Scientific Research Publishing

Open Journal of Obstetrics and Gynecology, 2025, 15(8), 1319-1325
https://www.scirp.org/journal/ojog
ISSN Online: 2160-8806
ISSN Print: 2160-8792

Analysis of Maternal Death Occurred in the Immediate Postpartum Period

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How to cite this paper: Madoué, G.B., Cherif, H., Diallo, F.B., Abdelsalam, S., Koyamayele, P.D. and Lhagadang, F. (2025) Analysis of Maternal Death Occurred in the Immediate Postpartum Period. *Open Journal of Obstetrics and Gynecology*, **15**, 1319-1325.
https://doi.org/10.4236/ojog.2025.158109

Received: July 8, 2025
Accepted: August 25, 2025
Published: August 28, 2025

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Abstract

Background: Immediate postpartum period is defined as the first 24 hours following delivery, this is the most critical period for maternal survival. **Objective:** To analyze key sociodemographic and clinical factors of maternal deaths occurring in the immediate postpartum. **Patients and Method:** This retrospective, cross-sectional study analyzes the causes and characteristics of maternal deaths occurring in the immediate postpartum period at a university hospital in N'Djamena, Chad (NMCUH). The study included all patients died in the 24 hours following the delivery. Studied variables were socio-demographic, clinical, therapeutic and prognose. To compare data, we have used statistical tests, in particular p-value (p significant when ≤5%). **Results:** We have recorded 60 cases of maternal death in the postpartum period among 14,479 deliveries, giving a frequency of 0.4%. Of these, only 31 patients met our inclusion criteria. The study examined 31 cases from 2023-2023. The key findings indicate that hemorrhage (41.9%) and hypertensive disorders (25.8%) were the leading causes of death, with lack of antenatal care (54.8% of cases) and referral from other facilities (74.2%) being significant contributing factors. **Conclusion:** Maternal mortality remains a public health problem in Chad. Sensitivity aimed at improving antenatal visits seems necessary.

Keywords

Maternal Mortality, 24 Hours, Post-Partum, N'Djamena Chad

1. Introduction

Although pregnancy is a natural physiological phenomenon, it remains associated with major risks of maternal morbidity and mortality, particularly in low-income

countries [1].

Maternal death refers to the death of a woman during pregnancy or in the 42 days following its termination, whatever the duration or location, from any cause determined or aggravated by the pregnancy or its management, but neither accidental nor fortuitous [2].

Of the various phases of pregnancy, the immediate post-partum period, defined as the first 24 hours after delivery, is the most critical for maternal survival [3].

Worldwide, more than half of all maternal deaths occur during this period, largely due to severe hemorrhage, infection, hypertensive complications or thromboembolic disorders [4] [5].

In Chad, maternal mortality remains among the highest in the world, with an estimated ratio of 1063 deaths per 100,000 live births [6]. Weaknesses in the health system, delays in access to emergency obstetric care and lack of immediate postnatal monitoring are all contributing factors. Understanding the circumstances in which these immediate postpartum deaths occur is essential to prevent this mortality and thus improve the quality of maternal care [7].

Objective: analyze key sociodemographic and clinical factors of maternal deaths occurring in the immediate postpartum.

2. Patients and Method

This was a cross-sectional, descriptive and analytical study covering a period of over 24 months, from January 1st 2023 to December 31st 2023, performed in the maternity of N'Djamena Mother and Child University Hospital (NMCUH).

The study population consisted of all women who gave birth or were admitted in the immediate post-partum period. We have included all patients died in the 24 hours following the delivery. Studied variables were socio-demographic clinical, therapeutic and prognose. The data collected were entered using Microsoft Office Word and Excel 2017 and analyzed using Sphinx. To compare data, we have used statistical tests, in particular p-value (p significant when ≤5%).

3. Results

3.1. Frequency

We have recorded 60 cases of maternal death in the postpartum period among 14479 deliveries, giving a frequency of 0.4%. Twenty-nine (29) died after the 24 hours following the delivery. Only 31 patients met our inclusion criteria.

