Maternal Mortality at the Mother and Child Health Center of the Zinder region: Causes and Epidemiological Profile of Patients

Aboukari BM, Rabiu MB, Magagi A, Hounkpe PC, Lankonde Z, Maikassoua M, Idrissa A

Abstract: Introduction: The study of mortality makes it possible to control and revise therapeutic measures in a health facility. Maternal death is a major concern in the world, it is a social tragedy. We present a study on maternal death at the Mother Child Health Center in the Zinder region. Methodology: The study was a retrospective, descriptive study covering eleven months from January 1st to November 30th, 2017. Study conducted at the mother and child health center in the Zinder region, the main regional reference point for obstetric gynecology. The objective was to determine the epidemiological profile of deceased parturients. Patients admitted directly or evacuated from other health facilities and who died as a result of maternity were included. Patients who died outside the gestational setting were excluded. Data was collected from the admission register, the maternal death audit report and the patient record. The variables studied were epidemiological data, type of anesthesia, ASA class, cause of death, mode of transport. Results: A total of 10090 patients admitted were studied, one hundred and sixteen (116) women died (1.14%) and 3030 deliveries was conducted, of which 2635 were live births. The average age was 26.28 years with extremes of 15 years and 42 years. The 21 to 30 age group was the most affected with 31.89% (n = 37). Large multiparas (5 to 13 parities) were in the majority with 46.55% (n = 54). Transportation was unsafe at 86.20% (n = 100) and 68.96% (n = 80) was more than 50 km from the site of care. Almost all, 99.13% (n = 115) were uneducated and unprofessional. NPC was not achieved in 98.27% (n = 114) of the cases. Anesthesia was performed in 23.27% (n = 27) of the patients including 19.82% general anesthesia and 03.44% spinal anesthesia. The ASA I class represented 14.81% (n = 04), ASA II 74.07% (n = 20) and 11.11% for the other classes. The midwife was the caregiver in 87.93% (n = 103) of the cases. Delayed treatment was the leading cause of death in 51.72% (n = 60) of cases followed by inadequate treatment and delay in 12.06% (n = 14) and delayed diagnosis or intervention in 06.03% (n = 07) cases. Pathologically, anemia, haemorrhage and eclampsia were found in 39.65% (n = 46), 17.24% (n = 20) and 16.37% (n = 19) respectively. Conclusion: Poor quality of care, delay in care and inadequate quality and quantity of material and staff were the determining factors in the occurrence of deaths at the maternal health center. Child from the Zinder region.

Keywords: Maternal mortality, Zinder, Niger.

INTRODUCTION

World Health Organization, Geneva 1977, defined maternal death as: "The maternal death is the death of a woman during pregnancy or within 42 days of termination of the pregnancy, whether of the duration or the localization, for any cause determined or aggravated by the pregnancy or the care which it has treated, but neither accidental nor fatal ". Maternal mortality remains a major concern worldwide, although majority occurs in Africa Sub-sahara and part of Asia, death during pregnancy or during childbirth is a human tragedy at the individual, family and social level. The best way to assess the quality of care of a country and similarly in a hospital environment is to determine the maternal mortality rate. An audit will provides guide and help the policy makers to review preventive and therapeutic measures. In Africa the
likelihood exists for a girl of 15 years died of a complication related to a pregnancy and childbirth during her lifetime is highest, it reached a on twenty-six (1/26). In view of all the above, we proposed to study the causes and the epidemiological profile of deceased parturients as well as the factors likely to influence the mortality and morbidity at Zinder region.

**Aims**
Determine the epidemiological profile of parturient died in mother child health center in the region of Zinder.

**Specific objectives**
Evaluate the epidemiological data of patients, Identify the possible causes of maternal mortality.

