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.

Worse outcomes of pregnancy in COVID-19 infection during parturition may be due to referral bias: analysis in a prospective cohort of 963 pregnancies

OBJECTIVE: The initial studies of COVID-19 suggested that pregnant women have more severe infection with an increased risk of preterm birth, preterm rupture of membranes, and even maternal deaths.[1] Later studies and systematic reviews showed different results.[2] When pregnant women were universally screened, severe disease rates mirrored those of the normal population.[3] Most studies on outcomes have not controlled for either preexisting maternal risk factors or those acquired during pregnancy.[2] In addition, there is still a gray area in understanding how COVID-19 infection around the time of delivery affects pregnant women. Thus, we analyzed if the apparent high risk of severe COVID-19 in referral centers was confounded owing to other concomitant risk factors.

STUDY DESIGN: In our cohort from a single tertiary referral hospital in India, all pregnant women coming for delivery or with labor pain were universally screened for SARS-CoV-2 infection using reverse transcriptase polymerase chain reaction performed on oronasopharyngeal samples. The patients who left the hospital before delivery were excluded. Of 963 pregnant women, 127 were COVID-19 positive. They were compared using tests for proportion in terms of maternal complications (cesarean deliveries, antepartum and postpartum hemorrhage, preterm and prelabor rupture of membrane, puerperal sepsis, and mortality) and neonatal outcomes (appearance, pulse, grimace, activity, and respiration scores; low birthweight; intensive care requirement; neonatal COVID-19 infection; neonatal sepsis; and death). The generalized linear models (GLMs) were then built to assess the contribution of various maternal risk factors and COVID-19 positivity on these outcomes.

RESULTS: The age, gravida, parity, gestational diabetes, and pregnancy-induced hypertension (PIH) rates were similar between the COVID-19 positive and negative cohorts (Supplemental Table 1). The COVID-19 cohort had an overrepresentation of various other pregnancy risk factors (Table). Furthermore, the COVID-19 cohort had higher cesarean deliveries (87 [68%] vs 445 [53.3%] in the negative cohort; P=.02), higher postpartum hemorrhage (6 [4.7%] vs 1 [0.1%]; P<.001), and higher maternal mortality (2 [1.6%] vs 1 [0.1%]; P=.048) (Supplemental Table 2). Among neonatal outcomes, Apgar score was lower at 1 minute (mean [standard deviation], 7.20 (1.63) in COVID-19 vs 7.54 (1.69) in the controls; P=.035) and at 5 minutes

TABLE
Comorbidities and pregnancy risk factors

Condition	COVID-19 (n=127)	Controls (n=836)	*P* value
Prepregnancy comorbidity	26 (20.3)	159 (19.0)	.72
Hypertensive disease of pregnancy	9 (7.0)	64 (7.7)	>.99
Gestational diabetes	6 (4.7)	32 (3.8)	.62
Other pregnancy-related risk			
None	799 (95.70)	117 (91.40)	NA
Twin pregnancy	7 (0.80)	1 (0.80)	<.01[a]
Breech presentation	10 (1.20)	8 (6.30)	<.01[a]
Intrauterine growth restriction	3 (0.40)	1 (0.80)	<.01[a]
In-vitro fertilization	2 (0.20)	0	.017[a]
Rhesus-negative pregnancy	8 (1.00)	1 (0.80)	<.001[b]
Thalassemia	2 (0.20)	0	.017[a]
Obstetrical cholestasis	4 (0.5)	0	<.001[b]

Data are presented as number (percentage).

[a] Significant; [b] Highly significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

(mean [standard deviation], 8.27 (1.72) in COVID-19 vs 9.14 (1.74) in controls; $P<.001$) (Supplemental Table 3). In the first GLM model on the mode of delivery, the significant predictors were previous cesarean deliveries, COVID-19 positivity, presence of PIH, and gestational diabetes (Supplemental Table 4). In the second GLM model, bad maternal outcomes were only associated with the presence of PIH (Supplemental Table 5). In the third GLM model, bad neonatal outcomes were associated with the presence of PIH or 1 of the 7 other factors for high-risk pregnancy (Supplemental Table 6). Thus, the associations found on univariate analysis reflect a possible referral bias where the high-risk patients were being referred if they were COVID-19 positive than if they were negative.

