Maternal Mortality in Jos University Teaching Hospital, Nigeria

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Abstract
Context: Almost two decades after the launch of the Safe Motherhood Initiative, the maternal mortality rates in developing countries has remained unaccepatably high.
Objective: To determine the maternal mortality ratio and identify the causes of maternal deaths in Jos University Teaching Hospital (JUTH), Nigeria.
Study Design/Setting and Subjects: A descriptive study based on a review of case notes of all deaths that occurred due to pregnancy or pregnancy related causes in Jos University Teaching Hospital from 1st July 1999 to 31st August 2001 was conducted. Maternal mortality ratio was obtained using maternal deaths as numerator and number of live births as denominator.
Results: There were 38 maternal deaths and 5,352 live births in the hospital during the two-year period. This gives a maternal mortality ratio of 710 per 100,000 live births (95%CI= 503 to 973 per 100,000 live births). The maternal deaths were mainly due to direct causes including haemorrhage (n=10, 26.3%), pre-eclampsia/eclampsia (n=8, 21.0%) and sepsis (n=5, 13.1%). Most of the mothers that died (n=10, 26.3%) were above 34 years of age. Majority were grandmultiparous (n=17, 44.7%), unbooked (n=21, 60.0%) and illiterate (n=24, 63.2%). Fourteen (36.8%) women had Phase I delay only, 11(29.0%) had phase II delay, 2 (5.3%) had phase III and 4 (10.5%) had both Phase I and Phase III delay.
Conclusions: The high maternal mortality rate observed in this study could be reduced through community mobilisation and the provision of health resources in terms of personnel, equipment and supplies for emergency obstetric care.

Key Words: Maternal Mortality, Causes, Safe Motherhood [Trop J Obstet Gynaecol, 2006, 23:153-156]

Introduction

According to recently revised WHO and UNICEF global estimates for maternal mortality, the number of maternal deaths occurring every year is now estimated at 585,000[1]. Of these deaths, an estimated 90% occurs in Asia and sub-Saharan Africa, 10% in other developing regions, and less than 1% in developed countries[2]. The lifetime risk of maternal death of 1 in 12 women in parts of sub-Saharan Africa contrasts sharply with 1 in 4000 women observed in Northern Europe[1]. It has been estimated that maternal mortality ratios in Africa range from 190 to 1,239 per 100, 000 live births with an average of 604 per 100,000 live births. The average figures for Asia and Latin America are 420 and 270 respectively[1].

In Nigeria, maternal mortality ratios have been reported mainly from teaching and referral hospitals. These have shown high ratios ranging from 380 to 1,050 per 100,000 live births[3-5]. These high figures could be partly due to the pooling of high-risk cases in these tertiary health centres and referral delays. Despite these constraints, figures from these centres are useful in determining the causes of maternal mortality and the development of strategies aimed at reducing it.

Medical causes of maternal mortality in developing countries have been classified as direct and indirect causes. The five major direct causes are haemorrhage, obstructed labour, induced abortion, sepsis and hypertensive disorders. These account for approximately 80% of all maternal deaths[6]. Indirect medical causes account for the remaining 20% and these include anaemia, malaria, viral hepatitis and tuberculosis. Majority of maternal deaths in developing countries are preventable[7-9] . These deaths are more than just medical problems. They result from a complex interaction of a variety of factors that serve to limit or delay women's access to maternal health care services, particularly emergency care when life-threatening complications arise. These delays have been categorised as follows: (Phase I), delays in initial decision to seek care; (Phase II) delays in a woman's arrival at a hospital or clinic and (Phase III) delays that occur once a woman has arrived within the health care facility[10].

The present study was undertaken to determine the maternal mortality ratio and identify the causes of maternal mortality in Jos University Teaching Hospital (JUTH). This information is expected to guide policy makers and health practitioners in reducing avoidable maternal deaths.

