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.

Table 2. Odds ratio of neurologic/neurodevelopmental outcome for smaller twin in twin pairs

Variables	Group A (n=15366)		Group B (n=3422)	
	Crud OR (95% CI)	Adjusted OR (95% CI)	Crud OR (95% CI)	Adjusted OR (95% CI)
Any neurological or neurodevelopmental outcome	0.9394 (0.8799,1.003)	0.9614 (0.9001,1.0269)	1.1364 (0.9884,1.3067)	1.1967 (1.0375,1.3803)
Any developmental delay	0.9107 (0.803,1.0328)	0.9491 (0.837,1.0763)	1.3557 (1.0443,1.7601)	1.4505 (1.1069,1.9007)
Motor developmental delay	1 (0.8183,1.2221)	1.0036 (0.8215,1.2261)	1.1917 (0.8191,1.7339)	1.2243 (0.8318,1.8021)
Cognitive developmental delay	0.8395 (0.7208,0.9777)	0.8956 (0.7683,1.0439)	1.5072(1.0849,2.0941)	1.6959 (1.2127,2.3716)
Autism spectrum and attention-deficit/hyperactivity disorders	0.8386 (0.7281,0.9659)	0.8942 (0.7751,1.0316)	1.2196(0.8833,1.6839)	1.4073 (1.0124,1.9563)
Tics and stereotypic behavior	0.9238 (0.7406,1.1523)	0.9879 (0.7909,1.2339)	1.2043(0.752,1.9286)	1.4214 (0.8887,2.2734)
Epileptic seizures and febrile seizures	0.9671 (0.8959,1.0439)	0.9759 (0.9038,1.0537)	1.0486(0.8958,1.2274)	1.064 (0.9053,1.2505)

CI, confidence interval; OR, odds ratio

779 Progression of hypertensive disorders of pregnancy during induction of labor at term

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OBJECTIVE: To characterize the progression of disease in women with hypertensive disorders of pregnancy (HDP) undergoing induction of labor (IOL) at term.

STUDY DESIGN: This is a retrospective cohort study of nulliparous women with a singleton pregnancy and diagnosis of HDP who underwent term IOL at an academic center from 2018-2019. Women were categorized by diagnosis of HDP at the start of IOL (gestational hypertension (GHTN), preeclampsia without severe features (PEC), preeclampsia with severe features (PEC-SF), HELLP syndrome, and eclampsia). Women who presented in labor (modified Bishop score >5) were excluded. Progression of disease (POD) was defined as new lab abnormalities, symptoms, or abnormal vital signs that developed after the start of IOL and conferred a more severe HDP diagnosis per ACOG criteria. Rates of POD were compared by initial HDP diagnosis and mode of delivery (vaginal versus cesarean delivery (CD)). Time course of POD − labor, immediately postpartum, or delayed postpartum (after delivery hospitalization discharge) was also compared between groups. Chi-square and Fisher's exact tests were used for analysis with significance of $p < 0.05$.

RESULTS: 576 women were included and 90 (15.6%) had POD. Women with an initial diagnosis of PEC were significantly more likely to have POD (21.6%) compared to GHTN (14%), and PEC-SF (7.7%) (p=0.04, Table 1). Those who underwent CD had highest risk of POD (20.1% vs 12.8% for vaginal delivery, p=0.03). POD occurred at similar rates during labor, immediate postpartum, and delayed postpartum, and time course was not associated with initial HDP diagnosis or mode of delivery (Table 2).

CONCLUSION: Nulliparous women with HDP undergoing term IOL had an overall low risk of progression of HDP, and over half of these cases occurred during the postpartum period. Therefore, a diagnosis of HDP should not preclude women from IOL due to provider concerns for potential progression of disease. Further investigation into how decisions for IOL or CD at the time of diagnosis influence risk of perinatal complications will continue to inform patient and provider counseling.

