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ORIGINAL ARTICLE

Impacts of Covid-19 Pandemic on the Early Trimester Pregnancies

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ABSTRACT

Background and Aim: The COVID-19 pandemic caused by severe acute respiratory syndrome (SAR-CoV-2) had severe consequences and complications on the global health care system. Recent medical studies have been focused on the effect of COVID-19 pandemic on pregnancies outcomes especially early pregnancies. The present study aimed to investigate the impacts of the COVID-19 pandemic early-trimester pregnancies.

Materials and Methods: This retrospective study was carried out on 76 women who visited Obstetrics and Gynecology department for the first and second-trimester viability scan at Government Hospital, Samnabad Lahore from 1st January 2021 to 30th June 2021. Individuals of age between 19 years and 40 years with a diagnosis of spontaneous miscarriage were enrolled in this study. Ethical approval was taken from the respective hospital's ethical review committee. Patients with recurrent pregnancy loss, induced miscarriage, and other co-morbidities were excluded. All the demographic details were taken from the hospital medical record. All the patients underwent routine baseline tests to confirm the COVID-19 history and its impacts on the early trimester of pregnancy. The outcomes of early trimester pregnancy were viable pregnancy, miscarriage, pregnancy loss, and ectopic pregnancy were calculated in terms of frequency and percentage. SPSS version 20 was used for data analysis.

Results: The overall mean age study group patients was 28.72± 3.63 years. The control group comprised 57 pregnant women with a gestational age of 5 weeks to 11 weeks, and the mean maternal age was 34.83±4.91 years. Out of total pregnant women, 31 (40.7%) were of age 19-25 years old, 29 (38.2%) had age 25 to 30 years, and 31 to 40 years were 16 (21.1%). Of the total 76 pregnant women, about 41 (54%) had a miscarriage with positive COVID-19 tests and 24 (31.6%) had spouses who had COVID-19 positive tests. History of both spouse and personal positive COVID tests were eleven patients (14.4%). The incidence of miscarriage among control group was 10 (17.5%).

Conclusion: Our study found that the COVID-19 pandemic significantly affects the rate of pregnancy loss during the early trimester (first and second pregnancy). The maternal viremia or vertical transmission caused early trimester pregnancy loss and maternal infection during COVID-19.

Keywords: Pregnancy, Miscarriage, COVID-19 Pandemic

INTRODUCTION

The COVID-19 disease, instigated by severe acute respiratory syndrome coronavirus (SARS-CoV-2), has had worldwide pandemic complications [1, 2]. The virus was discovered in Wuhan, China, and has spread since 2019 globally, infecting over 91 million populations various regions [3–5]. Emerging evidence suggests that the pregnant and non-pregnant women are coarsening the disease generally comparable [6, 7]. However, the physiological variations associated with pregnancy (such as increased stroke volume, decreased volume of functional residual and respiratory tract mucosal edoema) [8] as well as adverse neonatal complications possibility of attentive exertions to thoroughly evaluate the destitute SARS-CoV-2 outcome had potential risk factors for the pregnant population. Previous research has associated with increased risk of viral pneumonia to preterm birth and perinatal mortality in pregnant women [9, 10].

SARS-CoV-2 was associated with an increase in maternal morbidity and mortality, miscarriage, and preterm birth, and intrauterine growth restriction among infected mothers [11, 12]. However, SARS-CoV-2 might affect pregnancy and the risks it poses to the unborn child and mother needs to be determined [13]. More specifically, due to the virus's novelty and recent spread, there is a scarcity of data on maternal and perinatal outcomes when the infection occurs in the early trimester of pregnancy. The CDC's frequent report emphasized adverse effects of COVID-19 on pregnancy and prevails on more extensive research to be carried out [14]. Evaluating the liaison of the early gestational trimesters of pregnancy is critical in COVID-19 for an effective counseling and provides vital intuition into pandemic may influence the future pregnancy.

