



## IMPACT OF COVID-19 ON ANTENATAL CARE; A TERTIARY CARE EXPERIENCE IN NORTH INDIA

### Gynaecology

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### ABSTRACT

**Introduction:** - Corona virus disease (COVID-19) is an infectious disease caused by Novel  $\beta$ -corona virus (SARS-CoV-2). World Health Organization (WHO) to declare COVID-19 as a pandemic on 11th March 2020.[1] Antenatal care was expected to be affected during a pandemic because of concerns about visit to healthcare facilities and exposure to the infection. There is paucity of such data evaluating the effect of COVID-19 in pregnancy on mother's health status. Therefore, the current study was planned to study the influence of COVID-19 pandemic on overall health and its psycho-social impact of pregnant women in India **Material and Methods:** - This was a single center observational questionnaire-based study conducted at Department of Obstetrics and Gynecology, Dayanand Medical College and Hospital, Ludhiana (Punjab) India between May 2020 and October 2020. Antenatal patients attending outpatient department or admitted to department of obstetrics and gynecology were enrolled after taking informed consent. A total of 200 patients pregnant were divided into 2 groups according to the months they visited DMCH. Group A consisted of the number of patients visiting the health care facility in the months of May, June and July, 2020 (n= 82). Group B consisted of the number of patients visiting the health care facility in the months of August, September and October, 2020 (n= 118). This coincided with the peak of COVID in Punjab. The questionnaire comprised of thirty-two questions incorporating the following subsections Patient demographics, medical and obstetric history, impact of COVID-19 pandemic on access to healthcare facilities, antenatal care, restriction of activities, psychosocial impact, outlook towards COVID-19. **Result:** - A total of 200 patients were analyzed. Twenty-four (12%) patients did not have access to health care facilities. Out of the remaining 176 patients, 12(63%) patients had delayed appointments and 26 (13%) patients reached doctor with difficulty. 17 percent(n=34) patients in our study had to change their place of delivery due to restricted movements. Eighty-five (85%) patients had impact on psychology. Due to fear of contracting Covid-19, patients did not have access to health services. The impact was more pronounced at the start of pandemic. **Conclusion:-** The current study concludes that COVID-19 pandemic had influence on pregnancy. Mental, physical and psycho-social health in pregnancy was affected. We need awareness programmes to decrease the adverse effects of COVID-19.

### KEYWORDS

COVID-19, Antenatal Care, Pregnancy, Pandemic

### INTRODUCTION

Corona virus disease (COVID-19) is an infectious disease caused by Novel  $\beta$ -corona virus (SARS-CoV-2). The disease which started from Wuhan in Hubei province of China spread rapidly across the globe forcing World Health Organization (WHO) to declare COVID-19 as a pandemic on 11<sup>th</sup> March 2020<sup>[1]</sup> Since then, this pandemic has impacted both the healthcare providers/facilities and healthcare seekers.<sup>[2]</sup>

In India, pregnant women constitute a significant population. More than 20 million pregnancies were reported in 2020.<sup>[3]</sup> It is therefore important to identify and address several issues pertaining to antenatal care during the times of pandemic as experiences from previous pandemics show that pregnant women are a vulnerable population likely to be affected in a negative manner during the pandemic.<sup>[4]</sup>

Antenatal care was expected to be affected during a pandemic because

of concerns about visit to healthcare facilities and exposure to the infection. The psychological and social impacts of the pandemic further complicate the scenario. There is paucity of such data evaluating the effect of COVID-19 in pregnancy on mother's health status. Therefore, the current study was planned to study the influence of COVID-19 pandemic on overall health and its psycho-social impact of pregnant women in India.<sup>[5,6]</sup>

### MATERIAL AND METHODS

#### Study Design

This was a single center observational questionnaire-based study conducted at Department of Obstetrics and Gynecology, Dayanand Medical College and Hospital, Ludhiana (Punjab) India between May 2020 and October 2020. The study was approved by Institutional Ethics Committee (IEC No. 2020-586). Written informed consent was obtained from each participant.