Table 1 – Progression of disease by initial HDP diagnosis and mode of delivery

	Progression of disease N= 90	No progression of disease N=486	p-value
Diagnosis			
GHTN	49 (14%)	301 (86%)	
PEC	37 (21.6%)	134 (78.4%)	
PEC-SF	4 (7.7%)	48 (92.3%)	
HELLP	0 (0%)	3 (100%)	
Eclampsia	0 (0%)	0 (0%)	**0.04**
Mode of Delivery			
CD	45 (20.1%)	179 (79.9%)	
VD	45 (12.8%)	307 (87.2%)	**0.03**

Table 2 – Timing of progression of disease by initial HDP diagnosis

	GHTN N= 49	PEC N=37	PEC-SF N=2	p-value
Labor	29 (59.2%)	19 (51.4%)	3 (75%)	0.58
Immediate postpartum	10 (20.4%)	12 (32.4%)	1 (25%)	0.45
Delayed postpartum	10 (20.4%)	6 (16.2%)	0	0.56

780 Acceptance of vaccines during pregnancy during the COVID-19 pandemic

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OBJECTIVE: To evaluate patient acceptance of standard vaccines against infectious diseases in pregnancy - Tetanus, Diphtheria and Pertussis (Tdap) and influenza (flu) - during the COVID-19 pandemic compared to historical controls.

STUDY DESIGN: This was a retrospective cohort study comparing rates of Tdap and flu vaccine uptake in women who received prenatal care at an academic center from 9/1/2020 to 1/31/2021 ("COVID cohort") compared to the same period the prior year ("2019 cohort"). Patients with an allergy or contraindication to vaccination were excluded. Demographic information, trimester of initiation of prenatal care, insurance status, and medical comorbidities were evaluated. Outcomes were analyzed using Chi-squared and Fisher's exact test, as well as multivariable logistic regression, with $p < 0.05$ considered significant.

RESULTS: 1713 women were included. The COVID cohort differed in age, race, timing of initiation of prenatal care, insurance status, and medical comorbidities. In unadjusted analysis, acceptance of Tdap decreased in the COVID cohort (92% vs 89%, p=0.03), while the uptake of influenza was similar (83% vs 81%, p=0.35). However, after adjusting for covariates, women were significantly more likely to accept influenza vaccine in the COVID cohort (aOR 1.7, 95% CI [1.27-2.29]), although this trend was not observed for the entire obstetric population. Non-white race, public insurance status and medical comorbidities were associated with lower rates of both flu and Tdap vaccine acceptance during the pandemic (Tables 1 and 2).

CONCLUSION: In a pandemic era, the overall population of pregnant women were more likely to accept vaccination with the influenza vaccine. However, this trend did not apply to other vaccines that protect against infectious disease such as Tdap and did not apply to high-risk groups with public insurance and medical comorbidities. This study highlights disparities in vaccination acceptance and supports increased efforts in vaccine counseling for these high-risk populations.

Table 1 – Rates of influenza vaccine acceptance by maternal characteristics

	2019 cohort (N= 894)		COVID cohort (N=819)		aOR [95% CI]
	Accepted	Declined	Accepted	Declined	
Race[a]					1.05 [0.96-1.15]
Non-Hispanic White	458 (80%)	117 (20%)	411 (82%)	92 (18%)	
Non-Hispanic Black	57 (79%)	15 (21%)	53 (76%)	17 (24%)	
Asian Pacific Islander	79 (94%)	5 (6%)	89 (90%)	10 (10%)	
Hispanic	25 (96%)	1 (4%)	25 (64%)	20 (36%)	
Other	83 (86%)	13 (14%)	62 (83%)	13 (17%)	
Insurance					**0.16 [0.10-0.24]**
Private	733 (83%)	155 (17%)	611 (88%)	83 (12%)	
Public	5 (83%)	1 (17%)	48 (40%)	73 (60%)	
Initiation of prenatal care					0.99 [0.71-1.42]
1st trimester	698 (83%)	145 (17%)	551 (83%)	116 (17%)	
2nd trimester	40 (78%)	11 (22%)	59 (65%)	32 (35%)	
3rd trimester	0	0	19 (66%)	10 (34%)	
Comorbidities	181 (80%)	44 (20%)	200 (76%)	63 (24%)	**0.54 [0.41-0.71]**
Obesity	35 (62%)	21 (38%)	93 (83%)	19 (17%)	
Hypertension	18 (60%)	12 (40%)	36 (73%)	13 (27%)	
Cardiopulmonary	28 (61%)	18 (39%)	61 (88%)	8 (12%)	
Diabetes	11 (61%)	7 (39%)	13 (72%)	5 (28%)	
Autoimmune	31 (67%)	15 (33%)	61 (88%)	8 (12%)	
Immunocompromise	12 (92%)	1 (8%)	4 (44%)	5 (56%)	
Other	59 (71%)	24 (29%)	77 (73%)	28 (27%)	

