Factors associated with maternal deaths in Bongor Provincial Hospital, Chad

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ABSTRACT

Introduction: Maternal mortality remains a major public health problem, particularly in Chad. The aim of this study was to analyse the factors associated with maternal death.

Method: This was a retrospective descriptive and analytical study conducted at Bongor Provincial Hospital (BPH) over a 5-year period (2015 to 2020). The study population consisted of all maternity patients who died in this hospital and whose records were complete. The variables studied were epidemiological, clinical, and therapeutic factors. The data were collected and analysed using Sphinx Plus²(V5) software. The Chi-square test was used to compare the variables. A p-value of less than 0.05 was considered significant.

Results: We registered 13,758 women with all pathologies, of which 6,349 met the inclusion criteria; 98 of them died (1.5%) giving a Maternal Mortality Rate (MMR) of 1005/100,000 live births. These deaths mainly occurred in women aged between 20 and 24 years (30.6%), who were married (79.6%), housewives (59.2%), multiparous (33.7%), from rural areas (74.5%), uneducated (39.8%) and who had had no prenatal care (60.2%). The main aetiologies reported were: genital haemorrhage (77.5%), infections (63.3%), malaria (61.2%), severe anaemia (39.8%) and dystocia (25.5%).

Conclusion: Maternal mortality is a major health problem, and its reduction requires the mobilization of all actors in society and implies good health education, improvement of the quality of prenatal follow-up and emergency obstetric care.

Keywords: maternal death, Bognor Provincial Hospital, Chad.

INTRODUCTION

Maternal death refers to the death of a woman during pregnancy or within 42 days of termination, regardless of duration or location, from any cause determined or aggravated by the pregnancy or its management, but not accidental.[1] Global estimates for 2017 indicate that there were 295,000 maternal deaths, 35% less than in 2000 when they were estimated at 451,000, of which 86% (254,000) were in sub-Saharan Africa and South Asia.[2] According to 2015 statistical data, the maternal mortality ratio (MMR) in Chad is 860 deaths per 10,000 live births and the causes are multifactorial.[3] The MMR is similar in Mayo-Kebbi Est Province.

The death of a woman of childbearing age is a significant economic loss for both family and community. Several strategies have been developed to reduce maternal mortality, including family planning, emergency obstetric and neonatal care (EmONC) and skilled birth attendants.[3]

Few studies have addressed the factors associated with maternal deaths in the province of Mayo-Kebbi Est, which is why we conducted this one at Bongor

Provincial Hospital (BPH), which is the reference care site for the populations of Mayo-Kebbi Est in Chad and Yagoua in Cameroon.

METHOD

This retrospective descriptive and analytical study took place over two months from 1 January 2015 to 31 December 2020 in the maternity ward of BPH.

It examined the clinical records of women who died in the maternity service of BPH during pregnancy, delivery, post-abortion and postpartum, as well as those of live births registered during the study period. Studied variables were epidemiological, clinical, and therapeutic factors.

Data were entered and analysed using Sphinx Plus 2 .v5 software and EXCEL 2010 software. Chi square and p-value statistical tests were used with a p-value <0.05 considered significant.

RESULTS

During the study period, 13,758 patients were admitted. Only 6,349 had complete records. Out of these 98 (1.5%) died.

The age group 20 to 24 years was more represented with 30.6%. The median age was 23.6 ± 6.6 years with a range of 14 to 42 years. (Table 1). Fifty-seven (58.1%) of the women who died were aged 24 years or below.

Nearly half the patients, 45.9% (n=45), reported having no education and respectively 24.5% (n=24), 23.5% (n=23) and 6.1% (n=6) had primary, secondary and university education. Most (74.5%.) came from rural areas and 80.6%.(n=77) were married.

