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RESEARCH ARTICLE

ANALYSIS THE OUTCOME OF COVID POSITIVE DELIVERIES IN TERTIARY CARE HOSPITAL IN RURAL INDIA

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Abstract

Aims And Objective: To evaluate the effect of coronavirus disease 2019(COVID19) on maternal perinatal and neonatal outcomes.The clinical characteristics and outcomes in pregnancy and the vertical transmission potential of SARS-COV-2 infection.

Introduction:-

COVID-19 has created an extraordinary global health crisis.On March 11th, 2020, the World Health Organization (WHO) classified the novel coronavirus disease (COVID-19), caused by the SARS-CoV-2 virus, as a global pandemic, highlighting the enormity of the viral outbreak [1].

At the time of this writing, COVID-19 has a global CFR of 6.4% and has caused more deaths than MERS and SARS combined [1] However, with limited understanding of the effects of COVID-19 during pregnancy, clinicians have serious concerns about its potential adverse effects on pregnancy.This is because pregnancy is associated with physiological changes in women that make them more susceptible to respiratory infections and their subsequent rapid progression to respiratory failure.

Coronaviruses are enveloped RNA viruses that cause respiratory, neurologic, hepatic, and enteric diseases. [2,3]Six coronavirus species are known to cause human disease, and four of them—229E, OC43, NL63, and HKU1—are less pathogenic and cause common cold symptoms in immunocompetent individuals. [4]The two other strains, severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV), are zoonotic in origin and may cause fatal illness. [5]

Studies of pregnant women with COVID-19 infection remain relatively rare. The extent to which the clinical characteristics of pregnant women with COVID-19 infection differ from those of non-pregnant women with COVID-19 infection is doubtful, and whether pregnancy and labour aggravate COVID-19 symptoms is unclear.

According to the guidelines from the Royal College of Obstetricians and Gynecologists (RCOG), pregnant women do not appear more likely to contract the COVID-19 infection than the general population.The centres for disease control and prevention (CDC) report thatpregnant women manifest a more severe illness when infected with viruses from the same family as the SARS CoV-2 virus. [6]

This study helps to study maternal and neonatal effects of COVID-19 during pregnancy to facilitate decision-making

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Materials and Methods:-

This prospective study was conducted in the Obstetrics and Gynecology department of a tertiary care hospital in Smt. Kashibai Navale Medical College and General Hospital Narhe, Pune.In total, 26 patients were studied in this study.

Inclusion criteria:
A laboratory-confirmed positive case of COVID-19 infection in pregnant women was included in this study.

Exclusion criteria:
Pregnancy with clinical signs and symptoms similar to SARS-CoV-2 but nasopharyngeal and pharyngeal swabs that were reported negative were excluded from this study.

This study is a prospective study of 26 cases based on compiled clinical and outcome data for pregnant women infected with COVID-19 between April 15,2019 and June 10, 2020, at a tertiary level hospital.

A laboratory-confirmed case of COVID-19 is done by reverse transcriptase polymerase chain reaction (RT-PCR) assay of maternal pharyngeal and nasopharyngeal swab specimens.All the safety precaution measures, such as a personal protective equipment (PPE) kit, gloves, an N-95 mask, a splash-resistant face shield, and goggles, were used by all the health care professionals in labour and delivery wards and operation theatres.Donning and doffing areas were assigned.

A complete epidemiologic history, obstetric history, clinical symptoms, signs, specific obstetric condition, laboratory and radiologic investigations, treatment measures, complications, and outcome data were collected.All laboratory investigations and radiologic assessments were performed.Laboratory investigations included a complete blood cell count (CBC), liver function test (LFT), renal function test (RFT), C-reactive protein (CRP), serum lactate dehydrogenase (LDH), and BSL profile.

Data on pregnancy and neonatal outcomes such as gestational age at delivery, mode of delivery, indication for caesarean delivery, complications, risk factors, neonatal birthweight, and neonatal intensive care unit (NICU) admission were analyzed.

Neonates are tested for SARS-CoV-2 using RT-PCR.Sample collection, processing, and laboratory testing are conducted according to WHO guidance. [7]

The measures taken into consideration are: • Symptoms at Presentation • Preterm Delivery (PTD) • Mode of Delivery • Risk Factors • Intensive Care Unit (ICU) Admission • Need for Respiratory Support • Maternal Mortality RateThe neonatal outcomes: • APGAR scores at 1 and 5 minutes • Birth weight • Neonatal symptoms at birth: fever, lethargy, vomiting, respiratory symptoms, or intolerance to feeding • Neonatal intensive care unit (NICU) admission • Neonatal investigations for COVID-19 • Evidence of vertical transmission

Results:-

The demographic characteristics of the cases shown in table1.

