OUTCOME OF TWENTY PREGNANT WOMEN WITH COVID-19 INFECTION-A CASE SERIES FROM PAKISTAN

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ABSTRACT

Objective: To assess vertical transmission of COVID-19 in pregnant women and to quantify the maternal and fetal outcomes.

Study Design: A case series.

Place and Duration of Study: Pak Emirates Military Hospital, Rawalpindi, from May 2020 to May 2020.

Methodology: In this case series clinical record of 20 consecutive pregnant women was reviewed who presented with COVID-19 in the Gynae & Obstetrics department of Pak Emirates Military Hospital (PEMH), Rawalpindi from 1st May, 2020 to 31st May, 2020. The demographic and clinical details were noted. The maternal outcomes in terms of mode of delivery, signs like shortness of breath, oxygen saturation, ventilator support etc. were noted. For fetal outcomes vertical transmission, APGAR score, birth weight, and admission to Neonatal Intensive Care Unit were analyzed.

Results: No maternal or fetal adverse outcomes in terms of maternal severe morbidity and mortality or fetal morbidity and mortality were noted. There were 4 women with symptoms of covid-19 (cough=2) and (body ache=2) rest were asymptomatic. All 20 neonates were observed in the nursery/Neonatal Intensive Care Unit for 24 hours after birth. None of them developed any complication. No vertical transmission of COVID-19 was found on the basis of PCR conducted 1 week apart after delivery.

Conclusion: There was no vertical transmission of COVID-19 in 20 pregnant women. There could be a relation between severity of symptoms and vertical transmission as in this study majority of cases were asymptomatic, which should be studied further.

Keywords: COVID-19, Fetal & maternal outcome, Pregnancy, Vertical transmission.

INTRODUCTION

COVID-19 has affected populations world-wide and has not let alone any age or gender[1]. Since its emergence from China in December, 2019 the corona virus infection has been assessed to understand its presence and response in different conditions[2]. Virus presence in pregnancy especially, at the time of delivery has been evaluated by many investigators and variable reports regarding its vertical transmission have been shared[3,4].

As of current the virus has affected approximately 7 million people around the world and has caused 0.4 million deaths most of them in the US and European regionshowing an overall fatality rate of 5.7%[5]. The so far COVID-19 fatality rate vary from region to region, 2% in Pakistan, 5.6% in US to 14.2% in UK and 14.4% in Italy[6].

Most of the studies done on COVID-19 is on general population targeting all age groups, however, very few have targeted special population groups such as pregnant women. And most of the trials done so far have witnessed no serious side effects on maternal and fetal outcomes, moreover, no vertical transmission has been witnessed. Evidence base suggests that older age, co-morbid conditions and immuno-compromised status of patients contacting COVID-19 are on a greater risk of severe morbidity and mortality[7]. The condition of women in pregnancy becomes risky and develops chances of co-morbidities, similarly, during delivery her life and of her fetal is at greater risk of morbidity and mortality[8]. Report from SARS-COVID-19 based analysis of

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pregnant women so far suggest variable reports regarding complication to the mother or child, however, continued attempts to monitor these groups is necessary. We planned the case series of 20 pregnant women confirmed of having COVID-19, to quantify any vertical transmission and the maternal or fetal effects.

METHODOLOGY

Thiscase seriesinvolved 20 cases of COVID-19 in pregnancy. The study was conducted in Gynae & Obstetrics Department, Pak Emirates Military Hospital (PEMH) in one month from 1st May, 2020 to 31st May, 2020. Ethics approval for the study was granted by the institutional review board (Ref no. A/28/EC/119). The administrative permission and consent of head of the department was taken to review the data. Clinical record of 20 consecutive pregnant women with COVID-19 was reviewed. The clinical symptoms, laboratory data and pregnancy outcome was analyzed.

Women were investigated by COVID-19 PCR test as well as chest x-rays. The x-ray chest was done to confirm and validate the PCR findings in the study cases. The diagnosis of COVID-19 met the criteria according to the guidance published by the National Health Commission of China.

Patient record included age, symptoms at onset, vital signs on admission, laboratory tests, the severity of COVID-19, comorbidities, treatments (multi-vitamins and calcium supplements), gestational age, outcome of pregnancy, and information on neonates (including birthweight, Apgar score, and perinatal complications).

The primary outcome of interest was vertical transmission of COVID-19 from mother to fetus. The neonates were followed in the Neonatal Intensive Care Unit and tested for infection with SARS-CoV-2 with serial RT-PCR, using samples from throat swab, same diagnostic criteria for COVID-19 in neonates was used as for adults,

Table-I: Demographic and clinical profile of cases.

