Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

18 Symptomatic versus Asymptomatic COVID-19: Does It Impact Placental Vasculopathy?

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OBJECTIVES: Previous research has revealed associations between COVID-19 and markers of vasculopathy and inflammation on placental histopathology. This study sought to assess the impact of COVID-19 on placental vasculature in the context of maternal symptomatology and trimester of infection.

METHODS: Retrospective cohort study of PCR-confirmed COVID-19 positive pregnant patients in a single health system who delivered between March-December of 2020. Primary outcome was incidence of any vascular malformations on placental pathology. Secondary outcomes were fetal or maternal vascular malformation (FVM, MVM) and histologic chorioamnionitis on placental pathology. Symptomatic (sCOVID) patients were compared to asymptomatic (aCOVID) patients. Sub-analysis by trimester of infection also performed. Bivariate statistics were used to analyze the data. Regression models were performed to control for confounders.

RESULTS: Of 99 women, 51 (52%) had symptoms and 48 (48%) did not. sCOVID patients were more likely to be older (30 vs 26 years old), have higher BMI (34.6 vs 30.7) and have an earlier gestational age (GA) at diagnosis (34.7wks vs 37.9wks) (all $p<0.05$).

25 (25.3%) patients had evidence of vascular malformations on placental pathology, of whom 24 (24.2%) had MVM. There was no significant difference in histologic finding of any placental vascular malformations when comparing aCOVID and sCOVID patients ($p=0.38$), nor were there any differences in FVM, MVM, or histologic chorioamnionitis (Table 1). After controlling for age, BMI, preeclampsia, and GA at COVID-19 diagnosis, no difference in odds of placental vascular malformations was seen, (aOR 0.68, 95%CI 0.24, 1.89).

When analyzed by trimester of infection, after controlling for maternal age and preeclampsia, no significant differences in MVM were found between sCOVID and aCOVID patients, regardless of the trimester of infection [2nd trimester aOR0.32 (95%CI 0.01, 8.48); 3rd trimester aOR0.60 (95%CI 0.21, 1.72)].

CONCLUSIONS: Symptomatic COVID-19 infection did not impact placental pathology, even when stratifying by trimester of infection. The incidence of MVM and histologic chorioamnionitis found in this study is comparable to rates found in low-risk nulliparous women without COVID-19 infection. Future research will be necessary to better understand how COVID-19 infection impacts placental pathology to predict clinical outcomes.

Table 1: Placental pathology among women with COVID-19 infections

	All COVID n=99(%)	aCOVID n=48(%)	sCOVID n=51(%)	p-value
Any Vascular malformations	25 (25.3)	14 (29.2)	11 (21.6)	0.38
Maternal vascular malformations	24 (24.2)	14 (29.2)	10 (19.6)	0.27
Fetal vascular malformations	1 (1.0)	0 (0.0)	1 (2.0)	0.33
Infectious findings	28 (28.3)	14 (29.2)	14 (27.5)	0.85

19 COVID-19 and the Placenta: Impact of Maternal Disease Severity

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OBJECTIVES: Pregnant patients are at increased risk for severe disease from COVID-19. Prior studies have found placental vasculopathy and inflammation associated with COVID-19 infection, suggesting that maternal COVID-19 infection impacts placental blood flow. The objective of this study is to describe the impact of maternal COVID-19 severity on placental vasculature.

METHODS: Retrospective cohort study of pregnant patients in a single health system with symptomatic COVID-19 who delivered March-December of 2020. Primary outcome was incidence of any vascular malformations on placental pathology. Secondary outcomes were fetal vascular malperfusion (FVM), maternal vascular malperfusion (MVM), or histologic infection (chorioamnionitis or funisitis) on placental pathology. Patients with mild disease (mCOVID) were compared to those with more symptomatic disease (including moderate, severe, or critical) (sCOVID), as defined by 2020 NIH guidelines. Treatment or medical therapy for patients with sCOVID were not collected in this study. Data were analyzed using bivariate statistics as appropriate.

RESULTS: Of 51 patients, 37 (73%) had mCOVID and 14 (27%) had sCOVID (moderate n=4, severe n=9, critical n=1). Race/ethnicity, BMI, maternal comorbidities, and gestational hypertensive disorders did not differ by mild vs. more symptomatic COVID status. No differences in gestational hypertensive disorders were seen (p=ns). Patients with sCOVID had an earlier median gestational age at delivery (37.4 wks vs 39.1 wks, $p=0.04$), and were more likely to deliver preterm (43% vs 14%, $p=0.02$); though delivery less than 34 weeks did not differ.

In the study cohort, 11 (29.7%) patients had evidence of a vascular malformation (FVM and MVM) on placental pathology, all of whom were in the mCOVID group ($p=0.02$). Similarly, 10 (27%) of mCOVID patients had MVM, while no sCOVID patients did ($p=0.02$). No difference in FVM or histologic infection was found between cohorts.

CONCLUSIONS: Among pregnant patients with symptomatic COVID-19, mild disease was associated with placental vascular changes on the maternal side while severe disease was not. Further studies are needed to understand the implications of COVID-19 infection severity on placental pathology and pregnancy outcomes.

Table 1: Placental pathology among women with COVID-19 infections

	Mild disease (N=37)	Mod/sev/crit disease (N=14)	p-value
Any Vascular malformation	11 (29.7)	0 (0.0)	0.02
Maternal vascular malformations	10 (27.0)	0 (0.0)	0.03
Fetal vascular malformations	1 (2.7)	0 (0.0)	0.53
Infectious findings	10 (27.0)	4 (28.6)	0.91