

Case Series of Covid-19 Infected Pregnant Women Delivered Covid-19 Infected Neonates. Possibility of Vertical Transmission.

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Abstract

WHO has declared coronavirus disease 2019(COVID-19) as a public health emergency of International concern on 30th January 2020. It has a major impact on healthcare system and societies. The mother and fetus do not seem to be at particular high risk. Nevertheless, obstetrics and maternal-fetal medicine practice have suffered profound changes to adapt to the pandemic. The available information suggests that the transmission is by respiratory droplets from infected person, direct contact with contaminated surfaces by infected secretions. Limited data are available for pregnant women with COVID-19 infection and chances of vertical transmission. In this case series we have 12 cases of covid-19 infected mothers who delivered neonates tested positive for covid-19 infection in early neonatal period within 24 to 48 hours of life in our institute.

Keywords: Covid-19 infection, maternal and neonatal covid-19 infection, vertical transmission.

Introduction

A novel coronavirus (SARS-CoV-2) outbreak occurred in Wuhan (Hubei province, China) in December 2019 and the SARS-CoV-2 infection (coronavirus disease 2019 [COVID-19]) rapidly spread worldwide leading to a pandemic. World Health Organisation declared it as a pandemic on 11th March 2020.¹ A novel coronavirus is a single standard RNA enveloped virus and the illnesses can range from the common cold to Pneumonia and Acute Respiratory Distress. It can affect any age group population among those Pregnant women are one of the endangered groups who need special attention in this situation.² pregnancy may have increased risk of morbidity due to physiological changes in the cardiovascular, respiratory, and coagulation systems during pregnancy. Therefore, it is important to gain knowledge about pregnancy outcomes during the COVID-19 pandemic.

The transmission is by respiratory droplets by available information. The possibility of vertical transmission is highly unlikely and has not been demonstrated in previous epidemics by other similar coronaviruses (severe acute respiratory syndrome SARS-Cov) and the Middle East respiratory syndrome MERS-Cov. Current data do not suggest an increased risk of birth defects, miscarriage, or early pregnancy loss in pregnancies with COVID-19.³ The risk of preterm delivery has been observed in maternal SARS-CoV and MERS-CoV infections and also been described in women with COVID-19.⁴ Much is still unknown about

the effects of COVID-19 on pregnancy and neonatal outcomes according to Centers for Disease Control and Prevention(CDC). Based on the data that is available there is no evidence of the presence of viruses in genital fluids, urine, amniotic fluid, or breast milk. Neonates from COVID-19-positive women should be tested, isolated, and cared for the following droplet and contact preventive measures.⁵ The WHO recommends for mothers with COVID-19 infection to be able to room in with their babies.⁶ The mother should wear a surgical mask and practice hand hygiene when in close contact with her infant, particularly when feeding. In this case series, we are reporting cases of COVID-19 infected neonates delivered to COVID-19 infected mothers.

DETAILS OF CASES:

All 12 mothers were infected with covid-19 during the 3rd trimester and were tested by doing nasopharyngeal swab RT-PCR. Among them seven mothers were asymptomatic, four mothers were having mild symptoms of fever, cold and cough at the time of admission one mother was having SOB and respiratory failure at the time of admission . All our mothers were in 20 to 35 age group among them 4 were primigravida 8 were multigravida. One mother had abnormalities of chest CT images and bilateral involvement of lungs. USG and Doppler findings of fetal growth were appropriate in 8 cases, 3 cases were having SGA fetuses one was having Oligohydramnios AFI(3). Four mothers had vaginal delivery rest of had Cesarean sections for various indications. Out of 12 cases 8 cases had term deliveries other four were preterm deliveries. All new-borns were isolated from mothers immediately after delivery. All had 1 min Apgar score of 5 to 7 and 5 min Apgar score 8 to 9. Four babies were having LBW rest of the babies were AGA babies. All received formula feeding after the delivery and were kept isolated from Covid-19 positive mothers while waiting for Nasopharyngeal swab RT-PCR for covid-19 infection of neonates.

