



EFFECTS OF COVID-19 INFECTION DURING PREGNANCY AND NEONATAL PROGNOSIS. WHAT IS THE EVIDENCE?

¹Dr Shahida Arshad, ²Dr Saud Raza, ³Dr Izzah Javed

¹Associate Professor, Islam Medical and Dental College, Gujranwala.

^{2,3}House Officer, Lahore General Hospital, Lahore.

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Corresponding author: Dr Shahida Arshad

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Abstract:

Background: Regarding the potential risk of Covid- 19 among pregnant ladies and frequent fetal transmission is the main aim of this study.

Material and Method: To answer the health-related field questions, systematic literature review papers are published, that during pregnancy and neonatal transmission what are the effects of covid- 19. Pregnant women with counts 755 and neonates having counts 598 are observed. Having C- section women are almost above half of the total, for SARS 398 (82%) infants are tested and infants that results positive are 9 (2%). Vertical transmission has no evidence because of the care provided during and after pregnancy, there is a shortage of biological testing, and knowledge gaps are more.

Conclusion: the clinical conditions of pregnant women infected with SARS- CoV-2 cannot be ruled out, whether the occurrence of respiratory disease, cardiac rhythm disturbances, acid-base imbalances, the infection is associated with comorbidities or not. So before and after the delivery of the baby, testing should be recommended.

1. Introduction

The outbreak of Covid- 19, a respiratory disease, caused by coronavirus SARS Covid -19, WHO declared it as 6th public international emergency. It had spread to more than 5 sub-continent due to its highly transmissible nature and people died due to covid are about 85,522. ^{1,2}

An infected person with an infected respiratory droplet is the major cause of spreading infection. And the sources used to mitigate the transmission of COVID- 19 are the quarantine, timely diagnosis, and universal precautions. ³

Asymptomatic cases have clinical manifestation range are upper respiratory tract infection, pneumonia up to severe, even fatal stage, and acute respiratory distress and failure. ⁴ Virus get into the lungs of person deep down and causes severe pneumonia, just because of people already suffer from comorbidities that make a person to fight with less strength with the virus. ⁵

Comorbidities are such as immune-compromised patients and non-communicable disease persons are more prone to develop early signs and symptoms of covid- 19 that gets severe after a couple of days. ⁶

How the pregnant women and the possibility of vertical transmission and premature birth are more susceptible to be attacked by this virus and this mechanism and evidences are still unknown. ⁷

The main factor that makes the women more susceptible to infectious diseases are the changes in the immune system. ⁸ ⁹ And risk of adverse maternal and neonatal complications, premature birth, spontaneous abortion, endotracheal intubation, and restriction of intrauterine growth, hospitalization in an intensive care unit, renal failure,

intravascular coagulopathy and transmission to the fetus or newborn are the clinical manifestation of covid infection. ^{10, 11}

The studies related to the susceptibility of pregnant women for covid infection is unproven. And how the infection transfer to the fetus during pregnancy and after delivery is still unknown. But the specific antibody IgG presence for infection has been found in the neonatal samples. ^{12, 13}

To prove the evidence of clinical practices related to pregnant women and transmission of infection to newborn baby regarding severity and possible adverse effects of COVID- 19 infection. ^{14, 15}

2. Material and Methods

With no protocol registration, the systematic literature review is used to prove the evidence of COVID- 19 infection and effects related to COVID- 19 infection during pregnancy and neonatal transmission. And this is adapted by the PECO method that is,

Population (P) = Pregnant women

Exposure (E) = COVID- 19 infection

Comparison (C) = has not been an object of study

Outcome (O) = maternal or fetal infection by SARS- CoV- 2

From the following databases, a search was conducted by US National Library of Medicine (PubMed), Scopus, Embase, Science Direct (Elsevier), Web of Science (WoS), Scholar Google, and bibliographic references of hand searching. These sites are chosen due to their representativeness and perfect range in the relevant field of Covid- 19. COVID- 19 or SARS CoV- 2 and Perinatal.

Addressing the clinical conditions of mother- fetus pair is reported by observational epidemiological studies and case studies. The period of publication or language has no restriction. The things excluded are the review papers, opinion reports, abstracts of events, and similar works.

3. Results

The persons included in the trial were 148, but we excluded 20 so the volunteers left are 128. Because of not following the objective of this trial, 56 were again excluded. An analysis was done on 72 people but the people that do not meet the criteria were 23 and the people who remained are only 49 that completed the trial process of COVID- 19 infections.

3.1 Findings from cross-sectional Analytical studies

Six were performed in China (86%) but one was collected in the United States of America involving pull methodological research (14%). A maximum of 133 pregnant women, verified by laboratory and clinical testing (78%), were diagnosed with COVID-19 (22 percent). Most pregnant women (80 percent) were in their third trimester and had mild to severe pneumonia (99 percent). Clinical studies indicated that only 41 (35%) women had any incidence (Table 2). Fever at diagnosis, postpartum fever, and cough were the most prominent physical signs.

