Section: Obstetrics and Gynaecology

Original Research Article

EVALUATION OF MATERNAL MORTALITY IN COVID POSITIVE PREGNANT WOMEN IN A TERTIARY CARE REFERRAL CENTER AT VISAKHAPATNAM IN THE SECOND WAVE

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Received : 13/12/2023
Received in revised form : 10/01/2024
Accepted : 04/02/2024

Keywords:
COVID-19, maternal mortality, Pneumonia, ARDS.

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DOI: 10.47009/jamp.2024.6.1.154

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2024; 6 (1); 792-795

Abstract

Background: A pandemic health emergency with a high human mortality rate is COVID-19 infection. It is unknown how an infection progresses during pregnancy. The study aims to analyse maternal mortality rate in covid -19 pregnant patients in second wave. Duration of severity of symptoms at the time of admission, trimester wise mortality rates and significance of associated co- morbidities in increasing the maternal mortality rates in covid -19 effected pregnant women were noted. **Material and Methods:** This is a retrospective study conducted on pregnant women who were admitted in covid ward of ward of a tertiary care hospital in Visakhapatnam with either RT-PCR or Rapid Antigen Test for Covid-19 positive report during the second wave of Covid-19 in April and May 2021. Data of all maternal deaths were collected and retrospectively the cause of death, trimester wise mortality rates and associated comorbidities were analysed. **Results:** Total 26 maternal deaths occurred in the second wave of Covid-19 during the study period. Out of these 26 deaths ,21 were antenatal,1 died after laparotomy for ruptured ectopic and 4 died postnatally. Of these 26 maternal deaths 19.2% had comorbidities like GDM, Pre-eclampsia and bronchial asthma. Of these 26 deaths 57.6% were second trimester, 38.4% were third trimester and remaining 4% were first trimester. 92.3% died of acute respiratory distress syndrome (ARDS) secondary to Covid pneumonia, 3.84% died of Haemorrhagic shock with respiratory failure, 3.8% died due to post-operative paralytic ileus with associated covid pneumonia **Conclusion:** Covid-19 is potentially a deadly infection. Pregnant women appear to present similarly to general population but severity is more when compared to their non-pregnant counterparts. Majority of the pregnant women had mild disease of Covid-19 and were recovered. Second trimester mortality is high according to my study and the comorbidities had no effect on the maternal mortality as 80% of the patients had no comorbidities.

INTRODUCTION

From December 2019 the world has been facing a global crisis after the discovery of novel corona virus SARS-Cov2 that causes covid-19, a disease with predominantly respiratory manifestations. Compared to pregnant women without covid -19, pregnant women with symptomatic covid-19 infection requiring hospitalisation have worse maternal outcomes including increased risk of death.[1,2]

The World Health Organization formally declared on March 11, 2020, that COVID-19 had spread over the world. The effects of COVID-19 during pregnancy are not well documented. Pregnant women are more likely to contract viral respiratory infections, and pregnancy-related physiological alterations to the immune and cardiovascular systems are the cause of severe pneumonia.[2,3]

Clinical presentation of covid-19 in pregnant women remains same as of general population. While estimated mortality rates for pregnant patients with covid 19, those with critical disease at the time of presentation account for the vast majority of deaths secondary to covid 19.[4]

Pregnant women who have COVID-19 infection are more likely to experience moderate symptoms or no symptoms at all.[5] However, new research from Sweden and the US has revealed that women who are pregnant or recently gave birth are more likely to experience serious COVID-19 complications.[6]

ISSN (O): 2687-5365; ISSN (P): 2753-6556

The lack of clinical data about COVID-19 infections during pregnancy necessitates a methodical investigation of the disease's clinical features, pathogenesis, and outcomes for pregnant patients.
The study aims to analyse the rate of maternal mortality due to Covid-19 in the second wave. Trimester wise mortality rate estimation. Duration and severity of symptoms at the time of admission of the study patients and to know whether the associated comorbidities have increased the risk of maternal mortality in Covid-19.

MATERIALS AND METHODS

This is a retrospective study conducted on pregnant women who were admitted in covid ward of a tertiary care hospital in Visakhapatnam with either RT-PCR or Rapid Antigen Test for Covid-19 positive report during the second wave of Covid-19 in April and May 2021.Data of all maternal deaths were collected and analysed retrospectively the cause of death, trimester wise mortality rates and associated comorbidities

Inclusion Criteria

All antepartum, intrapartum, and postpartum women who were diagnosed to have COVID-19 infection confirmed by RT-PCR/rapid antigen test and who died during the course of treatment.

Exclusion Criteria

Referred as COVID-19 pregnant case but not having COVID-19 RT-PCR report.

Statistical Analysis

Data was coded and entered in Microsoft Excel and analysed using IBM SPSS software (Version 22.0). The frequency was updated in proportion and percentages. Chi-Square and Fisher-exact test was used and test of significance. P<0.05 was considered the threshold for statistical significance.

