

## **Vertical transmission (risks of infected mothers passing Covid-19 to newborns) Published research Sep-Dec 2020**

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## Results

### 1. Maternal and perinatal outcomes in pregnant women infected by SARS-CoV-2: A meta-analysis

**Author(s):** Bellos I.; Pandita A.; Panza R.

**Source:** European Journal of Obstetrics Gynecology and Reproductive Biology; Jan 2021; vol. 256 ; p. 194-204

**Publication Type(s):** Review

Available at [European journal of obstetrics, gynecology, and reproductive biology](#) - from Unpaywall

**Abstract:**Evidence concerning coronavirus disease-19 (covid-19) in pregnancy is still scarce and scattered. This meta-analysis aims to evaluate maternal and neonatal outcomes in covid-19 pregnancies and identify factors associated with perinatal viral transmission. Medline, Scopus, CENTRAL, Web of Science and Google Scholar databases were systematically searched to 3 June 2020. Overall, 16 observational studies and 44 case reports/series were included. Fever was the most frequent maternal symptom, followed by cough and shortness of breath, while about 15 % of infected were asymptomatic. Severe disease was estimated to occur in 11 % of women in case reports/series and in 7 % (95 % CI: 4 %-10 %) in observational studies. Two maternal deaths were reported. The rate of neonatal transmission did not differ between women with and without severe disease (OR: 1.94, 95 % CI: 0.50-7.60). Preterm birth occurred in 29.7 % and 16 % (95 % CI: 11 %-21 %) in data obtained from case series and observational studies, respectively. Stillbirth occurred in 3 cases and 2 neonatal deaths were observed. Vertical transmission was suspected in 4 cases. Fever was the most common neonatal symptom (40 %), followed by shortness of breath (28 %) and vomiting (24 %), while 20 % of neonates were totally asymptomatic. In conclusion, the maternal and neonatal clinical course the infection is typically mild, presenting low mortality rates. The risk of vertical transmission is suggested to be low and may not be affected by the severity of maternal disease. Further large-scale studies are needed to clarify the risk factors associated with viral transmission and severe infection in the neonatal population. Copyright © 2020 Elsevier B.V.

**Database:** EMBASE

### 2. Vertical Transmission of COVID-19 to the Neonate

**Author(s):** Moreno S.C.; To J.; Chun H.; Ngai I.M.

**Source:** Infectious Diseases in Obstetrics and Gynecology; 2020; vol. 2020

Available at [Infectious diseases in obstetrics and gynecology](#) - from Europe PubMed Central - Open Access

Available at [Infectious diseases in obstetrics and gynecology](#) - from Hindawi Open Access Journals

Available at [Infectious diseases in obstetrics and gynecology](#) - from Unpaywall

**Abstract:**Objective. To estimate the incidence rate of vertical transmission of coronavirus disease 2019 (COVID-19) to the neonate during the third trimester. Study Design. We conducted a retrospective observational study of pregnant women diagnosed with COVID-19 during the third trimester, who delivered at Flushing Hospital Medical Centre (FHMC) or Jamaica Hospital Medical Centre (JHMC) between March 20, 2020, and April 30, 2020. The study participants were symptomatic pregnant women diagnosed with COVID-19 via positive SARS-CoV-2 RNA, real-time reverse transcription-polymerase chain reaction (SARS-CoV-2 rRT-PCR) test. Evidence of vertical transmission was assessed in the neonate via a SARS-CoV-2 rRT-PCR test, with nasopharyngeal swab samples collected on the neonates after 24 hours of birth. The exclusion criteria for this study were maternal or neonate records without SARS-CoV-2 rRT-PCR test results, neonates not delivered at FHMC or JHMC, and fetuses with suspected foetal anomalies or incomplete medical records. Results. We identified 19 symptomatic pregnant women diagnosed with COVID-19, including two

women with twin pregnancies. Seven patients (36.8%) were delivered via cesarean. 12 patients (63.1%) presented in spontaneous labour, and 8 (38.1%) had preterm delivery. No maternal intensive care unit admission, maternal sepsis, or maternal mortality was observed. Twenty-one neonates were evaluated for COVID-19 after birth. SARS-CoV-2 rRT-PCR test results were negative in 100% of the neonates. Thirteen neonates (61.9%) were admitted to the neonatal intensive care unit. Prematurity was the most common cause of NICU admission 6 (46.1%), with a length of stay of 5.5+/-6.4 days. No invasive mechanical ventilation, neonatal sepsis, or neonatal mortality was observed. Conclusion. In our cohort, symptomatic COVID-19 during the third trimester of pregnancy was not associated with vertical transmission to the neonate. Copyright © 2020 Sindy C. Moreno et al.

**Database:** EMBASE

### **3. Clinical characteristics and outcomes of pregnant women with COVID-19 and the risk of vertical transmission: a systematic review**

**Author(s):** Chi J.; Gong W.; Gao Q.

**Source:** Archives of Gynecology and Obstetrics; 2020

**Publication Type(s):** Review

Available at [Archives of gynecology and obstetrics](#) - from Unpaywall

**Abstract:** Purpose: This systematic review summarizes the clinical features and maternal-infant outcomes of 230 pregnant women (154 patients gave birth) infected with COVID-19 and their 156 infants, including the possibility and evidence of vertical transmission. Method(s): An electronic search of PubMed, Embase, Medline, MedRxiv, CNKI, and the Chinese Medical Journal Full Text Database following PRISMA guidelines was performed through April 18, 2020. Search terms included COVID-19, SARS-CoV-2, pregnant women, infants, and vertical transmission. Result(s): A total of 230 women with COVID-19 (154 deliveries, 66 ongoing pregnancies, and 10 abortions) and 156 newborns from 20 eligible studies were included in this systematic review. A total of 34.62% of the pregnant patients had obstetric complications, and 59.05% of patients displayed fever. Lymphopenia was observed in 40.71% of patients. A total of 5.19% of women received mechanical ventilation. Seven women were critically ill. One mother and two newborns died. A total of 24.74% of newborns were premature. Five newborns' throat swab tests of SARS-CoV-2 were positive, all of which were delivered by cesarean section. For eight newborns with negative throat swab tests, three had both elevated IgM and IgG against SARS-CoV-2. Nucleic acid tests of vaginal secretions, breast milk, amniotic fluid, placental blood, and placental tissues were negative. Conclusion(s): Most pregnant patients were mildly ill. The mortality of pregnant women with COVID-19 was lower than that of overall COVID-19 patients. Cesarean section was more common than vaginal delivery for pregnant women with COVID-19. Premature delivery was the main adverse event for newborns. The vertical transmission rate calculated by SARS-CoV-2 nucleic acid tests was 3.91%. Serum antibodies against SARS-CoV-2 should be tested more frequently, and multiple samples should be included in pathogenic testing. Copyright © 2020, The Author(s).

**Database:** EMBASE

### **4. Maternal, Perinatal and Neonatal Outcomes with COVID-19: A Multicenter Study of 242 Pregnancies and Their 248 Infant Newborns during Their First Month of Life**

**Author(s):** Marin Gabriel M.A.; Reyne Vergeli M.; Caserio Carbonero S.; Sole L.; Carrizosa Molina T.; Rivero Calle I.; Cuadrado Perez I.; Alvarez Fernandez B.; Forti Buratti A.; Fernandez-Canadas Morillo A.

**Source:** Pediatric Infectious Disease Journal; 2020

Available at [The Pediatric infectious disease journal](#) - from Ovid (LWW High Impact Collection 2020 - Legacy)

**Abstract:**Background: Our aim was to describe the clinical features of mothers with coronavirus disease 2019 (COVID-19) infection during gestation or delivery, and the potential vertical transmission. We also wish to evaluate the possible horizontal transmission after hospital discharge, by means of a follow-up of all the newborns included at 1 month of age. Method(s): This multicenter descriptive study involved 16 Spanish hospitals. We reviewed the medical records of 242 pregnant women diagnosed with COVID-19 from March 13 to May 31, 2020, when they were in their third trimester of pregnancy. They and their 248 newborn infants were monitored until the infant was 1 month old. Result(s): Caesarean sections (C-sections) were performed on 63 (26%) women. The initial clinical symptoms were coughing (33%) and fever (29.7%). Mothers hospitalized due to COVID-19 pathology had a higher risk of ending their pregnancy via C-section ( $P = 0.027$ ). Newborns whose mothers had been admitted due to their COVID-19 infection had a higher risk of premature delivery ( $P = 0.006$ ). We admitted 115 (46.3%) newborn infants to the neonatal unit, of those, 87 (75.6%) were only admitted due to organizational circumstances. No infants died and no vertical or horizontal transmission was detected. Regarding type of feeding, 41.7% of the newborns received exclusive breast-feeding at discharge and 40.4% at 1 month. Conclusion(s): We did not detect COVID-19 transmission during delivery or throughout the first month of life in the newborns included in our study. Exclusive breast-feeding rates at discharge and at 1 month of age were lower than expected. Copyright © 2020 Lippincott Williams and Wilkins. All rights reserved.

**Database:** EMBASE

## 5. Clinical course of novel COVID-19 infection in pregnant women

**Author(s):** Shmakov R.G.; Pekarev O.; Prikhodko A.; Polushkina E.; Shmakova E.; Dolgushin G.O.; Bolibok N.; Degtyarev D.; Sukhikh G.T.; Pyregov A.; Bychenko V.; Pripitnevich T.V.; Yarotskaya E.

**Source:** Journal of Maternal-Fetal and Neonatal Medicine; 2020

Available at [The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians](#) - from Unpaywall

**Abstract:**Objectives: Evaluation of clinical course of COVID-19 during pregnancy and maternal and perinatal outcomes of this pregnancy. Method(s): 66 women with polymerase chain reaction (PCR)-confirmed SARS-CoV-2 and their 42 neonates were included in the prospective observational study. Demographic, epidemiological, clinical, laboratory and instrumental data of pregnancy, delivery, postpartum period, including pharmacotherapy and neonatal outcomes were analyzed. Result(s): 15 (22.7%) women were asymptomatic, 25 (38%) had mild disease, while moderate and severe forms were detected in 20 (30.2%) and 6 (9.1%) cases, respectively. Additional oxygenation was required in 6 (9%) cases: 4 (6%) received CPAP therapy and 2 (3%)-mechanical ventilation. Main clinical symptoms were cough (51.5%), anosmia (34.9%), and hyperthermia (33.3%). Laboratory changes included increased levels of lactate dehydrogenase (LDH), creatinine, d-dimer, and C-reactive protein (CRP), anemia, and leukopenia. All pregnant women received low molecular weight heparin and interferon alfa-2b according to the National clinical recommendations. Antimicrobial drugs included Amoxicillin/Clavulanic acid (46%) and macrolides (28%) or carbapenems in severe cases of disease. Spontaneous abortion was reported in 6.1% of cases. Eight preterm (19%) and 34 term deliveries (81%) occurred. The mean weight of neonates was (3283 +/- 477) g, 1- and 5-min Apgar score was (7.8 +/- 0.6) and (8.7 +/- 0.5), respectively. No cases of neonatal COVID-19 infection were reported. Conclusion(s): Mostly, the manifestations of COVID-19 were mild. However, 9% of cases were severe, and could contribute to preterm delivery or maternal morbidity. Main predictors of severe

COVID-19 course in pregnant women were a decrease in the levels of erythrocytes and lymphocytes and increase in the levels of alanine aminotransferase and CRP. Elimination of the virus in pregnant women required more time due to altered immunity. No evidence of vertical transmission during pregnancy and delivery was found. However, the possibility of this cannot be excluded. Copyright © 2020 Informa UK Limited, trading as Taylor & Francis Group.

