



## COMPARISON OF EFFECTS OF COVID VIRUS ON ANTENATAL AND POSTNATAL MOTHERS DURING THE FIRST AND SECOND WAVES IN A TERTIARY CARE CENTER: A RETROSPECTIVE STUDY

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**ABSTRACT** Covid 19, caused by SARS – COV 2 has become a global pandemic giving rise to health threat throughout the world. This study compare the characteristics of the effects of the covid virus infection on the antenatal and postnatal mothers in Karur MCH over a period of 6 months from March 2020 to August 2020(1 wave) and from March 2021 to August 2021( 2 wave).AN and PN mothers infected during the first wave 88 among 2342 admissions and 209 mothers among 2843 admissions .55 covid positive mothers delivered among 1753 total deliveries during the 1st wave and 76 covid positive mothers delivered in 2nd wave among 1958 deliveries. Most common age group of mothers involved in both the waves include 20 yrs to 34 yrs. Multigravida were more infected in the first wave and primigravida in the second wave. Most infected mothers were in the 3 rd trimester. 85% mothers in the 1 st wave were asymptomatic. In the second wave only 40 % were asymptomatic. In the first wave, 12% mild cases and 3% moderate cases whereas during the second wave 30% mild , 10% moderate and 20 % severe cases requiring oxygen support and intensive care management. Treatment of patients during the first wave included azithromycin, vit C, Vit D3, Zinc . Inj Remedisivir , Inj methyl prednisolone were added to the treatment protocols in the second wave .Anticoagulants used in both the waves as per RCOG protocols No maternal mortality in the first wave, while on the contrary, 6 maternal deaths were reported in the second wave . Increase in the number of LBW babies in the second wave has been documented. This comparative study has shown increase in the number of cases and the increased severity of the disease revealing the emergence of new variant of SARS COV 2.

**KEYWORDS :** pandemic, maternal mortality, LBW

### INTRODUCTION:

The Coronavirus (CoV) is a large family of viruses known to cause illnesses ranging from the common cold to acute respiratory tract infection. The severity of the infection may be visible as pneumonia, acute respiratory syndrome, and even death. Until the outbreak of SARS, this group of viruses was greatly overlooked. However, since the SARS and MERS outbreaks, these viruses have been studied in greater detail, propelling the vaccine research. On December 31, 2019, mysterious cases of pneumonia were detected in the city of Wuhan in China's Hubei Province. On January 7, 2020, the causative agent was identified as a new coronavirus (2019-nCoV), and the disease was later named as COVID-19 by the WHO. The virus spread extensively in the Wuhan region of China and has gained entry to over 210 countries and territories.

### COVID 19- THE BASIC CONCERN:

The main route of human-to-human transmission is by droplets, which are generated during coughing, talking, or sneezing and are then inhaled by a healthy individual. They can also be indirectly transmitted to a person when they land on surfaces that are touched by a healthy individual who may then touch their nose, mouth, or eyes, allowing the virus entry into the body. Fomites are also a common issue in such diseases Aerosol-based transmission of the virus has not yet been confirmed. Stool-based transmission via the fecal-oral route may also be possible since the SARS-CoV-2 has been found in patient feces. Some patients with COVID-19 tend to develop diarrhea, which can become a major route of transmission if proper sanitation and personal hygiene needs are not met. There is no evidence currently available to suggest intrauterine vertical transmission of the disease in pregnant women On gaining entry via any of the mucus membranes, the single-stranded RNA-based virus enters the host cell using type 2 transmembrane serine protease (TMPRSS2) and ACE2 receptor protein, leading to fusion and endocytosis with the host cell. The uncoated RNA is then translated, and viral proteins are synthesized. With the help of RNA-dependant RNA polymerase, new RNA is produced for the new virions. The cell then undergoes lysis, releasing a load of new virions into the patients' body. The resultant infection causes a massive release of pro-inflammatory cytokines that causes a cytokine storm.