In 96 (95 percent) women, chest CT scans were suggestive, and lab studies showed elevated responsive C protein (78 percent), lymphocytopenia (77 percent), and neutrophilia (77 percent). 59 (65 percent) of the 106 women had a C-section, 19 of them due to COVID-19. 108 babies were delivered in total, including two pairs of twins. Eighty-seven (94%) were SARS-CoV-2 evaluated and all were negative. Of the newborns, twenty-three pregnant women were separated. No neonatal deaths occurred; 16 diploid cells were analyzed and no pathologic characteristics were found. There was no reported vertical transmission.

3.2 Findings from Longitudinal studies

The research paper (2%) was carried out by using the health history of pregnant women admitted to a Chinese hospital. The research analyzes the diagnostic value, maternal and neonatal results of 16 pregnant women with, but assumed of it being poisoned by, COVID-19 and 18 without the sickness. In the analysis, conditions for including members in the case or treatment conditions are not explicitly reported. The definition in Table 2 applies to contaminated pregnant women with COVID-19. The 16 women were in their third trimester of pregnancy, (31%) of which had no comorbidity associated with pregnancy. Fever was the most common symptom at admission (25 percent) and after birth (50 percent). Ten women had possible CT scans, and all the women surveyed had an improvement in reactive C protein and neutrophilia. Fourteen (87 percent) women had a C-section, but why a C-section was suggested is not mentioned in the analysis. A total of 17 infants, with one pair of twins and no complications, were born.

Often implemented in China, the randomized trial (2%) retrospectively identified 31 pregnant women and 35 non-pregnant women with COVID-19. They identify only the health results of pregnant women. There were 31 pregnant women measured in total. In the third trimester of pregnancy, the majority (71%) had RT-PCR evidence of a diagnosis, 21 (68%) experienced mild to moderate pneumonia, and 10 had extreme pneumonia. Disorders during breastfeeding were not identified at twenty-eight. The most common signs and symptoms were temperature (55%) and coughing (48 percent). In both cases, the chest CT scan was indicative, and irregular lab examination was associated with an elevated number of neutrophils (32%), aspartate transaminase (26%), and interleukin 6. There were 17 births, 13 of which (76 percent) were C-sections, but the researchers do not state that they suggested C-sections. A total of 17 single, stable fetuses were born and tested to be SARS-CoV-2 negative. There is no study on the separation steps taken around mothers and babies after birth, and no examination of placentas has been performed.

Table 1: Characteristics of included studies: reference, study design, location, level of evidence, and limitations.

Code	Reference	Study Design	Location	Level of Evidence	Limitations
1	Fan et al. (2020) [13]	Case report	China	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
2	Chen et al. (2020) [14]	Case report	China	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
3	Li et al. (2020) [15]	Case report	China	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
4	Lee et al. (2020) [16]	Case report	Asia	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
5	Xiaotong et al. (2020) [17]	Case report	China	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
6	Zambrano et al. (2020) [18]	Case report	Honduras	Very Low	Small sample size; single setting; only third-trimester pregnant women; without long-term follow-up
7	Iqbal et al. (2020) [19]	Case report	United States of America	Very Low	Small sample size; single setting; without long-

4. Discussion

The objective of this research was to address a query about the consequences of COVID-19 infection and neonatal prognosis during pregnancy. Forty-nine experiments were eligible which covered case notes, cross-sectional, cross-sectional analytical, case-control, and population with low proof grades. The low degree of data is due to the nature of the COVID-19 disease outbreak and the desire to gain information quickly to promote government policies. As the majority of instances increases worldwide, facts of the impact of this disease during pregnancy are forecast to expand for both women and newborns, due to the development of more comprehensive systematic reviews and experimental group join.

Characterization of Pregnant Women

A group of 755 pregnant women was analyzed, 635 from China, 60 from the US, 42 from Italy, 10 from Iran, and one pregnant woman from Asia, Honduras, Turkey, Spain, Peru, Switzerland, and Canada.^{16, 17} Both people surveyed were pregnant in the reproductive age, while pregnant women were pregnant in the first trimester (46/6%), in the second trimester (77/10%), and in the third trimester of pregnancy (632/84%), which is why only 598 children were born during that time.¹⁸

Considering cultural and statistical disparities relative to women who are pregnant from other countries and cultures, the fact that most pregnant women were from China puts constraints on the analysis of the data.¹⁹ Even so, non-Chinese pregnant women were examined also in the minority (120/16 percent) and the characteristics (clinical and epidemiological) revealed no variations.²⁰