**PATIENTS AND METHODS**
This study was a retrospective, descriptive conducted over 11 months from 1 January to 30 November 2017. The study took place at the mother child health center, the main reference center for obstetrics and gynecology in the region, but also receives patients from the Diffa region and northern Nigeria. All women that died from pregnancy or within 42 days of termination of the pregnancy, whether of the duration or the localization, for any cause determined or aggravated by the pregnancy or the care which it was treated admitted directly or after evacuation of other health facilities and died in the center were included in the study. All patients who died in the center outside pregnancy and childbirth were excluded. The data was collected from the admission register, the parturient record and the maternal death audit report. The variables studied were age, occupation, pregnancy, parity, mode of evacuation, time to evacuate, type of anesthesia, ASA class, time to care, distance covered to access care, cause of death and length of stay.

**RESULTS**
During the study one hundred and sixteen (n = 116) audited maternal deaths were recorded out of 10090 patients admitted and 3039 deliveries were made, including 2635 live births, a frequency of 1.14%. The average age of patients was 26.28 years old with extremes of 15 years old and 42 years old. The 21 to 30 age group was the most concerned with 37.93% (n = 44) followed by the 15 to 20 age group with 31.89% (n = 37) and the 31 to 40 age group represented 28.44% (n = 33).

Large multiparas (5 to 13 parities) made up 46.55% (n = 54) of the sample. primiparas 25.86% (n = 30) and 3 to 4 parities accounted for 26.72% (n = 31). The transport of the patients was not medicalized in 86.20% (n = 100) of the parturients against only 13.79% (n = 16) for the medicalized one. More than half of the patients 68.96% (n = 80) came from an average of more than 50 km from the place of care (maternal health center) versus 31.03% (n = 36) for the community urban area of Zinder, where the center exists.

Nearly all patients, 99.13% (n = 115) were unemployed and out of school, only one patient (0.86) was in school. More than half of the patients, 92.24% (n = 107) had no history of surgery, five of them (04.31%) (n = 05) had a scarred uterus and 01.72% (n = 01) had respectively arterial hypertension and diabetes. Nearly all patients, 98.27% (n = 114) did not have an antenatal consultation (ANC), only one patient (0.86%) had five (5) ANC. Anesthesia was performed in 23.27% (n = 27) of which 19.82% (n = 23) were general anesthesia versus 03.44% (n = 04) of spinal anesthesia. The ASA I class represented 14.81% (n = 04), the ASA II class accounted for 74.07% (n = 20) and the 01.72% (n = 03) for the ASA III, IV classes. The caregiver who took care of the patient first was a midwife in 87.93% (n = 103) of the cases. Patients were referred by a senior obstetric and neonatal technician in 10.34% (n = 12), and by the obstetrician gynecologist first in only 0.86% (n = 01) and in only one case was 0. 86% (n = 01) the midwife team, senior obstetric and neonatal technician and gynecologist obstetrician met together for management.

The file analysis found that treatment delay was one of the leading causes of death in 51.72% (n = 60) of cases, followed by treatment and delay inadequacy in 12.06% (n = 60). The delay in diagnosis or surgical intervention was the cause of death in 06.03% (n = 07) of the patients and the social weight of the husband was involved in 03.44% (n = 04) of the cases. In 26.72% (n = 31) of patients, the cause of death was imprecise. Pathologically, anemia was a major factor in the occurrence of death with 39.65% (n = 46), followed by hemorrhages in 17.24% (n = 20) and the eclampsia crisis in 16.37%. (n = 19).
Table-1: Pathology s and maternal death