The clinical presentation of the disease resembles beta coronavirus infections. The virus has an incubation time of 2–14 days, which is the reason why most patients suspected to have the illness or contact with

an individual having the illness remain in quarantine for the said amount of time. Infection with SARS-CoV-2 causes severe pneumonia, intermittent fever, and cough. Symptoms of rhinorrhoea, pharyngitis, and sneezing have been less commonly seen. Patients often develop acute respiratory distress syndrome within 2 days of hospital admission, requiring ventilatory support. It has been observed that during this phase, the mortality tends to be high. Chest CT will show indicators of pneumonia and ground-glass opacity, a feature that has helped to improve the preliminary diagnosis. The primary method of diagnosis for SARS-CoV-2 is with the help of PCR.

### COVID 19- THE OBSTETRIC CONCERN:

COVID 19, apart from its complications including Systemic Inflammatory Response Syndrome (SIRS), thrombo-embolic phenomena, anoxic stress, respiratory failure, multiorgan dysfunction and death, its complications in the antenatal patient and the fetus in-utero are noteworthy and makes it of greater concern in the field of obstetrics.

PREGNANCY OUTCOME	PERINATAL OUTCOME
Preterm birth	Fetal distress (most common)
Preeclampsia	APGAR <7 at 5 mins
Preterm prelabor rupture of membranes	Neonatal asphyxia
Fetal growth restriction	Admission to NICU
Miscarriage	Perinatal death (including stillbirths)
Cesarean delivery	Evidence of vertical transmission

### OBJECTIVES

To compare the outcomes of covid 19 in the first and second waves in obstetric patients.

### MATERIALS AND METHODS

Study design: Retrospective study

**Place of study:** Govt Karur medical college hospital, Karur district, Tamilnadu, India

**Study population:** Pregnant mothers and postnatal mothers affected with Covid-19 admitted in Govt Karur medical college hospital during the 1st and 2nd waves.

All the antenatal and postnatal mothers admitted in O&G dept at Karur MCH during the 1st and 2nd waves were tested by RT-PCR for covid 19. Data were consolidated during the respective waves in terms of variables like age, locality, parity, gestational age, complications, maternal and fetal outcomes, mode of treatment, etc. retrospectively and the variables corresponding to the waves were compared and statistical analysis was carried out and the results were interpreted.

#### Inclusion and exclusion criteria:

Number of RT –PCR done in karur MCH during the first wave was 29,292. Number of RT-PCR done in the second wave 21,472. No of covid positive patients in the first wave 1,394 and 11,885 covid positive patients diagnosed in the second wave were included. All the suspect cases and whose laboratory confirmation was not done were excluded.

#### STATISTICAL ANALYSIS:

Comparison of AN and PN mothers with covid virus admitted in Karur MCH during the first and second waves of covid 19 pandemic in India.

#### Comparison of total cases and Deliveries

Parameters	I WAVE	II WAVE
Total AN and PN	88	209
Total no of deliveries	55	76
LSCS	31	56
Vaginal deliveries	24	20

It is evident from the fact that the number of cases increased exponentially in the second wave.

As far as the number of deliveries are concerned, there is an increase of deliveries by 1.5 times the first wave. The disparity in the proportion of increase between total cases and total deliveries may be attributed to more number of cases tested and identified in the second wave as well as more number of cases in early trimesters were affected during the second wave. Delivery by cesarean section has increased on par with the total deliveries, whereas vaginal deliveries remained almost the same.

#### Distribution of Obstetric High risk cases

HIGH RISK	WAVE 1	WAVE 2
Pre LSCS	23	46
Anemia	26	22
Preeclampsia	4	18
GDM	2	6
Higher order	10	18
BOH	4	3
Oligohydramnios	1	11
Hypothyroid	1	9
Chronic HT	-	1
Overt DM	-	3
Heart disease	-	1
Multiple pregnancy	-	4
CKD	-	1
Rh incompatibility	-	5
Bronchial Asthma	-	1
Seizure disorder	2	2
TOTAL	78	146

The number of high risk cases dealt with during the second wave is evident to be two-fold than the first wave. Among them, pre eclampsia and Oligohydramnios were 4 fold higher than the first wave, while heart disease, Rh incompatibility, etc, were not seen in first wave unlike the second wave.