Case no	Age	Gestational Age	Gravidity	Parity	Routine Antenatal	Labour Pain	Antepartum Hemorrhage	Bleeding	Prelabor Rupture of Membrane	Preterm Labour	Decreased Fetal Movements	Diagnostics	Comorbid	Medicine
1	30	40	1	0	2	2	2	2	1	2	2	PCR, Chest x-ray	no	Multivit ± Iron ± Calcium
2	24	40	3	1	1	2	2	2	2	2	2	PCR, Chest x-ray	no	
3	27	38	1	0	1	2	2	2	2	2	2	PCR, Chest x-ray	no	
4	32	37	3	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
5	25	36	3	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
6	40	37	5	4	1	2	2	2	2	2	2	PCR, Chest x-ray	HTN (PIH)	
7	25	37	5	3	1	2	2	2	2	2	2	PCR, Chest x-ray	no	
8	24	38	2	1	2	1	2	2	1	2	2	PCR, Chest x-ray	no	
9	31	38	5	4	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
10	30	38	3	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
11	24	40	1	0	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
12	31	40	2	1	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
13	28	40	4	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
14	35	36	4	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
15	26	39	1	0	2	2	2	2	2	2	2	PCR, Chest x-ray	no	
16	32	38	3	2	1	2	2	2	2	2	2	PCR, Chest x-ray	no	
17	35	37	4	2	2	1	2	2	2	2	2	PCR, Chest x-ray	no	
18	26	38	1	0	1	2	2	2	2	2	2	PCR, Chest x-ray	no	
19	30	36	3	2	1	1	2	2	2	2	2	PCR, Chest x-ray	no	
20	26	37	1	0	1	2	2	2	2	2	2	PCR, Chest x-ray	no	

PCR = Polymerase chain reaction

with at least two negative RT-PCR tests from throat swabs after birth and no evidence of pneumonia being considered as free from SARS-CoV-2 infection. The severity of disease was considered in case of fever and respiratory symptoms of shortness of breathing, radiological findings of pneumonia, respiratory rate ≥30 breaths/minute, or oxygen saturation ≤93%). The condition was considered critical in case of respiratory failure needing ventilation, shock, or organ failurethat required intensive care unit admission), according to the World Health Orga-

Table-II: Maternal outcome.

Case No.	Mode of Delivery	Postpartum Hemorrhage	Preterm delivery	Respiratory Distress	Vent. Support	Symptoms	Cough	Fever	Body Ache	Diarrhea	Nasal Congestion	Sputum	Chestpain	Shortness of Breath	Severe acute Respiratory Distress Syndrome
1	Spontaneous vaginal delivery	2	2	2	2	2	2	2	2	2	2	2	2	2	2
2	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
4	Lower segment cesarean section	2	2	2	2	1	1	2	2	2	2	2	2	2	2
5	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
6	Lower segment cesarean section	2	2	2	2	1	2	2	1	2	2	2	2	2	2
7	Lower segment cesarean section	2	2	2	2	1	2	2	1	2	2	2	2	2	2
8	Severe vaginal delivery	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Severe vaginal delivery	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Severe vaginal delivery	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Severe vaginal delivery SVD	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Severe vaginal delivery	2	2	2	2	1	1	2	2	2	2	2	2	2	2
16	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	Lower segment cesarean section	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Observation	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	Observation	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Observation	2	2	2	2	2	2	2	2	2	2	2	2	2	2

nization's Clinical Guidelines for COVID-19 and Chinese Pneumonia Diagnosis and Treatment Guidelines[9].

Analysis was conducted in SPSS version 20. Continuous variables were summarized as means and standard deviations. Categorical variables were quantified as frequency and percentage.

RESULTS

The average age of women was 29.0 ± 4.3 years ranging from a minimum of 24 years to a maximum of 40 years. The mean gestational age was 38.0 ± 1.4 weeks. There were 3 cases of SGA whereas the rest of 17 were AGA. Half of the cases were matriculate or below education level whereas 4 cases had graduate to postgraduate level education. Majority (n=17) cases were from Rawalpindi District. Eighteen women were house wives whereas 2 were working women. There were 6 cases with primigravida status and 14 were multigravida table-I.

The presentation of women was variable, there were 11 cases who presented with labour pains, 9 presented for routine antenatal checkup. Two cases had PROM. All women were diagnosed for COVID-19 on the basis of PCR and chest x-ray. One women had a co-morbidity as hypertension. Four women were symptomatic; 2 with cough and 2 with body aches whereas rest of the cases were asymptomatic. The mode of delivery was cesarean in 11 cases, 6 cases had SVD whereas 3 cases had observation table-II.