<table>
<thead>
<tr>
<th>Pathology</th>
<th>Number of cases = n</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eclampsia</td>
<td>19</td>
<td>16.37 %</td>
</tr>
<tr>
<td>Anemia</td>
<td>46</td>
<td>39.65 %</td>
</tr>
<tr>
<td>Septicemia</td>
<td>12</td>
<td>10.34 %</td>
</tr>
<tr>
<td>Renal failure</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Haemorrhage</td>
<td>20</td>
<td>17.24 %</td>
</tr>
<tr>
<td>Endometritis</td>
<td>02</td>
<td>1.72 %</td>
</tr>
<tr>
<td>PAO</td>
<td>06</td>
<td>0.51 %</td>
</tr>
<tr>
<td>Chorioamnionitis</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Malaria on pregnancy</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Abdominal bloating</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Hypoglycemia</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Uterine rupture</td>
<td>04</td>
<td>0.34 %</td>
</tr>
<tr>
<td>Mole hydatiform</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Occlusion on pregnancy</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Anesthesia (stop on table)</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Diabetes on pregnancy</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Complication post op ératoire</td>
<td>01</td>
<td>0.86 %</td>
</tr>
<tr>
<td>Ovarian tumor on pregnancy</td>
<td>02</td>
<td>1.72 %</td>
</tr>
<tr>
<td>Trauma on pregnancy</td>
<td>01</td>
<td>0.86 %</td>
</tr>
</tbody>
</table>

The number of deaths in this center is decreasing over the years:

Table-2: Distribution of the number of deaths per year at CSME Zinder

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>167</td>
</tr>
<tr>
<td>2015</td>
<td>182</td>
</tr>
<tr>
<td>2016</td>
<td>138</td>
</tr>
<tr>
<td>2017</td>
<td>116</td>
</tr>
</tbody>
</table>

Elsewhere in the world it was found to be a high death rate compared to the rest of the world:

Table-3: Distribution of the death rate by country in 2015.

<table>
<thead>
<tr>
<th>Country</th>
<th>Death rate per 100,000 live births</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Niger</td>
<td>553</td>
<td>2015</td>
</tr>
<tr>
<td>Tchad</td>
<td>856</td>
<td>2015</td>
</tr>
<tr>
<td>Benin</td>
<td>405</td>
<td>2015</td>
</tr>
<tr>
<td>Mali</td>
<td>587</td>
<td>2015</td>
</tr>
<tr>
<td>Senegal</td>
<td>315</td>
<td>2015</td>
</tr>
<tr>
<td>Nigeria</td>
<td>814</td>
<td>2015</td>
</tr>
<tr>
<td>Kenya</td>
<td>510</td>
<td>2015</td>
</tr>
<tr>
<td>Djibouti</td>
<td>229</td>
<td>2015</td>
</tr>
<tr>
<td>Swiss</td>
<td>05</td>
<td>2015</td>
</tr>
<tr>
<td>Italy</td>
<td>04</td>
<td>2015</td>
</tr>
</tbody>
</table>

**DISCUSSION**

The demographic profile of parturients showed that, maternal mortality can occur in any women of childbearing age, married or single. However, the risk was high in our study because majority were uneducated and multiparous mothers. High proportions of housewives found among deaths correlate with the fact that the majority of the women were not educated and are unemployed. This study highlight the causes responsible for maternal deaths in Zinder region based on audit reports. Our study found anemia (39%) followed by haemorrhage (17%) and eclampsia (16%) was found to be the leading cause of maternal mortality in our setting.

WHO regions between 2003 and 2009 showing 73% of direct obstetric causes and 27% of indirect causes [13]. In sub-Saharan Africa, the main causes reported were hemorrhages 24.5% (16.9-34.1), hypertension 16% (11.7-21), abortion 9.6% (5.1-17.2), embolism 2.1% (0.8-4.5), sepsis 10.3% (5.5-18.5) [12]. Dellagi, et al. [15] found 69.8% hemorrhage. Touaibia, et al. [16] described the most common causes of death

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as bleeding (75.6%), hypertensive complications (28%),
dystocia (12%), heart disease (6%) and infections (4%).
One study [16] conducted in the city of Lubumbashi
(DRC) at Sendwe hospital indicates that out of 77
maternal deaths were identified during 2013-2015,
74.03% of deaths occurred direct obstetric causes;
bleeding with 61.04% was the leading cause of
maternal death followed by eclampsia (31.58%);
direct causes were dominated by heart disease
(30.0%); 75.32% of deaths had occurred within 24
hours of admission. The major causes are similar but
occurring with different rates according. Although,
various indirect factors might have contributed such as;
culture, poverty, negligence and ignorance.

