



**INCIDENCE OF HYPERTENSIVE DISORDERS IN PREGNANCY IN
SARS-COV-2 POSITIVE VERSUS SARS-COV-2 NEGATIVE WOMEN**

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ABSTRACT

Preeclampsia, a multisystem syndrome that complicates about 5% of pregnancies, is one of the leading causes of maternal mortality worldwide. This study shows incidence of hypertensive disorders of pregnancy in women diagnosed with SARS-CoV-2 and in women with SARS-CoV-2 negative. The main objective is incidence of hypertensive disorders of pregnancy among women who tested positive for SARS-CoV-2. Results: Out of the 66 women who were included in the analysis, 33(50%) were the women that had tested positive for COVID-19 and 33 tested negative for SARS-CoV-2. The incidence of hypertensive disorders of pregnancy was 72.7% among women who tested positive for SARS-CoV-2 and 39.3% women who tested negative for COVID-19 (p = 0.01) and at 95% CI : 1.1516 to 2.9596 (RR=2.18) After adjusting confounders, the incidence of hypertensive disorders of pregnancy in women who tested positive for SARS-CoV-2 when compared to women who tested negative for SARS-CoV-2 was 2.18 times higher.

INTRODUCTION

The coronavirus disease that caused a pandemic in 2019, caused by severe acute respiratory syndrome coronavirus 2 (SARSCoV2), led to a rapid expansion of knowledge its clinical manifestations, laboratory and radiographic abnormalities, and patient response. One of the areas of study was the effect that this illness may have on pregnancy and maternofetal disease. Pregnant women affected with SARS CoV2 infection have worse clinical outcomes than nonpregnant women with SARSCoV2. Preeclampsia is a multisystem disorder that complicates about 5% of pregnancies and is one of the leading causes of maternal mortality worldwide. Preeclampsia is defined as raised blood pressure (blood pressure 140 mm Hg/90 mm Hg) developing after 20 weeks of gestation in a previously normotensive woman. Gestational hypertension was defined as raised blood pressure without proteinuria. Earlier during the COVID19 pandemic, a preeclampsia like syndrome was reported in pregnancy with SARSCoV-2 and this association has been confirmed by case series and metaanalyses. Results have shown that the inflammatory response plays a significant role within the pathogenesis of hypertensive disease of pregnancy. It is a possibility, that acute inflammatory state of the COVID19

infection may exacerbate hypertension in pregnancy.

STUDY DESIGN

MATERIALS AND METHODOLOGY

A retrospective cohort study was conducted of 66 pregnant women who delivered at Krishna Institute of medical sciences, Karad over 6 months. It was a study of patients who had undergone Covid-19 RT-PCR testing at Krishna hospital over a period of 6 months. The development of hypertensive disorders of pregnancy was studied between 33 Covid-19 positive patients (GROUP A) versus 33 Covid-19 negative patients (GROUP B). Results and the primary outcome were seen in the form of development of pre-eclampsia in the two study groups.

INCLUSION CRITERIA:

1. Age: 20-25 years of age.
2. Primigravida with singleton pregnancy.

EXCLUSION CRITRIA:

1. Patients with a history of chronic hypertension
2. Any other obstetrical complication/(s).
3. Patients with multiple gestation.
4. Pre diagnosed preeclampsia.

OBJECTIVE: Incidence of hypertensive disorders in pregnancy in SARS-COV-2 positive was seen.

RESULTS

Our primary analysis included total 66 patients all of which had undergone covid-19 RT-PCR testing. Out of the 66, 33 were SARS CoV-2 positive and 33 were SARS CoV-2 negative. 24(72.7%) out of 33 developed hypertensive disorder of pregnancy in covid-19 positive group and 11(39.3%) out of 33 patients developed pre-eclampsia in women who tested covid-19 negative ($p=0.0036$) and at 95% CI: 1.2896 to 3.6913. Out of the 24 patients 2(8.33%) developed gestational hypertension, 5(20.83%) developed pre-eclampsia without severe features and 17(70.83%) developed pre-eclampsia with severe features. Out of the 11 patients 5(45.45%) developed gestational hypertension, 3(27.27%) developed pre-

eclampsia without severe features and 3(27.27%) developed pre-eclampsia with severe features. Out of 24 patients with SARS CoV-2 positive status who developed hypertensive disorder of pregnancy 19(79.16%) developed HDP at <37 weeks and 5(20.83%) at >37 weeks and out of 11 from covid negative group 3(27.2%) developed HDP at <37 weeks and 8(72%) at >37 weeks ($p=0.034$) 95% CI: 1.08-7.78) (RR=2.90). Out of 24 patients that developed HDP in SARS CoV-2 positive group, 20(83.33%) were symptomatic and 2 were asymptomatic with 17 developing severe preeclampsia and 9 out of 11 patients in SARS CoV-2 negative were symptomatic out of which 2 developed severe preeclampsia($p=0.0334$) (95%CI=1.11-13.16) (RR=3.82).