There were 14 baby boys and 6 baby girls born in this case series. The mean birth weight was 3.3 ± 0.4 kg ranging from minimum of 2.9kg to maximum of 4.3kg. The APGAR score at one minute was 7.6 ranging from 6 to 9 whereas at the APGAR score at 5 minutes was 9.5 ranging from 7 to 10. All 20 neonates were observed in the nursery/NICU for 36 hours after birth. None of the neonates developed any complication after birth. And no vertical transmission of COVID-19 was found on the basis of 2 PCR was conducted 24 hours apart after delivery table-III.

Table-III: Fetal outcome.

Case No.	Fetal Outcome	APGAR-1	APGAR-5	Birthweight	Neonatal ICU	COVID-19	Preterm baby	Jaundice	PCR Findings
1	Boy	9	10	3.4	1	2	2	2	2
2	Boy	7	10	3.1	1	2	2	2	2
3	Boy	7	10	3	1	2	2	2	2
4	Girl	7	9	3.2	1	2	2	2	2
5	Boy	7	9	3.6	1	2	2	2	2
6	Girl	7	10	3.4	1	2	2	2	2
7	Boy	8	10	3.5	1	2	2	2	2
8	Boy	9	10	3.6	1	2	2	2	2
9	Boy	9	10	3.6	1	2	2	2	2
10	Boy	8	10	3.5	1	2	2	2	2
11	Girl	6	7	3.8	1	2	2	2	2
12	Girl	7	10	3.6	1	2	2	2	2
13	Boy	7	10	4.3	1	2	2	2	2
14	Boy	8	10	2.9	1	2	2	2	2
15	Boy	8	9	3	1	2	2	2	2
16	Girl	8	9	3.4	1	2	2	2	2
17	Boy	8	9	3	1	2	2	2	2
18	Boy	8	9	3.2	1	2	2	2	2
19	Girl	8	10	3	1	2	2	2	2
20	Boy	8	10	3.2	1	2	2	2	2

DISCUSSION

This case series on COVID-19 infected pregnant women found out no vertical transmission

of the SARS-COVID-19. These findings validate the previous results of similar trials from around the globe[10,11]. As COVID-19 is still in its initial phases its effects on maternal and fetal health are not well known. Some recent smaller case series have found variable responses. Obstetricians around the world were conscious about presentation of COVID-19 cases and their concerns were high about the probable outcome of these cases[12]. The primary outcome of this case series i.e. vertical transmission of COVID-19 was similar to many recent reports on the topic. Rasmussen *et al*, witnessed that though effects like fetal distress and preterm delivery were seen, no evidence of in utero transmission was observed women with COVID-19[13]. Another study by Schwartz *et al*, assessed 38 pregnant women and their newborns in China, and found no evidence for vertical transmission[14]. One case series observed 9 pregnant women with COVID-19 in the late stage of pregnancy and witnessed negative results in all cases. They tested SARS-CoV-2 in amniotic fluid, cord blood, neonatal throat swab, and breastmilk samples. However, that study failed to answer whether it was possible to get the infection during vaginal delivery, because all the neonates were born by cesarean section[15]. In our study 6 cases had SVD and 3 observations and we did not found any vertical transmission. There were in contrast reports as well, one study investigated 19 neonates born to COVID-19 infected women in Wuhan, of which three were reported as SARS-CoV-2 positive. All infants with COVID-19 were confirmed early on the second day of life[16].

Unlike previous reports on studies based on H1N1 influenza and SARS-CoV where maternal and fetal outcomes were compromised by severe effects of virus SARS-CoV-2 had less side effects as well as vertical transmission rates. We noticed PROM in 2 cases, however, no other maternal or fetal complications were observed. Lieu *et al*, in a recent case series reported emergency caesarean section because of fetal distress (three), premature rupture of the membrane (one) and stillbirth (one) though the condition of COVID-19 in most of patients was mild to moderate[17]. The current study's mothers did not develop any serious side effects. Many other previous trials on women with H1N1 influenza and SARS-CoV witnessed significant maternal and fetal outcomes[18,19].

In this study no adverse fetal outcomes was observed, all neonates had adequate birth weight and no fetal distress, or premature birth was observed. Zhang *et al*, reported fetal distress and neonatal asphyxia in their study on COVID-19 infected women[20]. The contradictory results suggest further studies on the effects of COVID-19 in pregnancy.

In brief, it can be said that in Pakistan pregnant women with COVID-19 infection have less chances of maternal or fetal complications and vertical transmission of the disease is also not proven.