The progress made at the Mother and Child
Health Center in the Zinder region was partly due to the
strengthening of staff in both quality and quantity in
comparison with a year prior to this study. Indeed, there
had been the assignment of seven obstetrician
gynecologists against one at the beginning. It emerged
from this study majority of the patients 86% were not
transported with ambulance neither were accompanied
by any medical staff despite the critical nature of their
condition. These may be attributed to poor resources in
terms of manpower and logistics in our settings. This
study revealed that, the distance separating the center of
the health facilities having referred the patients (on
average more than 50 km for 68% of the patients) may
be significant contributing indirect factor associated
with poor outcomes found in our study, patients living
more than 50KM from our center may have delayed in
accessing tertiary care as a result of Delay or refusal in
taking decision. Poor roads network and lack of
national Ambulance services may result in further delay
in initiating advance care. Similarly, majority of the
patients in this study have no antenatal care (ANC), the
role of ANC in early identification of high risk
pregnancy cannot be over emphasize. Symptoms
associated with high risk pregnancy can be discussed
during health talk may prompt the pregnant women to
seek medical attention early thereby preventing further
deteriorating of their clinical conditions. Other causes
were also observed: the delay of care (51%), the
inadequacy of treatment (12%), the delay of diagnosis
(6%).

The health worker who first cared for the
patient would also have an impact in the occurrence of
the death. This has also been noticed in Kinshasa
[13]. In general, lack of money and transportation or
ignorance would prevent poor families from accessing
obstetric centers quickly. The study of Hynes, et al. [18]
reported that about 80% of the women arrived at the
health center on foot and 7% of women had had a
pregnancy at home. We agree with Alexander Dumont
[19] who concluded that the delay in care has a fatal
outcome for the mother in developing countries.
Maternal death is an indicator of the weak-nesses of the
health system and development as well in a country.
In this study majority of the parturient were seen by
midwives. Presence of obstetrician at rural areas will
indeed reduce the severity of the complications through
early detection and management.

With respect to health facilities, the
responsibilities are related to inadequate infrastructure
and lack of qualified people in rural and small health
facilities, consistent with the study of Hynes et al.,
according to that study, the authors showed that 52.1% of
the caregivers had received training in normal
( uncomplicated) deliveries, while only 10 (43.4%) had
received training on the complications of childbirth.
Mouzou, et al. [20] found in their study that almost all
deeased parturients who underwent caesarean had not
benefited from the physician’s services for
resuscitation.

Maternal death is an indicator of the
weaknesses of the health system and development as
well in a country [20]. However surprisingly, even in
the United States, the number of maternal deaths
remains high. A health system can be strong but the
cost of care must not be out of reach of the population
[21]. Many cases of maternal deaths are too often
multifactorial and can be hidden events and go notice
because of the diverse cultural practices and weakness
of health information and records. Also “near misses”
defined as women who almost died but, with luck and
care, survived [22] were not accounted in the present
study, contrarily to what is done in developed countries
where maternal deaths are rare. The study found that a
large proportion of maternal deaths were due to delayed
or insufficient emergency obstetric care, inadequate
management, lack of medical and technical equipment.
Thus, improving the infrastructure of obstetric medical
facilities and the professionalism of health practitioners,
while educating pregnant women on good birthing
practices and family planning and women
empowerment can significantly reduce maternal
mortality in that region. There is an urgent need to
develop specialist manpower and designed emergency
protocols such as early maternal warning score to
improve identification and the management of obstetric
complications in resource-poor settings.

CONCLUSION

Poor quality of care, delay in care and
inadequate quality and quantity of material and staff
were the determining factors in the occurrence of deaths
at the maternal health center. Child from the Zinder
region

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