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Corona Virus and Pregnancy

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Abstract

The objective of this research was to know about the complications of corona virus during pregnancy. The coronavirus is a deadly virus which is pandemic and an emergency situation which is spreading in the whole world like a fire in the forest. The number of cases and deaths increases day by day. It drastically affects the socio-economic condition of every country in the world. Pregnancy is physiological state in which a woman is more prone towards the infectious diseases and results in serious complications for the mother as well as for the newborn baby. This literature review is about the complications of the coronavirus affected mother and her baby.

Keywords: Corona Virus; Pregnancy; Fetus; Maternal and Fetal Complications; Respiratory Tract; Fever

Abbreviations: 2019-CoV: 2019 Novel Coronavirus; MERS-CoV: Middle East Respiratory Syndrome; SARS-CoV: Severe Acute Respiratory Syndrome; COVID-19: Coronavirus Disease 2019; WHO: World Health Organization; ICU: Intensive Care Unit; ALT: Alanine Aminotransferase; FDA: Food and Drug Administration.

Introduction

COVID-19 which was formerly referred as 2019 novel coronavirus (2019-CoV). In COVID-19, 'Co' stands for corona, 'Vi' stands for virus, 'D' for disease, and '19' represents the year 2019. The name of the virus is named coronavirus due to its structure that represents like a crown on its surface. There are mainly 4 types of corona virus including: alpha, beta, gamma and delta. The other human coronaviruses are beta coronavirus that causes Middle East Respiratory Syndrome (MERS-CoV), beta coronavirus that causes Severe Acute Respiratory Syndrome (SARS-CoV) and novel coronavirus which causes the coronavirus disease 2019 (COVID-19). The coronaviruses are rounded, enwrapped and largest of positive strands of RNA viruses. The first case of the COVID-19 was reported in Wuhan, China in December 2019 and since that it is declared as public health emergency condition which is of international concern by the World Health Organization (WHO). There are many common features of both SARS and MERS including nosocomial transmission, zoonotic infections, replication of the virus takes place in the lower respiratory tract, and viral immunopathology. Pregnant women who were suffer from the SARS and MERS showed poor obstetrical outcomes and maternal morbidity and mortality.

Pregnancy is physiological state of the body in which the embryo or fetus starts to develop inside the uterus of the mother. Many hormonal and physiological changes take place during the gestational period, due to this a pregnant female is more likely to prone towards the infections and results in illness if suffer from respiratory infections [1]. SARS-CoV and MERS-CoV are the viruses that affect the most a pregnant woman and even results in serious complications which needs admission to the intensive care unit (ICU), endotracheal intubation, renal failure and even death. In pregnant female the fatality rate of SARS-CoV infection is 25% [1,2].

SARS-CoV and Pregnancy

Few cases of the SARS-CoV are discussed in the Table 1. Luckily, no case was reported of vertical transmission among pregnant women infected with SARS-CoV during the 2002–2003 Asian epidemics, some other cases were also reported late in 2003 but no new case was reported after that [3-6].

SARS-CoV and Pregnancy					
Serial No.	**Year**	**Author**	**Country/ City**	**Sample Size**	**Complication**
1	2003	Martha Anker. [3]	China	100	Spontaneous abortion, admission to ICU, maternal death,
2	2003	Wong, et al. [1]	Hong Kong	12	1st trimester sustained miscarriage due to hypoxia, preterm delivery and death in women
3	2004	CM Lam, et al. [7]	Hong Kong	40	Renal failure, disseminated intravascular coagulopathy, endotracheal intubation, and death in 3 women
4	2017	Maxwell, et al. [8]	Toronto	7	2 were died, 4 were shifted to ICU for mechanical ventilation, 2 were recovered and continue their gestation but the delivered fetuses were suffered from IUGR but free from SARS-CoV
5	2003	Zhang, et al. [9]	China	5	5 were suffered from fever, 4 were affected from cough and hypoalbuminemia, 3 had chills and rigors and also elevated alanine aminotransferase (ALT), thrombocytopenia and lymphocytopenia in 2 women, 1 was shifted to ICU but all of the mothers were recovered and no death occurred and infants were also tested negative for the infection.
6	2003	Robertson, et al. [10]	United States	2	Fever, cough, sneezing, dyspnea, anorexia, fatigue and placenta previa in one woman but delivered a healthy baby. While the 2nd female was suffered from cough, fever, wheezing, productive cough muscle pain and dyspnea but the delivered fetus was tested negative and mother was also survived.
8	2003	Shek CC, et al. [5]	Hong Kong	5	All the 5 neonates were healthy and tested negative of the affected mothers

Table 1: Cases of SARS-CoV and Pregnancy.

