

Covid -19 during pregnancy, labour and postnatal: A review article

Abstract

Objectives: The aim was to make a review on COVID-19 during pregnancy to help in establishment of management plans for pregnant women with corona virus and during labour and postnatal care of the neonates.

Methods: Searches were made in PubMed to detect, recent studies regarding COVID-19 during pregnancy. Data were taken out from relevant manuscripts.

Conclusion: In comparison to MERS and SARS, COVID-19 seems less lethal, as regard to the inadequate number of cases documented till now.

A low-molecular-weight heparin should be given for pregnant women with COVID-19 to reduce the risk of thrombosis.

Keywords: pregnant, women, COVID-19–virus

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Introduction

The common human corona viruses 229 E (alpha corona virus), NL63 (alpha corona virus), OC43 (beta corona virus) and HKU1 (beta corona virus) result in common cold. It is now clear that there are 3 human corona viruses that lead to a more severe acute illness; MERS-CoV that lead to Middle East respiratory syndrome (MERS), SARS-CoV that causes severe acute respiratory syndrome (SARS) and SARS-CoV-2 the reason for COVID-19.

There are inadequate case series that document the effect of covid-19 during gestation. In women infected by SARS or MERS, the mortality is higher in those infected during gestation in comparison to non-pregnant women.¹

Discussion

There are no data on corona infection during first trimester of gestation. In a previous study, miscarriage occurred to four of seven cases.²

A case was reported with sore throat and fever with positive covid-19 infection at 34 weeks with deterioration of her condition and ICU admission and needed ECMO, her baby was still birth and delivered by CS.³

Zhang et al.⁴ documented a series of 5 pregnant ladies with positive SARS, 2 of them in the second trimester, 3 in third trimester, fetal death occurred in one fetus in a twin pregnancy while the other survived till the end of pregnancy.⁴

2 pregnancy losses were documented in women infected with MERS. One fetal loss happened at 20 weeks.⁵ Chen et al.⁶ made a study showed that among 32 women that had COVID-19, 15 pregnant women had a preterm delivery.⁶

In a research made by Zhu et al.⁷ 7 pregnant ladies who delivered by CS and 2 by vaginal delivery; 5 females out of 9 women delivered preterm.⁷ Liu et al. documented that among 13 women, 7 had preterm labour by CS; while the cause for preterm labour was not mentioned.³

In a previous study regarding MERS, 3 of 11 pregnant ladies with MERS were delivered preterm.^{8,9} In a previous study on women with COVID-19, they delivered within 2 weeks of start of symptoms, the fetal growth is not possible to be infected in this small time and there were no available information regarding placental pathology till now.^{3,6,7,10}

In pregnant women with SARS, when delivery was made after less than one week of symptoms, placental pathology showed deposition of fibrin but with no fetal growth restriction while when delivery was made after five to seven weeks, there was growth restriction avascular villi and bleeding behind placenta and abruption.¹¹

Samples from umbilical cord blood amniotic fluid, neonatal throat swab and breast milk showed no proof of CPVID-19 in 6 pregnancies delivered by CS.⁶

In a study made by Liu et al.³ revealed that samples from 10 pregnancies showed delivered by CS showed no vertical transmission.³

Moreover, there were no reported cases of vertical transmission for SARS or MERS during gestation either when pregnancy ended by vaginal route or by Cesarean section. Regarding neonatal outcome in COVID-19 infection, in a study made by Chen et al.⁶ no neonatal problems were reported.⁶

While Zhu et al.⁷ revealed that in babies delivered at gestational age (from 31 weeks); 6 out of 10 neonates were admitted to the ICU for breathing maintenance, two had disseminated intravascular coagulation (DIC) and one developed multi organ failure.^{4,7}

From the presently available documentations, an increase in the risk of miscarriage in women affected by COVID-19 cannot be excluded at this stage.¹ Delayed cord clamping is not advised by ISUOG nor by China Consensus guidance to reduce risk of vertical transmission.¹²

Recommendations from China reported that breast feeding should not be offered to infants of suspected or confirmed COVID -19 while Centre for Disease Control and prevention guidance is less obvious but they advise a cautionary recommendations.¹³

RCOG, in association with the RCPCH, made guidance for labour and neonatal care, which endorses that labour method is decided according to obstetric suggestion and advised against isolation of COVID-19-infected women and their neonates.¹⁴