**Database:** EMBASE

## **6. Outcomes of Neonates Born to Mothers with Severe Acute Respiratory Syndrome Coronavirus 2 Infection at a Large Medical Center in New York City**

**Author(s):** Dumitriu D.; Walzer L.; Saslaw M.; Scripps T.; Khan A.; Fernandez C.R.; Keown M.K.; Glassman M.E.; Stephens A.; Sultan S.; Abreu W.; Stockwell M.S.; Emeruwa U.N.; Ludwig E.; Arditi B.; Andrikopoulou M.; Baptiste C.; Breslin N.; Rubenstein D.; Simpson L.L.; Friedman A.M.; Hirsch D.S.; Miller R.S.; Fuchs K.M.; Gupta A.; Sibbles C.; Akita F.; Penn A.; D'Alton M.E.; Orange J.S.; Goffman D.; Saiman L.; Gyamfi-Bannerman C.; Kyle M.H.; Hanft E.; Liao G.V.; Whittier S.

**Source:** JAMA Pediatrics; 2020

Available at [JAMA Pediatrics](#) - from Unpaywall

**Abstract:** Importance: Limited data on vertical and perinatal transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and health outcomes of neonates born to mothers with symptomatic or asymptomatic coronavirus disease 2019 (COVID-19) are available. Studies are needed to inform evidence-based infection prevention and control (IP&C) policies. Objective(s): To describe the outcomes of neonates born to mothers with perinatal SARS-CoV-2 infection and the IP&C practices associated with these outcomes. Design, Setting, and Participant(s): This retrospective cohort analysis reviewed the medical records for maternal and newborn data for all 101 neonates born to 100 mothers positive for or with suspected SARS-CoV-2 infection from March 13 to April 24, 2020. Testing for SARS-CoV-2 was performed using Cobas (Roche Diagnostics) or Xpert Xpress (Cepheid) assays. Newborns were admitted to well-baby nurseries (WBNs) (82 infants) and neonatal intensive care units (NICUs) (19 infants) in 2 affiliate hospitals at a large academic medical center in New York, New York. Newborns from the WBNs roomed-in with their mothers, who were required to wear masks. Direct breastfeeding after appropriate hygiene was encouraged. Exposures: Perinatal exposure to maternal asymptomatic/mild vs severe/critical COVID-19. Main Outcomes and Measures: The primary outcome was newborn SARS-CoV-2 testing results. Maternal COVID-19 status was classified as asymptomatic/mildly symptomatic vs severe/critical. Newborn characteristics and clinical courses were compared across maternal COVID-19 severity. Result(s): In total, 141 tests were obtained from 101 newborns (54 girls [53.5%]) on 0 to 25 days of life (DOL-0 to DOL-25) (median, DOL-1; interquartile range [IQR], DOL-1 to DOL-3). Two newborns had indeterminate test results, indicative of low viral load (2.0%; 95% CI, 0.2%-7.0%); 1 newborn never underwent retesting but remained well on follow-up, and the other had negative results on retesting. Maternal severe/critical COVID-19 was associated with newborns born approximately 1 week earlier (median gestational age, 37.9 [IQR, 37.1-38.4] vs 39.1 [IQR, 38.3-40.2] weeks;  $P = .02$ ) and at increased risk of requiring phototherapy (3 of 10 [30.0%] vs 6 of 91 [7.0%];  $P = .04$ ) compared with newborns of mothers with asymptomatic/mild COVID-19. Fifty-five newborns were followed up in a new COVID-19 Newborn Follow-up Clinic at DOL-3 to DOL-10 and remained well. Twenty of these newborns plus 3 newborns followed up elsewhere had 32 nonroutine encounters documented at DOL-3 to DOL-25, and none had evidence of SARS-CoV-2 infection, including 6 with negative retesting results. Conclusions and Relevance: No clinical evidence of vertical transmission was identified in 101 newborns of mothers positive for or with suspected SARS-CoV-2 infection, despite most newborns rooming-in and direct breastfeeding practices. Copyright © 2020 American Medical Association. All rights reserved.

**Database:** EMBASE



## 7. Initial review of pregnancy and neonatal outcomes of pregnant women with COVID-19 infection

**Author(s):** Ogamba I.; Kliss A.; Rainville N.; Panarelli E.; Petrini J.; Chuang L.; Zilberman D.

**Source:** Journal of Perinatal Medicine; 2020

**Publication Type(s):** Review

**Abstract:** Objectives: Data regarding the pathogenesis and clinical manifestations of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) continue to emerge, however, there's limited data in regard to maternal and neonatal outcomes. Therefore, we conducted a retrospective analysis of all pregnant women who tested positive for SARS-CoV-2 within Nuvance Health system. Study design: Data were abstracted from the medical records of each patient and descriptive analysis was performed. Variables included demographics, COVID testing results, symptoms, management, labor course, neonatal information, and complications. Result(s): Total of 40 patients were identified. Average age was 29.6 years old, 35% were Hispanic, and approximately one in three patients had comorbidities. Of the patients who had repeated testing, the average number of days between first positive test and negative test was 36.8 days (+/- 19.9 days). Three out of four women reported symptoms. Of the 40 pregnant women who were positive for SARS-CoV-2, 25 of them delivered. About 84% of the women delivered after 37 weeks. Twelve percent of the women delivered under 33 and 6/7 weeks. Most patients had vaginal deliveries (68%) and the remaining had cesarean deliveries. Neonatal outcomes included: mean 1 and 5 min Apgar scores of 8 and 8.8, respectively and the mean birth weight was 3212 g. Twenty neonates were tested for SARS-CoV-2 and were all found to be negative. Conclusion(s): Overall, with routine prenatal care and preventive measures, pregnant patients and neonates in our study had good outcomes. At this time, there appears to be no evidence of vertical transmission. Copyright © 2020 De Gruyter. All rights reserved.

**Database:** EMBASE

## 8. Infeccion por coronavirus (Covid-19) en el embarazo Coronavirus (Covid-19) infection in pregnancy

**Author(s):** Ortiz E.I.; Herrera E.; De La Torre A.

**Source:** Colombia Medica; 2020; vol. 51 (no. 2); p. 1-7

**Publication Type(s):** Review

Available at [Colombia medica \(Cali, Colombia\)](#) - from Europe PubMed Central - Open Access

Available at [Colombia medica \(Cali, Colombia\)](#) - from Unpaywall

**Abstract:** Coronavirus illness 2019 (COVID-19) is an airways infection caused by the new coronavirus (SARS-CoV-2) which has been quickly disseminated all over the world, affecting to the general population including women in pregnancy time. As being a recent infection, the evidence that supports the best practices for the management of the infection during pregnancy is limited, and most of the questions have not been completely solved yet. This publication offers general guidelines focused on decision-making people, managers, and health's teams related to pregnant women attention and newborn babies during COVID-19 pandemic. Its purpose is to promote useful interventions to prevent new infections as well as prompt and adequate attention to avoid serious complications or deaths, trying to be adapted to the different contexts in which attention to expectant mothers is provided. Guidelines are set within a well-scientific evidence and available recommendations up to date. Copyright © 2020 Universidad del Valle.

**Database:** EMBASE



## 9. Most susceptible duo in COVID-19 crisis: A literature review

**Author(s):** Lakhkar B.B.; Guru B.; Damke S.

**Source:** Perinatology; 2020; vol. 21 (no. 3); p. 112-123

**Publication Type(s):** Review

**Abstract:**Background and Aims: December 2019 onward, the COVID-19 infection has created havoc in the world. This review aims to pool in the experiences of obstetricians and neonatologists to help provide some guidance to clinicians and researchers about managing COVID-19 infection in pregnant women and the neonates. The study analyzed the susceptibility of pregnant women and the neonates to COVID-19 infection and the disease severity and mortality in pregnant women and the neonates due to this infection. We also attempted to find evidence of vertical transmission of the COVID-19 virus. Material(s) and Method(s): Several databases (PubMed, MEDLINE, CINAHL, Google Scholar, and EMBASE) were explored, and relevant articles published between December 2019 and May 2020 were collated. A total of 46 published articles and 1 press note were selected for this review. A few landmark studies published during the preparation of this review were also included. Result(s): A total of 558 COVID-19-positive pregnant women were studied in 5 case reports, 20 case series, and 1 press note, with 443 deliveries and 445 neonates (2 sets of twins). Of the 329 pregnant women in whom the disease severity was reported, 232 (70.5%) women had mild disease, and 72 (21.8%) women were asymptomatic. However, comorbidities did not affect the severity of the disease. There were 2 (0.35%) maternal deaths, 2 (0.43%) neonatal deaths, and 1 (0.22%) still-birth. Of the 452 real-time polymerase chain reaction (RT-PCR) tests done in neonates, only 3 neonates had symptoms and none died. Although the neonates of COVID-19-positive mothers were kept away from them, these neonates had high levels of serum IgM and interleukins, and the results of the RT-PCR test of their nasopharyngeal swabs were positive for the COVID-19 virus (even at 16 hours after birth). This suggests the possibility of vertical transmission. The reproductive tissue and breast milk tested negative for the COVID-19 virus. Conclusion(s): Pregnant women are not additionally vulnerable to COVID-19 infection or its severity, although recent studies show a high susceptibility in some ethnic groups. Maternal and neonatal morbidity and mortality is low. Some evidence of vertical transmission is seen. Symptomatic disease in neonates is rare. Neonates can be left with their mothers, subject to the mothers practicing proper hand hygiene and using masks. The neonates should be breastfed. Copyright © 2020, Himalaya Drug Company. All rights reserved.

**Database:** EMBASE

## 10. Impact of COVID-19 on maternal and neonatal outcomes: a systematic review and meta-analysis

**Author(s):** Di Toro F.; Gjoka M.; Di Lorenzo G.; De Seta F.; Maso G.; Risso F.M.; Romano F.; Wiesenfeld U.; Ronfani L.; Ricci G.; Levi-D'Ancona R.

