RISING TREND IN MATERNAL MORTALITY AT THE UNIVERSITY OF MAIDUGURI TEACHING HOSPITAL

[1]Maisaratu Bakari, [1]Idris Usman Takai, [2]Mohammed Bukar

[1]Department of Obstetrics and Gynaecology, Aminu Kano Teaching Hospital,
[2]Department of Obstetrics and Gynaecology, University of Maiduguri Teaching Hospital

ABSTRACT

Context: Various interventions have been introduced to reduce the very high maternal mortality ratio in our environmentbut to date the success is only marginal at best.

Objective: To determine the trend in maternal mortality in University of Maiduguri Teaching Hospital (UMTH).

Methods: Analysis of records of all women who died in pregnancy, labour and puerperium[up to 42days after a pregnancy event] in UMTH between January, 2006 and December, 2010 was conducted.

Results: The maternal mortality ratio (MMR) was 1074/100,000 live births. The main causes of maternal mortality were eclampsia in 34.6% of cases, haemorrhage (9.1%), HIV(17.8%) and puerperal infections (7.5%). There was rising trend in maternal mortality ratio over the study period. Factors contributing to maternal death included advanced maternal age, grand-multiparity, illiteracy, non-utilization of antenatal care services and late presentation to hospital.

Conclusion: The maternal mortality ratio in UMTH is in in the upward trend and many of the causes of maternal death are avoidable. HIV appears to be an emerging major contributor to maternal deaths. There istherefore the need to strengthen the existing maternal health care services in Maiduguri, Borno state.

Key words:Maternal mortality, trends, causes, Maiduguri

INTRODUCTION

A maternal death is defined by the WHO as the death of a woman whilst pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to, or aggravated by the pregnancy or its management, but not from accidental causes.[1]It is commonly expressed as the number of maternal deaths per 100,000 live births or per 100,000 total deliveries.[1] Maternal mortality is one of the biggest health problems in sub-Saharan Africa.[2] According to current WHO estimates, although 25% of women of reproductive age live in the developed countries, only 1% of maternal deaths take place in those countries. [2, 3]whereas 11% of women of reproductive age live in Africa and 30% of maternal deaths occur there. [2, 3] Nigeria, a developing country in sub-Saharan Africa with a population of over 170million, is a typical case in point.[4] Nigeria's maternal mortality ratio over the last five years ranged from 475 to 615 per 100,000 live births with an average of545/100,000,[5] though the recent NDHS 2013 reported a fall in MMR to 350/100,000 live births. Nigeria constitutes 2% of the world population, but accounts for 10% of the maternal

Correspondence: Idris Usman Takai
Department of Obstetrics and Gynaecology,
Bayero University Kano/Aminu Kano Teaching Hospital, Kano
Nigeria. E-mail: takaiidris@yahoo.co.uk

deaths [5]. Statistics arising from some Nigerian sources indicate that rather than improving, death rates are probably increasing in more recent times[3, 6]Nigeria ranks second globally(next to India) in number of maternal deaths.[7] This has resulted in several researches and recommendations on interventions to reverse the ugly trend.[4]

Haemorrhage is the leading cause of maternal death in Nigeria.[8] Other causes include complications of unsafe abortion, hypertensive disorders, obstructed labour and infection.[8]What is more depressing as indicated in a joint WHO/UNICEF/ John Hopkins University study is that these women dying are not the ill, the very old or the young, but the very healthy ones in the prime of their lives.[2] There are more remote antecedent factors which play important part in causing maternal death and these may be social, cultural, economic, political or infrastructural.[3]These factors include poverty, malnutrition, ignorance, illiteracy, high parity, pregnancies at the extremes of life, short interval between pregnancies and unhealthy customs and beliefs.[1] A nation's maternal mortality is a basic indicator not just of the quality of its health care but of its attitude towards women.[9]Maternal mortality statistics provide one of the worst differentials in health indices between the developed and developing countries.[2] Maternal mortality ratio globally has been found to be lowest in Sweden where it is 5/100,000,[10] 7.1 for U.S.A.,[10] 6.1 for the United Kingdom,[10] 390 for Asia [8] and 870 for Africa.[8] In Nigeria, it has been quoted to be between 800-1000 per 100,000.[10]The recent National Demographic and Health Survey (NDHS-2013) data suggests that the ratios are different in the six geopolitical zones of the country.[11] Reports from different parts of the country indicate that MMR is about 265 in Enugu[10], 309 at Ibadan,[12] 827 at Benin,[5] 1700 in Lagos, [13]636 in Yola,[14]1930 in Shagamu,[15] 1776 in Port Harcourt, [16] 2138 in Sokoto ,[9] 740 in Jos,[17] 2420 in Kano,[18] 704 in Borno,[19] and 1732 in Bauchi.[20] Sadly, the high maternal mortality figures in the tropics are further plagued by under-reporting and misclassification of maternal deaths, poor case identification and recording as well as poor data collection and storage[3, 8, 21]and also, methods used to calculate maternal death rates are often complex and costly to use.[21]