#### Covid 19 Severity and outcome

SEVERITY	WAVE 1	WAVE 2
Asymptomatic	75	83
Mild disease	10	63
Moderate disease	3	20
Severe disease	0	38
Maternal Death	0	6

The second wave appears more severe than the first wave where severe disease or maternal death seldom occurred in 1st wave, while 38 patients with severe disease and 6 maternal death were encountered in the second wave.

#### EPIDEMIOLOGICAL CHARACTERISTICS

##### AGE

AGE	I wave	II wave
<19 yrs	4	14
20 – 34	80	184
>35	4	11

##### PARITY

PARITY	I wave	II wave
Primi	30	86
G2P1L1	22	66
G3 and above	36	57

##### GESTATIONAL AGE

Gestational Age	I wave	II wave
<14 wks	4	14
15 -28 wks	6	39
>29 wks	78	156

#### COMPARISON OF SYMPTOMS

SYMPTOMS	I WAVE	II WAVE
Fever	24	56
Cough	27	72
Breathlessness	7	28
Myalgia	20	40
Vomiting/Diarrhea	0	2

#### MANAGEMENT

Management	I wave	II wave
Conventional O2	7	58
High Flow Nasal O2	0	5
NIV	0	12
Ventilator	0	6
Inj Remedisivir	1	32
Inj MethylPred	1	32

#### DISCUSSION

During the 1<sup>st</sup> wave, the number of admissions in the O&G dept was 2342. Number of covid positive mothers is 88 which is 3.7%. whereas during the 2<sup>nd</sup> wave, the total admissions in the O&G dept was 2843 out of which 209 were covid positive mothers, denoting a burden of 7.3%.

This increase in the covid positive AN and PN mothers may be due to the emergence of more pathogenic strain of SARS –CoV 2. Also the increase may be attributed to the increased availability of testing and overall reporting has increased in the 2<sup>nd</sup> wave. Also, more number of AN and PN mothers were admitted due the severity of symptoms.

Comparison of age of the mothers and gestational age between the two waves shows that age group 20 to 34 yrs and gestational age >35 weeks showed the maximum preponderance for covid positive antenatal and postnatal cases.

The 1<sup>st</sup> wave showed a preponderance of multigravida/ multiparous women, while the second showed an increase of primigravida/primiparous women.

Among the total deliveries 1753 in the 1 wave, covid positive mothers delivered 55 which is 3.1%. Of the 1958 deliveries in the 2 wave covid positive mothers delivered were 76 which is 3.8%.

AN mothers admitted in the 1<sup>st</sup> wave were 25 and PN were 8. In the 2<sup>nd</sup> wave AN mothers admitted were 114 and PN mothers were 12, both showing a rise, but the antenatal admissions showed an exponential increase.

In the second wave there was one MVA and 6 Spontaneous expulsions, which did not happen during the first wave. In the 1<sup>st</sup> wave, out of 55 deliveries, delivery by LSCS were 31 and vaginal deliveries were 24. In the 2<sup>nd</sup> wave, there were 56 cesarean deliveries and 20 vaginal

deliveries. In the 2<sup>nd</sup> wave, no of primary LSCS contributed to 50%, the most common indication being failed induction in spite of avoidance of unnecessary inductions.

Regarding the presentation, about 75 mothers in the 1<sup>st</sup> wave were asymptomatic, which is 85% and 84 mothers were asymptomatic in the 2<sup>nd</sup> wave which is only 40%.

About 20% of mothers had severe infection that is 40 mothers in 2<sup>nd</sup> wave while no severe infection was reported in the 1<sup>st</sup> wave. Presentation of clinical symptoms almost similar in both the waves but the severity of symptoms and the number of cases with severe symptoms was increased in the 2<sup>nd</sup> wave.

Regarding the management methods adopted, conventional oxygen was used for 7 cases in the 1<sup>st</sup> wave and for 58 cases in the 2<sup>nd</sup> wave, which is 8 fold higher.