**Source:** Clinical Microbiology and Infection; 2020

**Publication Type(s):** Review

Available at [Clinical microbiology and infection : the official publication of the European Society of Clinical Microbiology and Infectious Diseases](#) - from Unpaywall

**Abstract:**Background: Previous outbreaks of severe acute respiratory syndrome coronavirus 1 (SARS-CoV-1) and Middle East respiratory syndrome coronavirus (MERS-CoV) have been associated with unfavourable pregnancy outcomes. SARS-CoV-2 belongs to the human coronavirus family, and since this infection shows a pandemic trend it will involve many pregnant women. Aim(s): This systematic review and meta-analysis aimed to assess the impact of coronavirus disease 19 (COVID-19) on maternal and neonatal outcomes. Sources: PubMed, EMBASE, MedRxiv, Scholar, Scopus, and Web of Science databases were searched up to 8th May 2020. Articles focusing on pregnancy and perinatal

outcomes of COVID-19 were eligible. Participants were pregnant women with COVID-19. Content: The meta-analysis was conducted following the PRISMA and MOOSE reporting guidelines. Bias risk was assessed using the Joanna Briggs Institute (JBI) manual. The protocol was registered with PROSPERO (CRD42042020184752). Twenty-four articles, including 1100 pregnancies, were selected. The pooled prevalence of pneumonia was 89% (95%CI 70-100), while the prevalence of women admitted to the intensive care unit was 8% (95%CI 1-20). Three stillbirths and five maternal deaths were reported. A pooled prevalence of 85% (95%CI 72-94) was observed for caesarean deliveries. There were three neonatal deaths. The prevalence of COVID-19-related admission to the neonatal intensive care unit was 2% (95%CI 0-6). Nineteen out of 444 neonates had a positive nasopharyngeal swab; one out of five neonates had elevated concentrations of serum IgM and IgG, but a negative swab. Implications: Although adverse outcomes such as ICU admission or patient death can occur, the clinical course of COVID-19 in most women is not severe, and the infection does not significantly influence the pregnancy. A high caesarean delivery rate is reported, but there is no clinical evidence supporting this mode of delivery. Indeed, in most cases the disease does not threaten the mother, and vertical transmission has not been clearly demonstrated. Therefore, COVID-19 should not be considered as an indication for elective caesarean section. Copyright © 2020 European Society of Clinical Microbiology and Infectious Diseases

**Database:** EMBASE

### **11. Intrauterine transmission of COVID-19 in pregnancy: Case report and review of literature**

**Author(s):** Elkafrawi D.; Rodriguez B.; Sisti G.; Joseph J.; Schiattarella A.

**Source:** Acta Biomedica de l'Ateneo Parmense; 2020; vol. 91 (no. 3); p. 1-5

**Abstract:**We report the first case of SARS-CoV-2 pregnancy in the U.S. Our literature review highlights the rarity of COVID-19 intrauterine transmission and the need for clinicians to promptly test neonates born to SARS-CoV-2 positive mothers at delivery for COVID-19. It is imperative to establish the real risk of in-trauterine transmission and to develop appropriate preventive and treatment strategies. ([www.actabiomedica.it](http://www.actabiomedica.it)). Copyright © Mattioli 1885.

**Database:** EMBASE

### **12. Clinical Analysis of Neonates Born to Mothers with or without COVID-19: A Retrospective Analysis of 48 Cases from Two Neonatal Intensive Care Units in Hubei Province**

**Author(s):** Liu W.; Wang J.; Ding L.; Zhou Z.; Liu S.; Chang L.; Rong Z.; Cheng H.

**Source:** American Journal of Perinatology; 2020

Available at [American Journal of Perinatology](http://www.ajperinatology.com) - from Unpaywall

**Abstract:**Objective aThe perinatal consequences of neonates born to severe acute respiratory syndrome-associated coronavirus-2 (SARS-CoV-2) infected mothers are uncertain. This study aimed to compare the differences in clinical manifestation, laboratory results, and outcomes of neonates born to mothers with or without coronavirus disease 2019 (COVID-19). Study Design aA total of 48 neonates were admitted to Tongji Hospital and Huangshi Maternal and Child Healthcare Hospital from January 17 to March 4, 2020. The neonates were divided into three groups according to the mothers' conditions: Neonates born to mothers with confirmed COVID-19, neonates born to mothers with clinically diagnosed COVID-19, and neonates born to mothers without COVID-19. The clinical data of mothers and infants in the three groups were collected, compared, and analyzed. Results aThe deliveries occurred in a negative pressure isolation room, and the neonates were separated from their mothers immediately after birth for further observation and treatment. None of the neonates showed any signs of fever, cough, dyspnea, or diarrhea. SARS-CoV-2 reverse

transcriptase-polymerase chain reaction of the throat swab and feces samples from the neonates in all three groups was negative. No differences were detected in the whole blood cell, lymphocytes, platelet, and liver and renal function among the three groups. All mothers and their infants showed satisfactory outcomes, including a 28-week preterm infant. Conclusion aThe clinical manifestations, radiological, and biochemical results did not show any difference between the three groups. No evidence of vertical transmission was found in this study whether the pregnant women developed coronavirus infection in the third (14 cases) or second trimester (1 case). Key points Characteristics of neonates born to mothers with and without COVID-19 have been compared. All the 48 cases presented in the study had good outcomes. A 28-week preterm born to COVID-19 mother presented to be clear of SARS-COV-2 infection. Copyright © 2020 Cambridge University Press. All rights reserved.

**Database:** EMBASE

### **13. No evidence for vertical transmission of SARS-CoV-2 in two neonates with mothers infected in the second trimester.**

**Author(s):** Tang, Jing-Yi; Song, Wen-Qi; Xu, Hao; Wang, Na

**Source:** Infectious diseases (London, England); 2020; vol. 52 (no. 12); p. 913-916

**Publication Type(s):** Case Reports Journal Article

Available at [Infectious diseases \(London, England\)](#) - from Unpaywall

**Abstract:**BACKGROUND COVID-19 reported in pregnant women has occurred in late pregnancy, while there are no reports of infection in the first and second trimester. We report two neonates born to mothers with COVID-19 during the second trimester. CASE PRESENTATION Two pregnant women had symptomatic COVID-19 in the second trimester. Throat swabs at delivery for SARS-COV-2 RNA were negative for both women and their newborns. The first woman had positive serum IgM and IgG antibodies to SARS-COV-2 before delivery. Her newborn had negative IgM antibody to SARS-COV-2 but IgG was positive on the 7th day after birth. The second woman had negative serum IgM antibody to SARS-COV-2 but IgG was positive before delivery. Her newborn had negative serum IgM antibody to SARS-COV-2 but IgG was positive at 48 h after birth. None of the neonates developed clinical symptoms of COVID-19. CONCLUSIONS SARS-COV-2 is unlikely to be vertically transmitted in utero as evidenced by the specific antibodies in the serum of the two women and their newborns. The two women with SARS-COV-2 infection in the second trimester did not develop serious complications at delivery and outcomes of the neonates were good.

**Database:** Medline

### **14. Maternal and perinatal characteristics and outcomes of pregnancies complicated with COVID-19 in Kuwait**

**Author(s):** Ayed A.; Benawadh A.; Ahmad A.; Embaireeg A.; Al-Fouzan W.; Hammoud M.; Al-Hathal M.; Alzaydai A.; Ayed M.

**Source:** BMC Pregnancy and Childbirth; Dec 2020; vol. 20 (no. 1)

Available at [BMC Pregnancy & Childbirth](#) - from BioMed Central

Available at [BMC Pregnancy & Childbirth](#) - from Europe PubMed Central - Open Access

Available at [BMC Pregnancy & Childbirth](#) - from Unpaywall

**Abstract:**Background: The effect of SARS-CoV-2 infection in pregnant women and newborns is incompletely understood. Preliminary data shows a rather fluctuating course of the disease from asymptomatic or mild symptoms to maternal death. However, it is not clear whether the disease

increases the risk of pregnancy-related complications. The aim of the study is to describe the maternal and neonatal clinical characteristics and outcome of pregnancies with SARS-CoV-2 infection. Method(s): In this retrospective national-based study, we analyzed the medical records of all pregnant women infected with SARS-CoV-2 and their neonates who were admitted to New-Jahra Hospital (NJH), Kuwait, between March 15th 2020 and May 31st 2020. During the study period and as part of the public health measures, a total of 185 pregnant women infected with SARS-CoV-2, regardless of symptoms, were hospitalized at NJH, and were included. Maternal and neonatal clinical manifestations, laboratory tests and treatments were collected. The outcomes of pregnancies included miscarriage, intrauterine fetal death (IUFD), preterm birth and live birth were assessed until the end date of the outcomes follow-up (November 10th 2020). Result(s): A total of 185 pregnant women infected with SARS-CoV-2 were enrolled with a median age of 31 years (interquartile range, IQR: 27.5-34), and median gestational age at diagnosis of SARS-CoV2 infection was 29 weeks (IQR: 18-34). The majority (88%) of these women had mild symptoms, with fever (58%) being the most common presenting symptom followed by cough (50.6%). At the time of the analysis, out of the 185, 3 (1.6%) of the pregnant women had a miscarriage, 1 (0.54%) had IUFD which was not related to COVID-19, 16 (8.6%) had ongoing pregnancies and 165 (89%) had a live birth. Only 2 (1.1%) of these women developed severe pneumonia and required intensive care. A total of 167 neonates with two sets of twins were born with median gestational age at birth was 38 (IQR: 36-39) weeks. Most of the neonates were asymptomatic, and only 2 of them tested positive on day 5 by nasopharyngeal swab testing. Conclusion(s): In this national-based study, most of the pregnant women infected with SARS-CoV-2 showed mild symptoms. Although mother-to-child vertical transmission of SARS-CoV-2 is possible, COVID-19 infection during pregnancy may not lead to unfavorable maternal and neonatal outcomes. Copyright © 2020, The Author(s).

**Database:** EMBASE

### **15. Protection challenges of pregnant women against vertical transmission during COVID-19 epidemic: A narrative review**

**Author(s):** Hasnain M.; Pasha M.F.; Ghani I.; Budiarto R.

**Source:** American Journal of Infection Control; Dec 2020; vol. 48 (no. 12); p. 1516-1519

**Publication Type(s):** Review

Available at [American Journal of Infection Control](#) - from Unpaywall

**Abstract:** This paper presents a narrative review study of 5 popular data repositories focusing on challenges of pregnant women protection during the COVID-19 pandemic. The study concludes that the likelihood of a vertical transmission of COVID-19 infection from pregnant women to neonates was not observed. Nevertheless, it remains a serious risk for them during their earlier stage of pregnancy, thus, special attention from health professionals has been recommended. Copyright © 2020

**Database:** EMBASE

### **16. Analysis of SARS-CoV-2 vertical transmission during pregnancy**

**Author(s):** Fenizia C.; Clerici M.; Biasin M.; Trabattoni D.; Cetin I.; Vergani P.; Callegari C.; Mileto D.; Gismondo M.R.; Mancon A.; Spinillo A.; Perotti F.; Cammarata S.; Savasi V.; Beretta I.; Nebuloni M.

**Source:** Nature Communications; Dec 2020; vol. 11 (no. 1)

Available at [Nature Communications](#) - from Europe PubMed Central - Open Access

Available at [Nature Communications](#) - from Nature (Open Access)

Available at [Nature Communications](#) - from Unpaywall

**Abstract:**The impact of SARS-CoV-2 infection during gestation remains unclear. Here, we analyse the viral genome on maternal and newborns nasopharyngeal swabs, vaginal swabs, maternal and umbilical cord plasma, placenta and umbilical cord biopsies, amniotic fluids and milk from 31 mothers with SARS-CoV-2 infection. In addition, we also test specific anti-SARS-CoV-2 antibodies and expression of genes involved in inflammatory responses in placentas, and in maternal and umbilical cord plasma. We detect SARS-CoV-2 genome in one umbilical cord blood and in two at-term placentas, in one vaginal mucosa and in one milk specimen. Furthermore, we report the presence of specific anti-SARS-CoV-2 IgM and IgG antibodies in one umbilical cord blood and in one milk specimen. Finally, in the three documented cases of vertical transmission, SARS-CoV-2 infection was accompanied by a strong inflammatory response. Together, these data support the hypothesis that in utero SARS-CoV-2 vertical transmission, while low, is possible. These results might help defining proper obstetric management of COVID-19 pregnant women, or putative indications for mode and timing of delivery. Copyright © 2020, The Author(s).

