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" Study Of Feto-Maternal Outcome In Covid-19 Positive Patients With Hypertensive Disorders In Pregnancy In A Tertiary Care Centre "

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I. Introduction

On March 11, 2020 World Health Organization (WHO) declared corona virus disease (COVID-19) a public health emergency of international concern since its outbreak in Wuhan, China.[1]Coronaviruses are enveloped RNA viruses that are distributed widely among humans, other mammals and birds and they 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 causing 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 sometimes causes fatal illness.[5]

Towards the end of 2019, a novel mutation of coronavirus (labelled as SARS-CoV2) was identified as the cause of a severe respiratory illness called coronavirus 2019 (COVID-19), which typically presents with breathlessness and fever.[6] Starting as an epidemic in China, COVID-19 infection has rapidly spread in large number of countries and the number of affected cases continues to rise significantly on a daily basis. COVID-19 was declared as public health emergency of international concern (PHEIC) on 30 January 2020.[7] India reported its first case of COVID-19 on 30 January 2020.[4] WHO announced by press conference on 11 March 2020 that it is a COVID-19 pandemic. It is well known that pregnant women are predisposed to a more severe course of pneumonia because of physiologic maternal adaptations to pregnancy with subsequent higher maternal and fetal morbidity and mortality.[8] But there is a lack of data in the literature about the effect of CoV infections during pregnancy, thus limiting both counselling and management of these patients. We report the results of a prospective observational study among all pregnant women with hypertensive disorders in pregnancy with COVID-19 infections admitted to labour and delivery units at tertiary care centre. We described the clinical presentation, obstetric and neonatal outcomes in patients with hypertensive disorders in pregnancy associated with COVID-19 at the time of delivery.

II. Aims And Objective

The aim of this study was to describe maternal and fetal outcomes of pregnant women with hypertensive disorders with COVID-19 infection and to prevent maternal mortality and morbidity by knowing prognostic factors and by prompt intervention.

III. Methods

STUDY DESIGN:

Retrospective observational analytical study conducted at department of obstetrics and gynaecology , J.L.N. Medical College , Ajmer, a tertiary care referral hospital. Women with hypertensive disorders in pregnancy consecutively admitted for delivery and tested via nasopharyngeal (NP) swab for SARS-CoV-2 using RTPCR from 1 January 2021 to 30 June 2021 were included in the study. A total number of 54 cases of hypertensive disorders with COVID-19 positive admitted to tertiary care hospital were taken into this study.

PARAMETERS STUDIED:

Variables like age, parity, duration of pregnancy, comorbid condition, mode of delivery and fetal condition were noted. COVID-19 testing of all the pregnant women using RTPCR method was done. The primary outcome measures studied were their risk factors, mortality and morbidity in pregnant women with hypertensive disorders infected with COVID-19 was noted.

STATISTICAL ANALYSIS

All the parameters were studied and analyzed on the basis of percentages. As this was a purely observational study, the maternal and neonatal parameters were analyzed using descriptive statistics like percentages and proportions were calculated and no statistical test was applied.

IV. Results

The study was conducted at a tertiary care centre over a span of 6 months. 54 cases of COVID-19 positive patients had hypertensive disorders.

1. AGE WISE DISTRIBUTION

AGE (IN YEARS)	NO.OF PATIENTS	PERCENTAGE
<25	24	44.5 %
26-30	20	37 %
>30	10	18.50 %

Majority of the study subjects were in the age range of <25 years of age followed by 26 -30 years and a very few are of more than 30 years of age.

2. **GESTATIONAL WEEK WISE DISTRIBUTION**

GESTATIONAL WEEKS	NO. OF PATIENTS	PERCENTAGE
< 37 WEEKS	34	63 %
>37 WEEKS	20	37 %

Majority of the study subjects were pre term pregnancies.

3. GRAVIDA – WISE DISTRIBUTION

GRAVIDA	NO.OF PATIENTS	PERCENTAGE
PRIMI GRAVIDA	30	55.5%
MULTI GRAVIDA	24	44.5 %

Majority of the subjects were primi gravida.

4. MODE OF DELIVERY WISE DISTRIBUTION

MODE OF DELIVERY	NO. OF PATIENTS	PERCENTAGE
LSCS	36	66.7 %
VAGINAL	18	33.3 %

About 66.7 % of the cases delivered by C-section, 33.3 % cases delivered vaginally.