3.2. Age

The age group from 26 to 40 years accounted for 58.1% followed by the age group of 20 - 25 years and <20 years with respectively 29% (n = 9) and 12.9% (n = 4). Mean age was 27.2 ± 6.7 years, with extremes ranging from 15 to 40 years.

3.3. Profession

Housewives were the most common, with a rate of 83.9%, followed by civil servant

9.7%.

3.4. Level of Education

Most patients were not schooled (54.8%), followed by primary, secondary and university level respectively (19.4% (n = 6), 9.7% (n = 3) and 3, 2% (n = 1).

3.5. Marital Status

Married women accounted for 90.3% (n = 28) followed by single and divorced women with 6.5% (n = 2) and 3.2% (n = 1) respectively.

3.6. Parity

Patients were multiparous in 41.9% (n = 13) followed by pauciparous and nulliparous women respectively 29% (n = 9) and 25.8% (n = 8).

3.7. Mode of Admission

The majority of patients who died were referred from other health facilities (74.2%, n = 23, p = 0.002), compared with 25.8% (n = 8) who came on their own.

Referred patients had presented the third delay, for receiving adequate care. That was the first reason of reference from surrounding health center.

Eighteen (18) patients (58.1%) lived in rural areas compared with 13 patients (41.9%) in urban areas.

The means of transport used were: ambulance (51.6%) followed by private car and public transport (38.7% and 9.7% respectively).

3.8. Reason for Admission

Pre-eclampsia/eclampsia was the reason for admission in 32.4% of cases (Table 1).

Table 1. Reason of admission.

reason of admission	n	%
Preeclampsia/éclampsia	10	32.4
Dystocic abour	7	22.8
Severe anémia	1	3.2
Malaria	1	3.2
Intra uterine death	1	3.2
Pre uterine rupture	1	3.2
Utérine rypture	1	3.2
Hydrocéphalia	1	3.2
Genital bleeding	2	6.4

Continued

Pelvic and fetal dysproportion	1	3.2
Abruption placenta	4	12.8
Parent refusal to receive treatment	1	3.2
Total	31	100

3.9. Antenatal Visits

Patients who had not attended any antenatal visits accounted for 54.8% (n = 17), followed by those who had attended 1 - 3 antenatal visits and 4 or more antenatal visits, with 32.3% (n = 10) and 12.9% (n = 4) respectively.

3.10. Cause of Death

Haemorrhage was the main cause of maternal death at 41.9% (**Table 2**).

Table 2. Cause of maternal death.

Cause of maternal death	n	%	p
Hémorrhage	13	41.9	0.001
Hypertension complications	8	25.8	0.002
Sepsis	3	9.6	
Amniotic embolism	1	3.2	
Malaria	2	6.4	

Among the haemorrhages we noted: immediate post partum haemorrhage, n = 7 (21.6% including 5 cases by atony and 2 cases by tearing), placenta previa/accreta n = 2 (6.4%), uterine rupture n = 3 (9;6%) and 1 case of retro placental haematoma (3.1%).

Taking into account the classification of maternal mortality, we found that the main causes of maternal death were: group 3 (21.6%), group 2 (25.8%), group 4 (16%) and group 5 (3.2%).

3.11. Length of Hospital Stay

The average length of stay for patients who died was 44.89 hours (1.87 days), with extremes of 0.75 hours (45 minutes) and 22 days (**Table 3**).

4. Discussion

The frequency of maternal death in immediate post-partum period was 0.41%. This frequency is lower than that reported by Foumsou [8] *et al* in Chad in 2018 and by Kantara [9] an al in Mali the same year at Kayes hospital, who obtained respectively 0.84% and 1.19%. The maternal mortality rate observed in our regions

could be explained by the absence or weak pregnancy monitoring by the patients

Table 3. Distribution of patients who died according to length of hospital stay (from admission to death).

