IMPACT OF COVID-19 ON PREGNANCY OUTCOMES: A CROSS SECTIONAL STUDY

Dr. Farah Yousaf¹, Dr. Sadaf Mubeen², Dr. Amna Javaid³, Dr Muhammad Aamir Raffique⁴, Hafiza Sobia Ramzan⁵

¹Professor Lady Aitchison Hospital

²Senior Registrar Obs. and Gynea., Lady Aitchison Hospital Lahore.

³Post Graduate Resident. Lady Aitchison Hospital Lahore.

⁴Assistant Professor Pharmacology

⁵Ph.D Scholar, Institute of Molecular Biology and Biotechnology (IMBB), University of Lahore.

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Corresponding author: Dr. Sadaf Mubeen

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Abstract:

Introduction: Atypical pneumonia known as coronavirus disease (COVID-19), which is caused by the SARS-CoV-2 virus, is highly infectious and is currently spreading rapidly around the globe.

Objectives: The main objective of the study is to analyses the impact of COVID-19 on pregnancy outcomes among local population of Pakistan.

Material and Methods: This cross sectional observational study was conducted in Lady Aitchison Hospital during September 2019 to August 2020. The data was collected through systematically designed questionnaire. Clinical characteristics, examination results, and treatment course were extracted from their medical records. For mothers, we collected socio demographic data, educational attainment, and occupation, maternal parity, medical history records, laboratory tests, and intensive care unit [ICU] admission.

Results: The data was collected from 685 patients. The two groups of pregnant women were compared in terms of severe preeclampsia, gestational diabetes, premature rupture of membranes, fetal distress, maternal mortality, IUD, fecal staining of amniotic fluid, premature birth, neonatal asphyxia, Abruption or other compression sutures, and there was no significant difference Significance (all $P > 0.05$); the proportion of IUD in the COVID-19 group was higher than that in the non COVID-19 group, and the difference between the two groups was statistically significant.

Conclusion: It is concluded that those patients who visited the hospital during COVID-19 pandemics have high rate of IUD, placenta abruption and maternal death.

Keywords: IUD., COVID-19

Introduction:

Atypical pneumonia known as coronavirus disease (COVID-19), which is caused by the SARS-CoV-2 virus, is highly infectious and is currently spreading rapidly around the globe. Since the emergence of SARS-CoV-2 in Wuhan, Hubei Province, China, during December 2019, it has caused thousands of morbidities and mortalities around the globe¹.

Many studies have focused on infected patients from the general population; however, details related to pregnancy outcomes of women with COVID-19 are scarce. Chen et al reported the maternal neonatal outcomes and vertical transmission potential of COVID-19 pneumonia in pregnant women. Their report focused on pregnant women who delivered babies through C-section only, and no case for normal vaginal delivery has been reported. Moreover, healthcare

workers were not included, even though healthcare workers are at higher risk of contracting the infection and psychological consequences².

Pregnant women may be at risk of having more severe disease, preterm deliveries are more common, and maternal and neonatal mortalities have been reported. Furthermore, risk of miscarriage associated with COVID-19 remains unclear although the presence of severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) in a second trimester placenta has been demonstrated³. These uncertainties are likely to add to psychological stress and may even lead to increased rates of pregnancy terminations. As many hospitals have put restrictions on visits by partners and relatives to pregnant women admitted to hospitals for delivery, some women may choose to deliver at home. This could create a problem as availability of qualified birth attendants and midwives to support home deliveries is limited, even in affluent countries, and may lead to increased maternal and neonatal complications⁴.

As SARS-CoV-2 continues to spread rapidly worldwide, pre-natal management, fetal safety, and the potential of vertical transmission (mother to fetus) are of significant interest and concern. However, based on available data, pregnant women do not appear more likely to contract the infection than women in the general population⁵.

Anyone planning a pregnancy in the time of COVID-19 might consider delaying until after the pandemic; however, there is no data to recommend doing so in otherwise healthy individuals. Pregnant women with congenital or acquired heart disease are at highest risk, and it is also important to consider the potential impact of pre-existing hyperglycemia, hypertension, and preeclampsia on the outcome of COVID-19 in pregnant women. Women with any other underlying disease or considered to have high-risk pregnancies will need to seek specialist advice early on as there may be additional prenatal or antenatal considerations in this group despite limited studies at the present time⁶.

Factors affecting pregnant women's health

Possible factors could be

1. Maternal depression due to COVID-19
2. Missing antenatal visits due to lockdown
3. Late diagnosis of high risk of pregnancy due to missing visits.
4. Managing delivery at home with birth attendants instead of visiting hospital due to COVID-19.