Clinical characterstics	Number of patients N(%)a
Age group (years)	
<20	1 (3.84%)
21 -30	20 (76.92%)
>30	5 (19.23%)
Gestational age on admission	
<37 weeks	6 (23.07%)
37 – 40 weeks	19(73.07%)
>40 weeks	1 (3.84%)
BMI	
18.5-24.9	13(50%)
25.0-29.9	9(34.61%)
>30	4(15.38%)

Hemoglobin	
<10	0(0%)
>10	26 (100%)
Gravidity	
Primigravida	7 (26.92%)
multigravida	19 (73.07%)
Contact with infected person	
Yes	4(15.38%)
No	22 (84.61%)
Covid 19 related clinical features	
Cold	7(16.92%)
Nasal congestion	4 (15.38%)
Sore throat	3(11.53%)
cough	7 (26.92%)
Fever	5 (19.23%)
Dyspnoea	3(11.53%)
Diarrhoea	2 (7.69%)
Myalgia,arhralgia	5(19.23%)
Malaise and fatigue	4(15.38%)
No symptoms	14 (53.84%)
Obstetric complications	
Preterm PROM	0(0%)
PROM	0(0%)
OLIGOHYDRAMNIOS	2(7.69%)
FETAL GROWTH RESTRICTION	1(3.84%)
Laboratory and radiological investigations	**Number of paients (N)%**
RT PCR Performed	26(100%)
RT PCR result positive	25 (96.15%)
Imaging chest xray performed	22 (84.61%)
Patchy haziness seen on xray	9(34.61%)
Imaging CT performed	9(34.61%)
Pneumonia found on CT	7(26.92%)
Leukocytes (normal range :4 to 11Ku/I)	
Decreased	0(0%)
increased	9(34.61%)
Normal	17 (65.38%)
Neutrophil/lymphocyte ratio NLR (normal:1-3)	
Normal	8 (30.76%)
Increased	18 (69.23%)
C reactive protein(normal range:<0.6 mg/dl)	
Positive	15 (57.69%)
Negative	11(42.30%)

Maternal outcome	
Mode of delivery	
Full term Caesarean section	7(26.92%)
Full term Vaginal delivery	14(53.84%)
Preterm Caesarean section	4(15.38%)
PretermVaginal delivery	1(3.84%)
ICU admission	2(7.69%)
Perinatal mortality	0(0%)
Patients symptomatic pre delivery	13(50%)

Patients symptomtic post delivery	15(57.69%)

Neonatal outcome	
Birthweight	
Birthweight <2500	5 (19.23%)
Birthweight >2500	21 (80.76%)
APGAR recorded	
Apgar < 7 at 1min	2(7.69%)
Apgar <7 at 5 min	0(0%)
NICU admission	4(15.38%)
Covid positive neonates	0(0%)
Neonates symptomatic on day 1	0(0%)
Neonates on exclusive breastfeeding at discharge	3(11.53%)
Neonates on any breastfeeding at discharge	26(100%)

The characteristics and outcomes of the study population of 26 laboratory confirmed COVID-19 positive cases are demonstrated in Table 1. The mean age was 25.2 (range 18-35) years with 76.92% cases between age of 21- 30 years.

The most common symptoms at presentation were cough and cold in 26.92% (7/26) and fever in 19.23% (5/26). Other reported symptoms were sore throat in 11.53% (3/26), myalgia or arthralgia in 19.23% (5/26), dyspnoea in 11.53% (3/26) while 53.84% (14/26) of cases were asymptomatic.5(19.23%) were admitted with fever for investigation, and 8 /26(30.26%)developed fever after childbirth.Most of these cases underwent necessary laboratory and radiological investigations and detailed epidemiologic history.

In this study, there were 1 cases (3.84%) with gestational diabetes and 5 cases (19.23%) with gestational hypertension and 1 cases (3.84%) with hypothyroidism,

There were 3 patients (11.53%) with mild pneumonia who were shifted on oxygen bed and oxygen saturation (SPO2) was monitored.