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Table 1.
Major Causes of Maternal Mortality in JUTH, 1999-2001

Causes	Frequency No. (%)
Haemorrhage	10 (26.3)
Preeclampsia/Eclampsia	8 (21.1)
Sepsis	5 (13.2)
Induced abortion	3 (7.9)
Sickle cell crisis	3 (7.9)
[+]Medical disorders	3 (7.9)
Ruptured uterus	2 (5.3)
Severe anaemia	2 (5.3)
Anaesthetic complications	2 (5.3)
Ectopic pregnancy	1 (2.6)
Advanced breast cancer	1 (2.6)
Molar pregnancy	1 (2.6)
*Unknown	3 (7.9)

[+]Chronic hypertension, Diabetes mellitus, tuberculosis, meningitis
*Insufficient information to determine cause of death

Materials and Methods

Jos University Teaching Hospital is located in the capital city of Plateau State in North-Central Nigeria. This city has an estimated population of 3,283,704[11]. JUTH has an obstetric bed capacity of 70 with an annual delivery rate of about 2,271. It serves as the referral centre for complicated cases referred from primary health care centres, private and general hospitals within the state and beyond.

This descriptive study analysed the case files of all deaths that occurred due to pregnancy or pregnancy related causes in Jos University Teaching Hospital during the two-year period from 1st July 1999 to 31st August 2001 was conducted. A proforma/data entry form consisting of three sections was developed. The first section obtained information on socio-demographic characteristics including maternal age, parity, literacy level and ethnicity. The second section collected information on obstetric history and care. The third section inquired about the cause of death and underlying factors, which may have indirectly contributed to death. Maternal mortality ratio was obtained using maternal deaths as numerator and number of live births as denominator. A 95% Confidence Interval (95%CI) was constructed around the MMR using STATCALC in EPI Info version 6 (CDC Atlanta Georgia, U.S.A).

Results

There were 38 maternal deaths in JUTH during the two-year period from July 1999 to August 2001. Similarly, there were 5,352 live births in the hospital during the same period. This gives a maternal mortality ratio of 710 per 100,000 live births (95%CI= 503 to 973 per 100,000 live births).

The maternal deaths were mainly due to direct causes including haemorrhage (n=10, 26.3%), pre-eclampsia/eclampsia (n=8, 21.0%) and sepsis (n=5, 13.1%). Other causes are shown in table I. Three deaths had no identifiable cause and none of the patients was subjected to autopsy due to refusal to give consent based on religious or financial grounds.

Most of the mothers that died (n=10, 26.3%) were above 34 years of age. They were grandmultiparous (5 or more previous deliveries) (n=17, 44.7%) and unbooked (n=21, 60.0%). In addition, majority were illiterate (n=24, 63.2%) belonging to either Hausa/Fulani (n=18, 28.9%) or Berom (n=5, 13.2%) ethnic groups as shown in table II.

Using the classification of Thaddeus and Maine[10], four (10.5%) of the women that died experienced no delay in decision-making, arrival or commencement of treatment at the health facility. In contrast, 14 (36.8%) of them had Phase I delay only, 11(29.0%) had phase II delay, 2 (5.3%) had phase III and 4 (10.5%) had both phases I and III delays. Twenty-seven (71.0%) of the patients died within 24 hours of admission, 8 (21.0%) died within a week and 3 (7.9%) deaths occurred after a week postpartum.

Discussion

The maternal mortality rate in JUTH during the period of this study was 710 per 100,000 live births. The main causes were haemorrhage, eclampsia and sepsis. Most of the women that died were illiterate, unbooked and grand multiparous. They were either from the Hausa/Fulani or Berom ethnic groups. Most of them had phase I or phase II delays and died within 24 hours of admission. This study was health facility-based, which limits its usefulness in assessing the overall level of maternal mortality in the community as a whole. We recognise that maternal mortality figures obtained from community-based studies are ideal, but such studies are expensive and cumbersome to execute.

The maternal mortality ratio of 710 per 100,000 live births obtained in this study is higher than the ratio of 450 seen at the same centre in 1990, lower than the rate of 1,060 per 100 000 observed in 1994 but similar to the figure of 739 per 100 000 deliveries obtained in 1999[12]. It is much lower than the rates reported from Port Harcourt[13] (2,736) and Kano[14] (2,420) but higher than

the rate seen in Enugu[15](270). Some of these differences may be explained by the diverse socio-cultural characteristics of the catchment population including literacy and utilization of maternal health services. The high rates are a reflection of the poor state of reproductive health status of women in various parts of the country. The MMR obtained in the present study is lower than the reported Nigerian national figure of 800 per 100,000 livebirths[16].