High flow nasal o2 was used in 5 mothers and NIV in 12 mothers in the 2<sup>nd</sup> wave. 6 patients needed invasive ventilation and were intubated and connected to Mechanical ventilator. Treatment protocols included anticoagulants for all the mothers according to RCOG guidelines. Antivirals, especially and commonly Inj Remdesivir was used and intravenous corticosteroids, especially Inj Methylprednisolone were used in severe infection which is about 20% and used only in one patient in the 1<sup>st</sup> wave.

Among the newborns in the 1<sup>st</sup> wave, 4 were preterm and 4 were LBW. In the 2<sup>nd</sup> wave 4 preterm and 13 were LBW. One neonatal death in the 1<sup>st</sup> wave and 4 neonatal deaths in the 2<sup>nd</sup> wave. No maternal death was reported in karur MCH in the 1<sup>st</sup> wave, but on the contrary, 6 maternal deaths were reported in the 2<sup>nd</sup> wave, which clearly states the severity of the disease by itself.

It is obvious from this comparative data, that a more pathogenic virulent strain, variant of SARS – CoV 2 has played a great role. These variants are the result of mutations. Some of these variants termed Variants Of Concern have the properties of increased severity and transmissibility. Number of variants identified so far with WHO terminology are B.1.1.7 (Alpha variant), B.1.351 (Beta variant), P.1 (Gamma variant) .Also recently B.1.617.2 (Delta variant) and B.1.617.3 (Kappa variant) have increased since Feb 2021.

Government has imposed preventive measures like 24 hrs lockdown, night curfew, mini lockdown to prevent the spread of infection. Mass gatherings were prohibited. Markets were closed. Public transport was stopped. Restricted transport between states and districts was implemented except movement of health care workers. Travel was allowed in emergency situations with travel pass issued by the government and a negative RT-PCR test report.

But with the tapering of 1<sup>st</sup> wave there was poor cooperation from the public. With timely relaxations in the lockdown public slowly returned to their normal life pattern with poor compliance to adhere to the rules of Social Distance, Mask wearing, Sanitiser use in spite of strict vigilance and fine imposition by the police and health department.

Government of India, ICMR and the State government organized vaccination to protect the people against the ill effects of the variants of corona virus. In our country administration of covid vaccine began on 16 th January 2021. India initially approved Oxford Astra Zeneca vaccine (COVISHIELD) manufactured under license by Serum Institute and COVAXIN locally manufactured by Bharath Bio Tech. Sputnik V manufactured under license by Dr Reddys Lab, Moderna vaccine, Johnson & Johnson and ZyCoV D locally by zydus Cadila are under trial in our country. Covishield includes inactivated adenovirus with segments of coronavirus and covaxin with inactivated coronavirus. Recommended gap between the 2 doses of covishield is 12 to 16 wks and for covaxin it is 4 weeks.

Vaccination of pregnant women can protect against vaccine preventable infections and potentially protect the fetus. Immunisation during pregnancy directly protect the fetus via transfer of antibodies. No risk to fetus documented after vaccination of pregnant women with inactivated vaccines. Vaccination of the mother provide immunity to the child for the first few months of birth until pediatric group is offered vaccine. Registration on CoWIN or walk-in to the nearest covid vaccination centre. Increased no of covid infected

pregnant mothers, increased severity of the disease requiring intensive care and increased maternal morbidity and mortality has made vaccination of antenatal and postnatal mothers is a life saving programme organized by the health ministry based on recommendation of NTAGI in consultation with FOGSI, NGO and technical experts. At the beginning of vaccination campaign there was hesitancy to vaccinate. With intense IEC through Televisions, Radio, Mobile and papers, the coverage of vaccinees has increased. Vaccination of antenatal and postnatal mothers with strict follow up of wearing mask, using sanitiser, maintaining social distance is the only solution to save the mother and the child and therefore the whole family.

#### CONCLUSION:

This comparative study in Karur MCH has revealed the increased proportion of Antenatal and Post natal mothers infected in the second wave with increased severity of clinical presentations mandating ICU admission with increased maternal morbidity and mortality. We have emphasized the role of vaccination which is the ultimate to save the mother, child and hence the family.

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