Of particular interest is the recent observation of an increase in maternal mortality rates in some major hospitals in Nigeria despite the launching of the Safe Motherhood initiative in Abuja in 1990.[10, 22] Even though this may be due to decreasing utilization of the institutional facilities by women with low-risk pregnancies (as a result of poverty), the observations are indeed worrying and indicate an urgent need to introduce measures that can drastically reduce the menace.[10,22]The low status and educational level of women, surrounding cultural values and beliefs, financial and family constraints, all contribute to underutilization of professional delivery services even when they do exist.[11, 14, 22] The poor quality of services, including poor treatment by health providers, also makes some women reluctant to use services.[11, 14, 22] HIV/AIDS has become the commonest cause of death in Sub-Saharan Africa. [23, 24] Women account for 47% of infected adults and most of these women are of childbearing age.[23]The disease has been shown to affect maternal mortality and has been a significant contributor to maternal mortality in Malawi.[24]

Generally,maternal mortality indicators are used in assessing the health status of a population, especially in developing countries such as Nigeria. The fact that maternal mortality in Nigeria is among the worst in the world, and Maiduguri in particular with one of the worst figures in the country, it is necessary that maternal mortality in UMTH needs to be revisited to allow assessment of trends so that health policy makers could put measures in place to reverse the ugly trend. ***This study was therefore to***

determine the trendin maternal mortality in UMTH Maiduguri.

MATERIALS AND METHODS

This was a hospital based retrospective study that was carried out to review maternal mortality over a five year period in UMTH, Maiduguri, Borno State. Data were identified by reviewing all maternal deaths that occurred in UMTH from January2006 to December 2010,and those whose folders could not be traced or with incomplete data, were excluded from the analysis. The retrieval rate was 83.6% (107/128) case records. Therefore 107 case notes were available for complete analysis. Cases were identified through labour ward, obstetric theatre, obstetric ward, gynaecology ward,ICU, and accidentand emergency records. The case notes were retrieved from the central records library. Data collected included the age, booking status, parity, ethnic group, area of residence, educational status, duration of hospital stay, symptoms before presentation, and causes of death and time of death in relation to pregnancy events. The cause of death was clinical as recorded in the patient's folder.Data was analysed using SPSS version 16(Chicago IL, USA). Frequency and descriptive statistics were computed. The MMR was calculated by dividing maternal death counts by the total number of live births recorded within the same study period multiplied by 100,000.Approval was obtained from the ethics and research committee of UMTH prior to the study.Results were presented in tabular form as frequencies and percentages and as well as in graphs.

RESULTS

During the study period, there were 11920 births and 128 maternal deaths at the UMTH, Maiduguri, giving a maternal mortality ratio of 1074 per100, 000 live births. The distribution of annual MMR is shown in table I. It was highest for the year 2010 (1807/100,000) and the lowest was in 2006 (468/100,000). A rising trend was noted over the study period. The trend is further graphically illustrated in figure 1.