It is thought to be a highly contagious disease spread by infected people's respiratory droplets, whether symptomatic or asymptomatic. COVID-19 symptoms range from asymptomatic patients to mild upper respiratory tract infection to severe and fatal pneumonia and acute respiratory failure [15]. It is unclear how the virus affects pregnancy, the fetus, and the newborn. Because pregnant women's immune responses differ from those of non-pregnant women, these women are more likely to experience maternal, fetal, and neonatal complications in addition to the usual course of disease [16, 17] Paternal infection may have an effect on various parameters of sperm, which may play a role in miscarriage.

METHODS

This retrospective study was carried out on 76 women who visited Obstetrics and Gynecology department for the first and second-trimester viability scan at Government Hospital, Samnabad Lahore from 1st January 2021 to 30th June 2021. Individuals of age between 19 years and 40 years with a diagnosis of spontaneous miscarriage were enrolled in this study. Ethical approval was taken from the respective hospital's ethical review committee. Patients with recurrent pregnancy loss, induced miscarriage, and other co-morbidities were excluded. All the demographic details were taken from the hospital medical record. All the patients underwent routine baseline tests to confirm the COVID-19 history and its impacts on the early trimester of pregnancy. The outcomes of early trimester pregnancy were viable pregnancy, miscarriage, pregnancy loss, and ectopic pregnancy were calculated in terms of frequency and percentage.

Demographic details booked antenatal, and miscarriage patients were taken from the hospital medical record. All the diagnosed miscarriage patients' obstetric and medical history were recorded especially myalgia, family history, fever, upper /lower respiratory tract infection, and anosmia during COVID-19 with current pregnancy. Polymer Chain reaction of coronavirus and chest X-rays were performed for the diagnosis of early-trimester pregnancy miscarriage. Routine blood tests such as HbsAg, blood complete picture, random blood sugar, blood group, and HCV were performed. SPSS version 20 was used for data analysis.

RESULTS

The overall mean age of study group patients was 28.72± 3.63 years. The control group comprised 57 pregnant women with a gestational age of 5 weeks to 11 weeks, and the mean maternal age was 34.83±4.91 years.

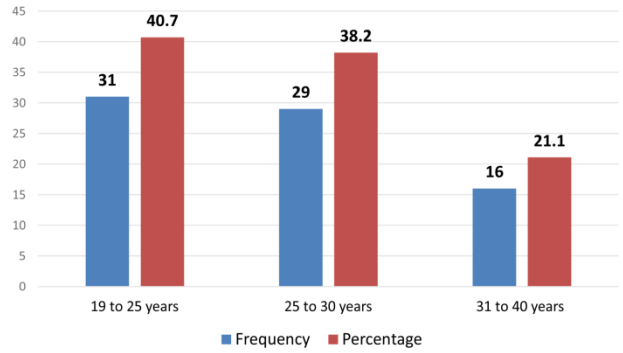

Figure-1 Age wise distribution of 76 patients

Out of total pregnant women, 31 (40.7%) were of age 19-25 years old, 29 (38.2%) had age 25 to 30 years, and 31 to 40 years were 16 (21.1%). Of the total 76 pregnant women, about 41 (54%) had a miscarriage with positive COVID-19 tests and 24 (31.6%) had spouses who had COVID-19 positive tests. History of both spouse and personal positive COVID tests were eleven patients (14.4%). The incidence of miscarriage among control group was 10 (17.5%). Figure-1 showed the age wise distribution of study group 76 patients. Table-1 and Figure-2 demonstrate the prevalence of COVID-19 positive testes with early trimesters of pregnancy complications. Comparison of the incidence of miscarriage among study and control groups as shown in Figure 3.

Table-1. The prevalence of COVID-19 positive tests history with early trimesters of pregnancy complications.

Early trimesters pregnancy and COVID-19 tests History	Frequency N	Percentage %
Miscarriage with positive COVID-19 tests	41	54
Spouses with COVID-19 positive tests	24	31.6
Spouse and personal positive COVID tests history	11	14.4
Total	76	100

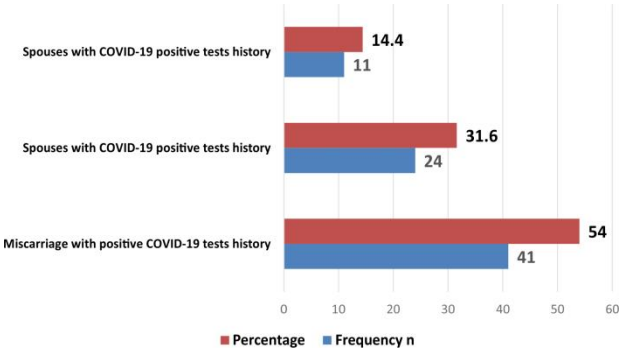

Figure-2 The prevalence of COVID-19 positive tests history with early trimesters of pregnancy complications.