**Database:** EMBASE

### **17. Pregnant woman infected by Coronavirus Disease (COVID-19) and calcifications of the fetal bowel and gallbladder: a case report**

**Author(s):** Sileo F.G.; Tramontano A.L.; Leone C.; Meacci M.; Gennari W.; Ternelli G.; La Marca A.; Facchinetti F.; Lugli L.; Berardi A.; Bertucci E.

**Source:** Minerva ginecologica; Nov 2020

**Abstract:**INTRODUCTION: COVID-19 was declared pandemic due to the rapid increase of cases around the world, including the number of pregnant women. Data about vertical transmission of Covid-19 are still limited and controversial: in most cases, although a positive mother, the virus could not be isolated in amniotic fluid, cord blood, breast milk or neonatal throat swab in these patients. No data have been published about possible intrauterine sonographic signs of infection. CASE PRESENTATION: A pregnant woman was diagnosed with SARS-CoV2 at 35+5 weeks of gestation and managed conservatively at home. At transabdominal ultrasound at 38+3 weeks, fetal bowel and gallbladder calcifications were noted. CMV and other infectious agents were ruled out; an iterative Caesarean Section was performed at 38+5 weeks without complications. Placenta resulted negative for SARS-CoV-2; the umbilical cord blood sample was IgG positive and IgM negative as per maternal infection. The baby developed respiratory distress syndrome requiring endotracheal surfactant administration and nasal-CPAP for one day but nasopharyngeal swabs at birth and after 48 hours were SARS-Cov2 negative. Neonatal abdominal ultrasound showed normal liver, acalculous gallbladder with mild parietal thickening. The baby was discharged in good conditions. CONCLUSION(S): although gallbladder calcifications and echogenic bowel are highly suspicious of viral infection and were thought to be due to the vertical transmission of SARS-CoV-2, these findings were not corroborated by the results of our diagnostic tests; these sonographic findings might represent a false positive of fetal infection in mother affected by COVID-19 since vertical transmission appears to be rare.

**Database:** EMBASE

### **18. Pregnancy and COVID-19: what anesthesiologists should know?**

**Author(s):** Wang Y.; Yang M.; Wang L.; Dong H.; Lu Z.

**Source:** Minerva anesthesiologica; Nov 2020

**Abstract:**INTRODUCTION: Anesthetic management of parturients with COVID-19 is a big challenge to anesthesiologists. Limited data are available about COVID-19 during pregnancy; however, information on illnesses associated with SARS and MERS might provide insights into COVID-19's

effects during pregnancy. EVIDENCE ACQUISITION: Evidence from previous reports from SARS and MERS, and from COVID-19 cases were reviewed. Concepts from guidelines from the government and academic societies were collected as well. EVIDENCE SYNTHESIS: The evidences were described and summarized. CONCLUSION(S): Principles to minimize the risk of infection as well as optimize patients' safety during obstetric anesthesia were found to include careful evaluation, tight protection, and multi-discipline-based strategy. Though vertical transmission of COVID-19 still needs more definitive evidences, strict isolation is necessary for the newborn of COVID-19 mothers. Psychological support for the parturients is also an important issue during COVID-19 pandemic.

**Database:** EMBASE

### **19. Possible Early Vertical Transmission of COVID-19 from an Infected Pregnant Female to Her Neonate: A Case Report**

**Author(s):** Bandyopadhyay T.; Sharma A.; Kumari P.; Maria A.; Choudhary R.

**Source:** Journal of tropical pediatrics; Nov 2020

**Abstract:** Severe acute respiratory syndrome-coronavirus-2 (SARS-CoV-19) has emerged as a public health emergency in recent times. The reported data on the mode of transmission of coronavirus disease 2019 (COVID-19) are largely through contact, droplet, airborne and fomite transmission methods with vertical transmission being a rare entity. We hereby report a case of a probable vertical transmission of SARS-CoV-19 from an infected pregnant female to her neonate. The transmission has been confirmed by a positive RT-PCR at 16h of life along with a positive IgG antibody test for SARS-CoV-19 in the baby and after excluding the possible environmental contamination of the sample. The baby was asymptomatic during the course of hospital stay and was discharged from the facility on Day 9 of life. Copyright © The Author(s) [2020]. Published by Oxford University Press. All rights reserved. For permissions, please email: journals.permissions@oup.com.

**Database:** EMBASE

### **20. Pregnancy and childbirth in the COVID-19 era-the course of disease and maternal-fetal transmission**

**Author(s):** Mazur-Bialy A.I.; Kolomanska-Bogucka D.; Tim S.; Oplawski M.

**Source:** Journal of Clinical Medicine; Nov 2020; vol. 9 (no. 11); p. 1-25

Available at [Journal of Clinical Medicine](#) - from Europe PubMed Central - Open Access

Available at [Journal of Clinical Medicine](#) - from Unpaywall

**Abstract:** From the beginning of the Coronavirus Disease 2019 (COVID-19) pandemic, special attention has been paid to pregnant women and to monitoring comorbidities, such as gestational diabetes and hypertension, which could increase their risk of disease and death. The purpose of this review is to synthesize the available knowledge on the course of COVID-19 in pregnant women as well as the risk of maternal-fetal transmission. The study indicated that the course of COVID-19 is worse in pregnant women who are more often admitted to intensive care units or who require mechanical ventilation than nonpregnant women with COVID-19. Some symptoms, such as dyspnea and cough, were similar to those observed in nonpregnant women, but fever, headache, muscle aches, chills, and diarrhea were less frequent. A study revealed that premature delivery and cesarean section were more common in pregnant women diagnosed with COVID-19. In addition, recent studies confirm the possibility of intrauterine maternal-fetal transmission by positive genetic tests and the presence of IgM in newborns just after delivery; at the moment, the probability of transmission through mother's milk is inconclusive. Considering all the above, a severe acute



respiratory syndrome coronavirus-2 (SARS-CoV-2) infection is an important factor that threatens the health and life of both the mother and the fetus, but further studies are still needed. Copyright © 2020 by the authors. Licensee MDPI, Basel, Switzerland.

**Database:** EMBASE

### **21. A Possible Case of Vertical Transmission of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in a Newborn With Positive Placental In Situ Hybridization of SARS-CoV-2 RNA**

**Author(s):** Alamar I.; Abu-Arja M.H.; Narula P.; Dygulska B.; Heyman T.; Roberts D.J.; Desai N.

**Source:** Journal of the Pediatric Infectious Diseases Society; Nov 2020; vol. 9 (no. 5); p. 636-639

Available at [Journal of the Pediatric Infectious Diseases Society](#) - from Unpaywall

**Abstract:** Little is known about the effects of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and the coronavirus disease 2019 (COVID-19) on pregnant mothers and their infants. Moreover, there is no definitive evidence that SARS-CoV-2 can be vertically transmitted from an infected mother to the unborn fetus. Copyright © The Author(s) 2020. Published by Oxford University Press on behalf of The Journal of the Pediatric Infectious Diseases Society. All rights reserved. For permissions, please e-mail: journals.permissions@oup.com.

**Database:** EMBASE

### **22. Clinical manifestation, outcomes in pregnant women with COVID-19 and the possibility of vertical transmission: A systematic review of the current data**

**Author(s):** Han Y.; Ma H.; Suo M.; Han F.; Wang F.; Ji J.; Yang H.

**Source:** Journal of Perinatal Medicine; Nov 2020; vol. 48 (no. 9); p. 912-924

Available at [Journal of Perinatal Medicine](#) - from Unpaywall

**Abstract:** To assess perinatal outcomes of COVID-19 infections during pregnancy and the possibility of vertical transmission. An analysis was performed using Stata 15.0, and Q-test was used to evaluate the heterogeneity of the included studies. The most common symptoms were found to be fever (64.78%), cough (59.81%) and shortness of breath or dyspnea (23.86%). Of this 88.73% patients demonstrated typical COVID-19 signs on chest CT or X-ray. Intubation was carried out in 35.87% of patients, and 4.95% of mothers were admitted to the intensive care unit, where the rate of maternal death was <0.01% and that of premature delivery was 25.32%. The rate of the birth weight being <2,500 g was 30.65% and that of Neonatal intensive care unit (NICU) admission was 24.41%. Positive nasopharynx swabs or sputum from newborns was <0.01%. Pregnant patients with COVID-19 most commonly presented with fever, cough, shortness of breath and dyspnea, most of which possessed imaging manifestations. The risk of intubation and admission to intensive care unit were high. The risk of premature delivery was higher, leading to a high risk of NICU admission and low neonatal birthweight. Vertical transmission of SARS-CoV-2 from mother to child was found to be unlikely. Copyright © 2020 2020 Walter de Gruyter GmbH, Berlin/Boston.

**Database:** EMBASE

### **23. Risk factors associated with adverse fetal outcomes in pregnancies affected by Coronavirus disease 2019 (COVID-19): A secondary analysis of the WAPM study on COVID-19**

**Author(s):** Di Mascio D.; Sen C.; Saccone G.; Galindo A.; Grunebaum A.; Chervenak F.; Yoshimatsu J.; Stanojevic M.; Kurjak A.

**Source:** Journal of Perinatal Medicine; Nov 2020; vol. 48 (no. 9); p. 950-958

Available at [Journal of perinatal medicine](#) - from Unpaywall

**Abstract:** To evaluate the strength of association between maternal and pregnancy characteristics and the risk of adverse perinatal outcomes in pregnancies with laboratory confirmed COVID-19. Secondary analysis of a multinational, cohort study on all consecutive pregnant women with laboratory-confirmed COVID-19 from February 1, 2020 to April 30, 2020 from 73 centers from 22 different countries. A confirmed case of COVID-19 was defined as a positive result on real-time reverse-transcriptase-polymerase-chain-reaction (RT-PCR) assay of nasal and pharyngeal swab specimens. The primary outcome was a composite adverse fetal outcome, defined as the presence of either abortion (pregnancy loss before 22 weeks of gestations), stillbirth (intrauterine fetal death after 22 weeks of gestation), neonatal death (death of a live-born infant within the first 28 days of life), and perinatal death (either stillbirth or neonatal death). Logistic regression analysis was performed to evaluate parameters independently associated with the primary outcome. Logistic regression was reported as odds ratio (OR) with 95% confidence interval (CI). Mean gestational age at diagnosis was 30.6+/-9.5 weeks, with 8.0% of women being diagnosed in the first, 22.2% in the second and 69.8% in the third trimester of pregnancy. There were six miscarriage (2.3%), six intrauterine device (IUD) (2.3) and 5 (2.0%) neonatal deaths, with an overall rate of perinatal death of 4.2% (11/265), thus resulting into 17 cases experiencing and 226 not experiencing composite adverse fetal outcome. Neither stillbirths nor neonatal deaths had congenital anomalies found at antenatal or postnatal evaluation. Furthermore, none of the cases experiencing IUD had signs of impending demise at arterial or venous Doppler. Neonatal deaths were all considered as prematurity-related adverse events. Of the 250 live-born neonates, one (0.4%) was found positive at RT-PCR pharyngeal swabs performed after delivery. The mother was tested positive during the third trimester of pregnancy. The newborn was asymptomatic and had negative RT-PCR test after 14 days of life. At logistic regression analysis, gestational age at diagnosis (OR: 0.85, 95% CI 0.8-0.9 per week increase;  $p < 0.001$ ), birthweight (OR: 1.17, 95% CI 1.09-1.12.7 per 100 g decrease;  $p = 0.012$ ) and maternal ventilatory support, including either need for oxygen or CPAP (OR: 4.12, 95% CI 2.3-7.9;  $p = 0.001$ ) were independently associated with composite adverse fetal outcome. Early gestational age at infection, maternal ventilatory supports and low birthweight are the main determinants of adverse perinatal outcomes in fetuses with maternal COVID-19 infection. Conversely, the risk of vertical transmission seems negligible. Copyright © 2020 2020 Walter de Gruyter GmbH, Berlin/Boston.