MERS-CoV and Pregnancy

The first case of MERS-CoV was reported in September 2012 in Saudi Arabia [11]. The mortality, morbidity, complications and symptoms were more severe in pregnant women as compared with non-pregnant females that are why it is also a serious infection. Few studies related to pregnancy and MERS-CoV is described in the Table 2.

Serial no.	**Year**	**Author**	**Country/ City**	**Sample size**	**Complications**
1	2016	Assiri, et al. [12]	Saudi Arabia	5	Death of 2 females and there were 2 perinatal deaths, 1 still birth and 1 death of the neonate soon after the cesarean section
2	2016	Alserehi, et al. [13]	Saudi Arabia	1	Respiratory failure and was shifted to ICU for mechanical ventilation. Preterm fetus was delivered at 32 weeks but was tested negative. Mother and baby both were survived.
3	2015	Alfaraj, et al. [2]	Saudi Arabia	2	One woman was asymptomatic while the other female was suffered from hypertension, last stage of renal failure, and hemodialysis. Both females were survived. The baby of the first female was healthy and alive while the status of the other baby is not known

4	2012	Payne, et al. [14]	Jordan	1	5 months pregnant female reported with cough, fever, sneezing, abdominal pain and vaginal bleeding, on the 7th day the fetal demise was seen during ultrasound.
5	2013	Malik, et al. [13]	United Arab Emirates	1	Respiratory failure, hypotension, later on delivered a healthy baby, but mother gone in septic shock and died
6	2015	Jeong, et al. [15]	South Korea	1	Abrupt vaginal bleeding due to the rupture of the membranes but delivered a healthy baby tested negative and mother was also survived.
7	2015	Alfaraj, et al. [2]	Saudi Arabia	11	3 mothers were died and in 1 case both mother and fetus were died.

Table 2: Pregnancy and MERS-CoV.

COVID-19 and Pregnancy

The mortality and morbidity rate are high in COVID-19 affected pregnant women especially due to the respiratory illness [1,16]. The human coronavirus is less dangerous for the pregnant women in comparison with SARS-CoV and MERS-CoV. The current COVID-19 is declared pandemic by the WHO on March 11, 2020 due to its increased cases day by day [16]. A current study was done by Chen et al. in which they reported 9 pregnant females who were tested positive for the COVID-19. Out of 9 pregnant females 7 were suffered from fever, 5 were affected from lymphocytopenia, 4 were affected from cough, and muscle pain in 3 females, and sore throat and malaise were seen in 2 females. All the babies were delivered with C-section delivery with good APGAR score and all females were also survived [17]. Another case series was published by Zhu et al. in which 9 pregnant women were enrolled who delivered 10 healthy neonates, in one case twins were delivered. Intrauterine fetal distress was reported in 6 pregnancies. 6 neonates were delivered preterm [18]. A preliminary analysis was done by Dehan Liu, et al. from January 2020 – February 2020 in which 15 pregnant females were enrolled who were tested positive for COVID-19 pneumonia. The objective of their research was to provide some clinical manifestation and CT features of the affected women. The involvement of the lungs was estimated with the help of semi quantitative CT scoring.

According to the results, during the duration of the study 11 patients successfully delivered the babies however the pregnancies were continued in 3 at 2nd trimester and in 1 at 3rd trimester. All the neonates were healthy and no complication was observed in any one of them. On early chest CT scan only ground glass appearance was seen then crazy paving pattern and consolidations were appeared which were all show absorptive changes till the end of the study. Out of 15 females, fever was noted in 13 patients, cough was in 9 and lymphocytopenia in 12 patients. It was concluded from this research that all the enrolled COVID-19 affected pregnant females did not show any aggravation in the symptoms or features of the CT scans they were all mild cases. They were all recovered from the COVID-19 [19].