Imaging of the chest should be made as clinically indicated in pregnant ladies. Treatment that is considered during the outbreak included remdesivir, Kaletra and Chloroquine.¹⁵

COVID-19 started with respiratory symptoms that may proceed to respiratory failure then it could proceed to multiorgan failure and death. In non pregnant patients admitted to the intensive care unit with pneumonia, the rate of venous thromboembolic disorders is twenty five percent diagnosed by lower limbs ultrasound.¹⁶

In series study with 184 women with diagnosed COVID-19 pneumonia, thirty one percent of them had arterial or venous thromboembolism with pulmonary embolism, stroke, myocardial infarction and deep vein thrombosis.¹⁷

The way through which viral infection leads to MOF is thought to be through secretion of inflammatory cytokines that cause secretion of tissue factor and activate thrombin. The increased level of D-dimer especially more than 1 mg/ml denotes increased thrombin production and is associated with the increased death risk.^{18,19}

Therapy with anticoagulants using low-molecular-weight heparin was linked with better result in women with severe COVID-19 illness classified by D-dimer results.²⁰

Healthy gravid females have proof of elevated thrombin and a prothrombotic state and elevated intravascular inflammation that is increased in presence of infection, these women might be at a bigger threat for thrombosis when infected with COVID-19. The International Society of Thrombosis and Haemostasis produced a simple protocol for treatment of coagulopathy associated with COVID-19.²¹

A low-molecular-weight heparin should be given for pregnant women with COVID-19. This evidence should be put into consideration by Obstetrics consultants who manage pregnant women with COVID-19.²²

Management of pregnant women with mild COVID-19 cases, requires home isolation with good hydration, with temperature adjustment with paracetamol up to a maximum dose of 4gm/day, with a home pulse oximetry could be used. Emergency is needed if there is a fever that is not responding to medications or if there is respiratory distress.²³

Prohibition of prolonged bed rest to decrease the risk of thrombosis that is already increased due to COVID-19 and due to pregnancy.

A tele health within 48 hours is recommended to evaluate the clinical state to put the future management plan based on the clinical situation. The antenatal visits must be delayed till finishing the period of isolation after passage of four weeks from the start of symptoms or 2 weeks after PCR test is negative.

If there is cases that need special arrangement for scanning by obstetrician due to growth restriction or another obstetric indication, this should be individually decided by maternal fetal specialist.²³

Where as in management of moderate and severe cases

Hospital admission with monitoring of vital signs. Therapy could include oxygen maintenance to keep an SO_2 more than 94% support could require monitoring in intensive care unit.

There is no proof of effectiveness of any drugs for Corona virus treatment in any well designated studies.²³

Drug therapy includes Lopinavir/ritonavir (100mg/25mg) 2 tablets/12 h (7–14 days depending on the clinical situation). Hydroxy chloroquine sulphate 400 mg every 12 h the first day followed by 200mg every 12 h for the next 4 days or Ivermectin.

Azithromycin 500mg (first day) followed by 250mg every 24 h to complete 4 days, orally or intravenously. These treatments are not contraindicated during pregnancy, but require informed consent for their use in this situation.²³

Ceftriaxone 1 to 2gm per day intravenously Plus teicoplanin 400mg twice daily for 3 doses then 400mg per day in case of high levels of procalcitonin that suspect bacterial super infection or alveolar infiltrate. Low-molecular-weight heparin should be started during hospital admission and for the next 2 weeks as a prophylactic therapy (irrelative of D-dimer values).²³

In critically ill women, medications as methylprednisolone, tocilizumab (an anti-inflammatory monoclonal antibody with IL-6-inhibitory effect), or remdesivir (an RNA polymerase inhibitor with in vitro activity against SARS-CoV-2). But, there are security worries uptill now about their use during gestation. Fetal health could be evaluated by CTG on a regularly according to gestational age and maternal status.²³

The overall data about COVID-19 during gestation and its impact on mother and child are still deficient, although preterm labour was a result of elective intervention. The knowledge is deficient to mothers who established the corona virus in late gestational age and women who delivered after a short period following Covid-19 infection. The fetal affection of long-standing infections occurring in early pregnancy are not yet known.²⁴