[a]28 patients in 2019 and 17 patients in the COVID cohort did not have race documented in the medical record.

Table 2 – Rates of Tdap vaccine acceptance by maternal characteristics

	2019 cohort (N= 894)		COVID cohort (N=819)		aOR (95% CI)
	Accepted	Declined	Accepted	Declined	
Race[a]					**1.28 [1.12-1.48]**
Non-Hispanic White	515 (90%)	60 (10%)	433 (86%)	70 (14%)	
Non-Hispanic Black	67 (93%)	5 (7%)	62 (89%)	8 (11%)	
Asian Pacific Islander	82 (98%)	2 (2%)	95 (96%)	4 (4%)	
Hispanic	25 (96%)	1 (4%)	51 (93%)	4 (7%)	
Other	103 (94%)	6 (6%)	72 (96%)	3 (4%)	
Insurance					**0.13 [0.08-0.21]**
Private	815 (92%)	73 (8%)	657 (95%)	37 (5%)	
Public	5 (93%)	1 (17%)	65 (54%)	56 (46%)	
Initiation of prenatal care					1.15 [0.76-1.82]
1st trimester	777 (92%)	66 (8%)	597 (90%)	70 (10%)	
2nd trimester	43 (84%)	8 (16%)	104 (85%)	19 (15%)	
3rd trimester	0	0	5 (17%)	24 (83%)	
Comorbidities	221 (94%)	15 (6%)	240 (88%)	34 (12%)	**0.67 (0.47-0.97)**
Obesity	47 (84%)	9 (16%)	149 (89%)	19 (11%)	
Hypertension	26 (87%)	4 (13%)	37 (76%)	12 (24%)	
Cardiopulmonary	40 (87%)	6 (13%)	65 (94%)	4 (6%)	
Diabetes	13 (72%)	5 (28%)	12 (67%)	6 (33%)	
Autoimmune	40 (87%)	6 (13%)	65 (94%)	4 (6%)	
Immunocompromise	13 (100%)	0 (0%)	8 (89%)	1 (11%)	
Other	72 (87%)	11 (13%)	87 (83%)	18 (17%)	

[a]28 patients in 2019 and 17 patients in the COVID cohort did not have race documented in the medical record.

781 Risk of adverse outcomes for small fetuses not meeting consensus criteria for fetal growth restriction

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OBJECTIVE: To assess whether an independent association exists between an estimated fetal weight (EFW) and/or abdominal circumference (AC) < 10th centile and adverse outcomes when Delphi consensus criteria [Gordijn S et al Ultrasound Obstet Gynecol 2016;48(3):333-9] for fetal growth restriction (FGR) are not met.

STUDY DESIGN: Data was derived from singleton non-anomalous gestations with an EFW and/or AC < 10th Hadlock centile at a tertiary care institution (2010-2020). An approximately equal number of fetuses with birthweight between the 20th and 80th centile were randomly selected from the same period as an appropriately grown ('AGA') comparator group. The cohort was retrospectively analyzed according to the occurrence of composite adverse perinatal outcome (APO): perinatal demise, 5-minute Apgar < 7, cord pH ≤ 7.1, or cord base excess ≥ 12.