**Database:** EMBASE

#### **24. Birth and Infant Outcomes Following Laboratory-Confirmed SARS-CoV-2 Infection in Pregnancy - SET-NET, 16 Jurisdictions, March 29-October 14, 2020**

**Author(s):** Woodworth K.R.; Olsen E.O.; Neelam V.; Lewis E.L.; Galang R.R.; Oduyebo T.; Aveni K.; Yazdy M.M.; Harvey E.; Longcore N.D.; Barton J.; Fussman C.; Siebman S.; Lush M.; Patrick P.H.; Halai U.-A.; Valencia-Prado M.; Orkis L.; Sowunmi S.; Schlosser L.; Khuwaja S.; Read J.S.; Hall A.J.; Meaney-Delman D.; Ellington S.R.; Gilboa S.M.; Tong V.T.

**Source:** MMWR. Morbidity and mortality weekly report; Nov 2020; vol. 69 (no. 44); p. 1635-1640

Available at [MMWR. Morbidity and mortality weekly report](#) - from ProQuest (Health Research Premium) - NHS Version

Available at [MMWR. Morbidity and mortality weekly report](#) - from Unpaywall

**Abstract:** Pregnant women with coronavirus disease 2019 (COVID-19) are at increased risk for severe illness and might be at risk for preterm birth (1-3). The full impact of infection with SARS-CoV-2, the virus that causes COVID-19, in pregnancy is unknown. Public health jurisdictions report information, including pregnancy status, on confirmed and probable COVID-19 cases to CDC through the National Notifiable Diseases Surveillance System.\* Through the Surveillance for Emerging Threats to Mothers

and Babies Network (SET-NET), 16 jurisdictions collected supplementary information on pregnancy and infant outcomes among 5,252 women with laboratory-confirmed SARS-CoV-2 infection reported during March 29-October 14, 2020. Among 3,912 live births with known gestational age, 12.9% were preterm (<37 weeks), higher than the reported 10.2% among the general U.S. population in 2019 (4). Among 610 infants (21.3%) with reported SARS-CoV-2 test results, perinatal infection was infrequent (2.6%) and occurred primarily among infants whose mother had SARS-CoV-2 infection identified within 1 week of delivery. Because the majority of pregnant women with COVID-19 reported thus far experienced infection in the third trimester, ongoing surveillance is needed to assess effects of infections in early pregnancy, as well the longer-term outcomes of exposed infants. These findings can inform neonatal testing recommendations, clinical practice, and public health action and can be used by health care providers to counsel pregnant women on the risks of SARS-CoV-2 infection, including preterm births. Pregnant women and their household members should follow recommended infection prevention measures, including wearing a mask, social distancing, and frequent handwashing when going out or interacting with others or if there is a person within the household who has had exposure to COVID-19.+.

**Database:** EMBASE

## **25. COVID-19 during Pregnancy and Postpartum: Antiviral Spectrum of Maternal Lactoferrin in Fetal and Neonatal Defense**

**Author(s):** Naidu S.A.G.; Naidu A.S.; Clemens R.A.; Pressman P.; Zaigham M.; Davies K.J.A.

**Source:** Journal of dietary supplements; Nov 2020 ; p. 1-37

Available at [Journal of dietary supplements](#) - from Unpaywall

**Abstract:**As the COVID-19 pandemic intensified the global health crisis, the containment of SARS-CoV-2 infection in pregnancies, and the inherent risk of vertical transmission of virus from mother-to-fetus (or neonate) poses a major concern. Most COVID-19-Pregnancy patients showed mild to moderate COVID-19 pneumonia with no pregnancy loss and no congenital transmission of the virus; however, an increase in hypoxia-induced preterm deliveries was apparent. Also, the breastmilk of several mothers with COVID-19 tested negative for the virus. Taken together, the natural barrier function during pregnancy and postpartum seems to deter the SARS-CoV-2 transmission from mother-to-child. This clinical observation warrants to explore the maternal-fetal interface and identify the innate defense factors for prevention and control of COVID-19-Pregnancy. Lactoferrin (LF) is a potent antiviral iron-binding protein present in the maternal-fetal interface. In concert with immune co-factors, maternal-LF modulates chemokine release and lymphocyte migration and amplify host defense during pregnancy. LF levels during pregnancy may resolve hypertension via down-regulation of ACE2; consequently, may limit the membrane receptor access to SARS-CoV-2 for cellular entry. Furthermore, an LF-derived peptide (LRPVAA) has been shown to block ACE receptor activity in vitro. LF may also reduce viral docking and entry into host cells and limit the early phase of COVID-19 infection. An in-depth understanding of LF and other soluble mammalian milk-derived innate antiviral factors may provide insights to reduce co-morbidities and vertical transmission of SARS-CoV-2 infection and may lead to the development of effective nutraceutical supplements.

**Database:** EMBASE

## **26. COVID-19 during Pregnancy and Postpartum**

**Author(s):** Naidu Ms PharmD S.A.G.; Naidu PhD Facn Fls Fissvd A.S.; Clemens DrPH Fift Cfs Fasn Facn Cns Fiafst R.A.; Pressman Md Ms Facn P.; Zaigham BSc Md PhD M.; Kadkhoda PhD Sm Ascp D Abmm D Abmli K.; Davies PhD DSc Mae Frsc Frcp Fls Fri K.J.A.

**Source:** Journal of dietary supplements; Nov 2020 ; p. 1-28

Available at [Journal of Dietary Supplements](#) - from Unpaywall

**Abstract:** Coronavirus Disease 2019 (COVID-19) triggered by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) infection has been declared a pandemic by the World Health Organization (WHO) on March 11, 2020. Oxidative stress and its related metabolic syndromes are potential risk factors in the susceptibility to, and severity of COVID-19. In concert with the earliest reports of COVID-19, obstetricians started to diagnose and treat SARS-CoV-2 infections during pregnancy ("COVID-19-Pregnancy"). High metabolic demand to sustain normal fetal development increases the burden of oxidative stress in pregnancy. Intracellular redox changes intertwined with acute phase responses at the maternal-fetal interface could amplify during pregnancy. Interestingly, mother-to-fetus transmission of SARS-CoV-2 has not been detected in most of the COVID-19-Pregnancy cases. This relative absence of vertical transmission may be related to the presence of lactoferrin in the placenta, amniotic fluid, and lacteal secretions. However, the cytokine-storm induced during COVID-19-Pregnancy may cause severe inflammatory damage to the fetus, and if uncontrolled, may later result in autism spectrum-like disorders and brain development abnormalities in neonates. Considering this serious health threat to child growth and development, the prevention of COVID-19 during pregnancy should be considered a high priority. This review summarizes the intricate virulence factors of COVID-19 and elucidate its pathobiological spectrum during pregnancy and postpartum periods with a focus on the putative and complex roles of endogenous and exogenous lactoferrin in conferring immunological advantage to the host.

**Database:** EMBASE

## **27. Fetal Transient Skin Edema in Two Pregnant Women With Coronavirus Disease 2019 (COVID-19)**

**Author(s):** Garcia-Manau P.; Garcia-Ruiz I.; Rodo C.; Sulleiro E.; Maiz N.; Catalan M.; Fernandez-Hidalgo N.; Balcells J.; Anton A.; Carreras E.; Suy A.

**Source:** Obstetrics and gynecology; Nov 2020; vol. 136 (no. 5); p. 1016-1020

Available at [Obstetrics and gynecology](#) - from Ovid (LWW High Impact Collection 2020 - Legacy)

Available at [Obstetrics and gynecology](#) - from Unpaywall

**Abstract:**BACKGROUND: The risk of vertical transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection remains unknown. Positive reverse-transcription polymerase chain reaction (RT-PCR) test results for SARS-CoV-2 infection in neonates and placental tissue have been reported, and immunoglobulin M antibodies have been detected in neonates born to mothers with infection. CASES: The first case is a woman at 22 3/7 weeks of gestation with coronavirus disease 2019 (COVID-19) who was admitted to the intensive care unit. In the second case, the patient remained at home with mild symptoms, starting at 20 weeks of gestation. In both cases, fetal skin edema was observed on ultrasound examination while maternal SARS-COV-2 RT-PCR test results were positive and resolved when maternal SARS-COV-2 RT-PCR test results became negative. The RT-PCR test result for SARS-CoV-2 in amniotic fluid was negative in both cases. The two pregnancies are ongoing and uneventful. CONCLUSION(S): Transient fetal skin edema noted in these two patients with COVID-19 in the second trimester may represent results of fetal infection or altered fetal physiology due to maternal disease or may be unrelated to the maternal illness.

**Database:** EMBASE

## **28. COVID-19 in pregnancy: Placental and neonatal involvement**

**Author(s):** Prochaska E.; Jang M.; Burd I.

**Source:** American Journal of Reproductive Immunology; Nov 2020; vol. 84 (no. 5)

Available at [American journal of reproductive immunology \(New York, N.Y. : 1989\)](#) - from Unpaywall

**Abstract:** Since December 2019, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has caused over 12 million infections and more than 550 000 deaths.<sup>1</sup> Morbidity and mortality appear partly due to host inflammatory response.<sup>2</sup> Despite rapid, global research, the effect of SARS-CoV-2 on the developing fetus remains unclear. Case reports indicate that vertical transmission is uncommon; however, there is evidence that placental and fetal infection can occur.<sup>3-7</sup> Placentas from infected patients show inflammatory, thrombotic, and vascular changes that have been found in other inflammatory conditions.<sup>8,9</sup> This suggests that the inflammatory nature of SARS-CoV-2 infection during pregnancy could cause adverse obstetric and neonatal events. Exposure to intrauterine inflammation and placental changes could also potentially result in long-term, multisystemic defects in exposed infants. This review will summarize the known literature on the placenta in SARS-CoV-2 infection, evidence of vertical transmission, and possible outcomes of prenatal exposure to the virus. Copyright © 2020 John Wiley & Sons A/S. Published by John Wiley & Sons Ltd

**Database:** EMBASE

### **29. Multicentre Spanish study found no incidences of viral transmission in infants born to mothers with COVID-19**

**Author(s):** Marin Gabriel M.A.; Cuadrado I.; Alvarez Fernandez B.; Gonzalez Carrasco E.; Alonso Diaz C.; Llana Martin I.; Sanchez L.; Olivas C.; de las Heras S.; Criado E.; Carrizosa Molina T.; Royuela Vicente A.; Forti Buratti A.; Palanca Maresca I.; Dip M.E.; Martinez Bernat L.; Fernandez-Canadas Morillo A.; Domingo Comeche L.; Olza I.; de Alba Romero C.; Olabarrieta I.; Caserio Carbonero S.; Villar Villar G.; Dacosta A.I.; Rivero I.; Reyne M.; del Rio R.; Casas C.; Sole L.