According to many previous studies found in the literature pregnant ladies are more prone to develop the infectious diseases. Another interesting case was published by Xiaotong Wang, et al. in which a 28 years woman who was 30 weeks pregnant was admitted to the hospital having a history of intermittent fever but at this time she was tested negative for COVID-19. After 2 days subpleural patchy consolidations was seen on left side and ground glass opacities on the right sided chest computed tomography scan. On 4th day she was tested positive for COVID-19 and then shifted to ICU. On day 7 the bilateral ground glass opacities were noted in the chest CT scans and in the afternoon the variability was detected in the fetal heart rate and fetal movements. Due to this reason an emergency c-section was done with all the precautionary measures for the doctors and staff members who were in the operation theatre. A preterm baby boy was delivered having weight of 1.83 kg with good APGAR score (9 and 10 at 1 and 5 minutes). The baby was kept in the neonatal intensive care unit NICU and the samples of amniotic and gastric fluid, umbilical cord, placenta and throat swabs were sent for the investigation but luckily all were tested negative. On 18th day of the admission of the mother, the test of the mother was also negative [20]. Another case was reported in which the researcher say that a baby was born on 2nd February 2020 in Wuhan children hospital of a COVID-19 positive mother and the neonate was also tested positive. All the vital signs were normal but the breathing was difficult with abnormal chest radiographs and liver functions test [21]. In the same hospital previously a case was reported on 13th January 2020 a baby was delivered and after few days baby's nanny was tested positive for COVID-19 and after few days the mother of the baby was also tested positive. And on January 29 the symptoms were also started to develop in the baby [21].

By keeping in mind these and further cases of neonatal infection are acquired prior to delivery, A fundamental point to remember is that newborn infants can acquire

an infection in other ways beyond intrauterine maternal-fetal transmission. In few cases, infection can be acquired during a vaginal delivery or through breast feeding, although these routes of transmission would be highly unusual for a respiratory virus. The neonates can be affected by the inhalation of the virus by the mother's cough, sneezing etc. or it can be of any person who is around the neonate or it can also be hospital acquired.

Fundamental Points that Should be Considered

- Proper cleaning and disinfection should be done of the ultrasound transducers and CT scan machines etc. after the scanning of the COVID-19 affected mother.
- All the doctors, nurses, paramedic's staff who are in contact with the affected patients should be properly covered with gowns, masks and gloves.
- Presently very little information is found in the literature about the transmission of virus to the neonate from breast milk. So, care should be taken in affected mothers especially in the severe cases.
- The management of the affected mother should be taken by the multidisciplinary team who can able to cope up with any emergency situation.
- Time and mode of delivery should be planned according to the condition of the mother and fetus under the local or general anesthesia [22].

Discussion

Insufficient data was gathered about coronavirus infections that occur during the pregnancy. The past experiences with coronavirus infections in pregnancy shows that these viruses (SARS-CoV and MERS-CoV) both are capable of causing serious clinical outcomes including maternal death, hospitalization, intensive care admission and mechanical ventilation. Serious complications were also noted in fetuses, neonates and infants including spontaneous abortion, intrauterine growth restriction, preterm birth, breathing difficulties, deranged liver functions tests etc. but the maternal to fetal transmission of the virus is very low as compared with Ebola and Zika virus [10]. Pregnant women should be considered to be at high risk for developing severe infection during this pandemic [20]. Additional clinical research on the treatment of SARS, MERS, and the new coronavirus 2019-nCoV is necessary if we are to understand the potential risks and benefits of novel therapies and new vaccines in pregnancy [5]. COVID-19 is an infectious illness with a rapid expansion in cases and mortality since its first recognition in China. Presently, according to the food and drug administration (FDA) of United States there is no specific treatment or vaccination introduced for the successive treatment of the coronavirus disease, only symptomatic treatment is present. Because coronavirus disease might grow the probability of risk for the complications of pregnancy, therefore the management should be done in a health care facility centers with close monitoring of the mother and fetus. Following steps should be taken for the management of the infected patient during pregnancy: isolation of the patient as soon as possible, procedures should be performed that can control the spread of infection, oxygen therapy, avoid the overload of fluid intake, empiric antibiotics, SARS-CoV-2 and co-infection testing, monitoring of the fetus and uterine contraction, early mechanical ventilation for progressive respiratory failure, delivery planning, and a team-based approach with multi-specialty consultations.

Conclusion

SARS-CoV and MERS-CoV have increased mortality and morbidity in compassion with novel coronavirus disease.

References

1. Wong SF, Chow KM, Leung TN, Ng WF, Ng TK, et al. (2004) Pregnancy and perinatal outcomes of women with severe acute respiratory syndrome. Am J Obstet Gynecol 191(1): 292-297.

2. Omrani AS, Tawfiq JAA, Memish ZA (2015) Middle East respiratory syndrome coronavirus (MERS-CoV): animal to human interaction. Pathog Glob Health 109(8): 354-362.