All neonates were tested for covid-19 infection by nasopharyngeal swab with 24 to 48 hours of delivery. Since all these case series babies were turned out to be infected with covid-19 infection were given to mothers for breast feeding after the test results of RT-PCR. Chest X-ray was done in 2 neonates and it was normal. One neonate required nasal Continuous Positive Airway Pressure (nCPAP) for 2 days later breathing become regular with 3 days. One mother who had type 1 respiratory failure at the time of admission she was primi with 36weeks 1 day with GHTN had complaints of fever, cough for 1 week and also treated for dengue and typhoid fever 2 weeks back. At the time of admission she had SOB with saturations 80% in room air 94% with 10 liters of oxygen, tachycardia, bilateral lungs had basal crepitations. ABG showed respiratory alkalosis required non-invasive ventilation-CPAP, also had hypokalemia received correction. Had emergency LSCS due to pathological CTG. Baby was having sepsis. X ray chest done for baby was normal. Both mother and baby received antibiotics and were discharged on POD-10 in a healthy condition.

All other mothers and neonates had normal hospital stay during post delivery period and were discharged in healthy condition.

Table 1: Showing Diagnosis and Blood Investigations of Cases

Parameter	Case1	Case 2	Case-3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12
Age(years)	25	28	22	28	30	24	26	21	35	25	26	27
Diagnosis at admission	Primid 34 weeks 1 day with SPE	G2L1 36 Weeks PCS	G2L1 36 Weeks PCS	G2L1 38 weeks PCS	G3P1L1 A1 39 weeks PCS	Primid 40 weeks 3 days	G3P2L2 38 weeks 1 day with hypothyroidism	Primid 39 weeks 4 days	G3P2L2 38 weeks 3 days	G4P2L2 A1 37 weeks	G3P2L2 38 weeks 2 days with 2 PCSs with SPE	Primid 36 weeks 6 days GHTN,B/L Pneumonia, Type 1 respiratory failure
Hemoglobin, g/L	11	11.8	10	11	12	11.1	8.3	10.9	11.1	10	12.9	11.3
WBC, $\times 10^3/L$	13	14	5.87	5	10	11	12.88	12.9	5.97	14	17.8	8.24
Neutrophils, $\times 10^3/L$	11	11.8	4.3	4.5	8.4	8.4	9.15	9.9	4	11	14.5	5.46
Lymphocytes, $\times 10^3/L$	1.5	1.36	1.28	0.9	1.5	1.96	2.71	2	1.51	1.5	2.31	2.15
Platelets, $\times 10^3/L$	1.1	1.8	1	2.5	2.3	3.8	1.96	3.58	2.24	3.9	1.23	1.38
AST/ALT, U/L	12/16	8.9/13	10/17	16/26		12/19	8/16	13.2/32.3	15/21		10/12	27.3/33.3
Bilirubin total/Direct/Indirect, mmol/L	0.88/0.4/-	0.77/-/-	0.55/-/-	0.35/-/-		0.4/-/-	1.14/0.38/-	0.23/0.03/-	0.45/0.08/-		1.14/-/-	0.53/0.17/-
PT-INR, seconds	11.3/0.9	10.5/0.87	11.6/0.9			14/1.17		15.7/1.19	11.5/0.95		11.6/0.96	12/0.9
Creatinine, umol/L- Blood urea	0.66/15	0.5/9.04	0.6/11	0.55/16		0.5/15	0.6/16	0.46/15.36	0.65/18		0.51/16	0.6/14
Serum sodium/potassium, mEq/L	140/3.8	139/4.3	135/3.7	144/3.8		134/4.2	136/3.6	130/4.6	137/4		139/3.6	135/2.6
USG and Doppler findings of fetal growth	Normal Doppler study, AFI[3]	USG showed SGA fetus, normal Doppler and AFI	Normal growth and AFI	USG showed SGA fetus, normal Doppler and AFI	Normal growth and AFI	Normal growth and AFI	Normal growth and AFI	USG showed SGA fetus, normal Doppler and AFI	Normal growth and AFI	Normal growth and AFI	Normal growth and AFI	Normal Growth and AFI