Table II details the socio-demographic and reproductive characteristics of the study population. The age range of the study population was 15-40years with mean age of 27.5±3.1years.The highest (29%), maternal death was in the 25-29 year age group and the lowest was in those 40 years and above. The highest maternal death occurred in para 5 and above accounting for 44.9%, followed by Para 1 and 2 (28%), while the lowest maternal mortality (11.2%) was amongprimigravidae. Majority of the patients 82 (76.6%) had no formal education, 12 (11.2%) had secondary education, 4(3.8%) had tertiary education. Sixty-five (60.7%) of the women were unbooked, 17 (15.9%) were booked elsewhere and 25 (23.4%) were booked in UMTH. The Kanuri is the major indigenous ethnic groups and accounted for 52 (48.6%), Hausa 20 (18.7%), Shuwa 11 (10.3%), Igbo 5 (4.7%), Fulani 4 (3.7%), Yoruba 1 (0.9%) and others(Bura, Marghi, Gwoza, Chibok13.1%). Majority (70.1%) were from urban areas while 29.9% were from rural areas.

The direct and indirect causes of maternal deaths are shown in table III. The direct obstetric causes of maternal deaths accounted for 63.5%. The major direct causes were eclampsia (34.6%), haemorrhage (9.3%), sepsis (7.5%), ruptured uterus (5.6%), anaemia(3.7%) obstructed labour (1.9%), andabortion (0.9%).Amongst the indirect causes of maternal death which accounted for 36.5%, HIV was a factor in17.8% of cases, postpartum cardiac failure (8.4%), hypocalcaemia (4.7%), pulmonary tuberculosis andliver disease were responsible for 1.9% each, whilegastroenteritis and GullianBarre syndrome contributed 0.9% each.

Approximately 70% of the mortalities presented

with symptoms of greater than 24 hours. Two (1.9%) patients died from postpartum haemorrhage which developed after delivery in UMTH. Table V shows duration of hospital stay before death. Majority (47.7%) died less than 24 hours of admission, while (35.5%) died within 1-7 days and (16.8%) greater than one week. Time of death in relation to pregnancy events was highest within 1-7 days.

Table I: Annual Maternal Mortality Ratio

Year	Total birth	Total Death	MMR/100,000
2006	2138	10	468
2007	2093	15	717
2008	2112	18	852
2009	2256	25	1108
2010	3321	60	1807

Figure I: Trend Of Maternal Mortality In Umth, Maiduguri

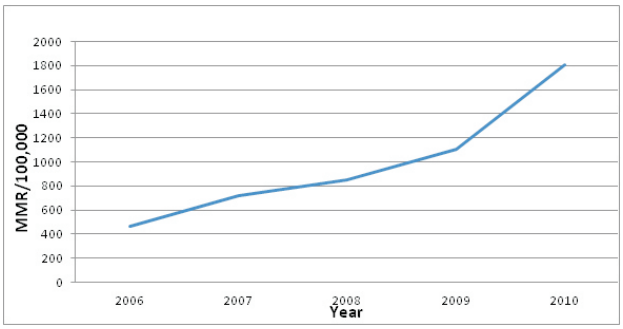

Table II: Socio-Demographic Characteristics

Characteristics	Number	Percentage
Age**15-19**	12	11.2
20-24	29	27.1
25-29	31	29.0
30-34	22	20.6
35-39	8	7.5
>40	5	4.7
Total	**107**	**100**
Parity**0**	12	11.2
1-2	28	26.2
3-4	19	17.8
>5	48	44.9
Total	**107**	**100**
Education**Informal**	82	76.6
None	8	7.5
Primary	1	0.9
Secondary	12	11.2
Tertiary	4	3.8
Total	**107**	**100**
Ethnic group**Kanuri**	52	48.6
Shuwa	11	10.3
Hausa	20	18.7
Fulani	4	3.7
Igbo	5	4.7
Yoruba	1	0.9
***Others**	14	13.1
Total	**107**	**100**
Booking status	17	15.9
Booked in UMTH		
Unbooked	65	60.7
Booked elsewhere	25	23.4
Total	**107**	**100**
Area of residence**Urban**	75	70.1
Rural	32	29.9
Total	**107**	**100**