### Study Population

Antenatal patients attending outpatient department or admitted to department of obstetrics and gynecology were enrolled after taking informed consent. A total of 200 patients pregnant were divided into 2 groups according to the months they visited DMCH.

Group A consisted of the number of patients visiting the health care facility in the months of May, June and July, 2020 (n= 82)

Group B consisted of the number of patients visiting the health care facility in the months of August, September and October, 2020 (n= 118). This coincided with the peak of COVID in Punjab.

### Questionnaire

A Questionnaire was developed to measure the experiences of antenatal patients during the time of COVID-19 pandemic. The questionnaire comprised of thirty-two questions incorporating the following subsections

1. Patient demographics
2. Medical and obstetric history
3. Impact of COVID-19 pandemic on access to healthcare facilities
4. Antenatal care
5. Restriction of Activities
6. Psychosocial impact
7. Outlook towards COVID-19

The questionnaire was administered by a single investigator (HK) in a face to face interview. It was checked for completeness after completion of the interview by a second investigator (GK). Incomplete questionnaires were excluded from the analysis.

### Statistical Analysis

Data were described in terms of range, mean  $\pm$  SD, frequencies, and relative frequencies (percentages) as appropriate. All statistical calculations were done using SPSS version 21.0 (IBM Corp. Released 2012. IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY: IBM Corp.)

### RESULTS

A total of 865 antenatal patients visited the department of obstetrics and gynecology, Dayanand Medical College and Hospital, India between May 2020 and October 2020. Of these, 256 (29.6%) patients consented to be part of this study. Fifty-six (6.4%) questionnaire responses were incomplete and excluded from the analysis. A total of 200 patients were analyzed.

#### 1. Demography of enrolled patients are depicted in Table 1.

**Table 1. Demographic Characteristics (n=200)**

Mean Age (years)	29.65 $\pm$ 4.67
Period of Gestation	n (%)
Trimester 1 (upto 12 weeks)	21 (10.5 %)
Trimester 2 (12-28 weeks)	82 (41 %)
Trimester 3 (28 weeks-Term)	97 (48.5 %)
Parity	
Primigravida	80 (40 %)
Multipara	120 (60%)
Singleton	187 (93.5 %)
Twins	13 (6.5 %)
Previous Abortions	
Nil	131 (65.5 %)
One	38 (19 %)
Two or more	31 (15.5 %)
Co-morbidities	
Bronchial Asthma	2 (1 %)
Diabetes Mellitus	5 (2.5 %)
Heart disease	5 (2.5 %)
Connective Tissue Disorder	1 (0.5 %)
Thalassemia Major	3 (1.5 %)
Chronic Kidney Disease	2 (1 %)
Seizure Disorder	1 (0.5 %)
Educational Qualification	
Under Graduate	76(38 %)
Post Graduate	124 (62 %)

### 2. Access to Health Care Facilities

The Participants were inquired about access to health care facilities, particularly in view of nationwide lockdown and curfew.

Twenty-four (12%) patients did not have access to health care facilities. Out of the remaining 176 patients, 126 (63%) patients had delayed appointments and 26 (13%) patients reached doctor with difficulty. Seventy (35%) patients had to change their obstetrician/physician to a local/nearby doctor due to restriction on inter-city movements during the lockdown. Thirty-four (17%) patients were forced to change their place of delivery as a result of curbs and movement imposed by the authorities. Ninety-three (46.5%) patients contacted their doctor telephonically at least once during the study period and out of these, 87 (93.54%) patients were satisfied with the tele-consultation. Twenty-four patients (12%) did not have access to prescribed medications including iron and folic acid supplements.

