28 vs ≥ 37 weeks	T1	28	2.0137	1.3512	3.0010	0.0006
	T2	45	1.5630	1.1372	2.1482	0.0059
Cesarean Delivery	T1	768	1.0854	1.0280	1.1460	0.0031
	T2	1434	1.0255	0.9844	1.0682	0.2275
	T3	2741	1.0425	1.0110	1.0749	0.0078
Admitted to Neonatal ICU	T1	223	1.2276	1.0865	1.3871	0.0010
	T2	447	1.1899	1.0887	1.3006	0.0001
	T3	781	1.1390	1.0616	1.2219	0.0003
Peri-natal death	T1	12	1.2322	0.6818	2.2269	0.4893
	T2	18	0.9295	0.5679	1.5215	0.7712
	T3	17	0.4515	0.2664	0.7650	0.0031