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During The COVID-19 Pandemic, The Prevalence Of Pregnancy-Related Deaths And Associated Factors Among Pregnant Women

Vandna sharma

Assistant Professor

Universal Group Of Institution

Abstract:

Background: Pregnant women are more likely to experience serious COVID-19 problems, which could worsen pre-existing conditions and have negative effects.

Goals: We conducted this study to investigate the prevalence of pregnancy-associated deaths and the contributing factors among pregnant women, in light of the maternal mortality associated with pregnancy-related problems during the COVID-19 pandemic.

Techniques: Ten pregnant women who passed away and were referred to Al-Zahra Hospital in Rasht, Iran, during the COVID-19 epidemic were the subjects of this cross-sectional study. Patients' clinical and demographic information was documented. SPSS software version 22 was used to analyse the data, and a significance level of less than 0.05 was taken into consideration.

Findings: The average age of the pregnant women who passed away was 29.30 ± 5.31 years. Eight patients had underlying medical issues, three patients tested positive for COVID-19, and all were admitted to the intensive care unit (ICU). The average gestational age was 31.60 ± 4 weeks, and the average length of hospitalisation was 10.10 ± 5.68 days. Eight patients (80%) had low socioeconomic level, and two people (20%) had a history of prior miscarriages. The majority of deaths happened during pregnancy or soon after birth, and the most common cause (40%) was pre-eclampsia exacerbated by COVID-19.

1. Context

Pregnancy-related fatalities continue to be a major global health concern, especially in developing nations (1). Reducing the maternal mortality ratio to less than 70 deaths per 100,000 live births by 2030 is a major global health target included in the Sustainable Development Goals (2). With the majority of maternal deaths occurring in low- and middle-income nations, the epidemiological landscape of pregnancy-associated deaths shows notable variations across geographic regions, socioeconomic strata, and healthcare accessibility (3,4).

In addition to direct obstetric causes like haemorrhage, hypertensive disorders, and sepsis, pregnancy-exacerbated indirect causes include infectious diseases and pre-existing medical issues (5). The aetiology of pregnancy-associated mortality is multifaceted. One of the main causes of maternal morbidity and mortality during pregnancy is pregnancy-induced hypertension, especially pre-eclampsia (6). Cerebral haemorrhage, retinal detachment, liver hematoma/rupture, acute renal failure, disseminated intravascular coagulation (DIC), and placental abruption are among the maternal consequences that are linked to these diseases and can result in maternal mortality (7). High blood pressure and proteinuria are hallmarks of pre-eclampsia in pregnancy, which is linked to serious problems for both the mother and the foetus (8). Additionally, haemolysis, increased liver enzymes, and low platelet count, or HELLP syndrome, is a severe form of pregnancy-induced hypertension diseases . The COVID-19 pandemic has had a profound effect on practically every aspect of life worldwide, ranging from public health to the economy. Healthcare systems have been particularly under scrutiny as disparities in access and outcomes have been made public. Vulnerable populations, including pregnant women, individuals with pre-existing conditions, and the elderly, have been at higher risk for serious disease (10–13). Efforts to stop the pandemic's spread

through vaccination, social distancing, and public health activities have been vital, even if its long-term effects are still influencing global health and policy responses (14, 15).

2. **Goals**

Pregnancy-related mortality research provides important information for international efforts to meet sustainable development objectives. The prevalence of pregnancy-related fatalities and associated variables in pregnant women were examined in the current study.

3. **Techniques**

Data from 12,014 pregnant women were used in this cross-sectional study; 12,004 of these women had successful births, and 10 of them passed away from pre-eclampsia at Al-Zahra Hospital in Rasht, Iran, between 2020 and 2023. A clinical pharmacologist and a specialist in obstetrics and gynaecology examined the papers of the dead individuals.