CONCLUSION: This study reiterates that COVID-19 infection does not pose additional risk to pregnancy outcomes by itself. Earlier systematic reviews were hampered by the high heterogeneity of the reported cohorts.[4] This was compounded by duplicate reporting of the same patients in different cohorts, variable inclusion criteria of systematic reviews, and scarce and missing data.[5] More recent systematic reviews have shown that maternal deaths and neonatal outcomes were similar in deliveries conducted in COVID-19 mothers compared with non−COVID-19 mothers.[6] The limitations of our study include the fact that we do not have the indications for cesarean deliveries in the cohort and that it was carried out in a tertiary center that would receive more complicated cases. It brings to light that COVID-19−positive mothers being treated at tertiary care centers have higher rates of cesarean delivery and higher morbidity and mortality, possibly owing to the extra underlying risk factors arising from a referral bias. ■

Mohini, MD
Department of Obstetrics and Gynaecology
Kalinga Institute of Medical Sciences
Kalinga Institute of Industrial Technology University
Bhubaneswar, India

Sakir Ahmed, MD, DM
Department of Clinical Immunology and Rheumatology
Kalinga Institute of Medical Sciences
Kalinga Institute of Industrial Technology University
Bhubaneswar, India

Vyshnavi Kasarla, MBBS
Sudanshu Kumar Rath, MD
Department of Obstetrics and Gynaecology
Kalinga Institute of Medical Sciences
Kalinga Institute of Industrial Technology University
Bhubaneswar, India 751024
sudanshu.rath@kims.ac.in

S.A. has received honorarium from Pfizer as a speaker (unrelated to this study). The remaining authors report no potential conflict of interest.

REFERENCES

1. Allotey J, Stallings E, Bonet M, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ 2020;370:m3320.
2. Wang CL, Liu YY, Wu CH, Wang CY, Wang CH, Long CY. Impact of COVID-19 on pregnancy. Int J Med Sci 2021;18:763–7.
3. Pettirosso E, Giles M, Cole S, Rees M. COVID-19 and pregnancy: a review of clinical characteristics, obstetric outcomes and vertical transmission. Aust N Z J Obstet Gynaecol 2020;60:640–59.
4. Teles Abrao Trad A, Ibirogba ER, Elrefaei A, et al. Complications and outcomes of SARS-CoV-2 in pregnancy: where and what is the evidence? Hypertens Pregnancy 2020;39:361–9.
5. Ang XL, Chonkar SP, Chua MSQ, Sulaiman S, Lee JCS. Problems with early systematic reviews: the case of coronavirus disease 2019 (COVID-19) in pregnancy. Matern Child Health J 2021;25:38–41.
6. Huntley BJF, Mulder IA, Di Mascio D, et al. Adverse pregnancy outcomes among individuals with and without severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2): a systematic review and meta-analysis. Obstet Gynecol 2021;137:585–96.

 https://doi.org/10.1016/j.ajog.2021.08.058

Social support and resilience in Black women affected by endometrial cancer

Check for updates

OBJECTIVE: Considering the issue of endometrial cancer, the role of social support in the experiences of Black women has not been explored. We share our process of stakeholder engagement that assessed the experiences of Black women with endometrial cancer, with attention to both the barriers and the facilitators of support.

STUDY DESIGN: We conducted 2 stakeholder engagement-focus groups with patient survivors. The participants were recruited from the Endometrial Cancer Action Network for African Americans peer education program and survivor community.[1] They had to carry a diagnosis of endometrial cancer and identify as Black or African-American. The focus group sessions were facilitated through interactive audiovisual conferences, which were recorded and transcribed. The transcripts were qualitatively analyzed via close reading and memo notes, employing Braun and Clarke thematic analysis techniques

SUPPLEMENTAL TABLE 1
Demographics of the cohort

Characteristic	COVID-19 positive (n = 127)		COVID-19 negative (n = 836)		*P* value
	Mean	Standard deviation	Mean	Standard deviation	
Age	28.18	4.64	27.71	4.23	.29
Gravida	1.69	0.98	1.72	0.87	.74
Parity	0.42	0.58	0.51	0.59	.11
Period of gestation at delivery	36.94	3.14	37.42	2.90	.10
Body mass index	28.00	1.33	28.12	1.35	.34

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

SUPPLEMENTAL TABLE 2
Maternal outcomes (univariate analysis)

Outcome	COVID-19 (n = 127)	Controls (n = 836)	*P* value
Cesarean delivery	87 (68)	445 (53.3)	.002[a]
Maternal intensive care unit requirement	3 (2.3)	6 (0.7)	.10
Antepartum hemorrhage	0	15 (1.8)	.11
Preterm premature rupture of membranes	1 (0.8)	35 (4.2)	.036[a]
Preterm rupture of membranes	2 (1.6)	38 (4.6)	.08
Postpartum hemorrhage	6 (4.7)	1 (0.1)	<.001[b]
Puerperal sepsis	0	0	NA
Maternal mortality	2 (1.6)	1 (0.1)	.048[a]

Data are presented as number (percentage).

