Maternal deaths due to COVID-19 in Recife, Brazil (2020–2021): Case Series

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Abstract

Introduction: the COVID-19 pandemic has had a strong impact on maternal health, amplifying biological and social vulnerabilities and highlighting regional inequalities. In Brazil, pregnant and postpartum women showed a high risk of complications and death, particularly in regions with limited health system response capacity. This study aimed to describe the clinical and care profile of maternal deaths due to COVID-19 in Recife, Brazil, between 2020 and 2021.

Description: eighteen cases of maternal deaths due to COVID-19 were analyzed, based on records from the Mortality Information System of the Brazilian Unified Health System (SIM/SUS) and the Municipal Committee on Maternal Mortality (CMMM) of the city of Recife. Most women were 20–35 years old, of mixed race, and had comorbidities, mainly hypertensive syndromes (60.9%) and obesity (33.3%). Dyspnea and dry cough were the most common symptoms. Cesarean section was the predominant delivery route (61.1%), and 83.3% required intensive care, with mechanical ventilation used in 94.4% of cases. The CMMM classified 72.2% of the deaths as preventable, and the most frequent underlying causes were acute respiratory distress syndrome and septic shock.

Discussion: the findings reveal high clinical severity and persistent weaknesses in obstetric care, reflected in delayed transfers and a high proportion of preventable deaths. Maternal deaths from COVID-19 expose structural inequalities and reinforce the need to strengthen epidemiological surveillance, improve data recording, and expand access to timely and qualified obstetric intensive care.

key words *Maternal mortality, COVID-19, Coronavirus infections, Maternal health, Pregnancy*

Introduction

The disease caused by SARS-CoV-2, referred to as COVID-19, had a substantial impact on maternal health worldwide. In Brazil, pregnant and puerperal women constituted a risk group, exhibiting increased maternal mortality.[1-3] The presence of comorbidities, such as hypertensive disorders and obesity, potentiates the severity of the infection.[4-5] The late inclusion of pregnant and puerperal women in the National COVID-19 Immunization Program contributed to the observed severity.[6] Characterizing the profile of these deaths allows for the identification of care deficiencies and informs prevention strategies. The aim of this study is to report this case series of maternal deaths due to COVID-19 in Recife-PE between 2020 and 2021, highlighting clinical and care aspects.

Description

A total of 18 confirmed cases of maternal death due to COVID-19, occurring in Recife-PE between 2020 and 2021, were included. Data were obtained from the Brazilian Mortality Information System and the Municipal Maternal Mortality Committee, as reported in the Epidemiological Bulletin of the Recife Health Secretariat.[7] Most women were between 20 and 35 years of age, were Brown and married, had completed high school and had paid employment. Dyspnea (83.3%) and dry cough (77.7%) were the most prevalent symptoms, with hypertensive disorders being the most frequent comorbidity (60.9%). Obesity was present in one third of patients, while smoking and alcohol use were infrequent.

Most deaths occurred in the puerperium (77.8%), with a median gestational age of 33.6 weeks. Cesarean section was the predominant mode of birth (61.1%). While 83.2% of women received prenatal care, only 44.4% had more than six consultations, and only a single woman had been immunized against COVID-19 (Table 1).

During hospitalization, 83.3% required ICU admission, and 94.4%, required mechanical ventilation, often lasting more than 24 hours. Approximately two thirds were transferred between healthcare facilities, highlighting vulnerabilities in the care network. Antibiotics were used in 88.9% of cases, corticosteroid therapy in 77.8%, and anticoagulants in 66.7%. Notably, 72.2% of cases, the deaths were classified as avoidable (Table 2). The most frequent underlying causes were severe acute respiratory syndrome (SARS) and septic shock, with information complemented by the Epidemiological Bulletins of the Recife Health Secretariat and the Brazilian Ministry of Health.[7,8]

Table 1

Obstetric characteristics of COVID-19-related maternal deaths during the pregnancy-puerperal cycle in Recife, Pernambuco, 2020–2021.

Obstetric characteristics	N	%
Timing of death		
During pregnancy	1	5.5
During delivery		5.5
During puerperium	14	77.8
During miscarriage/ gestational loss	2	11.1
Gestational age (weeks)		
Median (IQR)	33.6 (30 - 38)	
Route of Delivery		
Cesarean section	11	61.1
Vaginal delivery	4	22.2
Gestational loss	3	16.6
Days Postpartum		
Median (IQR)	16 (3 - 29)	
Number of pregnancies		
Median (IQR)	2 (1 - 3)	
Primigravida	6	33.3
Parity		
Median (IQR)	1.5 (1 - 3)	
Primipara	8	44.4
Number of abortions / gestational losses		

Median (IQR)		0 (0 -1)
Number of living children		
Median (IQR)		1.5 (1 – 3)
Prenatal care consultations		
No prenatal care	3	16.6
> 6	8	44.4
< 6	7	38.8
COVID-19 Vaccination Status		
Yes	1	5.5
No	15	83.3
Unknown	2	11.1

IQR= interquartile range.
Source: Data from the Recife/PE Mortality Epidemiological Surveillance System and IMIP research; 2023.