One third of the patients were multiparous of whom 27.6% (n=27) were grandmultiparous (≥ 5), 13.3% (n=13) were primiparous and 15.3% (n=15) were pauciparous. Most, 69.4% (n = 68),were referred from facilities outside BPH. Table 2 shows that 60% of the women had had no prenatal contacts. Fifty-four of the deaths (55.1%) occurred in the postpartum period. (Table 3) For 24 (24.5%) labour was the entry diagnosis. (Table 4) Haemorrhage was the direct obstetric cause of death for 67.4% (n = 66) women; others include pre-eclampsia/eclampsia 10% (10.2), infection 9% (9.2), abortion 8%(8.1) and obstructed labour 5% (5.1). Malaria was the most frequent indirect cause of death for 61.2% (n = 60) women. (Table 5) The hospital stay was 24 hours or less for 55.1% (n = 54) of the women, between 24 – 48 hours for 23.5% (n=23) and more than 48 hours for 21.4% (n=21).

DISCUSSION

During the study period, the maternity service recorded

Table 1. Age distribution of the women who died (N=98)

Age (year)	Frequency n (%)
≤19	27(27.5)
20-24	30 (30.6)
25-29	21 (21.4)
30-34	13 (13.3)
35-39	4 (4.1)
≥40	3 (3.1)
Total	**98 (100)**

Table 2. Number of prenatal contacts

Antenatal consultations	Frequency n (%)
0	59 (60.2)
≤3	35 (35.7)
4-6	3 (3.1)
7-8	1(1)
Total	**98 (100)**

Table 3. Stage of pregnancy when death occurred

Stage of pregnancy	Frequency n (%)
During pregnancy	12 (12.4)
Post-abortion	26 (26.5)
During childbirth	6 (6.1)
During the first 24 hours postpar-tum	39 (39.8)
After 24 hours postpartum	15 (15.3)
Total	**98 (100)**

Table 4. Distribution according to entry diagnosis on admission

Diagnosis at admission	Frequency n (%)
Postpartum haemorrhage	14 (14.3)
Endometritis	19 (19.4)
Malaria	21 (21.4)
Abortion	14 (14.3)
Eclampsia	8 (8.2)
Pre-term labour	18 (18.4)
Labour and delivery	24 (24.5)
Ectopic pregnancy	8 (8.2)
Molar pregnancy	6(6.1)
Uterine rupture	2 (2)
Placenta praevia	2 (2)

Table 5. Distribution according to indirect causes of death

Indirect causes of death	Frequency n (%)
Post-operative complications	12 (12.2)
Post-partum cardiomyopathy	10 (10.2)
Kidney diseases	5 (5.1)
Malaria	**60 (61.2)**
Severe anaemia	39 (39.8)
Chlamydia/Syphilis	36 (36.7)
HIV/AIDS	17 (17.3)
Tuberculosis	8 (8.2)
Hepatitis	7 (7.1)

6,349 admissions that met the inclusion criteria, among whom 98 (1.5%) died. This rate is higher than the 1.2% reported by Baldé in Mali in 2019.[4] The MMR of 1005 per 100,000 live births is significantly higher than those found by Djongali et al. in Chad in 2017[5] and Anki in Congo in 2015[6] who reported a MMR of 653/100,000 per live births and 830/100,000 per live births respectively. Our MMR is higher than that of developed countries - estimated at 12/100,000 live births.[2] This result demonstrates that maternal mortality remains a major public health problem in Chad.

This mortality particularly affects young women. In this study 57 (58.1%) were aged 24 years and younger. Oyeniyi[6] in Sokoto, Nigeria, notes that the 15-24 age group represented 59% of patients. This can be explained by the areas in which the studies were conducted. In rural areas, low school enrolment and poverty encourage cultural practices such as marriage among adolescents. Adolescent pregnancy and childbirth are causes of obstetrical complications which, if unchecked, can lead to maternal death.

Those with less schooling had more obstetric complications. In our study 39.8% women had not attended school which is lower than rates reported by Hatouna in Chad in 2022[7] and Baldé in 2019 in Mali.[4] This demonstrates the negative role that the lack of literacy plays on maternal mortality. The more educated women are, the better informed they are about the risks related to complications of pregnancy and childbirth, and the more likely they are to attend health facilities.