**Table 2:- Access to health care facility was depicted in table 2:-**

	group A (n=82)	group B (n=118)	Total (n=200)
No access to health care facility	20(24.3%)	4(3.3%)	24 (12%)
Delayed Appointment	72 (87.8%)	54 (45.7%)	126 (63%)
Reached Doctor with difficulty	23 (28%)	3 ( 2.5%)	26 (13%)
Changed Doctor	42 (51%)	28 (23.7%)	70 (35%)
Change place of Delivery	22 (26.8%)	12 (10.1%)	34 (17%)
Telephonic Consultation	61 (74.3%)	32 (27.1%)	93 (46.5%)
No access to prescribed medication	21 (25.6%)	3 (2.5%)	24 (12%)

### 3. Antenatal Services

Thirty-six (18%) patients were unable to receive the mandatory two doses of tetanus vaccination. Majority of the patients (n=105, 52.5%) were unable to get their ultrasonographic examinations as prescribed by the obstetrician. A similar number of patients (n=105, 52.5%) were also unable to get the routine laboratory investigations of Pregnancy.

**TABLE 3:-**

	Group A (N=82)	Group B (N=118)	TOTAL(N=200)
Tetanus vaccination not received	25(30.4%)	11(9.3%)	36(18%)
USG not done	76(92.6%)	29(24.5%)	105(52.5%)
Laboratory Investigation not done	77(93.9%)	28(23.7%)	105(52.5%)

### 4. Complications during pregnancy:-

Out of 200 enrolled patients, 76 patients had complications enumerated in table 4.

**Table 4. Complications Reported During Pregnancy in COVID-19 (n=76)/n (%)**

	Group A (n= 82)	Group B(n=118)	TOTAL (n=200)
Complications	51(62.1%)	25(21.1%)	76(38%)
Hypertension	12(14.65)	8(6.7%)	20 (10 %)
Gestational Diabetes Mellitus	8(9.7%)	3(2.5%)	11 (5.5 %)
Premature rupture of membranes	3(3.6%)	3(2.5%)	6(3%)
Tested positive for COVID	1(1.2%)	6(5.08%)	7(3.5%)
Congenital malformations	11(13.4%)	2(1.6%)	13(6.5%)
APH	4(4.8%)	3(2.5%)	7(2.5%)
Decreased Fetal Movements	0	1(0.8%)	1 (0.5 %)
Abortions:-			
Inevitable Abortion	1(1.2%)	2(1.6%)	3 (1.5 %)

Threatened Abortion	5 (6%)	3(2.5%)	8 (4 %)
Congenital Malformations			
Dandy Walker Malformation	2(2.4%)	0	2 (1%)
Congenital Rubella Syndrome	1(1.2%)	0	1 (0.5 %)
Unossified Nasal Bone	1(1.2%)	1(0.8%)	2 (1 %)
Tuberous Sclerosis	1(1.2%)	0	1 (0.5 %)
Fetal rhabdomyolysis	0	1(0.8%)	1(0.5%)
Meningomyelocele	1(1.2%)	1(0.8%)	2(1%)
Trisomy 21	1(1.2%)	0	1(0.5%)
Single toe, Club hand, Urinary bladder cyst, Single umbilical artery	1(1.2%)	0	1(0.5%)
Intracardiac echogenic foci, echogenic bowel, choroid plexus cyst, fullness of renal pelvis Echogenic foci in left ventricle	1 (1.2%)	0	1(0.5%)
Fetal growth retardation	2(2.4%)	2(1.6%)	4 (2 %)
Antepartum hemorrhage	4(4.8%)	3(2.5%)	7 (3.5 %)
Intrauterine Death	2(2.4%)	1(0.8%)	2 (1 %)
Twin to twin transfusion syndrome with one twin dead	1(1.2%)	0	1 (0.5 %)

**5. Restriction of Outdoor Movements**

Out of the 149(74.5%) patients who were afraid of moving out of the home due to risk of contracting COVID-19; 96.3% patients belonged to Group A and 59.3% patients belonged to group B. 79.2% vs 34.7% patients of group A and group B respectively restricted contact with family living outside the home, 48.7% vs 12.7% patients of group A and group B respectively limited in-person contact with friends and 74.3% patients of GROUP A and 10.1% patients of group B restricted their movements to grocery stores and restaurants.

