COVID-19 in pregnancy may significantly affect fetal growth

Serena **Simeone** [1], Silvia **Vannuccini** [1], Laura **Marchi** [2], Irene **Turrini** [2], Anna **Morucchio** [1], Federica **Barsanti** [1,*], Serena **Lucarelli** [1], Caterina **Serena** [1], Serena **Ottanelli** [1], Marianna Pina **Rambaldi** [1], Sara **Zullino** [1], Giacomo **Bruscoli** [1], Edoardo **Corsi** [3], Antonio **Salvatore** [4], Alice **Maraschini** [4], Serena **Donati** [4], Felice **Petraglia** [5], Anna Franca **Cavaliere** [2], Federico **Mecacci** [5]

[1] Department for Women and Children Health, Careggi University Hospital, Florence, Italy.

[2] Obstetrics and Gynecology Unit, Hospital "Santo Stefano", AUSL Toscana Centro, Prato, Italy.

[3] Department of Biomedicine and Prevention, University of Rome Tor Vergata, Rome, Italy.

[4] National Centre for Disease Prevention and Health Promotion, Istituto Superiore di Sanità (Italian National Institute of Health), Rome, Italy.

[5] Department of Biochemical, Experimental and Clinical Sciences "Mario Serio", University of Florence, Florence, Italy.

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Objective. Whilst most cases of COVID-19 in pregnancy evolve uneventfully, some others have a poor outcome, such as preterm birth and HDP. The effect of COVID-19 on fetal growth still has to be addressed and appears controversial. Our study aims to focus on fetal growth velocity across the trimesters in pregnancy affected with COVID-19.

Materials and Methods. This is a multicentric prospective observational study on data from COVID-19 pregnancies referred to the centers of Careggi University Hospital and "S. Stefano" Hospital in Prato from 2020 to 2022, included in the local branch of ItOSS surveillance. Fetal growth was evaluated across the three trimesters of pregnancy by abdominal circumference (AC) and expected fetal weight (EFW). Both AC, and EFW plus birthweight were used to calculate growth velocity (Vannuccini *et al*., 2017).

Results. Data from a cohort of 211 cases was collected. The majority (80%) of COVID-19 cases occurred in the third trimester. Of note, the percentage of gestational diabetes (12.3%) and preterm births (7.1%) was comparable to the general population. Mean birthweight was 3259 ± 509 g. The percentage of cesarean sections was acceptable (13.7%).

Concerning the velocity of growth, AC decreased from the second to third trimester to reach values < 10th centile in 24% of cases and < 5th percentile in 17% of cases, even in presence of 2% of hypertensive disorders (HDP). Fetal growth restriction according to Gordjin *et al*. (2015) was antenatally identified in 4.7% of cases. Fetal growth > 95th centile occurred in 5.7% of cases.

At birth, the cumulative percentage of small for gestational age newborns defined as birth weight < 2500 g resulted 5.2%. A significant percentage of newborns required NICU assistance (7.8%).

Conclusions. Regardless of the association and prevalence of preterm birth, SGA and HDP in pregnant women, fetal growth appears to be affected by COVID-19 with a higher incidence of impaired growth velocity compared to the general population.

	34 w (N=14)	35 w (N=31)	36 w (N=114)	37 w (N=9)	P value
Delivery outcomes					
Indication to delivery					0.41
Spontaneous labor	10 (71.4)	18 (58.0)	65 (59.6)	2 (22.2)	
pPROM (no suspected triple I)	3 (25.0)	9 (29.0)	39 (34.2)	6 (66.7)	
Indicated	1 (8.3)	5 (16.0)	10 (8.7)	1 (11.1)	
Labor					0.01
No labor	**4 (28.6)**	**5 (16.1)**	**26 (22.8)**	**0**	
Spontaneous	**8 (57.1)**	**20 (64.5)**	**60 (52.6)**	**2 (22.2)**	
Induced	**2 (14.3)**	**6 (19.3)**	**28 (24.6)**	**7 (77.8)**	
Mode of Delivery					**0.05**
Spontaneous vaginal	10 (71.4)	21 (67.7)	81 (71.0)	6 (66.7)	
Operative vaginal	**0**	**2 (6.4)**	**7 (6.4)**	**3 (33.3)**	
Cesarean Section	**4 (28.6)**	**8 (25.8)**	**26 (22.8)**	**0**	
pPROM to delivery interval (days)	**1 (0-1)**	**1 (0-1)**	**1 (0-2)**	**3 (2 – 3)**	**0.000**
Maternal hyperpyrexia in labor (≥38°C)	0	0	3 (2.6)	0	0.69
Antibiotic treatment	14 (100.0)	30 (96.7)	110 (96.5)	**6 (66.7)**	**0.001**
Antenatal corticosteroids					**0.01**
No administration	**12 (85.7)**	**27 (87.1)**	**105 (94.6)**	**9 (100.0)**	
Before 34 weeks	**0**	**4 (12.9)**	**4 (3.6)**	**0**	
After 34 weeks	**2 (14.3)**	**0**	**2 (1.8)**	**0**	
Tocolysis	**1 (7.1)**	0	0	0	**0.01**
Neonatal outcomes					
Birthweight (g)	**2228.8 ± 345.6**	**2605.4 ± 311.2**	**2710.4 ± 327.7**	**2871.1 ± 316.5**	**0.000**
Apgar score ≤ 7 at 5'	**2 (14.3)**	**0**	**1 (0.8)**	**0**	**0.003**
Arterial pH ≤ 7.1	0	0	3 (2.7)	0	0.71
Respiratory support	**2 (14.3)**	**1 (3.2)**	**0**	**0**	**0.000**
Neonatal sepsis	1 (7.1)	1 (3.2)	0	0	0.08
Adverse neonatal outcome*	**8 (61.5)**	**11 (36.7)**	**22 (20.4)**	**1 (12.5)**	**0.000**