Objectives

The main objective of the study is to analyse the impact of COVID-19 on pregnancy outcomes among local population of Pakistan.

Material and methods

This cross sectional observational study was conducted in Lady Aitchison Hospital during September 2019 to August 2020. The data was collected through systematically designed questionnaire.

Inclusion criteria

All the pregnant women's who gave birth during this study period were included in this study.

Exclusion criteria

Those who have any other metabolic issue were excluded from this study.

Data collection

Clinical characteristics, examination results, and treatment course were extracted from their medical records. For mothers, we collected socio demographic data, educational attainment, and occupation, maternal parity, medical history records, laboratory tests, and intensive care unit [ICU] admission. For all women, we registered pregnancy outcomes, i.e., gestational age at delivery, mode of delivery, and occurrence of gestational hypertensive disorder, gestational diabetes mellitus, premature rupture of membranes, and fetal distress. We collected the data into two parts one is 1st six months and last six months of the year. Descriptive data include total number of births in one year, types of birth (C-section or normal delivery), eclampsia or pre-

eclampsia, uterine rupture and maternal mortality. Neonatal data collected included sex, birthweight, 1- and 5-minute Apgar scores, congenital anomalies, fever, respiratory distress and neonatal ICU (NICU) admission.

Statistical analysis

Then we compare all the data and analyzed it using SPSS version 19. All the values were expressed in mean and standard deviation.

Results

The data was collected from 685 patients. The descriptive statistics of all selected patients are represented in table 01. The mean birth score was 374 ± 107.27 and out of this the mean score of S-section deliveries were 171 ± 76 .

Table 1: descriptive statistics of selected patients

Descriptive Statistics						
	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
PT'S SEEN	2284.00	350.129	.667	.637	.871	1.232
Admission	453.08	124.863	2.288	.637	6.149	1.232
Total Birth	374.00	107.277	1.828	.637	4.380	1.232
SVDS	204.42	49.992	1.261	.637	.774	1.232
C.SEC	171.00	76.485	1.320	.637	1.494	1.232
PIH	10.08	2.843	.212	.637	-.593	1.232
GDM	10.42	7.573	.797	.637	-1.147	1.232
ANEMIAS	18.33	10.369	.913	.637	-.423	1.232
ACUTE HEPATITIS	2.08	1.730	.227	.637	-1.217	1.232
ECTOPIC PREGANCY	2.58	1.730	.654	.637	.050	1.232
ABRUPTIONS	3.75	1.815	1.101	.637	1.360	1.232
PRE ECLAMPSIA	3.75	1.288	-.057	.637	-.657	1.232
ECLAMPSIA	1.83	1.642	.909	.637	-.358	1.232
PPH	1.75	1.357	.540	.637	-.605	1.232
ACCRETA/INCRETA	.75	1.055	1.149	.637	.126	1.232
UTERINE RUPTURES	.50	.674	1.068	.637	.352	1.232
MATERNALMORTALITY	.58	.793	.988	.637	-.464	1.232
Received IUD	1.50	1.087	.255	.637	-1.128	1.232

The two groups of pregnant women were compared in terms of severe preeclampsia, gestational diabetes, premature rupture of membranes, fetal distress, maternal mortality, IUD, fecal staining of amniotic fluid, premature birth, neonatal asphyxia, Abruption or other compression sutures, and there was no significant difference Significance (all $P > 0.05$); the proportion of IUD in the COVID-19 group was higher than that in the non COVID-19 group, and the difference between the two groups was statistically significant.

Table 2: Paired sample statistics of IUD and placenta abruption among two groups

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	R.IUD1	1.1667	6	1.16905	.47726
	R.IUD2	1.8333	6	.98319	.40139
Pair 2	Placenta. Abruption	3.0000	6	1.26491	.51640
	Placenta Abruption2	4.5000	6	2.07364	.84656

Table 3: Correlation analysis between two groups

Paired Samples Correlations		N	Correlation	Sig.
Pair 1	R.IUD1 & R.IUD2	6	-.319	.538
Pair 2	Placenta Abruptio 1 & Placenta Abruptio 2	6	-.457	.362

Table 4: Significance value and paired sample t-test for IUD and placenta abruptio

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	R.IUD1 - R.IUD2	-.66667	1.75119	.71492	-2.50443	1.17109	-.933	5	.394
Pair 2	Placenta Abruption 1 – Placenta Abruption 2	1.50000	2.88097	1.17615	-4.52339	1.52339	-1.275	5	.258

Discussion

The data was collected from 685 patients. Our results shows that there is a significant difference of receiving IUD among two groups of patients. Data shows that those patients who visited the hospital during COVID-19 have high rate of IUD, placenta abruptio and maternal death rate. The health of pregnant women needs to be taken into account during this rapidly changing coronavirus pandemic. It is important to provide critical interventions necessary for pregnant women⁷. These carefully evaluated decisions must be extensively discussed while considering both maternal and foetal outcomes in the context of the potential impact of COVID-19 on the pregnancy⁸.