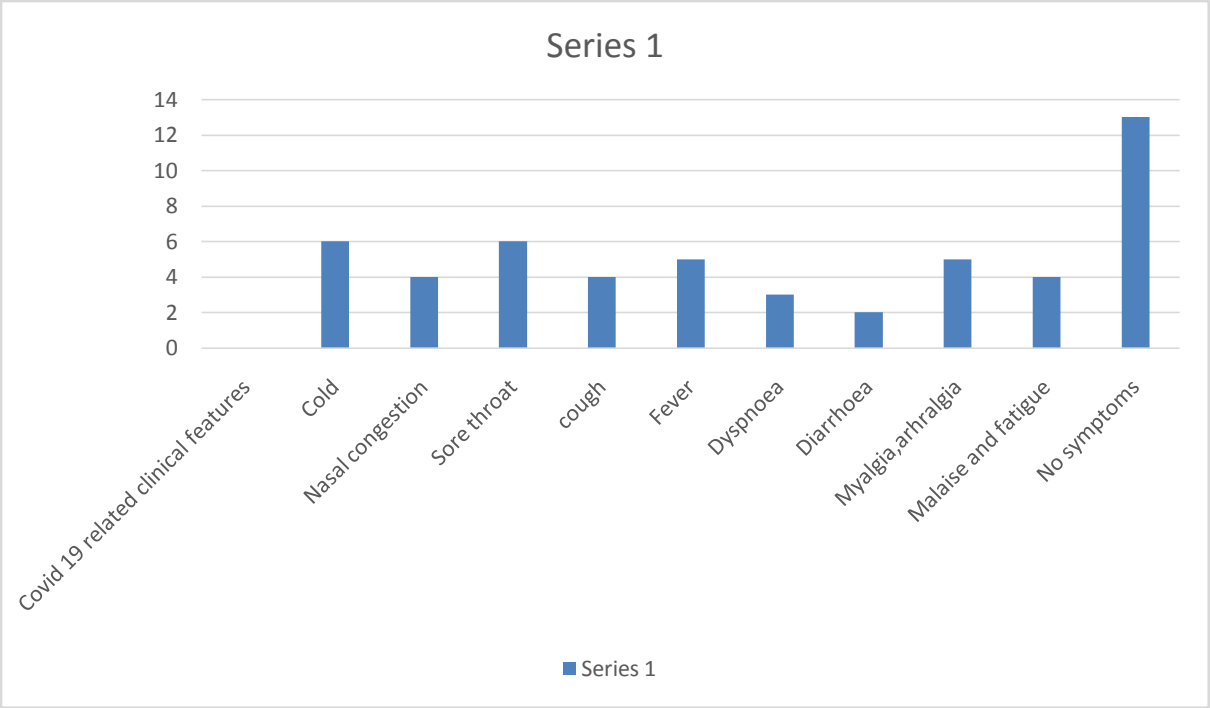
Treatment	
Antibiotic therapy	26(100%)
Antiviral therapy	0(0%)
Multivitamins containing zinc	26(100%)
Tablet vitamin C	26(100%)
Use if corticosteroids	8(30.76%)
Use if inj LMWH	5(19.23%)
Clinical outcome	
Discharged after negative swab report	3(11.53%)
Remains asymptomatic till discharged	11(42.30%)
Remained in wards	5(19.23%)
Died	0(0%)

Antibiotics and supportive multivitamins including vitamin C were given in all the 26 patients. Steroids was administered in 11.53% (3/26). These 8 patients were treated with steroids injection methyl-prednisone started with 40 mg and then dose is tappered was found to be very effective in controlling the inflammation. Sugar monitoring was done in patents who are on steroid therapy

2 patients required ICU admission 1 with obstetrics hysterectomy and another with moderate form of pneumonia

On admission, total leucocyte count (TLC) was increased in 34.61% (9/26) of the patients and neutrophil/lymphocyte ratio (NLR) was elevated in 69.23% (18/26) of patients. Elevated levels of C-reactive protein were found in 57.69% (15/26) of the patients.Liver enzymes - SGPT/SGOT were elevated in 11.53% (3/26) patients and 15.38% (4/26) reported increased serum levels of LDH

In the 22/26 cases that underwent chest X-ray and 9/26 underwent CT scan in postnatal period ,7.69% (2/22) revealed abnormal results (patchy haziness and peripheral opacities).



Pregnacy Outcome
A total of 26 pregnant women
14/26(53.84%) full term vaginal delivery and 1/26(3.84%) preterm vaginal delivery

7/26 (26.92%) full term Caesarean delivery 4/26 (15.38%)preterm Caesarean delivery

Caesarean delivery was indicated for previous caesarean delivery in COVID19 infection in 36.36%(4/11), protracted labour in 18.18 %(2/11), induction failure in 27.27% (3/11), IUGR 9.09% (1/11),placenta accrete 9.09%(1/11)

With respect to maternal outcomes, there were no recorded cases of maternal mortality and 7.69 % (2/26) required admission to the ICU. Amongst hospitalised patients, 4/26 (15.38%)required nasal prongs for supplemental oxygen therapy.

The length of stay in our hospital ranged from 3 to 26 days, with a median of 6.5 days.

A total of 18 (69.23%) cases had been discharged on day 14 postpartum and there was no maternal death.

