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Management of COVID-19 Positive ANC Patients

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ABSTRACT

SARS-CoV-2 is the causative organism for the corona virus disease. First it was detected in Wuhan, China in the month of December 2019 and there has been an exponential rise in the number of cases since then. Over 40 lakh cases of COVID-19 and at least 2.5 lakh mortalities worldwide were present around May 2020. However, there is very less evidence about the information regarding the clinical manifestations of antenatal women who have been infected with the corona virus. Due to the maternal physiological and immunological changes, the pregnant women can be more prone for the SARS-CoV-2 infection and its complicated clinical manifestations. The clinical presentation of SARS (Severe Acute Respiratory Syndrome) and MERS (Middle Eastern Respiratory Syndrome) during pregnancy gives an insight about the effects of COVID-19 viral infection. Intrauterine deaths, miscarriages, still births, fetal growth retardation and high neonatal fatality rates have been associated with SARS and MERS but with COVID-19 infection identical outcomes are seen like that of non-pregnant women. There is no greater risk of contracting the infection or having the severe consequences in pregnant women as compared to rest of the adult population of similar age. Moreover, transmission of virus to the baby during antenatal or intranasal period is not too common and also currently no evidence as such has been given. The outcome of the neonates of pregnant females who had COVID-19 viral infection is pretty good.

It is advised that pregnant females with COVID infection should be treated in a facility with sufficient safety measures and isolation practices. The baby should be kept in a different room or kept at a safe distance from the mother. Breastfeeding is not restricted in these circumstances. These infection prevention and treatment ideas are applicable to medical facilities that provide medicine to ANC patients with confirmed novel corona virus or pregnant women under investigation in medical set ups such as medical specialty sorting, labor and delivery, recovery, and postpartum care.

Key words: COVID-19, Pregnant, ANC, Transmission, Neonate, Labour, Caesarean section

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INTRODUCTION

COVID-19 virus being capsulated ssRNA virus. Aerosols/ respiratory droplets or with direct contact with the fomites transmission the infection [1]. It affects different people differently. Mostly it is mild and recovers without the need of any hospitalization. The common clinical features of this infection are same as that of any other viral infection which includes fever, cough, weakness and loss in the taste sensation.

In December 2019, in Wuhan few patients with pneumonia like illness with unknown etiology were reported by WHO. Since then, novel corona infection caused by Corona-19 virus has disseminated rapidly and exponentially across the world. As COVID-19 infection is similar to Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS) additional preventive measures were taken for pregnant women as them being more susceptible as the pandemic unfolded [2]. Federation of Gynaecology and Obstetricians (FIGO) has suggested that the regular antenatal care must be taken and replacement of hospital visits with video calls or telephonic consultations should be considered whenever and wherever possible as women could not visit the health care facilities [3-5].

LITERATURE REVIEW

Physiological modifications in the body during pregnancy and its significance in COVID-19 infection

Immunological response: Pulmonary cells are infected by the aerosols generated by an infected patient who invades the body *via* nasal route. Pyroptosis of host cells is the mechanism by which the virus multiplies. The response to the infection is affected by the modifications of maternal immune mechanisms in pregnancy. It is mediated by [6]

- CD_4 + T cells population shifts from Th_1 to Th_2 phenotype during pregnancy.
- The count of Natural Killer cells (NK) circulating the body is reduced.
- Plasmacytoid dendritic cells count is also reduced.
- Progesterone levels are increased in the body which helps in the recovery from lung infections.
- Inflammation is enhanced even more due to altered immune mechanism.

Respiratory response: The gravid uterus causes splitting of the diaphragm which in turn results in elevation of the diaphragm and alters the thoracic shape. Even though the tidal volume increases by 30-40%, the total lung capacity reduces. Also, the secretions cannot be cleared properly. All the pulmonary dysfunctions make the ANC women more prone for complicated pulmonary infections [7].

Response of coagulation system: Thromboembolic manifestations are seen in the general population who have been infected from the corona virus. Hypercoagulable state and a rise in intravascular inflammation in pregnancy has a synergistic effect on the risk factors for thrombosis. This hypothesis is backed up by a case report that describes death in a pregnant female with 29 weeks of period gestation due to pulmonary embolism due to COVID infection. Thromboprophylaxis must be given to all pregnant females with confirmed corona viral infection until 10 days after the termination of the pregnancy [8].