Pregnant women undergo physiological changes, which lead to altered immune systems. This does not necessarily make them more susceptible to viral infection; hence, their response to COVID-19 may be similar to any other viral infection. However, due to the modulated immune system, they may experience severe symptoms, albeit there is a low probability of this happening. According to 1 study, pregnancy itself does not

worsen the symptoms experienced, or the findings on a CT scan of COVID-19 related pneumonia⁹.

Given the novelty of COVID-19, not enough evidence is available to conclude the definite effect of this virus during pregnancy. Comparison to other coronavirus infections, such as SARS and MERS, may provide a possible indication of the outcome of the COVID-19 virus process. Three studies have reported no maternal complications, such as postpartum COVID-19 infection and preterm labour. However, various other studies have reported both maternal and foetal complications including preterm delivery, respiratory distress, foetal distress, and PROM¹⁰. Additionally, a case report published in Iran has stated 1 maternal death and subsequently 1 intrauterine foetal death, which has been directly linked to the COVID-19 infection during the third trimester¹¹. In an adjudicated case series from Iran, 9 pregnant women diagnosed with severe COVID-19 disease during their later second or third trimester were identified. At the time of reporting, 7 of 9 died, 1 of 9 remained critically ill and ventilator-dependent, and 1 of 9 recovered after prolonged hospitalisation¹².

Conclusion

It is concluded that those patients who visited the hospital during COVID-19 pandemics have high rate of IUD, placenta abruption and maternal death. This is not only because of COVID-19 but there are other factors also that contribute towards death. Due to a paucity of inconsistent data regarding the impact of COVID-19 on the newborn, caution should be undertaken to further investigate and monitor possible infection in the neonates born to COVID-19-infected mothers.

References

1. Li N, Han L, Peng M, Lv Y, Ouyang Y, Liu K, et al. Maternal and neonatal outcomes of pregnant women with COVID-19 pneumonia: a case-control study. *Clin Infect Dis*. 2020.
2. Shanes ED, Mithal LB, Otero S, Azad HA, Miller ES, Goldstein JA. Placental pathology in COVID-19. *Am J Clin Pathol*. 2020;154(1):23–32.
3. Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus–infected pneumonia in Wuhan, China. [Published online ahead of print, February 7, 2020.] *JAMA* 2020;323:1061–1069.
4. Chen H, Guo J, Wang C, 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;6736:1–7.
5. Khan S, Nabi G, Han G, et al. Novel coronavirus: how the things are in Wuhan. [Published online ahead of print, February 11, 2020.] *Clin Microbiol Infect* 2020; S1198–743X(20)30084-7. doi:10.1016/j.cmi.2020.02.005.
6. Wong SF, Chow KM, Leung TN, et al. Pregnancy and perinatal outcomes of women with severe acute respiratory syndrome. *Am J Obstet Gynecol* 2004; 191:292–297.
7. Huntley, B. Rates of Maternal and Perinatal Mortality and Vertical Transmission in Pregnancies Complicated by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-Co-V-2) Infection, *Obstetrics & Gynecology*: June 09, 2020 - Volume Publish Ahead of Print - Issue - doi: 10.1097/AOG.0000000000004010.
8. Yu, N et al. Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. *The Lancet Infectious Diseases*, 20 (5)pp. 559-564. [https://doi.org/10.1016/S1473-3099\(20\)30176-6](https://doi.org/10.1016/S1473-3099(20)30176-6)
9. World Health Organisation. Coronavirus disease (COVID-2019) situation reports 2020 [Available from: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports/> accessed 01 June 2020.
10. Centers for Disease Control and Prevention. Human Coronavirus Types 2020 [Available from: <https://www.cdc.gov/coronavirus/types.html> accessed 01 June 2020.
11. Docherty AB, Harrison EM, Green CA, et al. Features of 16,749 hospitalised UK patients with COVID-19 using the ISARIC WHO Clinical Characterisation Protocol. *medRxiv* 2020:2020.04.23.20076042. doi: 10.1101/2020.04.23.20076042
12. Smith V, Seo D, Warty R, et al. Maternal and neonatal outcomes associated with COVID-19 infection: A systematic review. *PLOS ONE* 2020;15(6):e0234187. doi: 10.1371/journal.pone.0234187