Neonatal Outcome
In relation to neonatal outcomes,4/26 (15.38%)neonates were admitted in the NICU. Out of them 2 were admitted because of low birth weight and 1 for fetal distress and 1 for sugar monitoring. Rest 22/26 (84.61%) were in postnatal care wards and were without any symptoms of COVID19 infection

At 1 minutes APGAR scores of 24 (92.20%) neonates were greater than 7and 5 minutes, APGAR scores of all neonates were greater than 7. 19.23% (5/26) of delivered babies weighed less than 2500g at time of birth (low birth weight), 80.76% (21/26)of delivered babies weighed less than 2500g at time of birth (low birth weight),

In this case study, all the neonates underwent RTPCR testing none of them found to be positive for COVID-19 infection.Thus the evidence of vertical transmission is found to be negligible .

Discussion:-

Preliminary study of 26 casesTo our best knowledge, in this We found that SARS-CoV-2 infection caused generally mild respiratory symptoms in pregnant women. The clinical signs and symptoms mainly included fever and cough, but other respiratory symptoms like dyspnea were less common. Fever is the most dominating feature However; it is of note that most patients did not have any symptoms on admission.

Till date, summarized data from 26, with a total of 23 women with ongoing pregnancy, indicated that the most common symptoms at presentation were cough (61.6%) and fever (46.4%); 8 (38.4%) of pregnant patients did not present with symptoms, but most of these patients were diagnosed as having COVID-19 infection by rapid antigen screening testing which was become routine investigation during outbreak in all pregnant women who got admitted in this tertiary. health care centerauthors observed that the clinical characteristics of the women with COVID-19 infection during pregnancy were similar to those of nonpregnant adults with COVID-19 infection comparable with studies by Guan et al and Wu et al. [8,9] we asked all pregnant women who got admitted for delivery to do rapid antigen testing.we didn't advise chest X ray or CT scan to any one of them. We did RTPCR COVID19 testing after COVID 19 RAT report positive and chest X ray scan in postpartum period. We did CT scan of 9 patients to rule out any significant consolidation. Slightly increased WBCs, neutrophils, eosinophils, and CRP were found in postpartum blood tests.

This highlights the need of enhancing screening for COVID-19 pneumonia on admission, as well as strengthening infection control measures in obstetric wards during the epidemics

We observed incidence rate of premature delivery in confirmed cases is 19.23% (5 out of 26)

All these events of preterm delivery were triggered by gestational complications such as premature rupture of membranes and placental bleeding, which might not be directly related to COVID-19.

We did not observe any deaths or events of severe complications associated with COVID-19 pneumonia that required critical care in the pregnant women and newborns.
None of our patients developed severe respiratory complications to require critical care.

Hence, the adverse effects of COVID-19 pneumonia on pregnancy appear to be less severe than those of SARS-CoV and MERS-CoV. Three pregnant women died during the 2003 SARS outbreak in Hong Kong, and preterm delivery was as high as 80% [18]. Although no maternal deaths were recorded in the MERS-CoV outbreak, more than half of their newborns required critical care, and nearly 30% eventually died.

Similar to 2 previous reports of pregnant women with confirmed COVID-19 infection [8, 22], we did not find any evidence to support the vertical transmission of SARS-CoV-2 from mother to fetus via placenta or during cesarean delivery.Therefore, there is limited evidence of vertical transmission via placenta or during cesarean delivery. Our study also adds some evidence to suggest that the risk of vertical transmission during vaginal delivery might also low. Neither of their newborns had respiratory systems failure after birth.

Conclusions:-

In pregnancy, there are various physiological alterations in cardiovascular, respiratory and immune system, the pregnant women are at greater risk and vulnerable for COVID19 infection specially during outbreak.

In normal pregnancy there is physiological activation of the innate limb of the immune response but study by Nacaasha et al reported that pregnant women with acute infection display a more aggressive immune response. [10]

In present study, 2 0f 26 (7.69%) pregnant women experienced severe COVID-19 infection, which is in significantly lower

Currently, there is no evidence that pregnant women are at greater risk to succumb to COVID-19 infection and experience severe pneumonia.

It has been reported that viral pneumonia in pregnant women is associated with an increased risk of preterm birth, fetal growth restriction (FGR), and perinatal mortality by Madinger et al. [11]

RCOG, in consultation with the RCPCH, have provided guidance for delivery and neonatal care, which recommends that mode of delivery be determined primarily by obstetric indication, and recommends against routine separation of COVID-19-affected mothers and their babies. [12]

One of the main purposes of this study was to look for the possibility of vertical transmission of SARS-CoV-2 infection. Authors could only evaluate neonatal nasopharyngeal and pharyngeal swab samples at birth to ascertain the possibility of vertical transmission.

This preliminary study however does not rule out the possibility of vertical transmission of SARS-CoV2 when it manifests towards the end of pregnancy need to Evaluate it more as in this study not a single neonate was found to be covid 19 infection positive.

The life of health care professionals engaged in the battle against SARS-CoV-2 is equally important and adequate safety measures were ensured by using fully equipped PPE kits including N-95 masks

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