The studies analyzed revealed a large variance and an absence of proof of SARS-CoV-2 infection during the first and second trimesters of pregnancy concerning the age, reproductive duration, and duration of pregnancy of pregnant women.^{21, 22} It can be concluded that many of them may be symptomless and/or with moderate symptoms, with no need for medical attention, as per the lower incidence of major infection in pregnant women (57/8 percent), substantiating data from different viral epidemics.²³

In terms of the minimal evidence on Middle East Respiratory Syndrome (MERS), seven items that did not disclose premature birth were retrieved through a comprehensive meta-analysis study.²⁴ The early birth rate was 32.1% (3 of 11), all of which happened before 34 weeks of pregnancy. Anemia was 19.1 percent (1 of 7) defined, but no cases of premature stroke onset or reduced birth weight were recorded.²⁵ The C-section and perinatal mortality rates were 61.8 percent (5 of 8) and 33.2 percent (3 of 10), with 2 stillbirths and 1 perinatal mortality, overall (4 h after the birth of an extremely premature baby). Fetal discomfort, Apgar score <7 at 5 min, cardiac asphyxia, or entrance to the pediatric ward were not registered (ICU).

Finally, during the join phase, indications of infected persons were not observed in any of the newborn babies.^{26, 27}

See above, it seems that scant evidence on new coronavirus infection in early pregnancy may be correlated with, but not related to, the lack of samples collected during this time, since symptomless cases may go overlooked due to weaker pregnancy monitoring due to limitations on medical personnel or women who are pregnant themselves from attending in-house examinations.^{28, 29} Thus, we recommend that COVID-19 studies should be done regularly in clinical treatment.³⁰

Clinical findings in Pregnant Women

The diagnostic analysis indicates that 589 (81 percent) and 139 (19 percent) of the 728 women who are pregnant examined were identified with transfection, followed by polymerase chain reaction (RT-PCR) and clinical examination, accordingly. The single currency for the diagnosis of Covid-19 is the sample collection in which the receptor is isolated, using nucleotide bases acid-detecting Polymerase Chain Reaction (PCR). However, a single outcome not observed by RT-PCR for SARS-CoV-2 does not preclude a case of COVID-19 because there are multiple considerations, like insufficient collecting of the sample, the type of blood fluid, the time elapsed between the processing of the specimen, and the severity of the disease, and the variability of the antibody levels that may affect the results of the survey. For this purpose, if there are discordances among outcomes and observational factors, an RT-PCR test must be replicated in another sample of a patient's lung tissue, including in communities where a false-positive may have dire effects.

The prevalence of pregnancy-related illnesses seems not to have a significant effect on the negative impacts of pregnant women and their newborns, since the two deaths came from mothers who did not have risk factors, but who experienced extreme pneumonia for whatever cause. After all, it is noted that the most prominent disorders were gestational diabetes and fetal pain, indicating that the symptoms of the fetus, especially those symptomless but without illnesses, must be specifically important. The lack of chronic conditions will also directly impair the care given and thought given to pregnant women by clinicians, exposing any of them to the worse diagnosis.

Regarding the evidence of infection at the time of enrollment, 689 (91%) pregnant women were examined, and fever at admission (363/53%), cough (290/42%), and dyspnea (83/12%) were the key physical symptoms reported. It is notable that 83 (12%) of pregnant women were asymptomatic but were screened (through RT-PCR to detect SARS-CoV-2) caused by exposure to people who are diagnosed with COVID-19, highlighting a need to comply with the Institutions for Disease Control and Prevention (CDCs) guidelines for monitoring risk areas in touch with

those infected with COVID-19, although this method may not have been feasible

Concerning computed tomography, in 577 (76 percent) pregnant women, chest CT scans were conducted with 538 (93 percent) pregnant women displaying changes indicative of disease. At the time of entry, CT scans were very helpful in the initial evaluation. In the C-reactive protein results, which were outside the normal level, and lymphocytopenia, the most common improvements were. It is noteworthy that these improvements in CT scans and lab tests have been recorded in overall studies[66]. These may aid in the treatment of heart disease for the assessment of cosmetic tests, whether they are the chest X-rays or chest X rays, but it shouldn't be considered as a firm proof to validate or remove SARS-CoV-2 infections. The hypothesis is that multiple bacterial and viral etiological agents trigger lung diseases.

Childbirth

Conclude, 587 births were confirmed, with far more than half (379/65 percent) of pregnant women having C-sections. Pregnancy-related disorders were the source of C-section performance in 148 pregnant women when the C-section signs were checked; in 103 cases, the sign was an illness, and in 128 cases, signs were not identified. When the predictor for a C-section was the disease, no specifics were given. In certain instances, obstetric considerations dictated the timing of birth instead of the clinical evaluation of COVID-19.