**Source:** Acta Paediatrica, International Journal of Paediatrics; Nov 2020; vol. 109 (no. 11); p. 2302-2308

Available at [Acta paediatrica \(Oslo, Norway : 1992\)](#) - from Unpaywall

**Abstract:** Aim: Our aim was to describe the clinical features of mothers infected with COVID-19 and examine any potential vertical mother to newborn transmission. We also assessed how effective the discharge recommendations were in preventing transmission during the first month of life. Method(s): This multicentre descriptive study involved 16 Spanish hospitals. We reviewed the medical records of 42 pregnant women diagnosed with COVID-19 from March 13, 2020, to March 29, 2020, when they were in their third trimester of pregnancy. They and their newborn infants were monitored until the infant was 1 month old. Result(s): Over half (52.4%) of the women had a vaginal delivery. The initial clinical symptoms were coughing (66.6%) and fever (59.5%), and one mother died due to thrombo-embolic events. We admitted 37 newborn infants to the neonatal unit (88%), and 28 were then admitted to intermediate care for organisational virus-related reasons. No infants died, and no vertical transmission was detected during hospitalisation or follow-up. Only six were exclusively breastfed at discharge. Conclusion(s): There was no evidence of COVID-19 transmission in any of the infants born to COVID-19 mothers, and the post-discharge advice seemed effective. The measures to avoid transmission appeared to reduce exclusive breastfeeding at discharge. Copyright © 2020 Foundation Acta Paediatrica. Published by John Wiley & Sons Ltd

**Database:** EMBASE

### **30. COVID-19 during pregnancy: an overview of maternal characteristics, clinical symptoms, maternal and neonatal outcomes of 10,996 cases described in 15 countries.**

**Author(s):** Figueiro-Filho, Ernesto Antonio; Yudin, Mark; Farine, Dan



**Source:** Journal of perinatal medicine; Nov 2020; vol. 48 (no. 9); p. 900-911

**Publication Type(s):** Journal Article Review

Available at [Journal of perinatal medicine](#) - from Unpaywall

**Abstract:**The objective of this review was to identify the most significant studies reporting on COVID-19 during pregnancy and to provide an overview of SARS-CoV-2 infection in pregnant women and perinatal outcomes. Eligibility criteria included all reports, reviews; case series with more than 100 individuals and that reported at least three of the following: maternal characteristics, maternal COVID-19 clinical presentation, pregnancy outcomes, maternal outcomes and/or neonatal/perinatal outcomes. We included eight studies that met the inclusion criteria, representing 10,966 cases distributed in 15 countries around the world until July 20, 2020. The results of our review demonstrate that the maternal characteristics, clinical symptoms, maternal and neonatal outcomes almost 11,000 cases of COVID-19 and pregnancy described in 15 different countries are not worse or different from the general population. We suggest that pregnant women are not more affected by the respiratory complications of COVID-19, when compared to the outcomes described in the general population. We also suggest that the important gestational shift Th1-Th2 immune response, known as a potential contributor to the severity in cases of viral infections during pregnancy, are counter-regulated by the enhanced-pregnancy-induced ACE2-Ang-(1-7) axis. Moreover, the relatively small number of reported cases during pregnancy does not allow us to affirm that COVID-19 is more aggressive during pregnancy. Conversely, we also suggest, that down-regulation of ACE2 receptors induced by SARS-CoV-2 cell entry might have been detrimental in subjects with pre-existing ACE2 deficiency associated with pregnancy. This association might explain the worse perinatal outcomes described in the literature.

**Database:** Medline

### **31. NEONATAL OUTCOMES and VERTICAL TRANSMISSION in COVID-19 INFECTED PREGNANT WOMEN; A SYSTEMATIC REVIEW**

**Author(s):** Ahmed F.T.; Jabbar S.S.

**Source:** Journal of Global Trends in Pharmaceutical Sciences; Oct 2020; vol. 11 (no. 4); p. 8589-8595

**Publication Type(s):** Review

**Abstract:**Objective: to review the probable vertical transmission and neonatal outcomes in confirmed COVID-19 pregnant women. Method(s): Google Scholar, Science Direct, and PubMed were searched for qualified articles describing neonatal outcomes and the chances of perinatal transmission in COVID-19 pregnant women through the period from 1 January to 20 June 2020. A systematic review was done. Result(s): Nineteen articles were found eligible, investigated 125 neonates. Ten neonates (8%) confirmed to be infected, preterm delivery occurred in 33 neonates (26.4%), NICU admission (17, 14.8%), low birth weight <2500g (13, 11.3%), lung radiographic imaging suggestive for COVID-19 (14, 11.2%), and finally death (1, 0.8%). Conclusion(s): Although no evidence yet confirms COVID-19 vertical transmission, its potential occurrence should be taken into account as suggested by many studies. Good neonatal outcomes in general showing not to be significantly affected, despite the fact that COVID-19 perinatal infection can lead to neonatal deleterious outcomes. Copyright © Journal of Global Trends in Pharmaceutical Sciences

**Database:** EMBASE

### **32. Vertical Transmission of Novel Coronavirus (COVID-19) from Mother to Newborn: Experience from a Maternity Unit, the Indus Hospital, Karachi**

**Author(s):** Khan M.A.; Kumar V.; Ali S.R.



**Source:** Journal of the College of Physicians and Surgeons Pakistan; Oct 2020; vol. 30 (no. 2)

**Publication Type(s):** Letter

Available at [Journal of the College of Physicians and Surgeons Pakistan](#) - from Unpaywall

**Database:** EMBASE

### **33. COVID-19 and pregnancy: A review of clinical characteristics, obstetric outcomes and vertical transmission**

**Author(s):** Pettiroso E.; Rees M.; Giles M.; Cole S.

**Source:** Australian and New Zealand Journal of Obstetrics and Gynaecology; Oct 2020; vol. 60 (no. 5); p. 640-659

**Publication Type(s):** Review

Available at [The Australian & New Zealand journal of obstetrics & gynaecology](#) - from Unpaywall

**Abstract:**Background: Since its emergence in December 2019, COVID-19 has spread to over 210 countries, with an estimated mortality rate of 3-4%. Little is understood about its effects during pregnancy. Aim(s): To describe the current understanding of COVID-19 illness in pregnant women, to describe obstetric outcomes and to identify gaps in the existing knowledge. Method(s): Medline Ovid, EMBASE, World Health Organization COVID-19 research database and Cochrane COVID-19 in pregnancy spreadsheet were accessed on 18/4, 18/5 and 23/5 2020. Articles were screened via Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. The following were excluded: reviews, opinion pieces, guidelines, articles pertaining solely to other viruses, single case reports. Result(s): Sixty articles were included in this review. Some pregnant participants may have been included in multiple publications, as admission dates overlap for reports from the same hospital. However, a total of 1287 confirmed SARS-CoV-2 positive pregnant cases are reported. Where universal testing was undertaken, asymptomatic infection occurred in 43.5-92% of cases. In the cohort studies, severe and critical COVID-19 illness rates approximated those of the non-pregnant population. Eight maternal deaths, six neonatal deaths, seven stillbirths and five miscarriages were reported. Nineteen neonates were SARS-CoV-2 positive, confirmed by reverse transcription polymerase chain reaction of nasopharyngeal swabs. [Correction added on 2 September 2020, after first online publication: the number of neonates indicated in the preceding sentence has been corrected from 'Thirteen' to 'Nineteen'.]. Conclusion(s): Where universal screening was conducted, SARS-CoV-2 infection in pregnancy was often asymptomatic. Severe and critical disease rates approximate those in the general population. Vertical transmission is possible; however, it is unclear whether SARS-CoV-2 positive neonates were infected in utero, intrapartum or postpartum. Future work should assess risks of congenital syndromes and adverse perinatal outcomes where infection occurs in early and mid-pregnancy. Copyright © 2020 The Royal Australian and New Zealand College of Obstetricians and Gynaecologists

**Database:** EMBASE

### **34. Safe Perinatal Management of Neonates Born to SARS-CoV-2 Positive Mothers at the Epicenter of the Italian Epidemic**

**Author(s):** Biasucci G.; Cannalire G.; Raymond A.; Capra M.E.; Benenati B.; Vadacca G.; Schiavo R.; Pavesi C.; Bonini R.

**Source:** Frontiers in Pediatrics; Oct 2020; vol. 8

Available at [Frontiers in Pediatrics](#) - from Europe PubMed Central - Open Access

Available at [Frontiers in Pediatrics](#) - from Unpaywall

**Abstract:**Introduction: 2019-novel Coronavirus Disease (COVID-19) pandemic has recently struck Northern Italy. Limited data are available about COVID-19 during pregnancy and infancy, mostly from China. Herein, our experience on a safe perinatal management of neonates born to COVID-19 mothers is reported. Method(s): Since late February through May 15, 2020, 375 pregnant women delivered at our City Hospital in Piacenza, at the epicenter of the Italian epidemic. Of these, 144 were tested via a SARS-CoV-2 quantitative rRT-PCR nasopharyngeal swab prior to delivery, firstly on the basis of epidemiological and clinical criteria, then adopting a universal screening approach. All newborns from SARS-CoV-2 positive mothers were tested via nasopharyngeal swab at birth, on day 3 and/or day 7. In case of positive result, they were re-tested on day 14. Result(s): Fifteen women tested positive for SARS-CoV-2 infection. All newborns except one were born at term. All of them were non-infected at birth, irrespective of mode of delivery; 13 out of 15 remained negative; the two positive neonates became negative by day 14 of life. All of them have always remained asymptomatic. All newborns except two were allowed to have immediate bonding, permanent rooming-in, and direct breastfeeding. Conclusion(s): Our study supports the claim that COVID-19 in pregnancy is not associated with worse clinical outcomes compared to non-COVID-19 pregnant women and/or with higher rates of preterm birth and intrauterine growth restriction. Intrauterine vertical transmission of SARS-CoV-2 seems to be unlikely. Breastfeeding appears to be safe and protective for the neonate, once appropriate preventive measures are adopted. © Copyright © 2020 Biasucci, Cannalire, Raymond, Capra, Benenati, Vadacca, Schiavo, Pavesi and Bonini.