Endothelial cell function: The onset and course of ARDS are influenced by pulmonary endothelial cell dysfunction. For the best pregnancy results, the mother's vascular adaptation to pregnancy is crucial. Hypertension and proteinuria are common in preeclampsia-affected pregnancies. Reduced vascular resistance in the mid to end stages of pregnancy, as well as related endothelial cell dysfunction, are linked to maternal problems. A study reported that there are increased chances of pre-eclampsia with pregnant women who had been hospitalized for the viral infection. The vulnerability of these women infected with COVID-19 infection is due to these endothelial functions.

Transmission

Placenta being an efficient barrier forbids infections from mother to spread to the fetus. But certain pathogens can still transmit vertically due to the breach of the placental barrier. Firstly, it does not suggest that there is placental infection by the mere evidence of virus on the placenta. Secondly, the vertical transmission is not confirmed if there is viral infection of cells of the placenta and thirdly, it does not mean that there will be fetal damage even after vertical transmission of the virus. A no. of damaging mechanisms can be involved in vertical transmission like break in the villous tree, through maternal endothelium, increase in the number of maternal immune cells or ascending infections from vagina.

The samples taken from a mid-trimester placenta showed presence SARS-CoV-2, but it is uncertain whether the transmission of infection was because of primary infection or due to pathologies causing placental damage. When the fetal tissues were tested no viral expression was detected [9]. The authors correlated it to be related to the viral infection as the case reports showed macrophage deposits were seen on placental histology. It is advised to match the standardized examination of placental samples of COVID-19 women with the negative controls as for research. Even in case of SARS-CoV-2 positivity, significant distress in the neonates is uncommon. It is not confirmed if the infection occurs during the intra uterine period or during the intrapartum period or after the birth of the baby; or by transmission from infected mother or asymptomatic health care workers during the immediate new born phase. There is an increased concentration of IgM and IgG for COVID-19 virus as seen on antibody testing provides evidence in support of the occurrence of vertical transmission [10].

DISCUSSION

Effect of COVID-19 on pregnant females

Pregnant females not at a risk for COVID-19 related complications in comparison with the general population as suggested by some early report from China, the epicentre of pandemic [11]. Mostly the symptoms in pregnant women were absent *i.e.* majorly were asymptomatic and few those who were symptomatic had symptoms like cough, fever and shortness of breath [12]. Fever was the most common symptom (40%) and next common was cough (39%). Most common consequence of COVID-19 infection in pregnancy was pneumonia. Its manifestation is similar to non-pregnant population. Pleural effusion was one of the reasons for which few ANC patients were admitted and treated in the hospital. Mild to severe disease can be manifested which cause pulmonary embolism and acute coronary syndrome. COVID-19 31% pregnant females require hospitalization when collated with 5.8% of non-pregnant women. There is minimal absolute risk of maternal deaths [13].

Not much evidence is present which suggests that COVID-19 in early pregnancies can be linked with increased incidences of miscarriages [14]. If corona infection is contracted in late pregnancy, adverse outcomes such as preterm delivery and perinatal mortality. But these outcomes are very rare [15].

- 74% COVID positive ANC patients present asymptomatically.
- In comparison to the other normal pregnant females, the pregnant females with the COVID-19 disease require more of ICU admission and invasive ventilation.
- Patients having severe COVID-19 infection are said to have been associated with increased maternal age, high BMI, chronic hypertension and diabetes.

Management of COVID-19 positive ANC patients

If a pregnant female meets all the COVID-19 testing criteria, immediate testing for the infection by either RT-PCR or rapid antigen testing. She should be handled as though she has proven corona virus infection until test results are available.

The pregnant women should continue with her routine antenatal check-ups even if she tests to be positive either by going to the hospital or through teleconsultation. If she is symptomatic, delay of 7-14 days can be done for her routine ANC check-ups. If she wants to a doctor the patient should either go by herself or should call an ambulance by informing the driver. The check-up should be done under all necessary COVID-19 precautionary guidelines and social distancing. The hospital staff should be well protected and all the instruments (speculum, retractors) and devices (Doppler, CTG probes and BP apparatus) should be sanitized and used.

The care provider must not delay obstetrical treatment in order to test for COVID-19. Routine growth scans that aren't strictly based on guidance and routine clinical and physical investigations must be kept to the bare minimum. If the patient is hospitalized, Hourly observations of each and every value, and also change in the trends should be seen. These include BP, pulse, respiratory rate, oxygen saturation, fetal heart rate, uterine contractions, fetal movements and cardiotocography. Maintain oxygen saturation of >94%. Maintain the partographs. Management of associated obstetric complications is to be done simultaneously.

