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

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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, laboratary 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 consequences\(^2\).

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 demonstrated\(^3\). 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 complications\(^4\).

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 population\(^5\).

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 time\(^6\).

### 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 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.

### 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 Statistic | Std. Deviation Statistic | Skewness Statistic | Kurtosis Statistic | Std. Error Mean | Std. Error Kurtosis |
|-------------------------|----------------|--------------------------|-------------------|-------------------|-----------------|---------------------|
| 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              | -.1217          | 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 | -0.319      | 0.538|
| Pair 2 Placenta Abruption 1 & Placenta Abruption 2 | 6 | -0.457 | 0.362|

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

| Paired Samples Test | Paired Differences | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Difference | t | df | Sig. (2-tailed) |
|---------------------|-------------------|------|----------------|-----------------|------------------------------------------|---|----|----------------|
| Pair 1 R.IUD1 - R.IUD2 | -.6667 | 1.75119 | 0.71492 | -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 abruption 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 women. 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 pregnancy.

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 pneumonia.

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 PROM. 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 trimester. 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 hospitalisation.
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.

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