**Database:** EMBASE

### **35. Does lack of vertical transmission of COVID-19 guarantee the health of the fetus or neonate in infected mothers?**

**Author(s):** Sadeghi M.R.

**Source:** Medical Journal of Reproduction and Infertility; Oct 2020; vol. 21 (no. 4); p. 229-230

**Publication Type(s):** Editorial

Available at [Journal of reproduction & infertility](#) - from Europe PubMed Central - Open Access

Available at [Journal of reproduction & infertility](#) - from ProQuest (Health Research Premium) - NHS Version

Available at [Journal of reproduction & infertility](#) - from Unpaywall

**Database:** EMBASE

### **36. Novel Coronavirus SARS-CoV-2 (COVID-19) and Pregnancy: A hypothetical view**

**Author(s):** Division of Anatomy and Embryology, Zoology Department, Faculty of Science, Beni-Suef University

**Source:** Endocrine, metabolic & immune disorders drug targets; Oct 2020

**Abstract:**BACKGROUND: The complications of the SARS-CoV-2 infection and its COVID-19 disease on mothers and their offspring are less known. OBJECTIVE(S): The aim of this review was to determine the transmission, severity, complications of SARS-CoV-2 infection during the pregnancy. This review showed the influence of COVID-19 disease on the neonatal neurogenesis. Owing to no specific vaccines or medicines that were reported for the treatment of COVID-19 disease, this review suggested some control strategies like treatments (medicinal plants, antiviral therapy, cellular therapy, and immunotherapy), nutrition uptake, prevention, and recommendations. DISCUSSION: This overview showed in severely states that SARS-CoV-2 infection during the early stage of pregnancy might increase the risk of stress, panic, and anxiety. This disorder can disturb the maternal immune system, and thus causing a neurodevelopmental disturbance. This hypothesis may

be depending on the severity and intensity of the SARS-CoV-2 infection during pregnancy. However, vertical transmission of SARS-CoV-2 from dams to their fetuses is absent until now. CONCLUSION(S): During this global pandemic disease, maintaining safety during pregnancy, vaginal delivery, and breastfeeding may play a vital role in a healthy life for the offspring. Thus, international and national corporations should be continuing for perinatal management, particularly during the next pandemic or disaster time. Copyright© Bentham Science Publishers; For any queries, please email at [epub@benthamscience.net](mailto:epub@benthamscience.net).

**Database:** EMBASE

### **37. COVID-19 (SARS-CoV-2) Infection in Pregnancy: A Systematic Review**

**Author(s):** Akhtar H.; Patel C.; Abuelgasim E.; Harky A.

**Source:** Gynecologic and Obstetric Investigation; Oct 2020; vol. 85 (no. 4); p. 295-306

**Publication Type(s):** Review

Available at [Gynecologic and Obstetric Investigation](#) - from Unpaywall

**Abstract:**Introduction: To review published studies related to the association of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections with pregnancy, foetal, and neonatal outcomes during coronavirus disease 2019 (COVID-19) pandemic in a systematic manner. Method(s): A comprehensive electronic search was done through PubMed, Scopus, Medline, Cochrane database, and Google Scholar from December 01, 2019, to May 22, 2020, along with the reference list of all included studies. All cohort studies that reported on outcomes of COVID-19 during pregnancy were included. Qualitative assessment of included studies was performed using the Newcastle-Ottawa scale. Result(s): Upon admission, most pregnant women underwent a low-dose radiation CT scan; the reports of which included unilateral/bilateral pneumonia in most patients. A marked lymphopenia was also noted in many patients with COVID-19. 513 titles were screened, and 22 studies were included, which identified 156 pregnant women with COVID-19 and 108 neonatal outcomes. The most common maternal/foetal complications included intrauterine/foetal distress (14%) and premature rupture of membranes (8%). The neonatal clinical manifestations of COVID-19 commonly included shortness of breath (6%), gastrointestinal symptoms (4%), and fever (3%). Conclusion(s): COVID-19 infection in pregnancy leads to increased risk in pregnancy complications such as preterm birth, PPRM, and may possibly lead to maternal death in rare cases. There is no evidence to support vertical transmission of SARS-CoV-2 infection to the unborn child. Due to a paucity of inconsistent data regarding the impact of COVID-19 on the newborn, caution should be undertaken to further investigate and monitor possible infection in the neonates born to COVID-19-infected mothers. Copyright © 2020 The Author(s). Published by S. Karger AG, Basel.

**Database:** EMBASE

### **38. Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study.**

**Author(s):** Salvatore, Christine M; Han, Jin-Young; Acker, Karen P; Tiwari, Priyanka; Jin, Jenny; Brandler, Michael; Cangemi, Carla; Gordon, Laurie; Parow, Aimee; DiPace, Jennifer; DeLaMora, Patricia

**Source:** The Lancet. Child & adolescent health; Oct 2020; vol. 4 (no. 10); p. 721-727

Available at [The Lancet Child and Adolescent Health](#) - from Unpaywall

**Abstract:**BACKGROUNDThe risk of vertical and perinatal transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2, which causes COVID-19), the most appropriate management,

and the neonate's risk of developing COVID-19 during the perinatal period are unknown. Therefore, we aimed to elucidate best practices regarding infection control in mother-newborn dyads, and identify potential risk factors associated with transmission. **METHODS** In this observational cohort study, we identified all neonates born between March 22 and May 17, 2020, at three New York Presbyterian Hospitals in New York City (NY, USA) to mothers positive for SARS-CoV-2 at delivery. Mothers could practice skin-to-skin care and breastfeed in the delivery room, but had to wear a surgical mask when near their neonate and practice proper hand hygiene before skin-to-skin contact, breastfeeding, and routine care. Unless medically required, neonates were kept in a closed Giraffe isolette in the same room as their mothers, and were held by mothers for feeding after appropriate hand hygiene, breast cleansing, and placement of a surgical mask. Neonates were tested for SARS-CoV-2 by use of real-time PCR on nasopharyngeal swabs taken at 24 h, 5-7 days, and 14 days of life, and were clinically evaluated by telemedicine at 1 month of age. We recorded demographics, neonatal, and maternal clinical presentation, as well as infection control practices in the hospital and at home. **FINDINGS** Of 1481 deliveries, 116 (8%) mothers tested positive for SARS-CoV-2; 120 neonates were identified. All neonates were tested at 24 h of life and none were positive for SARS-CoV-2. 82 (68%) neonates completed follow-up at day 5-7 of life. Of the 82 neonates, 68 (83%) roomed in with the mothers. All mothers were allowed to breastfeed; at 5-7 days of life, 64 (78%) were still breastfeeding. 79 (96%) of 82 neonates had a repeat PCR at 5-7 days of life, which was negative in all; 72 (88%) neonates were also tested at 14 days of life and none were positive. None of the neonates had symptoms of COVID-19. **INTERPRETATION** Our data suggest that perinatal transmission of COVID-19 is unlikely to occur if correct hygiene precautions are undertaken, and that allowing neonates to room in with their mothers and direct breastfeeding are safe procedures when paired with effective parental education of infant protective strategies. **FUNDING** None.

**Database:** Medline

### **39. Potential effects of SARS-CoV-2 infection during pregnancy on fetuses and newborns are worthy of attention.**

**Author(s):** Dang, Dan; Wang, Liying; Zhang, Chuan; Li, Zhenyu; Wu, Hui

**Source:** The journal of obstetrics and gynaecology research; Oct 2020; vol. 46 (no. 10); p. 1951-1957

**Publication Type(s):** Journal Article Review

Available at [The journal of obstetrics and gynaecology research](#) - from Unpaywall

**Abstract:** The outbreak of the 2019 novel coronavirus disease (SARS-CoV-2) has resulted in a major epidemic threat worldwide. However, the effects of neoviruses on infected pregnant women and especially on their fetuses and newborns are not well understood. Most up-to-date evidences about how SARS-CoV-2 affected patients especially in pregnancy were collected by conducting a comprehensive search of medical literature electronic databases. Immune-related data of pregnant women, fetuses and newborns were further analysis. According to the limited literature, SARS-CoV-2 utilizes angiotensin converting enzyme 2 as its receptor and causes severe hypoxemia. Insufficiency of angiotensin converting enzyme 2 in pregnant women and the effects of hypoxia on the placental oxygen supply will cause severe perinatal complications. In addition, SARS-CoV-2 infection may disrupt maternal-fetal immune tolerance and cause immunological damage to embryos. Because of these reasons, pregnancy complications such as fetal demise or premature birth, preeclampsia, intrauterine growth restriction, respiratory dyspnea, nervous system dysplasia and immune system defects are likely to occur in pregnant women with COVID-19 or their newborns. Pregnant women infected with SARS-CoV-2 should be treated as a special group and given special attention. Fetuses and newborns of SARS-CoV-2-infected pregnant women should be given more protection to reduce the occurrence of adverse events. In this review, we intend to provide an overview of the physiological and immunological changes that induce the pregnancy complications. This article will

benefit the treatment and prognosis of fetuses and newborns of SARS-CoV-2-infected pregnant women.

**Database:** Medline

#### **40. Vertical transmission of antibodies in infants born from mothers with positive serology to COVID-19 pneumonia.**

**Author(s):** Vendola, Nicoletta; Stampini, Viviana; Amadori, Roberta; Gerbino, Martina; Curatolo, Annalisa; Surico, Daniela

**Source:** European journal of obstetrics, gynecology, and reproductive biology; Oct 2020; vol. 253 ; p. 331-332

**Publication Type(s):** Letter Case Reports

Available at [European journal of obstetrics, gynecology, and reproductive biology](#) - from Unpaywall

**Database:** Medline

#### **41. Maternal transmission of SARS-COV-2 to the neonate, and possible routes for such transmission: a systematic review and critical analysis.**

**Author(s):** Walker, K F; O'Donoghue, K; Grace, N; Dorling, J; Comeau, J L; Li, W; Thornton, J G

**Source:** BJOG : an international journal of obstetrics and gynaecology; Oct 2020; vol. 127 (no. 11); p. 1324-1336

**Publication Type(s):** Journal Article Systematic Review

Available at [BJOG: An International Journal of Obstetrics and Gynaecology](#) - from Unpaywall

**Abstract:**BACKGROUND Early reports of COVID-19 in pregnancy described management by caesarean, strict isolation of the neonate and formula feeding. Is this practice justified? OBJECTIVE To estimate the risk of the neonate becoming infected with SARS-CoV-2 by mode of delivery, type of infant feeding and mother-infant interaction. SEARCH STRATEGY Two biomedical databases were searched between September 2019 and June 2020. SELECTION CRITERIA Case reports or case series of pregnant women with confirmed COVID-19, where neonatal outcomes were reported. DATA COLLECTION AND ANALYSIS Data were extracted on mode of delivery, infant infection status, infant feeding and mother-infant interaction. For reported infant infection, a critical analysis was performed to evaluate the likelihood of vertical transmission. MAIN RESULTS Forty nine studies included information on mode of delivery and infant infection status for 655 women and 666 neonates. In all, 28/666 (4%) tested positive postnatally. Of babies born vaginally, 8/292 (2.7%) tested positive compared with 20/374 (5.3%) born by Caesarean. Information on feeding and baby separation were often missing, but of reported breastfed babies 7/148 (4.7%) tested positive compared with 3/56 (5.3%) for reported formula fed ones. Of babies reported as nursed with their mother 4/107 (3.7%) tested positive, compared with 6/46 (13%) for those who were reported as isolated. CONCLUSIONS Neonatal COVID-19 infection is uncommon, rarely symptomatic, and the rate of infection is no greater when the baby is born vaginally, breastfed or remains with the mother. TABLE ABSTRACT Risk of neonatal infection with COVID-19 by delivery route, infant feeding and mother-baby interaction.