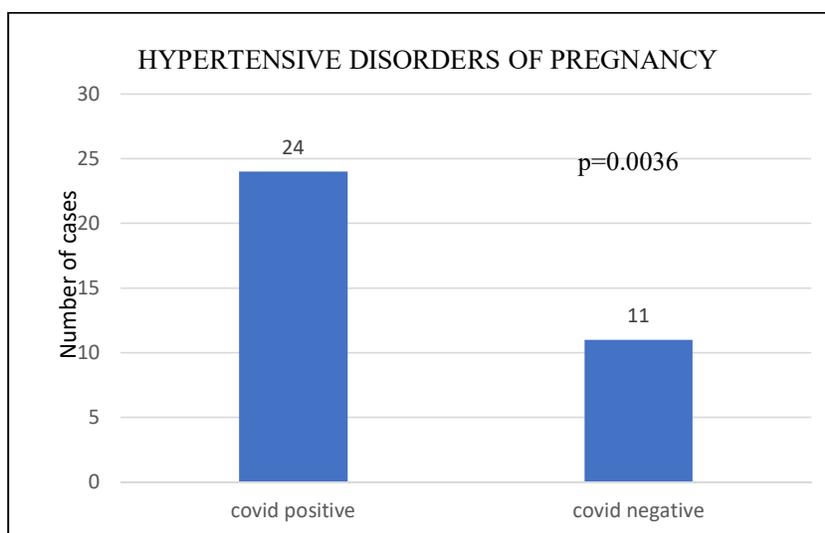


Figure 1 : Incidence of hypertensive disorder in pregnancy In both groups

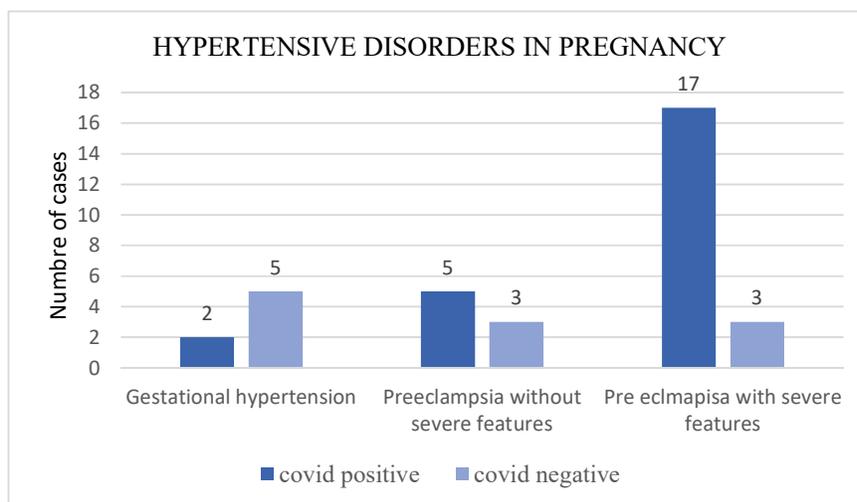


Figure 2: Hypertensive disorders in covid positive and covid negative women

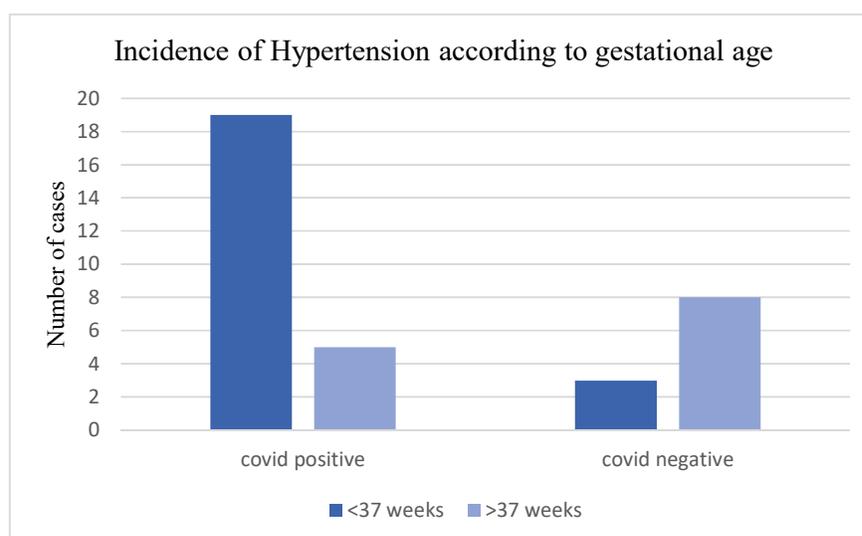


Figure 3: Incidence of hypertensive disorders in pregnancy according to gestational age

DISCUSSION

In a study conducted by Conde-Agudelo A. et al [1] SARS-COV-2 infection during pregnancy and risk of pre-eclampsia there was a statistically significant increase in the odds of preeclampsia with severe features among pregnant women with SARS-CoV-2 infection when compared to those without the infection. In our study out of the 66, 33 were SARS CoV-2 positive and 33 were

SARS CoV-2 negative. 24(72.7%) out of 33 developed hypertensive disorder of pregnancy in covid-19 positive group and 11(39.3%) out of 33 patients developed pre-eclampsia in women who tested covid-19 negative (p=0.0036) and at 95% CI: 1.2896 to 3.691.

