ORIGINAL RESEARCH PAPER

Obstetrics & Gynaecology

A RETROSPECTIVE STUDY TO ASSESS FETO-MATERNAL OUTCOME IN SEVERELY ILL COVID-19 POSITIVE PREGNANT FEMALES ADMITTED AT DEDICATED COVID CARE CENTER

KEY WORDS: COVID-19, PPH, NICU

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ABSTRACT

Background - Covid 19 infection caused by corona virus SARS- COV -2To study the fetomaternal outcome in severely ill covid positive pregnant females.

Methods- An Observational study was conducted at dedicated COVID care center, jhalawar from Jan 2021 to May 2021 among pregnant females. In this study we included all Severely ill symptomatic COVID positive females which could not maintain oxygen saturation, were included in this study.

Results-A total of 54 pregnant women, 24women delivered with 2 twin pregnancy . Out of this 30% underwent cesarean section and 15% were delivered by vaginal route. Postpartum hemorrhage seen in 29% of patients.24% of baby were < 2.5 kg, 12% babies were admitted in NICU. Blood products transfused in 9 patients. Remdesivir were given in 26 (48%) patients.

Conclusion-We found that severe COVID-19 infection in pregnancy was associated with risks of preeclampsia, stillbirth, preterm birth and NICU admission. Future studies are needed to collect more robust data to further validate or substantiate these findings, better understand the pathophysiologic pathways that explain these associations and identify effective strategies to prevent adverse outcomes in pregnant people with COVID-19

INTRODUCTION-

Covid 19 infection caused by corona virus SARS- COV -2. It was declared a pandemic on 11 march 2020 by WHO. It is a multisystem disease ranging in severity from asymptomatic to fatal. physiological Adaptations in normal pregnancies, mainly cardiorespiratory and immune are known to increase the susceptibility of pregnant women to several infectious agents[1]. Physiological Adaptations of pregnancy such as diaphragmatic elevation,edema of respiratory tract mucosa and increased oxygen consumption[2,3].Pregnant women are more prone to develop severe pneumonia and hypoxemic respiratory failure due to covid 19 pneumonia. pregnancy is a hypercoagulable state, increased procoagulant factors, It contribute to increased covid 19 morbidity[4]. There is high incidence of adverse fetomaternal outcome including need for admission to ICU, endotracheal intubation, ARDS,MODS(multiple organ dysfunction syndrome) and even death, also high incidence of still birth,fetal growth restriction and preterm birth[5-7].During Pregnancy there is immunomo dulatory effect there is a shift in the balance between Th1 (T helper 1) associated and Th2 (T helper 2) associated cytokines. The cell mediated immune response is downregula ted causing a Th2 dominant.humoral immune response which allows for immune tolerance to developing fetus but also contributes to increased susceptibility to viral infection in particular respiratory pathogens [8,9].Th1 immune mediated response plays a imp role in covid 19. Elevation of Th-1 associated cytokines eg IL-6 has been associated with poor outcome in covid 19 patients. SARS-COV 2 is transmitted by respiratory droplets, direct contact with fomites, close person to person contact and possibly by areosoles generated enters the body via the nasal passage and infect pulmonary cells via SARS COV2 receptors angiotensin enzyme 2 (ACE2) and uses transmembrane serine protese 2. It causes pyroptosis, inflammation mediated programmed cell death[10].

MATERIAL AND METHOD

An Observational study was conducted at dedicated COVID care center, jhalawar from Jan 2021 to May 2021 among pregnant females. Total 236 patients were admitted in this duration.

According to National institutes of health COVID- 19 disease severity criteria, in severe category oxygen saturation less than 94% on room air, oxygen requirement, respiratory rate greater than 30 breaths per minute, ratio of PAO2: FiO2 less than 300, chest imaging with greater than 50% lung involvement.

In this study we included all Severely ill symptomatic COVID positive females which could not maintain oxygen saturation, were included in this study. Out of 236 patients 54 Patients, who could not maintain oxygen saturation were included in this study.

Asymptomatic positive females excluded.