¤ Babur, Marghi, Gwoza, Chibok

Table III: Causes of Maternal Death

CAUSES	NUMBER	PERCENTAGE
(A) Direct		
Eclampsia	37	34.6
Haemorrhage	10	9.3
Sepsis	8	7.5
Ruptured uterus	6	5.6
Anaemia	4	3.7
Obstructed labour	2	1.9
Abortion	1	0.9
(B) Indirect		
HIV	19	17.8
Postpartum cardiac failure	9	8.4
Hypocalcaemia	5	4.7
PTB	2	1.9
Liver disease	2	1.9
GullianBarre syndrome	1	0.9
Gastroenteritis	1	0.9
Total	**107**	**100**

Table IV: Duration Of Hospital Stay Before Death

Duration of hospital stay	Number	Percentage
<24hrs	51	47.7
1-7days	38	35.5
>1wk	18	16.8
Total	**107**	**100**

DISCUSSION

The maternal mortality ratio of 1074/100,000 births found in this study is extremely high, This was the situation before safe motherhood initiative was launchedand has remained so despite this global effort, when compared with values of 5/100,000 and 7.1/100,000 for Sweden and U.S.A. respectively.[10]Thisfigure is also higher than 704/100,000 recorded in a previous study[19] in the same centre. It is however, lower than 1776/100, 000[16]and 2138/100, 000[5] reported in Port Harcourt and Sokoto respectively. Despite the fact that the values are lower than that of some other centres in the country, maternal mortality is still high and on the increase in UMTH. Our MMR in UMTH was as low as 468/100,000 before the closure of the State Specialist Hospital in 2008, the largest referral centre owned by Borno State governmentfor renovationwhich was closed for over 3years and since we shot the 1000 mark from 2009, we have not gone down to three digit MMR up to 2014*(annual report, dept. of OBGYN, UMTH)*, there was therefore inadequate state health care services and increase in referrals and/or infection as HIV appeared to be a major contributorto maternal death in this study.

The association between maternal mortality and antenatal care has been established and also observed in this study. The percentage of maternal deaths in unbooked patients was much higher than in booked patients. This agrees with the findings in the previous study in UMTH [19, 22]and from other centres.[9, 12, 14, 16, 21]. In this regards there is the need to improve on the utilization of available maternal health care services.Maternal deaths were also greater in those who received antenatal care elsewhere when compared to those who received their antenatal care services in UMTH. This may be in part due to greater expertise available in UMTH as a tertiary health institution.

It has also been observed that maternal mortality is higher in those of high parity (44.9%) in this review. This is because high parity predisposes the woman to increase risk of uterine rupture and postpartum haemorrhage, which increase the risk of dying at childbirth. This finding is similar to the findings of previous studies[12, 14, 15, 22].Illiteracy was also found to be closely associated with high maternal mortality ratio in this study, as 76.6% of all maternal deaths in this study occurred in women who had no formal education. Studies have shown that a large proportion of women dying in Nigeria are illiterate,

young and of low socio-economic status[13, 14, 19, 22].Illiteracy is therefore an important risk factor for maternal mortality. This problem of illiteracy is further compounded by the fact that most(60.7%) of the women in this study were also not booked for antenatal care and this group of people may likely have poor health seeking behavior. Girl-child education, as stated in the Millennium Development Goal 2 (MDG 2), is therefore an appropriate response to the high level of illiteracy recorded in this study. In this regards, the Universal Basic Education (UBE) programme of the Federal Government of Nigeria is a long-term strategy for reducing maternal mortality.

Eclampsia was the leading cause of maternal death in this study as previously reported in some series[12,13, 14, 16, 19, 22] .This is probably a reflection of the poor and or/ under-utilization of antenatal care services by the majority of our illiterate (76.6%) mothers recorded in this study. This is evidenced by the fact that 60.7% of the patients in this study did not receive antenatal care. These deaths might have been prevented if appropriate antenatal care was available to these patients.However, this finding is at variance with findings from Jos[17] where obstetric haemorrhage was found to be the leading cause of maternal deaths and Umuahia[1] where the leading cause of death was sepsis.