**6. Psychosocial Impact**

Eighty-five (85%) patients had impact on psychology. 74.3% patients of Group A and 14.4% patients of group B felt lonely or depressed during the time of pandemic. 75.8% patients of Group A and 18.6 % patients of group B complained of worsening of sleep and 24.3% patients of Group A and 6.7% patients of group B patients complained of worsening of daily energy levels.

**7. Outlook towards COVID-19**

The following table shows the outlook towards COVID-19 in group A and group B:-

	Group A (n=82)	Group B (n=118)	Total (n=200)
Patients relied on social media / electronic and print media for COVID info	80(97.5%)	89(75.4%)	169(84.5%)
Patients relied on the doctors / WHO approved resources.	15(18.2%)	16(13.5%)	31(15.5%)
Patients concerned about the medical care they will receive during delivery	62(75.6%)	56(47.45%)	121(60.5%)

Patients concerned regarding the effect of COVID-19 on the outcome of pregnancy and effect on neonate / infant health	72(87.8%)	80(68.6%)	169(84.5%)
Patients thought that they were at increased risk of acquiring COVID-19 infection because they were pregnant	75(91.4%)	92(77.9%)	167 (83.5%)
Patients willing to get tested	12(14.6%)	34(28.8%)	46(23%)

**DISCUSSION**

Currently, we are in the middle of a pandemic. Globally, there have been 78.7 Million confirmed cases of COVID-19, including 1.73 million deaths, as reported by the World Health Organization, as of December 2020. The coronavirus disease 2019, caused by the severe acute respiratory distress syndrome coronavirus 2 (SARS-COV2) affects all ages and populations, including pregnant women. The purpose of this article is to emphasize on the impact of COVID 19 in pregnancy on mother's health status.

**Access to health care services**

Due to fear of contracting Covid-19, patients did not have access to health services. The impact was more pronounced at the start of pandemic. Reductions in local services and shutdown made it difficult to reach healthcare facilities. Residents avoided healthcare for the fear of being diagnosed or becoming infected with COVID-19. Some residents turned to locally available healthcare services. More patients had access to healthcare facilities in group B.

This can be explained by the fact that during the first three months, patients were afraid of contracting COVID patients, but in the next 3 months patients were sensitized and moved out of their homes so that the more percentage of patients had access to healthcare facilities in later months.

17 percent(n=34) patients in our study had to change their place of delivery due to restricted movements. The number was higher in group A as compared to group B because of strict lockdown imposition by the government in those months. To add to this, there was fear of getting delivered at a tertiary care center who were offering COVID services as well. There was a significant impact of COVID-19 on the psychology of the patient. The trust and comfort she had developed with the primary clinician during her pregnancy was no longer effective. Dahlberg and colleagues reported that relationship continuity promotes empowerment for women and gives her positivity during childbearing process. COVID 19 pandemic hit these aspects of antenatal care, warranting the development of a plan for future to minimize this collateral damage.<sup>[7,8]</sup>

**Antenatal Services**

The COVID-19 pandemic and strict lockdown have greatly affected maternal and child healthcare services in India. Across the world, covid-19 has choked access to routine health care services, medical staff and supplies. A study in The Lancet shows that such disruptions could result in up to 39% additional women dying of pregnancy and childbirth-related issues every month in poorer countries, including delays in regular antenatal and postnatal care due to the fear of getting infected at the health facility, and medicine and vaccine shortages.<sup>[8]</sup>

Preventive services in maternal and child health, including immunization and antenatal care, were mostly available free of cost in government sector. In spite of this fact, a majority of patients of group A did not receive tetanus vaccination and underwent routine antenatal tests of pregnancy. The impact of Covid-19 was more pronounced in the beginning of the pandemic.