Administration of corticosteroids has been proven reduce poorer outcomes. Corticosteroids like dexamethasone and hydrocortisone are used [16]. The prognosis and outcome of both mother and the baby depends upon the efficient obstetric management. The time of delivery, choice of caesarean section, choice of anaesthesia, protocols for setting up of delivery room to prevent infections and new born management must be taken care of.

Timing of delivery: The Chinese medical association suggests that to terminate a pregnancy, this infection is not an absolute indication, but must be decided on a case to case basis [17,18]. Main concerns are gestational age, advancement of Maternal disease and intrauterine status of the fetus. Gestational age is used to determine the time of delivery. In complicated pregnancies with COVID-19 infection the timing of termination of the pregnancy is governed by the following 4 principles:

- Obstetric indications should be demonstrated for early delivery like malpresentation, preeclampsia and placenta previa.
- Early termination of pregnancy is advised even if there are no obstetric indications and still there is no improvement with the treatment [19].
- Presence of severe or critical features, delivery should be done in order to ensure maternal safety regardless of gestational age (respiratory distress, O_2 saturation<93% at rest, PaO_2/FiO_2<300 mmHg, mechanical ventilation and ICU management needed).
- Mild or moderate infection indicates delivery in the last trimester.

Indications for caesarean section: The method of delivery is decided by the obstetric indications. The overall goal is to reduce maternal physical exertion, safety of other post-natal women, health care workers and new born [20].

Delivery room and infection protection: An isolated place instead of the regular delivery room should be used for delivery. Minimize unnecessary objects and other medical and attending staff. Vaginal examination, artificial ruptures of membranes, etc. should be carried out with strict protection of staff. Disposable masks, face shields, 2 layered gloves, shoe covers. 7 step handwashing techniques along with alcohol or soap must be used to wash hands.

If caesarean section is done, pay attention to haemostasis and prevent PPH and risk of blood transfusions. Bio specimen (blood from the umbilical cord, liquor, placenta and throat swab of the neonate) should be collected to presence of vertical transmission [21].

Anesthesia: one must use either use epidural or general anesthesia. Endotracheal intubation can be used in pregnant COVID-19 positive women for general anesthesia. But general anesthesia can exacerbate infection or cause side effect in the new born (muscle tone and breathing).

Neonatal management: obstetric doctors and paediatricians must work together closely. Evaluation of the new born must be done immediately after being transferred to the neonatal isolation ward. Discharge of the baby can be done from the isolation ward if the nucleic acid test is negative twice consecutively. The baby becomes eligible for home based care when the mother also comes out to be negative. If the mothers test comes out to be positive, new born should be quarantined for 14 days. The risk of severe complications is yet to be proven due to COVID-19 infection. The contact with respiratory infection is found to have a risk of transmission of infection after birth. Temporary isolation is considered until the mother's transmission based risk are terminated like separate rooms or isolation ward. The advantages and disadvantages of a temporary separation should be discussed by the health care staff While they are working, the infant should be kept in a separate isolation room or remain a PUI. It depends on case-to-case basis whether to isolate the baby from the mother as suggested by the doctors, preventive medicine specialist, and public health workers. The severity of the condition, the signs and symptoms of illness, and the findings of laboratory tests for the virus that causes COVID-19 in the mother and new born should all be considered when making a decision. According to the mother's preference the new born is collocated (also known as "rooming in") in the same room, it is done in. Health care systems should take measures to reduce new-born's exposure to the virus and its transmission. One can employ

engineering controls such as physical barriers (for example, between the mother and the new born place a curtain) and keeping a 6 feet distance between mother and the infant. Before feeding the child or having a close contact with the baby the mother should cover her face with a mask and maintain hand hygiene if a healthy adult is not there with the mother to look after the child. Continue the transmission preventive measures while the mother is in a hospital facility.

Breastfeeding: it is uncertain that there is transmission of COVID-19 infection through breast milk. Even if the mother has tested positive, it is advised that the mothers should continue breastfeeding. Follow basic hygiene and wear a mask while feeding. The neonatal infection in general is asymptomatic and mild which outweighs the advantages of breastfeeding.

Neonatal outcomes

- The neonates generally if infected have a mild infection are asymptomatic.
- No difference in the rates of still births in COVID positive ANC patients than the non-pregnant.
- Spontaneous preterm birth rate is 6%.