5. MATERNAL COMPLICATION WISE DISTRIBUTION

MATERNAL COMPLICATION	NO. OF PATIENTS	PERCENTAGE
ECLAMPSIA	5	9.25 %
ABRUPTION	5	9.25 %
HELLP	4	7.40 %
AKI	3	5.55 %
ARDS	3	5.55 %
PRES	3	5.55 %
ICU ADMISSION	11	20.40 %

Out of total 54 patients , 34 patients got copmplicated out of which 9.25% had eclampsia, 9.25 % had abruptio placenta, 7.40 % had HELLP, 5.55 % had acute kidney injury, 5.55 % had ARDS and 5.55% had PRES,further, 11 patients needed ICU admission with ventilatory support.

6. BABY BIRTH WEIGHT WISE DISTRIBUTION

BABY BIRTH WEIGHT (K.G.)	NO. OF BABIES	PERCENTAGE
< 2.5 KG	24	44.5 %
>2.5 KG	30	55.55 %

About 44.5 % of the babies were low birth weight and 55.55 % were normal birth weight.

7. NEONATAL COMPLICATIONS WISE DISTRIBUTION

NEONATAL COMPLICATIONS	Percentage
STILL BIRTHS	15.33%
IUGR	15.33%
PREMATURE	26.66%
NICU ADMISSIONS	35 %
IUFD	7.66%

Among the 54 births, 15.33% were still birth, 7.66% of them did not survive, 15.33% had IUGR, 26.66% were premature and 35 % had to be admitted in NICU for treatment after delivery.

V. Discussion

Hypertensive disorders complicate 5 to 10% of all pregnancies and along with haemorrhage and infection, they form the deadly triad that increases maternal morbidity and mortality rates. Pre-eclampsia is one of the hypertensive disorders of pregnancy that developed after 20th gestational week with proteinuria and represent one of the leading cause of maternal and fetal morbidity and mortality.[6] Our knowledge is restricted that termination of pregnancy is the only curative treatment, as we know little about its exact aetiology. Previous reports record that maternal infections, especially viral, contributing to the development of preeclampsia via suboptimal trophoblastic invasion and inducing maternal systematic inflammatory response. [9] It is reported that pregnant women are at high risk of severe morbidity and mortality from respiratory infections, such as H1N1 and Varicella pneumonia. This includes a higher risk of severe illness when infected with viruses from the same family as COVID-19 and other viral respiratory infections, such as influenza. With regard to currently available limited data on COVID-19, it does not indicate that pregnant individuals are at an increased risk of infection or severe morbidity (e.g. need for intensive care unit (ICU) admission or mortality) compared with nonpregnant individuals in the general population. An intense inflammatory response has been reported as one of the key features of severe COVID-19 and as there is relative immunosuppression in pregnancy this may partly explain why severe respiratory symptoms do not develop in many pregnant women. However, pregnant patients with comorbidities may be at increased risk for severe illness consistent with the general population with similar comorbidities.

From report of 54 women, who had hypertensive disorders in pregnancy with COVID-19 infections delivering 54 babies , 44.5 % were <25 years of age, 63 % was primigravida, 55.5% was <37 weeks of gestation, 66.7% delivered by LSCS , 20.4 % of complicated pregnancies need ICU admission, and 55.5 % of babies was >2.5 kg of weight.

There is a need for systematic data reporting on women affected by COVID-19 and their pregnancies to provide an evidence base for management, treatment and prevention and to target limited resources during the outbreak.

VI. Conclusion

To conclude with, we still have limited knowledge about the full immunological aspects of preeclampsia. Further studies are recommended to show the association between COVID-19 and development of hypertensive disorders in pregnancy and worsening of the symptoms. On a daily basis the evidence on this novel infection is changing. Our primary responsibility is to ensure all women have access to safe maternity services which includes remaining up to date with the evidence for the treatment of COVID-19 in the pregnant population and ensuring strict infection control measures to prevent the spread of disease within our own units. We must also be aware of those that are potentially vulnerable during this time, both patients and colleagues and we must ensure adequate supports are available to them during these uncertain times. Women will need to be monitored in their booking maternity units and should be transferred to centres with appropriate neonatal intensive care facilities for delivery. In pregnant women with COVID-19 infection, if maternal illness is not severe, the considerations should be based more on obstetric indications for delivery. This is truly unchartered territory and at present, there is no cure or vaccine for this disease and we are faced with the prospect of having to co-exist with this virus until an effective treatment option is found. We must prepare and plan on how we can begin to re-establish our gynaecology and fertility services to ensure that all women receive the necessary care they need in these unusual times.

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