Haemorrhage was the next common (9.3%) cause of maternal deaths and whether antepartum or postpartum, is the fastest killer among all major causes of maternal death. PPH accounted for 8.4%. This finding agrees with other reports that showed PPH as being a commoner cause of death than APH[25], but contrast with findings from Bauchi[20] where antepartum haemorrhage nearly equals postpartum haemorrhage. Sepsis was also a leading cause of death in this studyas similarly reported from other series[12,13, 14, 16, 19, 22]. It was responsible for 7.5%. Most of these patients died before the effect of antibiotics and probably the poor financial status of the patients might have resulted in inadequate antibiotic therapy. Similarly in all the cases broad spectrum antibiotics were commenced before bacteriological cultureresults which were not readily available, before their death. This might have affected the choice of antibiotic therapy.Obstructed labour if unrelieved, especially in the multipara, could lead to uterine rupture. It was found to be 13.2% in a previous study in the same environment[22]. In this study, it accounted for only 1.9%.This difference may be as a result of more pregnancies at extreme of ages in the previous study.

HIV seems to be emerging as a leading indirect cause of maternal mortality in UMTH. This has also been reported to be the experience in Malawi[24]. HIV encephalopathy and postpartum cardiac failure ranked highest among the indirect causes of maternal death in UMTH.The incidence of HIV/AIDS has been increasing in our environment with its attendant increase in overall mortality and hence its effect on maternal mortality is expected to be marked. This might be due to late presentation as a result of denial and/or stigmatization, coupled with cultural and traditional practices in this society. HIV/AIDS may influence maternal mortality in several ways. Women living with HIV/AIDS may be more susceptible to direct causes of maternal mortality such as postpartum haemorrhage, puerperal sepsis and complications of caesarean section. AIDS-related deaths may be incidental to pregnancy (fortuitous) or may be true indirect causes of maternal mortality[26].

It was found that about 47.7% of the maternal deaths occurred within the first 24hours of admission, similar to a previous report[22].This goes to show that most of the patients presented to hospital very late making early and appropriate intervention difficult. By far, a higher figure of 79% was reported in Jos[17].

Despite the introduction of the Safe Motherhood

Initiative, Essential Obstetric Care and several concerted efforts to reduce maternal mortality in our environment, the maternal mortality ratio is still unacceptably high at the University of Maiduguri Teaching Hospital and is on the increase with HIV/AIDS also becoming a significant new contributor to maternal deaths.

This study is limited by its retrospective and hospital-based nature where only available hospital records were analysed. The data is usually incomplete. Post-mortem examination was not done to assess the true cause of death. Causes of death were therefore based on clinical judgment. The findings therefore may not be a true representation of what may be happening in the general community. Despite these, the study is useful for determining the causes of deaths and trend of maternal mortality. This will enable health policy makers improve on maternal health care servicesat all levels to reversethis ugly trend.