Table 2

Therapeutic modalities performed during hospitalization, therapeutic itinerary, and avoidability of deaths among women with COVID-19 in the pregnancy-puerperal cycle in Recife, Pernambuco, 2020–2021.

Therapeutic modality performed	N	%
Therapeutic antibiotics (n,%)	16	88.9
Anticoagulants (n,%)	12	66.7
Blood products (n,%)	9	50.0
Dialysis (n,%)	5	27.8
Corticosteroids (n,%)	14	77.8
AMV (n,%)	17	94.4
AMV duration (n,%)		
<24h	4	23.5
>24h	13	76.5
NIV (n,%)	15	83.3
NIV duration (n,%)		
<24h	2	26.7
>24h	11	73.3
Hospitalization due to COVID-19 infection and/or complications (n,%)	17	94.4
Hospitalization duration (n,%)		
<24h	3	17.7
>24h	14	82.3
Range (days)		3 - 81
Median (IQR)		13 (7 – 24)
Symptom duration (n,%)		
Range (days)		2 - 15
Median (IQR)		8 (3 – 13)
ICU admission (n,%)	15	83.3
Duration of ICU stay (n,%)		
<24h	2	13.3
>24h	13	86.7
Hospital transfer (n,%)	12	66.7
Avoidability of death (n,%)		
Probably avoidable	3	16.7
Potentially avoidable	13	72.2
Inconclusive	2	11.1

AMV= assisted mechanical ventilation; NIV= non-invasive ventilation; ICU= Intensive Care Unit.
Source: Data from the Recife/PE Mortality Epidemiological Surveillance System and IMIP research; 2023.

Discussion

The findings of this series reveal a pattern of high severity, marked by a predominance of puerperal deaths and a high requirement for intensive care. The association between severe COVID-19 and preexisting comorbidities, particularly hypertensive disorders and obesity, is well-documented, reinforcing a synergy linked to worse maternal outcomes.[4,5]

The significant number of transfers and the limited availability of examinations point to deficiencies in the obstetric care network, including the access to prenatal care, timely arrival at health units, and the provision of adequate treatment – aspects described in the Thaddeus and Maine's Three Delays Model.[9] The interruption of routine prenatal care during 2020 and the late inclusion of puerperal and pregnant women in the immunization campaign may also have contributed to the observed severity.[6] Collectively, these elements support the interpretation that the pandemic potentiated pre-existing structural vulnerabilities in obstetric care. National and international reports indicate that the pandemic revealed structural inequalities in the maternal care, disproportionately affecting women in vulnerable contexts.[7,8,10]

The high proportion of deaths classified as avoidable underscores the need to strengthen protocols for managing respiratory insufficiency, train healthcare teams and expand the access to obstetric ICU beds. Investing in surveillance and integration between primary and specialized care is critical to mitigate avoidable deaths in future public health emergencies.[10-13]

Maternal mortality due to COVID-19 results from a combination of factors that extends the direct action of the virus, encompassing biological vulnerabilities, social inequalities, and structural weaknesses in the obstetric care network. The deaths recorded in Recife reflect the national scenario, characterized by regional disparities and limited response capacity in crisis situations.

The findings underscore the need to enhance epidemiological surveillance, improve the completeness and accuracy of medical records and death certificates, and invest in the continuous professional development of healthcare teams and the strengthening of Maternal Mortality Prevention Committees. We recommend expanding investigations at both the state and inter-state levels, comparing maternal deaths attributable to and non-attributable to COVID-19, aiming to inform public policies that ensure timely obstetric care, active surveillance and reproductive justice.

Authors' contribution

Souza KR: data curation, formal analysis, investigation, and manuscript writing. Katz L: conceptualization, methodology, supervision, and writing, review, and editing of the manuscript. Cunha ACC: methodology, formal analysis, visualization, writing, review, and editing of the manuscript. Amorim MMR: conceptualization, project administration, supervision; review and editing of the manuscript. All authors approved the final version of the article and declared no conflicts of interest.

Data Availability

All datasets supporting this study are included in the article.

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