CONCLUSION

COVID-19 infection in pregnant females has risks similar to that of any healthy individual. Except for the additional social distancing guidelines need to be followed, appropriate COVID infection therapies to be implemented and safety precautions to be addressed rest management is similar to COVID negative pregnant female. Apart from this the hospitals and maternity care centres must prepare themselves for this exponentially overwhelming rise in the number of patients and optimize the available resources well before hand, for quick diagnosis, isolation, prevention and management, and prevention of infection. To plan for a significant expansion in critical care bed capacity, hospital authorities, government servants, and policymakers must work with hospital staff and health care practitioners. The caesarean section is mostly done due to obstetric indications and mother's well-being and not due to the presence of COVID infection. Breastfeeding should not be discontinued as its benefits outweigh the risk of transmission of infection and complication of novel corona virus infection in a new born.

REFERENCES

1. WHO (World Health Organization). Coronavirus disease 2019 (COVID-19), Situation Report – 97. 10:00 CEST, 26 April 2020.
2. Mascio DD, Khalil A, Saccone G, et al. Outcome of coronavirus spectrum infections (SARS, MERS, COVID-19) during pregnancy: a systematic review and meta-analysis. Am J Obstet Gynecol 2020; 100107.
3. Bourne T, Kyriacou C, Coomarasamy A, et al. ISUOG Consensus Statement on rationalization of early-pregnancy care and provision of ultrasonography in context of SARS-CoV-2. Ultrasound Obstet Gynecol 2020; 55:871–878.
4. Poon LC, Yang H, Kapur A, et al. Global interim guidance on coronavirus disease 2019 (COVID-19) during pregnancy and puerperium from FIGO and allied partners: Information for healthcare professionals. Int J Gynaecol Obstet 2020; 149:273–286.
5. Royal College for Obstetrics and Gynaecology. Guidance for antenatal and postnatal services in the evolving coronavirus (COVID-19) pandemic. RCOG, 2020.
6. Wenham C, Smith J, Morgan R, et al. COVID-19: the gendered impacts of the outbreak. Lancet 2020; 395:846–848.
7. Goodnight WH, Soper DE. Pneumonia in pregnancy. Crit Care Med 2005; 33:390-397.
8. Ji HL, Zhao R, Matalon S, et al. Elevated plasmin (ogen) as a common risk factor for COVID-19 susceptibility. Physiol Rev 2020; 100:1065-1075.
9. Baud D, Greub G, Favre G, et al. Second-trimester miscarriage in a pregnant woman with SARS-CoV-2 infection. JAMA 2020; 323:2198-2200.
10. Renzo GC, Giardina I. Coronavirus disease 2019 in pregnancy: consider thromboembolic disorders and thromboprophylaxis. Am J Obstet Gynecol 2020; 223:135.
11. Hirshberg A, Kern-Goldberger AR, Levine LD, et al. Care of critically ill pregnant patients with coronavirus disease 2019: a case series. Am J Obstet Gynecol 2020; 223:286-290.
12. Allotey J, Stallings E, Bonet M, et al. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ 2020; 370:3320.
13. Zambrano LD, Ellington S, Strid P, et al. Update: characteristics of symptomatic women of reproductive age with laboratory-confirmed SARS-CoV-2 infection by pregnancy status-United States, January 22–October 3, 2020. MMWR Morb Mortal Wkly Rep 2020; 69.
14. Mosby LG, Rasmussen SA, Jamieson DJ, et al. 2009 pandemic influenza A (H1N1) in pregnancy: a systematic review of the literature. Am J Obstet Gynecol 2011; 205:10–18.
15. Kemp MW, Newnham JP, Challis JG, et al. The clinical use of corticosteroids in pregnancy. Hum Reprod Update 2016; 22:240–259.
16. World Health Organization (WHO). Clinical management of severe acute respiratory infection when novel coronavirus (nCoV) infection is suspectedInterim guidance. 2020; 16:9–26.
17. Maxwell C, McGeer A, Tai KFY, et al. No. 225-Management guidelines for obstetric patients and neonates born to mothers with suspected or probable Severe Acute Respiratory Syndrome

(SARS). J Obstet Gynaecology Can 2017; 39:130-137.

18. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020; 395:497-506.
19. The Lancet. Emerging understandings of 2019-nCoV. Lancet. 2020; 395:311.
20. National Health Commission. Office of the National Administration of Traditional Chinese Medicine. Guidelines for the Diagnosis and Treatment of Novel Coronavirus (2019-nCoV) Infection (Interim Version 5, the Revision) 2020.
21. Groß R, Conzelmann C, Meuller JA, et al. Detection of SARS-CoV-2 in human breastmilk. Lancet 2020; 395:1757–1758.