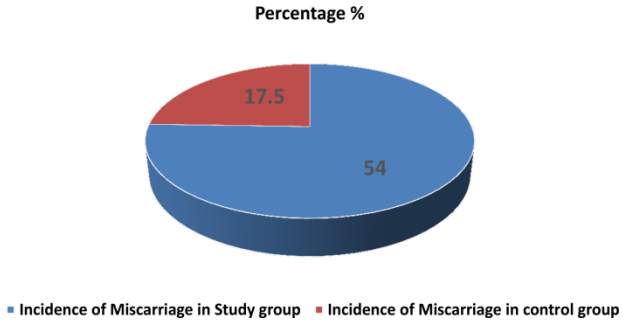

Figure-3. Comparison of the incidence of miscarriage among study and control groups

DISCUSSION

Despite the fact that the majority of symptoms are mild, pregnant women and newborns are a concerning population because of the sarcastic data on the COVID-19 infected outcome and complications in pregnant women [18]. Maternal mortality rate was highly observed during the SARS-CoV-2 outbreak [19]. Infected pregnant women who survived reported miscarriages in the first trimester and intrauterine growth restriction (IUGR) in the second and third trimesters [20]. Considering the emerging challenges of the COVID-19 pandemic, the pregnant population should be placed for identifications of pregnancy outcomes and complications. The recent study is among few advanced studies which evaluate the clinical characteristics of early pregnancy during the COVID-19 pandemic. A study conducted on coronavirus impact on pregnancy reported prevalence of symptoms like cough (33%) and fever (39%)

in early trimester pregnant women [21]. Other studies found similar findings in the third trimester of pregnancy [22, 23]. Another study was carried out on third trimesters pregnancy found a higher prevalence of fever (68%) and cough (34%) among third-trimester pregnant women [24]. Vascular system damage and neuroblast cells might die due to cell migration disruption associated with elevated temperature in pregnant women [25]. The organogenesis period during the first trimesters has potential concern over neonatal and maternal outcomes [26].

Another study reported miscarriage experienced in second trimesters pregnancy with COVID-19. Swabs of meconium, placenta, amniotic fluid, fetal blood, and fetal mouth were taken for the fetal autopsies and histological examination of the placenta. Histopathology results showed infiltrate inflammation on the placenta despite the negative results of Swabs. Negative swabs caused the maternal disease severity level short and mild. Fetal demise caused by maternal positive COVID-19 tests [27]. A Chinese recent investigation revealed various biological samples such as saliva, urine, respiratory tract, lacrimal secretions, and feces in coronavirus-positive tested patients. Maternal to neonatal vertical transmission has been suspected but virus localization in the genital area or tract is under investigation [28].

Another study reported respiratory distress syndrome and the need for a ventilator in confirmed positive tested coronavirus patients. Aspirin, Paracetamol, Azithromycin, and Loratidine were utilized for the treatment of patients with mild to moderate symptoms [29]. Later stage gestation was investigated in early pregnancy by another researcher from China and found possible transmission and clinical investigations in intrapartum and intrauterine. Besides radiological findings in neonates, some neonates had Immunoglobulin G (lgG) and Immunoglobulin M (lgM) [30]. The severe acute respiratory syndrome virus vertical transmission was evaluated through chronic villi and amniotic fluid of COVID-19 in early pregnant women. Invasive technique indications were studied in pregnant women with polymer chain reaction positive results [31].But in the present study, first and second trimesters pregnancies were investigated with the incidence of miscarriage among positive tested COVID-19 patients. All the patients of induced abortions, pregnancy loss, co-morbidities, and maternal age<20 and > 40 years were excluded in the present study.