Ethical concerns

The above-mentioned study was conducted in this institution after obtaining due ethical clearance from the Ethical Committee.

RESULTS

Table 1: Cause of Death

Cause of Death	Number	Percent	P-value
Acute Respiratory Distress Syndrome (ARDS) secondary to Covid pneumonia,	24	92.4	**0.01***
Haemorrhagic shock with respiratory failure	1	3.8	
Post-operative paralytic ileus with associated-covid pneumonia.	1	3.8	

Table 2: Investigations

Investigations	Abnormal	Percent
D- dimer	23	88
CRP	19	73
LDH	19	73
Ferritin	10	38
Chest X-ray	13	50
ECG	10	38

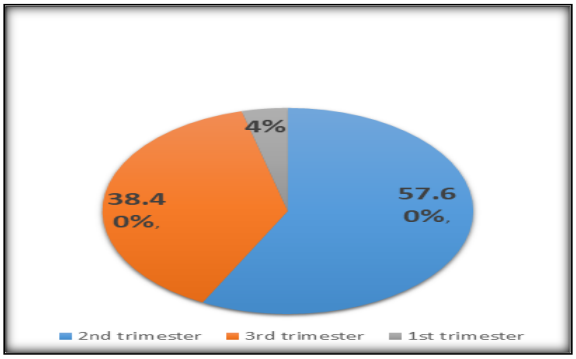

Figure 9: Trimester wise mortality rate

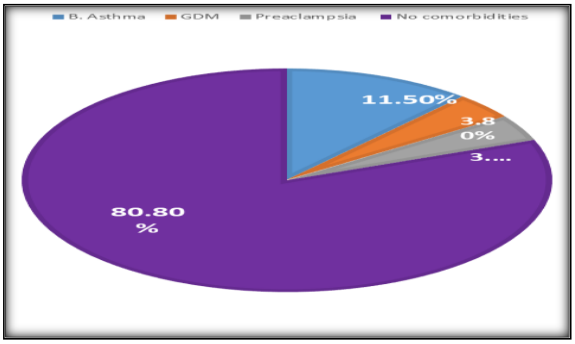

Figure 2: Comorbidities association

As per figure 1 trimester wise mortality rate was calculated and it was seen the highest mortality was seen during second trimester 57.6% followed by 3rd trimester (38.4%) and it was found to be statistically significant. (p<0.05). Of these 26 deaths 18 cases were referred to KGH from rural area hospitals.

Asper figure 2 total 26 maternal deaths occurred in the second wave of Covid-19 during the study period. Of these 26 maternal deaths 19.2% had comorbidities like GDM, Pre-eclampsia and bronchial asthma.

As per table 1 out of these 26 deaths ,21 were antenatal,1 died after laparotomy for ruptured ectopic and 4 died postnatally. 92.3% died of Acute Respiratory Distress Syndrome (ARDS) secondary

ISSN (O): 2687-5365; ISSN (P): 2753-6556

to Covid pneumonia, 3.84% died of Haemorrhagic shock with respiratory failure, 3.8% died due to post-operative paralytic ileus with associated covid pneumonia and it was statistically significant ($p<0.05$). [Table 1]

As per table 2 all the necessary investigations were done. Around 88% had abnormal D-dimer. 73% had abnormal LDH and CRP. 38% had abnormal Ferritin and ECG. Majority of these patients had oxygen saturation of <80% at the time of admission and the mean duration of hospital stay was 2-4 days. 85% of these patients had raised CRP and D-dimers for which steroids and anticoagulants were started. [Table 2]

DISCUSSION

The reduction in total lung capacity and inability to clear secretions can make pregnant women more susceptible to severe respiratory infections. Covid-19 during pregnancy is not related with an increased possibility of spontaneous abortions or preterm births.

In the present study, mean age was 27.4 years. In study conducted by Ahmed et al., mean age was 29 years.7 Most of the deaths in young mothers may be due to severity of the disease, leading to multiorgan failure or COVID-19 directly affecting the cardiorespiratory system.

In this study, 83.7% are between 20 and 30 years, and 2.7% are above 40 years. Majority of patients are in the age group 20–30 years. Young mothers dying may suggest the severity of disease, stronger immune system leading to heightened reaction to the virus, or the virus is primarily causing severe cardiorespiratory dysfunction.