There was lack of access to maternal healthcare services and the absence to face-to-face interactions with healthcare providers. Also, in rural areas, antenatal care services which were provided in groups (usually 10 to 20 pregnant women at a facility) was not possible in the pandemic. As a result, many pregnant and lactating mothers were left without essential healthcare.<sup>[8]</sup>

#### Impact on abortion services

Another impact was that a huge number of women could not access safe abortion services during lockdown. Contributing to it was restricted access of women to contraceptives. According to a recent study 1.85 million women in India could not terminate an unwanted pregnancy during COVID 19 lockdown.<sup>[9,10]</sup> Millions of women would have thereby been forced to either continue with an unwanted pregnancy or undergo a late or unsafe abortion. All of these are likely to have profound consequences for their overall health and well-being.<sup>[11,12]</sup>

#### Complications of COVID-19 during pregnancy

Pregnancy generally do not increase the risk for acquiring COVID infection. It may worsen the clinical course of COVID-19 compared with nonpregnant individuals of the same age. Most (>90 percent) infected mothers recover without undergoing delivery<sup>[1]</sup>.

One patient tested positive for COVID in group A vs six patients of group B. The peak of COVID coincided with group B. Hence more COVID positive pregnancies were seen in group B.

The frequency of spontaneous abortion with COVID-19 does not appear to be increased, but data on first-trimester infections are limited<sup>[2,3]</sup>. Hyperthermia, which is common in COVID-19, is a theoretical concern as elevation of maternal core temperature from a febrile illness during organogenesis in the first trimester may be associated with an increased risk of congenital anomalies, especially neural tube defects, or miscarriage. An increased incidence of these outcomes has not been observed in our study.

Preterm birth and cesarean delivery rates with COVID-19 infection have been increased in many studies. Fever and hypoxemia may increase the risks for preterm labor, prelabor rupture of membranes, and abnormal fetal heart rate patterns. It appears that many of third-trimester symptomatic cases are electively delivered by cesarean because of the belief that management of severe maternal respiratory disease would be improved by delivery; however, this hypothesis is unproven.<sup>[5]</sup>

The other complications of pregnancy like congenital malformations cannot be attributed to COVID-19 pandemic.

#### Psychological impact of coronavirus disease 2019 in pregnant women

Pandemics pose a challenge to psychological resilience and can lead to heightened levels of stress. Anxiety is a common response to any stressful situation. Pregnant women are more likely to be at risk. Prevalence of anxiety disorder during pregnancy, in developed and developing countries, are 10 and 25%, respectively.<sup>[13]</sup> Anxiety symptoms during pregnancy have emerged as an independent risk factor for adverse obstetric and developmental outcomes. It is associated with increased likelihood of postnatal depression and impaired bonding and obstetric complications such as length of labor, premature delivery and impaired fetal growth.

A survey conducted in China showed that 53.8% of the respondents rated the psychological impact of the outbreak as moderate or severe, and 28.8% reported moderate to severe anxiety symptoms and stress levels.<sup>[14]</sup> Almost half of the women reported high anxiety regarding the vertical transmission of the disease. These findings can be used to formulate psychological interventions to improve mental health and psychological resilience during the COVID-19 epidemic. In our study, 170 (85%) patients had negative impact from Covid-19 pandemic. Sixty-one 61 (74.3%) patients belonged to group A and seventeen 17 (14.4%) patients of group B patients felt lonely or depressed during the time of pandemic. The percentage was higher in group A as compared to group B because of more stress and fear regarding the unknown disease and its effect on pregnancy and fetus at the beginning of the pandemic.

#### CONCLUSION

The current study concludes that COVID-19 pandemic had influence

on pregnancy. Mental, physical and psycho-social health in pregnancy was affected. We need awareness programmes to decrease the adverse effects of COVID-19.

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