**Database:** Medline

#### **42. Outcomes in COVID-19 Positive Neonates and Possibility of Viral Vertical Transmission: A Narrative Review.**

**Author(s):** Sheth, Sudip; Shah, Nidhi; Bhandari, Vineet

**Source:** American journal of perinatology; Oct 2020; vol. 37 (no. 12); p. 1208-1216

**Publication Type(s):** Journal Article Review

Available at [American journal of perinatology](#) - from Unpaywall

**Abstract:**OBJECTIVE Novel coronavirus disease 2019 (COVID-19) seems to affect adults and pediatric patients differently. While neonates are a special population, little is known about the neonatal outcomes. This study aimed to investigate the outcomes in COVID-19 positive neonates and incidence of vertical transmission of the virus by reviewing available literature. STUDY DESIGN This study is a narrative review of available literature on "COVID-19 in neonates," for which PubMed and Google Scholar were used to search the published articles. RESULTS We summarized the data from 39 published studies that are comprised of 326 COVID-19 positive peripartum mothers with respective neonatal outcomes. Twenty-three neonates have been reported to be COVID-19 positive. Male neonates were affected significantly more (79%) than female neonates. Approximately 3% neonates acquired infection through suspected vertical transmission. Strict infection prevention measures during the perinatal time can significantly reduce the chance of horizontal transmission of the virus. Overall, neonates were asymptomatic or mildly symptomatic regardless of gestational age at birth and required only supportive measures. There was 0% mortality in COVID-19 positive neonates. CONCLUSION From available published data to date, we can conclude that the prognosis of COVID-19 positive neonates is good with no mortality. There appears to be minimal vertical transmission of the infection. KEY POINTS · Majority of COVID-19 positive neonates showed mild clinical signs and symptoms with no mortality.. · Most COVID-19 positive neonates require only supportive measures.. · Possibility of viral vertical transmission is very low..

**Database:** Medline

### **43. Case Series of COVID-19 Asymptomatic Newborns With Possible Intrapartum Transmission of SARS-CoV-2**

**Author(s):** Hascoet J.-M.; Jellimann J.-M.; Wittwer A.; Hartard C.; Jeulin H.; Franck P.; Morel O.

**Source:** Frontiers in Pediatrics; Sep 2020; vol. 8

Available at [Frontiers in Pediatrics](#) - from Europe PubMed Central - Open Access

Available at [Frontiers in Pediatrics](#) - from Unpaywall

**Abstract:**Background: Despite the pandemic, data are limited regarding COVID-19 infection in pregnant women and newborns. This report aimed to bring new information about presentation that could modify precautionary measures for infants born of mothers with a remote history of COVID-19. Method(s): We report two infants with possible maternofetal transmission, and four mothers without immunologic reactions. Data were collected from the patient files. Result(s): One mother exhibited infection signs 10 days before uncomplicated delivery, with negative RT-PCR and no antibody detection thereafter. Another mother exhibited infection 6 weeks pre-delivery, confirmed by nasopharyngeal swab testing with positive RT-PCR, and positive antibody detection (IgM and IgG). Both newborns were asymptomatic but tested positive for nasopharyngeal and stool RT-PCR at 1 and 3 days of age for the first one and at 1 day of age for stool analysis for the second one. Two additional mothers exhibited infection confirmed by positive RT-PCR testing at 28- and 31-days pre-delivery but did not present detectable antibody reaction at the time of delivery. Conclusion(s): These observations raise concerns regarding contamination risk by asymptomatic newborns and the efficacy of immunologic reactions in pregnant mothers, questioning the reliability of antibody testing during pregnancy. © Copyright © 2020 Hascoet, Jellimann, Hartard, Wittwer, Jeulin, Franck and Morel.

**Database:** EMBASE



#### **44. Current evidence of SARS-CoV-2 vertical transmission: An integrative review**

**Author(s):** de Oliveira L.V.; Lopes L.P.; Agra I.K.R.; da Silva C.R.A.C.

**Source:** Revista da Associacao Medica Brasileira; Sep 2020; vol. 66 ; p. 130-135

**Publication Type(s):** Review

Available at [Revista da Associacao Medica Brasileira \(1992\)](#) - from Unpaywall

**Abstract:**OBJECTIVE: To review the current scientific evidence of vertical transmission related to coronavirus disease 2019 (COVID-19). METHOD(S): An integrative review was performed by two independent researchers, based on the literature available in the MEDLINE (via PubMed) and LILACS databases, using the descriptors "pregnancy" AND "COVID-19" AND "vertical transmission". This search included case reports or case series published up until 17th June 2020 in English or Portuguese. After reading the articles available in their entirety, those related specifically to the potential risks of vertical transmission of COVID-19 during pregnancy were selected. We initially found a total of 57 articles; 26 were carefully screened and 15 were finally selected. RESULT(S): Pregnancy can make women more susceptible to infections, especially by viral pathogens, given the various physiological and immunological changes that occur to maintain maternal-fetal balance. It is speculated that the fetus may be a possible target for COVID-19. Few studies (3 out of 15) in our analysis have found positive results for SARS-CoV-2 in fetal membranes, placenta, and in newborns right after birth. Additionally, no difference was noticed when comparing different modes of delivery, and seems reasonable to assume that pregnant women with stable clinical conditions can be encouraged for vaginal delivery. CONCLUSION(S): Further studies with a great number of cases are warranted to elucidate whether the virus may be vertically transmitted to the fetus and if any maternal conditions can influence that. Our findings seem to demonstrate that vertical transmission is possible but quite unusual. Copyright © 2020 Associacao Medica Brasileira. All rights reserved.

**Database:** EMBASE

#### **45. Fetal Diagnosis and Therapy during the COVID-19 Pandemic: Guidance on Behalf of the International Fetal Medicine and Surgery Society**

**Author(s):** Deprest J.; Choolani M.; Chervenak F.; McCullough L.; Farmer D.; Lagrou K.; Lopriore E.; Olutoye O.; Simpson L.; Van Mieghem T.; Ryan G.

**Source:** Fetal Diagnosis and Therapy; Sep 2020; vol. 47 (no. 9); p. 689-698

Available at [Fetal diagnosis and therapy](#) - from Unpaywall

**Abstract:**The COVID-19 pandemic has stressed patients and healthcare givers alike and challenged our practice of antenatal care, including fetal diagnosis and therapy. This document aims to review relevant recent information to allow us to optimize prenatal care delivery. We discuss potential modifications to obstetric management and fetal procedures in SARS-CoV2-negative and SARS-CoV2-positive patients with fetal anomalies or disorders. Most fetal therapies are time sensitive and cannot be delayed. If personnel and resources are available, we should continue to offer procedures of proven benefit, acknowledging any fetal and maternal risks, including those to health care workers. There is, to date, minimal, unconfirmed evidence of spontaneous vertical transmission, though it may theoretically be increased with some procedures. Knowing a mother's preoperative SARS-CoV-2 status would enable us to avoid or defer certain procedures while she is contagious and to protect health care workers appropriately. Some fetal conditions may alternatively be managed neonatally. Counseling regarding fetal interventions which have a possibility of additional intra- or postoperative morbidity must be performed in the context of local resource availability. Procedures of unproven benefit should not be offered. We encourage participation in registries and trials that

may help us to understand the impact of COVID-19 on pregnant women, their fetuses, and neonates. © 2020 S. Karger AG, Basel. Copyright: All rights reserved.

**Database:** EMBASE

#### **46. Placental barrier against COVID-19.**

**Author(s):** Komine-Aizawa, Shihoko; Takada, Kazuhide; Hayakawa, Satoshi

**Source:** Placenta; Sep 2020; vol. 99 ; p. 45-49

**Publication Type(s):** Journal Article Review

Available at [Placenta](#) - from Unpaywall

**Abstract:**Vertical transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and possible induction of pregnancy complications, including miscarriage, fetal malformations, fetal growth restriction and/or stillbirth, are serious concerns for pregnant individuals with COVID-19. According to clinical information, the incidence of vertical transmission of SARS-CoV-2 is limited to date. However, even if a neonate tests negative for SARS-CoV-2, frequent abnormal findings, including fetal and maternal vascular malperfusion, have been reported in cases of COVID-19-positive mothers. Primary receptor of SARS-CoV-2 is estimated as angiotensin-converting enzyme 2 (ACE2). It is highly expressed in maternal-fetal interface cells, such as syncytiotrophoblasts, cytotrophoblasts, endothelial cells, and the vascular smooth muscle cells of primary and secondary villi. However other route of transplacental infection cannot be ruled out. Pathological examinations have demonstrated that syncytiotrophoblasts are often infected with SARS-CoV-2, but fetuses are not always infected. These findings suggest the presence of a placental barrier, even if it is not completely effective. As the frequency and molecular mechanisms of intrauterine vertical transmission of SARS-CoV-2 have not been determined to date, intensive clinical examinations by repeated ultrasound and fetal heart rate monitoring are strongly recommended for pregnant women infected with COVID-19. In addition, careful investigation of placental samples after delivery by both morphological and molecular methods is also strongly recommended.

**Database:** Medline

#### **47. COVID-19 in pregnant women: A systematic review and meta-analysis.**

**Author(s):** Capobianco, Giampiero; Saderi, Laura; Aliberti, Stefano; Mondoni, Michele; Piana, Andrea; Dessole, Francesco; Dessole, Margherita; Cherchi, Pier Luigi; Dessole, Salvatore; Sotgiu, Giovanni

**Source:** European journal of obstetrics, gynecology, and reproductive biology; Sep 2020; vol. 252 ; p. 543-558

**Publication Type(s):** Meta-analysis Journal Article Systematic Review

Available at [European journal of obstetrics, gynecology, and reproductive biology](#) - from Unpaywall

**Abstract:**OBJECTIVECoronavirus disease 2019 (COVID-19) is a novel infectious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Several reports highlighted the risk of infection and disease in pregnant women and neonates. To assess the risk of clinical complications in pregnant women and neonates infected with SARS-CoV-2 carrying out a systematic review and meta-analysis of observational studies.DATA SOURCESearch of the scientific evidence was performed using the engines PubMed and Scopus, including articles published from December 2019 to 15 April 2020.STUDY ELIGIBILITY CRITERIAOnly observational studies focused on the assessment of clinical outcomes associated with pregnancy in COVID-19 women were selected.STUDY APPRAISAL AND SYNTHESIS METHODSThe first screening was based on the assessment of titles and abstracts, followed by the evaluation of full-texts. Qualitative variables were

summarized with frequencies, whereas quantitative variables with central and variability indicators depending on their parametric distribution. Forest plots were used to describe point estimates and in-between studies variability. Study quality assessment was performed. RESULTSThirteen studies were selected. All of them were carried out in China. The mean (SD) age and gestational age of pregnant women were 30.3 (1.5) years and 35.9 (2.9) weeks, respectively. The mean (SD) duration from the first symptoms to the hospital admission and to labour were 5.5 (2.0) and 9.5 (8.7) days, respectively. Patients mainly complained of fever and cough (pooled (95 % CI) proportions were 76.0 % (57.0 %-90.0 %) and 38.0 (28.0 %-47.0 %), respectively). Several antibiotics, antivirals, and corticosteroids were prescribed in different combinations. The pooled prevalence of maternal complications and of caesarean section were 45.0 % (95 % CI: 24.0 %-67.0 %) and 88.0 % (95 %CI: 82.0 %-94.0 %). A proportion of pregnant women less than 20 % were admitted to ICU. The pooled proportion of preterm infants was 23.0 % (95 %CI: 11.0 %-39.0 %). The most frequent neonatal complications were pneumonia and respiratory distress syndrome. The pooled percentage of infected neonates was 6.0 % (95 %CI: 2.0 %-12.0 %).CONCLUSIONSThe present study suggests a high rate of maternal and neonatal complications in infected individuals. However, the current scientific evidence highlights a low risk of neonatal infection. Multicentre, cohort studies are needed to better elucidate the role of SARS-CoV-2 during pregnancy.

**Database:** Medline