CONCLUSION

Our study found that the COVID-19 pandemic significantly affects the rate of pregnancy loss during the early trimester (first and second pregnancy). The maternal viremia or vertical transmission caused early trimester pregnancy loss and maternal infection during COVID-19.

REFERENCES

1. Khalil A, Kalafat E, Benlioglu C, O'Brien P, Morris E, Draycott T, Thangaratinam S, Le Doare K, Heath P, Ladhani S, von Dadelszen P, Magee LA. SARS-CoV-2 infection inpregnancy:A systematic review and meta-analysis of clinical features and pregnancy outcomes. EClinicalMedicine 2020; 25: 100446.
2. Allotey J, Stallings E, Bonet M, Yap M, Chatterjee S, Kew T, Debenham L, Llavall AC, Dixit A, Zhou D, Balaji R, Lee SI, Qiu X, Yuan M, Coomar D, van Wely M, van Leeuwen E, Kostova E, Kunst H, Khalil A, Tiberi S, Brizuela V, Broutet N, Kara E, Kim CR, Thorson A, Oladapo OT, Mofenson L, Zamora J, Thangaratinam S; for PregCOV-19 Living Systematic Review Consortium. Clinical manifestations, risk factors, and maternal and perinatal outcomes of coronavirus disease 2019 in pregnancy: living systematic review and meta-analysis. BMJ 2020; 370: m3320.
3. Cosma S, Carosso AR, Cusato J, Borella F, Carosso M, Bovetti M, Filippini C, D'Avolio A, Ghisetti V, Di Perri G, Benedetto C. Coronavirus disease 2019 and first-trimester spontaneous abortion: acase-control study of 225 pregnant patients. Am J Obstet Gynecol 2021; 224: 391.e1–7.
4. Chmielewska B, Barratt I, Townsend R, Kalafat E, van der Meulen J, Gurol-Urganci I, O'Brien P, Morris E, Draycott T, Thangaratinam S, Le Doare K, Ladhani S, von Dadelszen P, Magee L, Khalil A. Effects of the COVID-19 pandemic on maternal and perinatal outcomes: a systematic review and meta-analysis. Lancet Glob Health 2021. DOI: 10.1016/S2214-109X(21)00079-6.
5. Yu N, Li W, Kang Q, Zeng W, Feng L, Wu J. No SARS-CoV-2 detected in amniotic fluid in mid-pregnancy. Lancet
6. Infect Dis 2020; 20: 1364. 31. Liu Y, Chen H, Tang K, Guo Y. Clinical manifestations and outcome of SARS-CoV-2 infection during pregnancy.
7. J Infect 2020. DOI: 10.1016/j.jinf.2020.02.028. 32. Wang J, Shu S, Zhang T, Zheng C. Chest CT findings in a pregnant woman in the second trimester with COVID-19 pneumonia. Clin Imaging 2021; 69: 266-8.
8. Panichaya P, Thaweerat W, Uthaisan J. Prolonged viral persistence in COVID-19 second trimester pregnant patient. Eur J Obstet Gynecol Reprod Biol 2020; 250: 263.
9. Inchingolo R, Smargiassi A, Moro F, et al. The diagnosis of pneumonia in a pregnant woman with coronavirus disease 2019 using maternal lung ultrasound. Am J Obstet Gynecol 2020; 223: 9-11.
10. Crovetto F, Crispi F, Llurba E, Figueras F, Gómez-Roig MD, Gratacós E. Seroprevalence and presentation of SARSCoV-2 in pregnancy. Lancet (London, England) 2020; 396: 530-1.
11. Hachem R, Markou GA, Veluppillai C, Poncelet C. Late miscarriage as a presenting manifestation of COVID-19. Eur J Obstet Gynecol Reprod Biol 2020; 252: 614.
12. Piersigilli F, Carkeek K, Hocq C, et al. COVID-19 in a 26week preterm neonate. Lancet Child Adolesc Health 2020; 4: 476-8.
13. Cosma S, Borella F, Carosso A, et al. The "scar" of a pandemic: cumulative incidence of COVID-19 during the first trimester of pregnancy. J Med Virol 2021; 93: 537-40.
14. Lamazou F, Oger P, Dieli-Crimi R, et al. COVID-19 infection in first trimester of pregnancy marked by a liver cytolysis in a woman previously treated by hydroxychloroquine for repeated implantation failure: a case report. BMC Infect Dis 2020; 20: 845.
15. Tang J, Song W, Xu H, Wang N. No evidence for vertical transmission of SARS-CoV-2 in two neonates with mothers infected in the second trimester. Infect Dis (Lond) 2020; 52: 913-6.
16. Hong L, Smith N, Keerthy M, et al. Severe COVID-19 infection in pregnancy requiring intubation without preterm delivery: a case report. Case Rep Womens Health 2020; 27: e00217.
17. Rubio Lorente AM, Pola Guillén M, López Jimenez N, et al. Study of amniotic fluid in pregnant women infected with SARS-CoV-2 in first and second trimester. Is there evidence of vertical transmission? J Matern Fetal Neonatal Med 2020. DOI: 10.1080/14767058.2020.1811669
18. La Cour Freiesleben N, Egerup P, Hviid KVR, et al. SARSCoV-2 in first trimester pregnancy: a cohort study. Hum Rep 2021; 36: 40-7.