High risk consent taken. A complete history of patients including present complaints, past obstetric, medical, surgical, family history were taken. Patient's Clinical examination done with all self precautions. RT- PCR testing done based on clinical symptoms of COVID (cough, fever, myalgia, chest pain, dyspnea). All data regarding patient's status, mode of delivery, baby details were collected.

RESULTS

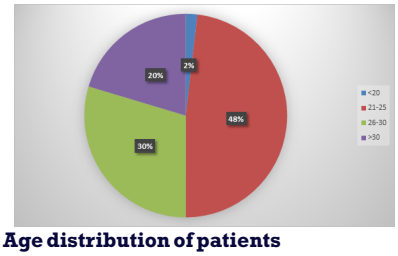

Figure 1: Age distribution of patients

2% were of age group <20 year, 48% women were of 21-25 year of age, 30% women were of 26-30 year of age group,20% women were of >30 years of age group.

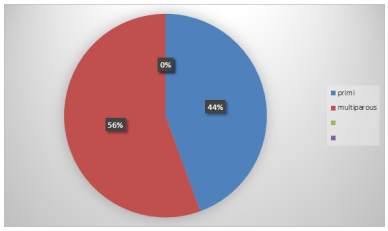

Figure 2: distribution of patients according to parity

In our study 44% patients were primi, 56% of patients multiparous.

Table 1- Gestational age on admission

Gestational age	No. of patients	Percentage
>37 week	13	24
34.1-36.6 week	12	22
<34 week	29	53

Most of patients were of < 34 week of gestational age group.

Table 2- Associated comorbidities

Comorbidity	No of patients	Percentage
Diabetes	1	1.85
Preeclampsia/eclampsia	12	22.22
Hypothyroidism	4	7.40
Anemia	17	31.48

In 2% of patients diabetes present.Eclampsia and preeclam psia were seen in 4% and 18% of patientsresp ectively. Anemia and hypothyroidism were seen in 31% and 7% of patients. None of patients had past history of Asthma or cardiovascular disease.

Table 3- Symptoms observed in patients

Symptoms	No of patients	Percentage
Fever	40	74.07
Cough	38	70.37
Dyspnea	46	85.18
Sore throat	12	22.22
Diarrhea	2	3.70
Myalgia	24	44.44

Most prevalent symptom was dyspnea, it was seen in 85% of patients, followed by fever n cough were seen in 74% and 70% of patients respectively.

Table 4- Laboratory finding observed in patients

Findings	No of patients	Percentage
Radiographic imaging on chest imaging	38	70.37
Elevated CRP	26	48.14
Elevated IL -6	15	27.77
Thrombocytopenia	17	31.48
Lymphopenia	21	38.88
Leukocytosis	20	37.03
Abnormal LFT	10	18.51
Elevated d- dimer	20	37.03

In our study lymphopenia,leukcytosis,elevated CRP were seen in 39%,37% and 48% respectively. Elevated IL6 and elevated d dimer were seen in 28% and 37% of patients respectively.

Table 5-Maternal outcome

Outcome	No of patients	Percentage
Admission to ICU	38	62.96
Maternal mortality	21	38.88
invasive ventilation	14	25.92
Oxygen	40	70.07

Out of 54 patients 38 patients were admitted in ICU. Mortality occurred in 39% of patients. All patients were on oxygen support and empirical antibiotics.Invasive ventilation received by 26% of patients while 70% received oxygen by noninasive ventilation (11%), bains (18%) rest by NRBM and venturi mask.

Table 6- Pregnancy related outcome

Outcome	No of patients	Percentage
Cesarean section	16	29.62
Vaginal delivery	8	14.81
PPH	7	29.16
Stillbirth	6	11.11
Admission to NICU	7	12.96
Low birth weight baby (2.5kg)	13	24.07

A total of 54 pregnant women, 24women delivered with 2 twin pregnancy. Out of this 30% underwent cesareansection and 15% were delivered by vaginal route. Postpartum hemorrhage seen in 29% of patients.24% of baby were < 2.5 kg, 12% babies were admitted in NICU. Blood products transfused in 9 patients. Remdesivir were given in 26 (48%) patients.

DISCUSSION

Limited literature was available regarding fetomaternal outcome and COVID-19 infections.