The involvement of mother and/or fetal deficiency typically affects the option of the mode of delivery more often. An emergency C-section was the option preferred where there were immediate threats, as has arisen in the case of SARS-CoV-2 infections where the health state of the pregnant woman is complicated. Even so, the requirement for C-sections was smaller than normal in the case of COVID-19, so that patient safety protocols could be more readily pursued and the spread of disease to the fetus reduced.

New birth

598 babies were born, with 590 single births and eight twins, regarding the features of the newborns. A total of 493 (82%) newborn babies were screened for SARS-CoV-2, of which nine (2%) tested positive, 101 (20%) were immature, and 28 (6%) were overweight (<2500 g) born. Ten cardiac fatalities were registered and one birth trauma. Among 130 parents and their newborns, isolation measures were identified, although no neurologic differences (indicative of disease) were observed in the 54 platelet tests evaluated.

Remember that there was no production of large for the majority of newborns. Adverse effects include ten estimated to die, one accidental miscarriage, eight infant mortality, one stillbirth, nine (2%) positive SARS-CoV-2 samples, and three strong IgG and IgM SARS-CoV-2 antibodies in newborns.

With regards to the nine newborns that received treatment for SARS-CoV-2, three tested positive shortly after birth, but then came back negative 24 hours after birth. 36 hours after birth, another infant tested positive. It is important to remember that it is not stated if mother and baby were separated after birth in all three cases, rendering it hard to ascertain the mode of action, in addition to the lack of vaginal tissues and blood clots tests, as per the authors.

After becoming vaccinated by their mothers without wearing gloves, two newborn babies positively identified for the new coronavirus because the paternal disease was not identified in the postpartum. However, it was not necessary to validate or rule out aerial delivery, as the researchers noted that the newborns were not screened for COVID-19 directly after birth. Besides, in the same report, a COVID-19 pregnant woman gave birth to a vaginally delivered newborn baby who tested positive for SARS-CoV-2 despite the mother wearing a surgical mask and the surgical staff wearing appropriate PPE during labor. In another study, the discovery of viral RNA in the dairy of one of the pregnant mothers and eventual evidence of infant infection enhanced incremental gains by breast milk, while the mother adopted safety measures while breastfeeding the child. This highlights the need to test mothers, using suitable garments, before giving birth (staff and mother), it is not realistic to stop breastfeeding during testing.

During birth, the other two newborn babies positively identified for 16 and 53, overall. The following protocols were found in both studies: the use of masks by the patient, the entire medical staff was dressed, mother and baby were separated after birth and no breastfeeding was noted. After all, the author stated a significant weakness of the analysis, the lack of comparative evaluations (presence of viruses in amniotic fluid, umbilical cord blood, or placental tissue). Of the nine healthy infants, two were intubated and three had moderate pneumonia, but within a few days, they had completely recovered.

Limitations

There are some limits to the studies retrieved in this study. Limited sampling sizes, historical examination of medical history with missing results, as well as the low number of children screened for SARS-COV-2, as opposed to the birth rate, are among these.

Even amongst the shortcomings of this study, we emphasize the likelihood that the very same patients may be identified more than once since they could have been involved in multiple trials and only secondary details will be discussed. Most of the confirmed incidents apply to Chinese pregnant women and there has been a lack of normal examination of the involvement of viruses in mucous fluid, blood plasma, or placental tissue in newborn babies. No detail was also given about the treatment provided during birth and post-birth, and the treatment group lacks clear inclusion requirements. Nevertheless, despite these shortcomings, this analysis has benefits, such as providing a summary of all

existing data so far, collecting and grouping dispersed data more precisely to interpret and inferences, and, depending on what has been evaluated, stating that there is no proof of vertical dissemination so far, as there are information discrepancies about the treatment given during an evaluation.

5. Conclusion

These findings suggest that it is not possible to rule out the possible deterioration of women afflicted with SARS-CoV-2, whether or not the condition is linked with comorbidity. There is a chance of women experiencing respiratory problems or experiencing, and other, heart rhythm abnormalities or acid-base deficiency, as reported here. There is a substantial chance of spontaneous abortion and premature birth, which is why C sections have been commonly used. For pregnant women who report indicated clinical symptoms of COVID-19, constant surveillance is required, particularly at a time when women in communities with radical exclusion policies have trouble accessing routine antenatal care. To prevent the transmission of the disease, those who could not be screened before birth should stop making interactions with the baby and wear masks.

Concerning the danger to infants, there is no definite evidence of vertical transfer, but this probability cannot be dismissed. Cases of chronic bronchitis, elevated Apgar indices, and moderate pneumonia have nevertheless been identified. Luckily, all the kids who tested positive for the infection completely and soon survived. A thorough examination of the health symptoms of the newborn, as well as chest CT scans, is prescribed about several days after delivery.

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