RESULTS: 2653 consecutive pregnancies met inclusion criteria. 374 (14%) were complicated by APO. None of the 455 pregnancies with an EFW and/or AC < 10th centile that failed to meet consensus criteria based on Doppler waveforms (and growth velocity ≥ 32 weeks) for FGR ('SGA') resulted in perinatal demise. 42 (9%) were affected by APO based on 5-minute Apgar scores and/or cord gas results compared to 110 (8%) in the AGA group (RR 1.10, 95% CI 0.84-1.44). 222 of 860 (25.8%) that met consensus FGR criteria ('FGR') resulted in APO (RR 1.96, 95% CI 1.77-2.16), including 32 with perinatal demise. Factors independently associated with APO included: BMI (< 25 and ≥ 50), pregestational diabetes, male fetal sex, hypertensive disorders of pregnancy, and 'FGR'. The bias-corrected bootstrapped AUROC for the 7-factor model predicting APO was 0.71 (95% CI 0.68-0.74).

CONCLUSION: We found no evidence that fetuses with an EFW and/or AC between the 3rd and 9th centile that fail to meet consensus criteria for FGR are at increased risk of adverse outcomes. While growth of these fetuses should be monitored to rule out evolving FGR, the majority are healthy constitutionally small fetuses that do not warrant additional antenatal testing or iatrogenic preterm/early term delivery.

Table 1. Characteristics of pregnancies (N=2653) by severe adverse perinatal outcome.

	Severe Adverse Perinatal Outcome[a]		*P*
	Present (n=374)	Absent (n=2279)	
Maternal age at time of delivery, y	27.9 ± 6.0	28.3 ± 5.8	.32
Body mass index (kg/m²)	30.9 ± 8.5	29.5 ± 7.9	<.01
Body mass index classes			.017
<18.5	8 (2.1)	73 (3.2)	
18.5-24.9	95 (25.4)	684 (30.0)	
25.0-29.9	97 (25.9)	564 (24.8)	
30.0-34.9	71 (19.0)	432 (19.0)	
35.0-39.9	48 (12.8)	299 (13.1)	
40.0-49.9	41 (11.0)	194 (8.5)	
≥ 50	14 (3.7)	33 (1.5)	
Parity, median (IQR)	1 (2)	1 (2)	<.0001
Nulliparity	129 (34.5)	444 (19.5)	<.0001
Race & Ethnicity			.92
Non-Hispanic Black	224 (59.9)	1349 (59.2)	
Non-Hispanic White	128 (34.2)	803 (35.2)	
Other race or Hispanic ethnicity	22 (5.9)	127 (5.6)	
Chronic hypertension	76 (20.3)	208 (9.1)	<.0001
Hypertensive disorder of pregnancy	159 (42.5)	395 (17.3)	<.0001
Smoker	102 (28.0)	548 (24.3)	.14
Pregestational diabetes	32 (8.6)	87 (3.8)	<.0001
Male fetal sex	205 (54.8)	1088 (47.8)	.012
Based on Delphi consensus criteria (Gordijn *et al* 2016) for FGR			
FGR	222 (59.4)	638 (30.2)	<.0001
Non-growth restricted	42 (11.2)	413 (19.6)	<.01
Estimated gestational age at delivery, w	33.9 ± 5.6	37.5 ± 2.9	<.0001
Birthweight, g	1936.1 ± 1117.1	2753.4 ± 752.0	<.0001
Ponderal index, g/cm³	2.30 ± 0.45	2.40 ± 0.34	<.001

Data presented as n (%) or mean ± standard deviation unless otherwise stated; *IQR*, interquartile range; *FGR*, fetal growth restriction; [a]perinatal demise, 5-minute Apgar < 7, cord pH ≤ 7.1, or cord base excess ≥ 12