Principles of management of covid -19 include early isolation, aggressive infection control measures, oxygen therapy, avoidance of fluid overload, laboratory investigations, early mechanical ventilation for progressive respiratory failure and a team based approach with multispeciality consultations.[8,9]

In a cohort study by José Villar, the presence of any COVID-19 symptoms was associated with higher morbidity and mortality. Severe pregnancy and neonatal complication rates were higher in women with fever and shortness of breath.[10]

In the United Kingdom (UKOSS study), most women were hospitalized in the third trimester or peripartum.11 Hazari et al., in his study of critically ill COVID-19 pregnant women, have reported 5 cases out of 7 critically ill cases in the 3rd trimester of pregnancy.[12]

In Takemoto study, 21 patients had GDM, 5 patients had asthma, 26 patients had cardiovascular disease, and 12 patients had obesity. Coexisting acute infections like typhoid, meningitis, and TB meningitis would alter the immune reserve leading to poor outcome.[13]

Most of the patients had elevated luekocytes, elevated D-dimers, ferritin LDH, and CRP. A study by Tjendra et al. suggested the association of leukocytosis characterized by neutrophilia associated with severe disease.14 All cases (100%) showed elevated CRP levels and raised ferritin levels. Tjendra et al. performed a comparison study between survivors and nonsurvivors in COVID-19 and found an upward trend of CRP and ferritin in nonsurvivors, these findings are comparable with the findings in our study.[14]

These changes may be the cause for severe COVID infections in antepartum period, which are resistant to standard COVID medical treatment or delivery, leading to very poor maternal outcomes and deaths. In one study, admission to death interval was less than 72 hours. In 3 cases, 72 hours–1 week in 1 case, 1–2 weeks in 4 cases, and beyond 2 weeks in 1 case. This suggests that the association of severe form of COVID-19 in pregnancy could be related to negative outcome.[15]

CONCLUSION

Covid-19 is potentially a deadly infection. Pregnant women appear to present similarly to general population but severity is more when compared to their non-pregnant counterparts. Majority of the pregnant women had mild disease of Covid-19 and were recovered. Second trimester mortality is high according to my study and the comorbidities had no effect on the maternal mortality as 80% of the patients had no comorbidities. Increasing awareness and very close monitoring for severe symptoms could prevent worsening and finally leading to death.

Conflict of Interest: None declared.

REFERENCES

1. Boushra MN, Koyfman A, Long B. COVID-19 in pregnancy and the puerperium: A review for emergency physicians. Am J Emerg Med. 2021; 40:193-198.
2. Tripathi S, Gogia A, Kakar A. COVID-19 in pregnancy: A review. J Family Med Prim Care 2020; 9:4536-40.
3. www.acog.org/clinical/clinical-giudence/practice-advisory/articles/2020/03/novel-coronavirus-2019
4. Sonja A. Rasmussen, MD, MS; John C. Smulian, MD, MPH, Coronavirus Disease 2019 (COVID-19) and pregnancy: what obstetricians need to know: AJOG VOLUME 222,
5. Álvaro Francisco Lopes de Sousa, Herica Emilia Félix de Carvalho: Int J Environ Res Public Health. 2020 Jun; 17(11): 4176. Published online 2020 Jun 11.
6. Https://www.rcog.org.uk/en/guidelines-research-services/guidelines/coronavirus-pregnancy/covid-19-virus-infection-and-pregnancy.
7. Ahmed I, Azhar A, Eltaweel N, et al. First COVID-19 maternal mortality in the UK associated with thrombotic complications. Br J Haematol 2020;190(1): e37–e38.
8. Samadi P, Alipour Z, Ghaedrahmati M, Ahangari R. The severity of COVID- 19 among pregnant women and the risk of adverse maternal outcomes. Int J Gynecol Obstet. 2021; 154:92–99.
9. Shahnaz S, Sharmin R, Sattar MA. Pregnancy with COVID-19: Weal and Woe. J South Asian Feder Obs Gynae 2020;12(4):258–260.

ISSN (O): 2687-5365; ISSN (P): 2753-6556

10. Villar J, Ariff S, Gunier RB, et al. Maternal and neonatal morbidity and mortality among pregnant women with and without COVID-19 infection: The INTERCOVID multinational cohort study. JAMA Pediatr 2021;175(8):1–10.
11. Vousden N, Bunch K, Morris E, et al. The incidence, characteristics and outcomes of pregnant women hospitalized with symptomatic and asymptomatic SARS-CoV-2 infections in the UK from March to September 2020: A national cohort study using the UK Obstetric Surveillance System (UKOSS).
12. Hazari KS, Paulose L, Kurien N, et al. Clinical characteristics, management, maternal and neonatal outcome among seven severe and critically ill pregnant women with COVID-19 pneumonia. Clin J Obstet Gynecol 2020; 3:158–166.
13. Takemoto M, Menezes MO, Andreucci CB, et al. Clinical characteristics and risk factors for mortality in obstetric patients with severe COVID-19 in Brazil: a surveillance database analysis. BJOG 2020;127(13):1618–1626.
14. Tjendra Y, Al Mana AF, Espejo AP, et al. Predicting disease severity and outcome in COVID-19 patients: a review of multiple biomarkers. Arch Pathol Lab Med 2020;144(12):1465–1474.
15. Nambiar SS, Ajith S, Reshmi VP. Assessing disease outcome in COVID-19 pregnancies in a Tertiary Referral Center in South India: A single-center retrospective cohort study. J South Asian Feder Obs Gynae 2020;12(5):335–339. DOI: 10.5005/jp-journals-10006-1822

ISSN (O): 2687-5365; ISSN (P): 2753-6556