REFERENCES

1. Chinwuzie J., Okolocha C. A pragmatic Approach to Reduction of Maternal Mortality in Africa. Trop. J. Obstet. Gynaecol. 1999; 16: 18-20.
2. Chukwudebelu W.O. Maternal Mortality. Trop. J. Obstet. Gynaecol. 1995; 12: 1-3.
3. Otoide V.O. Case reporting of maternal deaths in Nigeria. Trop. J. Obstet. Gynaecol. 2002; 19: 30-32
4. Adamu Y.M, Salihu H.M, Sathiakumar N, Alexander G.R. Maternal mortality in northern Nigeria: a population- based study. Eur. J.Obstet. Gynaecol. Reprod. Biol. 2003; 109: 153-159.
5. Gharoro E.P., Okonkwo C.A. Changes in service Organization: Antenatal care policy to improve attendance. Trop. J. Obstet. Gynaecol. 1999; 16: 21-25.
6. Wilson J.B., Lassey A.T. Maternal Mortality in the tropics. In: Kwawukume E.Y., Emuveyan E.E.(Eds). Comprehensive Obstetrics in the tropics. Dansoman: Ashanti &Hittscher printing press Limited, 2002: 243-249.
7. Lale S, Mie I, Samuel M and Emi S. Mortality in 2005: estimates developed by WHO, UNICEF, UNFPA and the World Bank. Geneva: WHO; 2007; 15-17.
8. Anya A.E., Anya S.E. Trends in Maternal Mortality due to Haemorrhage at the Federal Medical Centre, Umuahia, Nigeria. Trop. J. Obstet. Gynaecol. 1999; 16: 1-5.
9. Finnih O. An overview of Maternal Mortality in Nigeria. The proceedings of SOGON workshops on Strategies for the reduction of High Maternal Mortality. UNICEF. 1999: 1-7.
10. Otolorin E.O. An overview of maternal mortality in Nigeria. In: The Proceedings of SOGON Workshops on Strategies for reduction of maternal mortality. UNICEF. 1999: 52-64.
11. NPC and ICF International. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: National Population Commission (NPC) [Nigeria] and ICF International; 2014. P. 127-54.
12. Obineche I.N. The role of Antepartum and Postpartum Haemorrhage in Maternal Mortality. In: The Proceedings of SOGON Workshops on Strategies for reduction of maternal mortality. UNICEF. 1999: 19-37.
13. Agboghoroma O.C. and Emuveyan E.E. Maternal Mortality in Lagos, Nigeria: a ten year review (1986-1995). Nig Quart J Hosp Med. 1997; 7: 230-233.
14. Bukar M, Kunmanda V, Moruppa JY, Ehalaiye B, Takai UI, Ndonya DN.

Maternal mortality at federal medical centre Yola, Adamawa State: A five-year review. Ann Med Health Sci Res 2013; 3(4): 568-71.

15. Ujah I.A.O., Uguru V.E., Aisien A.O., Sagay A.S., Otubu J.A.M. How safe is motherhood in Nigeria? : The trend of maternal mortality in a tertiary health institution. E. Afr Med J. 1999; 76: 434-437.
16. Fiebai P.O., Anya S.E., John C.T. A prospective study of Maternal Deaths at the University of Port Harcourt Teaching Hospital. Trop J. Obstet. Gynaecol. 2002; 19(2):17-18.
17. Ujah L.A.O., Asien O.A., Mutihir J. T., Vander jag D.J., Glew R.H., and Uguru V.E. Factors contributing to maternal mortality in Jos, north central Nigeria: A seventeen year review. Afr J Reprod Health 2005, 9(3): 27-40.
18. Yusuf M.A. Pattern of maternal mortality in Kano state: A geographical analysis. J SocMgt Science. 9 (special edition) 2005, 196-221.
19. Mairiga A.G., Kawuwa M.B., Kyari O. A fourteen –year review of Maternal Mortality at the University of Maiduguri Teaching Hospital, Maiduguri, Nigeria. NigHospPract 2008; 2(5):115-119.
20. Mairiga A.G. and Saleh W. Maternal Mortality at the State Specialist Hospital Bauchi, northern Nigeria. East African Medical Journal 2009; 86(1): 25-30.
21. Abubakar I.S., Zoakah A.I., Daru P.S., Pam I.C. Estimating Maternal Mortality Rate Using Sisterhood Methods in Plateau State, Nigeria. Highland Medical Research Journal. 2003;1:28-34.
22. Audu B.M., Takai U.I., Bukar M. Trends in Maternal Mortality at University of Maiduguri Teaching Hospital, Maiduguri, Nigeria-Afive year review. Niger Med J. 2010; 51(4): 147-151.
23. Damale N.K.R. Human immune deficiency virus in pregnancy. In: Kwawukume E.Y., Emuveyan E.E. Comprehensive Obstetrics in the tropics. Asante &Hittscher Printing Press Limited. 2002: 38-46.
24. Muula A.S., Phiri A. Did maternal mortality ratio increase in Malawi between 1992-1998? Review of Malawi demographic and health surveys and other data sources. Trop Doc. 2003; 33: 182-185.
25. Chama C.M., Audu B.M. and Mairiga A.G. The status of reproductive health facilities in Borno State. Borno Medical Journal, 2006; 3(1): 12-16.
26. Mctinyre J. Mothers infected with HIV. Br Med Bull 2003; 67: 127-135.