CONCLUSION

Based on this observation; it can be concluded that though COVID-19 is a serious threat to global populations and variable reports regarding it effects on maternal and fetal outcomes have been witnessed, this argument has not been proven in the current case series. We witnessed no serious maternal or fetal threat. No neonate was found to have vertical transmission of the disease. Further large scale trials are mandatory before generalization of the results of the current study.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

REFERENCES

1. Khan S, Siddique R, Ali A, Xue M, Nabi G. Novel coronavirus, poor quarantine, and the risk of pandemic. J Hosp Infect 2020; 104(4): 449-50.
2. Khan S, Nabi G, Han G, Siddique R, Lian S, Shi H. Novel coronavirus: how the things are in Wuhan. Clin Microbiol Infect 2020; 26(4): 399–00.
3. Chen L, Li Q, Zheng D, Jiang H, Wei Y, Zou L, et al. Clinical characteristics of pregnant women with COVID-19 in Wuhan, China. N Engl J Med 2020; 382(1): 1-3.
4. Smith V, Seo D, Warty R, Payne O, Salih M, Chin KL. Maternal and neonatal outcomes associated with COVID-19 infection: A systematic review. PLoS ONE 2020; 15(6): e0234187-99.
5. WHO. Coronavirus disease 2019 (COVID-19) Situation Report. Mar 16, 2020 (https://wwwwhoint/docs/default-source/

coronaviruse/situation-reports/20200318-sitrep-58-COVID-19pdf?sfvrsn = 20876712_2 (accessed Mar 16, 2020).
6. World Health Organization. Estimating Mortality from COVID-19. Available at URL: https://www.who.int/news-room/commentaries/detail/estimating-mortality-from-covid-19 (Accessed 15-06-2020).
7. Schnake-Mahl AS, Carty MG, Sierra G, Ajayi T. Identifying Patients with Increased Risk of Severe COVID-19 Complications: Building an Actionable Rules-Based Model for Care Teams. NEJM Catalyst Innovations in Care Delivery. 2020; 1(3): 1-10.
8. Filippi V, Chou D, Ronsmans C, Graham W, Say L. Levels and Causes of Maternal Mortality and Morbidity. Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, Third Edition (Volume 2). https://www.ncbi.nlm.nih.gov/books/NBK361907/ pdf/Bookshelf_NBK361907.pdf
9. National Health Commission of the People's Republic of ChinaTranscript of Press Conference on Feb 7, 2020. Available at URL:http://www.nhc.gov.cn/xcs/s3574/202002/5bc099fc9144445297e8776838e57ddc.shtml Date accessed: February 7, 2020 (in Chinese).
10. Huang C, Wang Y, Li X, Ren L, Zhao J, Hu Y, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. lancet 2020; 395(10223): 497-06.
11. Chen H, Guo J, Wang C, Luo F, Yu X, Zhang W, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. Lancet 2020; 395(1): 809-15.
12. Poon LC, Yang H, Kapur A, Melamed N, Dao B, Divakar H, 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 Gynecol Obstet 2020; 149(3): 273-86.
13. Rasmussen SA, Smulian JC, Lednicky JA, Wen TS, Jamieson DJ. Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know. Am J Obstet Gynecol 2020; 222(5): 415-26.
14. Schwartz DA, Graham AL. Potential Maternal and Infant Outcomes from (Wuhan) Coronavirus 2019-nCoV Infecting Pregnant Women: Lessons from SARS, MERS, and Other Human Coronavirus Infections. Viruses 2020; 12(2): 194-99.
15. Zhu H, Wang L, Fang C, Peng S, Zhang L, Chang G, et al. Clinical analysis of 10 neonates born to mothers with 2019-nCoV pneumonia. Transl Pediatr 2020; 9(1): 51-60.
16. Zeng L, Xia S, Yuan W, Yan K, Xiao F, Shao J, et al. Neonatal early-onset infection with SARS-CoV-2 in 33 neonates born to mothers with COVID-19 in Wuhan, China. JAMA Pediatr 2020; 174(7): 722-25.
17. Liu Y, Chen H, Tang K, Guo Y. Clinical manifestations and outcome of SARS-CoV-2 infection during pregnancy. J Infect 2020; 4453(20): 30109-12.
18. Jamieson DJ, Honein MA, Rasmussen SA, Williams JL, Swerdlow DL. H1N1 2009 influenza virus infection during pregnancy in the USA. Lancet 2009; 374(9688): 451-58.
19. Lam CM, Wong SF, Leung TN, Chow KM, Yu WC, Wong TY, et al. A case-controlled study comparing clinical course and outcomes of pregnant and non-pregnant women with severe acute respiratory syndrome. BJOG: An Inter J Obstet Gynae 2004; 111(8): 771-74.
20. Zhang L, Jiang Y, Wei M, Cheng BH, Zhou XC, Li J, et al. Analysis of the pregnancy outcomes in pregnant women with COVID-19 in Hubei Province. Zhonghua fu chanke za zhi 2020; 55(1): E009-E009.