[a] Significant; [b] Highly significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

SUPPLEMENTAL TABLE 3
Neonatal outcomes (univariate analysis)

Outcome	COVID-19 (n=127)	Controls (n=836)	*P* value
Apgar score at 1 min, mean (SD)	7.20 (1.63)	7.54 (1.69)	.035[a]
Apgar score at 5 min, mean (SD)	8.27 (1.72)	9.14 (1.74)	<.001[b]
Low birthweight <2 kg	16 (17.4)	127 (24.1)	.19
Neonatal intensive care unit requirement	28 (21.9)	206 (24.7)	.58
Neonatal COVID-19 positivity	5 (3.9)	0	<.001[b]
Neonatal sepsis	0	2 (0.2)	.75
Neonatal death	2 (1.6)	14 (1.7)	.64

Data are presented as number (percentage) unless stated otherwise.

SD, standard deviation.

[a] Significant; [b] Highly significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

SUPPLEMENTAL TABLE 4
Generalized linear model for mode of delivery

Parameter	B	Standard error	Wald chi-square	*P* value
(Intercept)	−2.625	2.0160	1.696	.193
Previous lower segment cesarean delivery	−2.590	.2819	84.436	<.001[a]
(COVID-19 status=negative) vs (COVID-19 status=positive)	.655	.2196	8.909	.003[a]
(Hypertensive disease of pregnancy=no) vs (hypertensive disease of pregnancy=yes)	1.330	.3307	16.173	<.001[a]
(Gestational diabetes=no) vs (gestational diabetes=yes)	1.184	.4248	7.771	.005[a]
(Other risk factor=no) vs (other risk factor=yes)	.607	.3412	3.167	.075
Body mass index	−.002	.0535	.002	.965
Hemoglobin	.050	.0812	.377	.539
Gravida	−.068	.1277	.284	.594
Parity	.120	.2087	.332	.564
Period of gestation at delivery	−.032	.0232	1.883	.170

[a] Significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

SUPPLEMENTAL TABLE 5
Generalized linear model for maternal complications

Parameter	B	Standard error	Wald chi-square	*P* value
(Intercept)	.237	2.8844	.007	.935
Previous lower segment cesarean delivery	.472	.3010	2.456	.117
(COVID-19 status=negative) vs (COVID-19 status=positive)	−.204	.3296	.381	.537
(Hypertensive disease of pregnancy=no) vs (hypertensive disease of pregnancy=yes)	.971	.3157	9.464	.002[a]
(Gestational diabetes=no) vs (gestational diabetes=yes)	.502	.4711	1.135	.287
(Other risk factor=no) vs (other risk factor=yes)	.586	.3929	2.228	.136
Body mass index	−.011	.0797	.020	.888
Hemoglobin	.171	.1133	2.275	.131
Gravida	−.055	.1804	.093	.760
Parity	−.229	.2953	.602	.438
Period of gestation at delivery	−.033	.0355	.864	.353

[a] Highly significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.

SUPPLEMENTAL TABLE 6
Generalized linear model for poor neonatal outcomes

Parameter	B	Standard error	Wald chi-square	*P* value
(Intercept)	−2.836	2.0216	1.967	.161
Previous lower segment cesarean delivery	.335	.1940	2.984	.084
(COVID-19 status=negative) vs (COVID-19 status=positive)	−.298	.2286	1.695	.193
(Hypertensive disease of pregnancy=no) vs (hypertensive disease of pregnancy=yes)	1.129	.2533	19.850	<.001[a]
(Gestational diabetes=no) vs (gestational diabetes=yes)	.290	.3614	.642	.423
(Other risk factor=no) vs (other risk factor=yes)	.730	.3219	5.145	.023[a]
Body mass index	.115	.0548	4.383	.036
Hemoglobin	−.054	.0836	.416	.519
Gravida	−.124	.1221	1.034	.309
Parity	.070	.2070	.114	.735
Period of gestation at delivery	−.013	.0239	.308	.579

[a] Significant.

Mohini. Outcomes of COVID-19 positive deliveries. Am J Obstet Gynecol 2022.