Table 2: Showing Severity of COVID -19 Infection and Delivery Details of Cases

Parameters	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6	Case 7	Case 8	Case 9	Case 10	Case 11	Case 12
Symptoms and Severity of disease	Mild Fever for 2 days	Asymptomatic	Mild fever for 2 days	Asymptomatic	Asymptomatic	Asymptomatic	Mild fever for 2 days	Asymptomatic	Cold and headache for 3 days	Asymptomatic	Asymptomatic	Cough, cold and SOB on exertion CT-chest :CORD S-4, 2D ECHO: normal, ECG : Normal
Mode of delivery and gestational age at delivery	Emergency LSCS at 33 weeks 4 days	Emergency LSCS at 36 weeks 2 days	Emergency LSCS at 36 weeks 4 days	Elective LSCS at 39 weeks	Emergency LSCS at 39 weeks	Emergency LSCS at 40 weeks 3 days	Vaginal delivery at 39 weeks 1 day	Vaginal delivery at 39 weeks 4 days	Vaginal delivery at 39 weeks	Vaginal delivery at 37 weeks	Elective LSCS at 38 weeks 2 days	Emergency LSCS at 36 weeks 6 days

Indication for cesarean section	Pathological CTG	Doubt full scar integrity	Doubt full scar integrity	Doubt full scar integrity	Doubt full scar integrity	Pathological CTG with MSL					Previous 2 LSCS	Pathological CTG
Preterm delivery	Yes	Yes	Yes	-	-	-	-	-	-	-	-	Yes
Birth weight	1.8 kg	2 kg	2.5 kg	2.2 kg	2.7 kg	3.5 kg	3kg	2.1kg	3kg	2.7kg	3kg	2.9kg
LBW	Yes	Yes	-	Yes	-	-	-	Yes	-	-	-	-
APGAR score 1 and 5 minutes	6 and 8	5 and 8	7 and 9	6 and 8	7 and 9	5 and 8	7 and 9	6 and 8	6 and 9	5 and 8	7 and 9	7 and 9

Table 3: Showing Postnatal Outcomes of Mother and Neonates of Cases

Parameter	Case1	Case 2	Case3	Case4	Case5	Case6	Case7	Case 8	Case9	Case10	Case11	case12
RT-PCR of neonates on day 1 of life	Positive	Positive	positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive	Positive
Chest x-ray of baby	Normal											Normal
Additional findings of baby	Baby had respiratory distress required CPAP for 1 day. received surfactant											CRP positive
Baby condition at discharge	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy	Alive and healthy
Mother condition at discharge	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive

DISCUSSION:

Since the beginning of the Covid-19 pandemic, the possibility of mother-to-child transmission has been the subject of intense research activity. Experiences and knowledge derived from previous respiratory viruses epidemic were the starting point for the first investigational activities. On March, 26th 2020 a first case of possible vertical transmission of Covid-19 infection was reported by Dong et al published on the Journal of American Medical Association.⁷ The case was neonate who delivered by cesarean section at 33 weeks 2 days tested positive for IgG antibodies and negative for IgM antibodies and nasopharyngeal swab and vaginal secretions to assess the mother to child transmission of covid-19 infection. This finding is similar to the findings of study reported by Chen et al. The possibility of a vertical transmission of the infection would have huge clinical and scientific implications. Wang et al reported one case of neonate who tested for covid-19 infection by neonatal throat swab, amniotic fluid, cord blood, breast milk samples qRT-PCR. Throat swab report was positive all other samples were negative at 36 hours of life and the neonate was discharged healthy. In this case vertical transmission could not be ruled out.⁸ Similarly Zeng et al reported 3 neonates had positive nasopharyngeal swab in their 48 hours of age. In all this 4 cases trans placental transmission could not be excluded and some findings are consistent with vertical transmission. In our case series, we reported 12 cases COVID-19 infected mothers delivered COVID-19 infected neonates proven by nasopharyngeal swab RT-PCR

tests done within 24 to 48 hours of life. There is a possibility of vertical transmission in all these neonates even though the trans-placental transmission cannot be excluded.

CONCLUSION:

Despite the increasing data on covid-19 in pregnancy currently there is not enough evidence on vertical transmission of covid-19 infection from mother to fetus. Further research involving an adequate sample is required to ascertain the possibility of vertical transmission of covid-19 infection.

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