Infection control measurements including decreasing number of persons in the delivery rooms, decrease movement between locations the number of visitors and caregivers to decrease the cross contaminations.²⁵

The management of labour if there is a suspected or confirmed women with COVID-19, strict adherence to rules for isolations of teams organized in delivery suite, general ward, procedure rooms, and outpatient units is advised.²⁶

Application of labour analgesia in managing of COVID-19 pregnant women could be arranged in early labour to have good pain control with starting epidural anesthesia to decrease viral transmission to staff produced by hyperventilation.^{14,27}

Inhaled entonox is not recommended as it might rise the possibility of viral distribution through aerosols.^{14,28–30} Donation of breast milk after screening from women free of COVID-19 should be planned.³¹

COVID-19 during pregnancy is not related with an increased possibility of spontaneous abortion or preterm birth. There is no proof of vertical transmission of severe acute respiratory syndrome when the infection happens during the third trimester of gestation.³¹

We thought that every pregnant woman should make efforts to enhance their immunity to prevent the severe form of Covid-19 infection or to fight it through a healthy balanced diet with high protein diet, plenty daily fluid intake, vegetables and fruits with more stress on these containing multivitamins especially Vitamin C and D. preventive measures should be followed with social distancing, mask wearing and frequent hand washing with soap or alcohol.

Recently many companies made vaccines for covid-19 (as sinofarm, moderna, astrazinica, fizer, and others) and people started to receive the vaccine and we hope the results will be helpful in preventing and decreasing the severity of the disease and its complications. Pregnant women will be allowed to receive the vaccine.

According to the ESHRE recommendation Last update - 09 February 2021 2.

Women who plan to conceive but are not yet pregnant have the following options; Either to postpone gestation till measures to effectively diminish the risk of the pandemic is undertaken as in areas with insufficient control of the pandemic and diminished current resources for vaccination, this might resemble a preferable choice or to Advance with plans to conceive, take measures to diminish risk of pandemic and seek a COVID-19 vaccination as soon as possible.

One hundred vaccines are at different stages of preparation, and results were published regarding ten 10 of them. They have a variety of various technologies, including the use of adenovirus vectors, messenger RNA encapsulated in lipid nanoparticles, and inactivated SARS-CoV-2 virus.³² None of these vaccines had been made with live-attenuated viruses (such as rubella, rubeola, varicella and mumps vaccines) which are contraindicated in pregnancy, but the safety profile for pregnant women of SARS-CoV-2 vaccines under development is unknown for any of them.

Those women who are currently pregnant have the following options:

Either to Continue all established preventive strategies and postpone COVID-19 vaccination till after pregnancy or to Pursue a COVID-19 vaccine as soon as possible and continue established mitigation measures including social distancing, mask-wearing, and hand washing.

The issue of COVID-19 vaccine intake in gestation is currently the most argumentative issue. Various professional organizations offered guidance that has ranged from a strong authorization of pregnant women receiving vaccination to a more cautious stance.³³⁻⁴⁰

COVID-19 vaccination is currently being presented to pregnant ladies at high risk for infection (e.g. primarily health care workers) in some countries such as the US, but universal recommendations had not yet arisen. In early 2021 a trend is arising in which more healthcare organizations and professional societies are suggesting that pregnant ladies be offered the vaccine when available (JCVI).³⁹

The recommendation for receiving these vaccines (WHO, CDC, EMA, JCVI, Moderna, Pfizer, Astrazeneca) include; that there is no waiting time for pregnancy after vaccine administration and the recommended vaccine in pregnancies with a comorbidity is that of CDC and the one that could be recommended is that of JCVI.

Moreover, the contraindications for all of them are History of severe allergic reaction or hypersensitivity to vaccine components.

While for breastfeeding women, the recommended vaccine is that of Pfizer and the vaccines that could be recommended also are these of CDC, EMA, JCVI while these of WHO, Moderna and Astrazeneca are unknown yet in breast feeding.⁴¹

The decision to take or refuse to receive the vaccine based on individual risk, availability of the vaccine, and the potential recipients' beliefs regarding unknown hazards of the new vaccines. Professional advice is strongly recommended both in pregnant women and those planning to conceive, especially as knowledge and counseling are continuing to grow.⁴¹

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Conflicts of interest

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