Lack of schooling is also a factor limiting women's activities. In rural areas, this situation forces women to take care only of household chores. This is supported by our findings that 59.2% of women gave their occupation as housewives which is lower than those reported by authors in Chad in 2022[7] and in Mali in 2019,[4] respectively 88.89% and 88.5%.

Most of the women who died (79.6%) were married. This can be explained by the fact that pregnancy or childbirth outside of marriage is considered dishonourable by many tribes in Chad. In order to avoid stigmatization, many women are forced to into a relationship.

According to the Chad Demographic and Health Survey, the total fertility rate is 6.2.[3] This places Chad among countries with high birth and fertility rates. In this study 27.6% of women were multiparous which is more than the 22.3% reported by Anki in Congo in 2015.[8] Multiparity is an established risk factor for maternal mortality. The uterus, after several deliveries, has a reduced capacity to retract. This impacts on its ability to ensure haemostasis in the postpartum period, thus increasing the chance of haemorrhagic complications.

Women with no prenatal contacts accounted for 60.2% of maternal deaths in this study. There was a statistically significant association between the number of contacts and maternal deaths. Women with no contacts were ten times more likely to die than those with four or more contacts [Chi square = 10.61; p = 0.0022]. This is higher than the 54.8% in Mali in 2019[4], and the 47.4% in Chad in 2022.[7] This high number of deaths in women with no prenatal contacts can be explained by them missing the information and awareness given during prenatal follow-up. Only 1% of our patients who had had frequent prenatal care (8 contacts) died.

Most of the women, 74.5% (n=73), were from rural areas. Data from the literature show that delay in accessing health care worsens maternal prognosis. The remoteness of households, the impassability of roads during certain months of the year, and lack and cost of transport cruelly hinder access to health facilities.

Sixty-eight (69.4%) of the women who died had been referred from outside BPH; this is less than that found by Baldé who noted 85.6% died after being referred.[4] Our high rate of referral could be explained by the lack of qualified personnel and insufficient technical facilities in peripheral health centres. Most of our referred patients were accompanied by unqualified people. Referral is a risk factor for maternal mortality but the earlier patients are referred, the better they can be managed in the referral facilities.

Haemorrhage was the direct cause of death for 67.4% of the women. The literature agrees on the multiplicity of direct causes in the occurrence of maternal deaths. However, there is a divergence of results as to the order of frequency.[9,10,11] Studies in Chad by Djongali et al[5] and Foumsou et al[12] found complications of hypertension, haemorrhage and infections as the main direct causes. The high rate of death from haemorrhage can be explained by the long distance travelled to BPH, sometimes without a venous line, the lack of a blood bank at BPH, the refusal

of blood transfusion imposed by certain religions, and delay by parents of patients consenting to provide blood.

Infection remains a significant cause of complications resulting from clandestine abortions and septic deliveries.

Among the indirect causes of death, malaria was the most common with 61.2%. This result complements that of Sayinzoga et al[13] who noted that malaria is the main indirect cause of maternal death. This can be explained by the fact that malaria is endemic in Chad and there is a lack of pregnancy monitoring for many women. During prenatal care the prescription of intermittent preventive treatment of malaria limits the occurrence of malaria.

In this study, half (55.1%) of women had a hospital stay of less than 24 hours before they died, which is lower than the 71% of deaths occurring less than 24 hours after admission reported by Baldé.[4] This rate is attributable to factors such as the unavailability of blood products. In the case of bleeding emergencies, anaemia must be corrected by blood transfusion. The absence of a blood bank at BPH further complicates treatment.

CONCLUSION

Maternal death remains a public health problem in developing countries. The MMR in Chad is high in both N'Djamena[5] and Bongor. The main characteristics of the deceased patients were: young, uneducated, multiparous and had been referred to BPH. The main causes of death were haemorrhage, infection and hypertension and their complications. Malaria was most common indirect cause. In order to reduce maternal mortality in Mayo-Kebbi Est Province, it is necessary to raise awareness of the importance of schooling for young girls and prenatal consultation, and to improve their access to health care facilities.

Conflict of interest: None

All authors participated in the design of this paper and agreed to its submission.

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