A study done by jeongyee et al ib their study the proportions of leukocytosis, lymphopenia and elevated CRP levels were 36 %,43% and 48% respectively[11]. In our study lymphocytosis, lymphopenia, elevated CRP were seen in 37%,39% and 48% respectively.

In our study most prevalent symptom was dyspnea, it was seen in 85% of patients, followed by fever n cough were seen in 74% and 70% of patients respectively, In study by Gao YJ et al fever followed by dry cough being the most common clinical presentation[12].

In our study 2% of patients diabetes present. Eclampsia and preeclampsia were seen in 4% and 18% of patients respectively. A Study by Jie Yan et al there is 7.8% with gestational diabetes, 4.3% with hypertensive disorders.

In Study by Tarun O et al 40% of early preterm deliveries (< 34 week) and 60% were late preterm deliveries (34.1- 36.6 week)[13]. In our study most of patients were of < 34 week of gestational age group.in our study 53% of patients were admitted with <34 week and 22% were of 34.1- 36.6 week

In study by Jie Yan 5.2% received ventilation,1.7% receive dinvasive ventilation[14]. In our study Invasive ventilation received by 26% of patients while 70% received oxygen by noninvasive ventilation (11%), bains (18%) rest by NRBM and venturi mask.

We found that COVID-19 in pregnancy is associated with preeclampsia, stillbirth and preterm birth. Severe COVID-19 was associated with an increased risk of Cesarean delivery and preterm birth. The mechanisms underlying the association between COVID-19 and preeclampsia are unclear, but investigators have shown that SARS-CoV-2 may lead to renin–angiotensin system dysfunction and vasoconstriction by binding to angiotensin-converting enzyme 2 receptors. The hallmark of preeclampsia is a systematic endothelial dysfunction, which may share a common pathway with COVID-19 illness as the vascular effects of SARS-CoV-2 infection are increasingly recognized.[15]

One study found that people with severe COVID-19 who were pregnant acquired clinical manifestations similar to preeclampsia and were distinguishable by biomarker levels, including serum-soluble *fms*-like tyrosine kinase and placental growth factor.[16]

Some studies have shown that SARS-CoV-2 infection may create a proinflammatory state that is followed by systemic endothelial dysfunction and preeclampsia.[17,18] Our finding is consistent with a 2020 study in Sweden that reported that pregnant people with COVID-19 had a higher prevalence of preeclampsia.[19]

Our result suggests that SARS-CoV-2 infection was associated with preterm birth, stillbirth and lower birth weight. We also

found that severe COVID-19 was strongly associated with preterm birth and other adverse perinatal outcomes. Some of these excess risks could relate to preeclampsia, although SARS-CoV-2 infection may also cause exaggerated systemic inflammatory responses involved in the pathogenesis of preterm birth or a suboptimal environment for fetal growth and development. Placental fetal vascular malperfusion has been found in placental histopathologic findings in patients with COVID-19 at delivery, [20] which may contribute to fetal growth, stillbirth and preterm birth. A recent national quasi-experimental study in the Netherlands found that COVID-19 mitigation measures were associated with a reduced incidence of preterm birth.[18]

Lack of knowledge about SARS-CoV-2 infection in pregnancy has raised urgent questions among obstetricians and neonatologists about the risk of maternal, fetal and neonatal morbidity and mortality. There is an urgent need for evidence to guide clinical decisions. Our findings suggest that SARS-CoV-2 infection increases the risk of preeclampsia, stillbirth, preterm birth and NICU admission, and that severe COVID-19 illness in pregnancy is particularly problematic for adverse maternal, fetal and neonatal outcomes. Clinicians should be aware of these adverse outcomes when managing pregnancies in patients with COVID-19 and adopt effective strategies to prevent or reduce risks to patients and fetuses.[17]

CONCLUSION

We found that severe COVID-19 infection in pregnancy was associated with risks of preeclampsia, stillbirth, preterm birth and NICU admission. Future studies are needed to collect more robust data to further validate or substantiate these findings, better understand the pathophysiologic pathways that explain these associations and identify effective strategies to prevent adverse outcomes in pregnant people with COVID-19.

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