Age, underlying conditions, marital status, educational status, socioeconomic status (determined by a combination of self-reported household income and educational attainment), COVID-19 infection at death, intensive care unit (ICU) stay, medication, length of hospitalisation, history of prior miscarriage, gestational age, multiple gestations, type of delivery, time of death, and cause of death (pre-eclampsia, eclampsia, sepsis, HELLP syndrome, cardiac arrest, obstetric haemorrhage) were all documented.

About 10 to 15% of pregnancies worldwide are affected by re-eclampsia, which is commonly characterised as new-onset hypertension (systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg) following 20 weeks of gestation along with proteinuria or other end-organ dysfunction (16). The STROCSS criteria were used to report this study (17). Numbers, percentages, and mean ± standard deviation (SD) were used to report the data. Version 22 of the SPSS program was used to analyse all the data, and 0.05 was chosen as the significance level.

4. Findings

The average length of stay in the hospital was 10.10 ± 5.68 days (1–20 days), and the average age of the women who died was 29.30 ± 5.31 years (21–38 years). The average gestational age was between 24 and 38 weeks, or 31.60 ± 4 weeks. Our research revealed that 50% of the women who died had only a diploma and 80% of them were married. Interestingly, 80% of the ladies were from low socioeconomic backgrounds.

According to their medical histories, 80% (n = 8) of the women had underlying illnesses, while 70% (n = 7) had no history of COVID-19. Obesity accounted for 40% of all comorbidities, with diabetes, hypertension, and hypothyroidism following at 20% each. According to obstetric variables, 80% of women (n = 8) had never experienced a miscarriage. The delivery methods were split equally between vaginal and caesarean sections. Ninety percent were singleton pregnancies. The majority of deaths happened either after birth (40%) or during pregnancy (50%). COVID-19-complicated pre-eclampsia accounted for 40% of the deaths. Antibiotics were the least used drug, whereas nutritional supplements were the most commonly used (90%) in terms of medication utilisation.

5. Conversation

Haemorrhage, sepsis, and pre-eclampsia are the leading causes of maternal death globally. Maternal fatalities are also thought to be significantly influenced by comorbidities, social determinants of health, and lack of access to healthcare (18). The current study demonstrated a high prevalence of pre-eclampsia and eclampsia in deceased women with COVID-19 disease. Similar studies show a high rate of pre-eclampsia in hospitalized pregnant women with COVID-19 (19, 20). Algeri et al. reported that the risk of pre-eclampsia in pregnant women with COVID-19 was considered a potential threat to maternal and fetal health (20, 21). A study by Papageorghiou et al. illustrated a significant association between COVID-19 during pregnancy and pre-eclampsia with maternal and neonatal complications and mortality (21).

Peripheral nervous system involvement and thrombotic problems were observed in pregnant women infected with COVID-19, demonstrating that the virus can predispose people to pre-eclampsia by disrupting many bodily systems (21, 23). These issues could result from increased coagulation activity brought on by thrombocytopenia, activation of coagulation pathways, and

possible progression towards DIC or fibrinolysis (24). Pregnant patients with COVID-19 may have extra risk factors for thrombosis because pregnancy is linked to increased coagulability, which can be brought on by increased intravascular inflammation and thrombin generation (25, 26).

Conclusions

These results demonstrated the intricate relationship between obstetric, medical, and socioeconomic aspects in pregnancy-related mortality, underscoring the necessity of managing comorbidities and providing comprehensive prenatal care, especially in light of the COVID-19 epidemic.

Restrictions :

This study provided valuable insights into maternal mortality related to pre-eclampsia; however, the cross-sectional and single-center design and small sample size of the study limited causal inferences and expansion to other populations. Additionally, certain important confounding variables — such as COVID-19 vaccination status, the specific viral variant, and the timing of infection in relation to pregnancy trimester — were not consistently or systematically documented in the medical records and therefore could not be reliably included in our analysis. As a result, there is a risk of residual confounding, which may affect the interpretation of our findings. Future prospective studies with standardized data collection are needed to more comprehensively assess these factors and their impact on pregnancy-associated mortality during the COVID-19 pandemic.

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