3. Schwartz DA, Graham AL (2020) Potential maternal and infant outcomes from (Wuhan) coronavirus 2019-nCoV infecting pregnant women: lessons from SARS, MERS, and other human coronavirus infections. Viruses 12(2): 194.

4. Ng PC, So KW, Leung TF, Cheng FWT, Lyon DJ, et al. (2003) Infection control for SARS in a tertiary neonatal centre. Archives of Disease in Childhood-Fetal & Neonatal Edition 88(5): F405-F409.

5. Shek CC, Ng PC, Fung GPG Cheng FWT, Chan PKS, et al. (2003) Infants born to mothers with severe acute respiratory syndrome. Pediatrics 112(4): e254.

6. Li AM, Ng PC (2005) Severe acute respiratory syndrome (SARS) in neonates and children. Archives of Disease in Childhood-Fetal and Neonatal Edition 90(6): F461-F465.

7. Lam CM, Wong SF, Leung TN, Chow KM, Yu WC, et al. (2004) A case-controlled study comparing clinical course and outcomes of pregnant and non-pregnant women with severe acute respiratory syndrome. BJOG

111(8): 771-774.

8. Maxwell C, McGeer A, Tai KFY, Sermer M (2017) No. 225-Management Guidelines for Obstetric Patients and Neonates Born to Mothers with Suspected or Probable Severe Acute Respiratory Syndrome (SARS). J Obstet Gynaecol Can 39(8): e130-e137.

9. Zhang JP, Wang YH, Chen LN, Zhang R, Xie YF (2003) Clinical analysis of pregnancy in second and third trimesters complicated severe acute respiratory syndrome. Zhonghua Fu Chan Ke Za Zhi 38(8): 516-520.

10. Robertson CA, Lowther SA, Birch T, Tan C, Sorhage F, et al. (2004) SARS and pregnancy: a case report. Emerg Infect Dis 10(2): 345-348.

11. Yudin MH, Steele DM, Sgro MD, Read SE, Kopplin P, et al. (2005) Severe acute respiratory syndrome in pregnancy. Obstet Gynecol 105(1): 124-127.

12. Tawfiq JAA, Kattan RF, Memish ZA (2016) Middle East respiratory syndrome coronavirus disease is rare in children: An update from Saudi Arabia. World J Clin Pediatr 5(4): 391-396.

13. Alserehi H, Wali G, Alshukairi A, Alraddadi B (2016) Impact of Middle East Respiratory Syndrome coronavirus (MERS-CoV) on pregnancy and perinatal outcome. BMC infect Dis 16: 105.

14. Payne DC, Iblan I, Alqasrawi S, Al-Nsour M, Rha B, et al. (2014) Stillbirth during infection with Middle East respiratory syndrome coronavirus. J Infect Dis 209(12): 1870-1872.

15. Jeong SY, Sung SI, Sung JH, Ahn SY, Kang ES, et al. (2017) MERS-CoV infection in a pregnant woman in Korea. J Korean Med Sci 32(10): 1717-1720.

16. Alfaraj SH, Tawfiq JAA, Memish ZA (2019) Middle East Respiratory Syndrome Coronavirus (MERS-CoV) infection during pregnancy: Report of two cases & review of the literature. J Microbiol Immunol Infect 52(3): 501-503.

17. Chen H, Guo J, Wang C, Luo F, Yu X, et al. (2020) Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet 395(10226): 809-815.

18. Zhu H, Wang L, Fang C, Peng S, Zhang L, et al. (2020) Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. Transl Pediatr 9(1): 51-60.

19. Liu D, Li L, Wu X, Zheng D, Wang J, et al. (2020) Pregnancy and perinatal outcomes of women with coronavirus disease (COVID-19) pneumonia: a preliminary analysis. AJR 215(1): 127-132.

20. Wang X, Zhou Z, Zhang J, Zhu F, Tang Y, et al. (2020) A case of 2019 Novel Coronavirus in a pregnant woman with preterm delivery. Clin Infect Dis 71(15): 844-846.

21. Poon LC, Yang H, Dumont S, Lee JCS, Copel JA, et al. (2020) ISUOG Interim Guidance on coronavirus disease 2019 (COVID-19) during pregnancy and puerperium: information for healthcare professionals- an update. Ultrasound Obstet Gynecol 55(6): 848-862.

22. Rasmussen SA, Smulian JC, Lednicky JA, Wen TS, Jamieson DJ (2020) Coronavirus Disease 2019 (COVID-19) and pregnancy: What obstetricians need to know. Am J Obstet Gynecol 222(5): 415-426.