Hospitalization stay	n	%
1 - 6 h	17	54.8
7 - 12 h	5	16.2
13 - 18 h	4	12.9
19 - 24 h	4	12.9
>24 h	1	3.2
Total	31	100

The age group from 26 to 40 years accounted for 58.1%. Mean age was 27.2 ± 6.7 years, with extremes ranging from 15 to 40 years. This corresponds to the period of intense sexual activity that led to pregnancy and delivery. Our findings are lower than those of Traoré [10] and Pambou [11] *et al.* who reported successively 61.89% and 68.75% for the age group of 20 to 34 years. Factors like prenatal cares and antecedent such as multiparity can justify our result. The lack of prenatal care can allow the occurrence of obstetric complication.

Fifty-four-point eight percent (54.8%) of patients were unschooled. This frequency is lower than the 72% of unschooled patients noted by Blaise [12]. Therefore, this result corroborated the WHO data showed a high rate of unschooled patients in low-resource country mainly living in rural areas [13]. This situation is explained by the fact that women who are unemployed and uneducated cannot take good care of themselves and are unaware of the risks linked to missed prenatal cares.

Married women accounted for 90.3%. The same was true in Mali with Kiré [14] and Diallo [15], who reported respectively 94.7% and 77.7%. This could be explained by the fact that in Chad, as in Mali, a sub-Saharan country with cultural similarities, early marriage is very common.

In our study, 58.1% of the patients who died came from rural areas, compared with 13 patients (41.9%) who lived in urban areas. A high number of the deceased patients were referred from other health facilities, accounting for 74.2%, this is higher than the findings of authors like Traoré [16] *et al.* in Mali (57.2%). In a study of maternal mortality in Tunis, Tunisia, Kharouf [17] *et al.* noted that transferring a woman in labour multiplies the risk of death by 12. These transfers have an impact on the increased risk of maternal mortality. They exacerbate the delay in dealing with obstetric emergencies.

Multiparous women were the most represented with 41.9%. The influence of parity on the risk of complications and maternal mortality is controversial. However, multiparity and very grand multiparity (≥5) are thought to be the most im-

portant determinants.

Some authors believe that maternal mortality increases as one moves from poverty to multiparity and from multiparity to major multiparity [17].

In 54.8% patients had not attended prenatal, this is very low compared to the minimal number of prenatal cares recommended by the World Health Organization (WHO. Our findings can be explained by the fact that women didn't attend prenatal care linked with poverty and the lack of information. All pregnant women should receive good antenatal care, which aims to detect, prevent and manage obstetrical complications.

Pre-eclampsia and eclampsia were the most common reasons for admission, accounted for 32.3% (**Table 1**). This result is lower than Traoré [16] findings representing 46.9%. This can be explained by the fact that N'Djamena Mother and Child University Hospital is recognized as a national hospital that can solve all type of obstetric complication.

The majority of the women who died (51.6%) had been transported by ambulance. This result is higher than that obtained by Blaise [12] accounting for 40.7% of the patients lived around 10 km from the hospital and had no means of transport. Factors like government commitments and the distribution of health facility can explain this result.

Taking into account the causes of maternal death, we found that hemorrhage was the leading cause of maternal death with 41.9% (**Table 2**). This result confirms previous findings showing that hemorrhage is the main cause of maternal death in our countries [18] [19]. In fact, in our countries, there is a lack of availability of blood products, especially in emergencies. This situation exacerbates the prognosis of patients, making certain deaths inevitable.

5. Conclusions

Maternal mortality remains a public health problem in Chad. Despite efforts to curb this health challenge, its incidence remains high.

Most of the women who died were young and did not attend school. Risk factors remain dominated by multiparity and lack of prenatal cares of patients coming for surrounding areas.

Hemorrhage and hypertensive complications were the most common causes. According to this study, one can say that sensitivity aimed at improving cares prenatal in surrounding area of N'djamena seems necessary.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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