The main causes of maternal mortality seen in this study are similar to those reported earlier from this centre by Ujah and colleagues[12]. It is consistent with the causes observed by Chukudebelu in Enugu[15]. It is also comparable with the findings of Adamu and others in Kano were they reported that 50% of maternal deaths were due to eclampsia, ruptured uterus and anaemia[14]. Furthermore, reports from Zaria also indicated that most common causes of MMR were sepsis, pregnancy induced hypertension and its consequences, haemorrhage, anaemia and obstructed labour[17] . The present study observed that almost 8% of maternal deaths were due to induced abortion. This proportion is higher than the figures (1.2%) reported from Kano[14] but lower than those from Ilorin[22] (19.4%) and Port Harcourt[13] (8.3%). These differences could be related to the prevalence of unsafe abortion in the catchment population. It also highlights the importance of the provision of post abortion care services. The refusal of patient relatives to consent to autopsy has also been reported from Zaria[17] and this could affect the establishment of the exact cause of death in some cases.

Table 2.
Characteristics of Mothers that Died in JUTH, 1999-2001

Variable	No. of deaths	Proportion
Age group (years)	**No.**	**(%)**
<15	-	-
15-19	5	13.2
20-24	6	15.7
25-29	12	31.6
30-34	5	13.2
35-39	7	18.4
40-44	3	7.9
Total	38	100.0
Literacy level		
Literate	13	34.2
Illiterate	25	65.8
Total	38	100.0
Ethnic group		
Hausa/Fulani	18	47.3
Berom	5	13.2
Ibo	4	10.5
Ngas	3	7.9
Jarawa	4	10.5
Idoma	2	5.3
Others	2	5.3
Total	38	100.0
Parity		
0	8	21.1
1	6	15.8
2-4	7	18.4
5	17	44.7
Total	38	100.0

The characteristics of women that died during pregnancy or puerperium in Jos are similar to mothers dying in other centres[13,15,18]. Reports from these centres showed that unbooked, grand multiparous women that are usually illiterate face the greatest risk of dying. The occurrence of the highest number of deaths among Hausa/Fulani women in the present study could be partly due to their socio-cultural practices.

A striking feature of Hausa/Fulani life is the low status accorded to women. Apart from the practice of home confinement (Purdah), women rarely share in the decision making process even regarding childbirth[18]. Many girls marry before menarche and commence child bearing before their pelvises are fully developed. Traditional customs such as “Kunya” prevent a girl from telling anyone about her pregnancy or asking any questions about childbirth. They are expected to be shy and modest. In addition, women of all ethnic groups shy away from operative delivery and go to great lengths to avoid caesarean section, which they see as a sign of reproductive failure. Another factor is illiteracy, 65.8% of the mothers that died were illiterate. Evidence shows that literate women are more receptive to health education and they utilize maternal health care services more than their illiterate counterparts[19].

Most of the women that died experienced delays in one or more phases of accessing emergency obstetric services. Many of the factors that contribute to delays in the initial decision to seek care and the timing of a woman's arrival at a hospital or clinic are the interplay of social, cultural and economic factors that come into play at the level of the family or within the community[4]. Similarly, transportation problems feature prominently in the second phase and in the third phase, the quality of

provider-client interactions, healthcare workers ability to remain motivated at work, as well as the availability of medicines and supplies may contribute to delays once a woman arrives at the health facility[20-21].

It is therefore pertinent that policymakers produce long-term strategies that will ensure gender equality pertaining to survival, education and economic opportunities. Similarly, rural road networks and transportation should be improved. The provision of health resources in terms of personnel and equipment for essential and comprehensive obstetric care to primary health care clinics, health centres and general hospitals need to be addressed. There is also a need to strengthen the technical capacity of health care providers through providing training on life saving skills to physicians and midwives. Another important issue that needs to be addressed is work motivation among health care providers.

There is a need to conduct social and operational research to identify factors responsible for delays in accessing care among pregnant women. The perception of risk associated with pregnancy among gatekeepers such as community and religious leaders, men, elderly women needs to be understood. In addition strategies that involve these leaders and the local transport and health systems need to be developed to reduce the high maternal mortality that occurs in developing countries.

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