In a study conducted by Lai J. et al [2], the study showed 43% of the cases of preeclampsia diagnosed after SARS-CoV-2

infection were preterm pre-eclampsia (less than 37 weeks) suggests that COVID-19 could be a cause of medically indicated preterm birth, which contributes to the excess preterm birth delivery rate reported previously. In our study out of 24 patients that developed hypertensive disorder of pregnancy in SARS CoV-2 positive group, 20(83.33%) were symptomatic and 2 were asymptomatic with 17 developing severe preeclampsia and 9 out of 11 patients in SARS CoV-2 negative were symptomatic out of which 2 developed severe preeclampsia($p=0.0334$) (95%CI=1.11-13.16) (RR=3.82).

Our findings are consistent with a study conducted Lai J. *et al* [2], which found that patients with severe COVID-19 have a 5 times increased risk of pre-eclampsia than asymptomatic patients. In our study the incidence of pre-eclampsia with severe features was higher in patients who tested positive for SARS-CoV-2 and were symptomatic than in patients who tested positive for SARS-CoV-2 and were asymptomatic ($p=0.034$).

Our findings are consistent with another study which was reported Metz TD. *et al* [3], which found that patients with symptomatic illness (odds ratio[OR], 2.11; 95% confidence interval [CI], 1.59e2.81) were more likely to be diagnosed with

preeclampsia than those who were asymptomatic.

In a study conducted by Madden N. *et al* [4], patients who were COVID-19 positive had higher rates of gestational hypertension and preeclampsia without severe features compared to COVID negative patients. In our study the findings were consistent with this study with pre-eclampsia developing at higher rates than in covid-19 negative patients.

In a study conducted by Papageorghiou AT. *et al* [5] it was seen that COVID-19 during pregnancy is strongly associated with preeclampsia, especially among nulliparous women. The results are consistent with our study where out of 66 patients, 33 were SARS CoV-2 positive and 33 were SARS CoV-2 negative. 24(72.7%) out of 33 developed hypertensive disorder of pregnancy in covid-19 positive group and 11(39.3%) out of 33 patients developed pre-eclampsia in women who tested covid-19 negative ($p=0.0036$) and at 95% CI: 1.2896 to 3.6913.

CONCLUSION

The incidence of hypertensive disorders of pregnancy was higher in SARS CoV-2 positive patients than in patients with SARS CoV-2 negative patients. ($p=0.01$)

The incidence of hypertensive disorders of pregnancy was higher in patients diagnosed

with SARS CoV-2 positive status at an earlier gestational age. ($p=0.034$)

The incidence of pre-eclampsia with severe features was higher in patients who tested positive for SARS-CoV-2 and were symptomatic than in patients who tested positive for SARS-CoV-2 and were asymptomatic ($p=0.034$)

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REFERENCES

- [1] Conde-Agudelo A, Romero R, SARS-COV-2 infection during pregnancy and risk of preeclampsia: a systematic review and meta-analysis, American journal of obstetrics and gynecology, 2021.
- [2] Lai J, Romero R, Tarca AL, Iliodromiti S, Rehal A, Banerjee A, et al, SARS-CoV-2 and the subsequent development of preeclampsia and preterm birth: evidence of a dose-response relationship supporting causality, American Journal of Obstetrics & Gynecology, 2021.
- [3] Metz TD, Clifton RG, Hughes BL, Sandoval G, Saade GR, Grobman WA, et al, Disease severity and perinatal outcomes of pregnant patients with coronavirus disease 2019 (COVID-19), Obstetrics and gynecology, 137(4), 2021, 571.
- [4] Madden N, Emeruwa U, Polin M, Bejerano S, Gyamfi-Bannerman C, Booker WA, 32 COVID-19 and new hypertensive disease in pregnancy, American Journal of Obstetrics & Gynecology, 224(2), 2021, S23-4.
- [5] Papageorghiou AT, Deruelle P, Gunier RB, Rauch S, García-May PK, Mhatre M, et al, Preeclampsia and COVID-19: results from the INTERCOVID prospective longitudinal study, American Journal of Obstetrics and Gynecology, 225(3), 2021, 289-e1.