19. 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: 415-26.
20. Alfaraj SH, Al-Tawfiq JA, Memish ZA. Middle East respiratory syndrome coronavirus (MERS-CoV) infection during pregnancy: report of two cases and review of the literature. J Microbiol Immunol Infect 2019; 52: 501-3.
21. Chen N, Zhou M, Dong X, Gong F, Han Y, Qiu Y, Wang J, Liu Y, Wei Y, et al. Epidermiolgical and clinical characteristics of 99 cases of 2019 novel coronavirus pneumonia in Wuhan, China. A descriptive study. Lancet 2020;395(10223):507-513.
22. Kourtis AP, Read JS, Jamieson DJ. Pregnancy and infection. N Engl J Med 2014;370:2211-2218.
23. Wong D, Hu B, Hu C, Zhu F, Liu X, Zang J, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus infected pneumonia in Wuhan, China. JAMA 2020;323:1061-1069.
24. Alvaro Francisco, Herica Emilia, Layze B, Guilherme S, Emerson L, Evandro W, et al. Effects of Covid 19 infection during pregnancy and Neonatal Prognosis: What is the Evidence? Int J Environ Res Public Health 2020;17(11):4176. https://doi.org/10.3390/ijerph17114176.
25. Qiao J. What are the risks of COVID-19 infection in pregnant women? Lancet 2020;396:760-762.
26. Baud D, Greub G, Favre G, Gengler C, Jaton K, Dubruc E, et al. Second trimester miscarriage in a pregnant woman with SARS-Co V-2 infections. JAMA 2020;e207233.
27. Pilot study to detect SARS-Co V-2 virus and sperm (COVSPERM). Clinicaltrials.gov Identifier: NCT 04584593. 9. Moumita Sarkar, Cindy Woodland, Gideon Koren, Adrienne RN. Pregnancy outcome following gestational exposure to azithromycin. BMC Pregnancy and Child birth 2006;6:18. doi:10.1186/1471-2393-6-18.
28. Yan-Ting Wu, Jun Liu, Jing-Jing Xu, Yan-Fen Chen, Wen Yang, Yang Chen, et al. Neonatal outcome of 29 pregnant women with COVID-19: A retrospective study in Wuhan, China. PLoS Med 2020;07;17(7):e1003195
29. US National Library of Medicine. Clinicaltrial.gov Identifier: NCT 04598347. Evaluation of possible vertical transmission of SARS-CoV-2 through study of Amniotic Fluid and Chorionic Villi of Affected Pregnant women for COVID-19.
30. Zaigham M, Andersson O. Maternal and perinatal outcomes with COVID-19: A systematic review of 108 pregnancies. Acta Obstet Gynecol Scand 2020; 99: 823-9.
31. Edwards MJ. Hyperthermia in utero due to maternal influenza is an environmental risk factor for schizophrenia. Congenit Anom (Kyoto) 2007; 47: 84-9. 52. Ovali F. SARS-CoV-2 Infection and the Newborn. Front Pediatr 2020; 8: 294.