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Maternal mortality in JOS Nigeria: A facility based prospective Review

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ABSTRACT

The study was designed to determine the maternal mortality ratio at the Jos University teaching Hospital and ascertain the causes of maternal death. Methods: This was a prospective descriptive analysis of all maternal deaths at the Jos University Teaching Hospital (JUTH), Jos north central Nigeria between 1st June, 2006 and 31st May, 2008. Results: During the study period, there were 56 maternal deaths and 4443 live births at the Jos University Teaching Hospital giving a maternal mortality ratio of 1260/100,000 live births. Of these, there were 15 deaths among 81 unbooked patients giving a maternal mortality ratio of 18518/ 100,000 live births. Twenty-five deaths occurred among those who booked elsewhere (2969/100,000 live births) and 9 deaths among women who booked in JUTH with a maternal mortality ratio of 256/100,000 live births. Thirty nine (69.6%) of the deaths were direct maternal deaths while 17 (30.4%) were indirect maternal deaths. The leading causes of direct maternal deaths were eclampsia (28.6%), haemorrhage (23.1%), unsafe abortion (8.9%) and pulmonary embolism (5.4%). Of the indirect causes of maternal mortality, HIV/AIDS accounted for 14.3% while anaemia, anaesthetic complications and thyrotoxicosis accounted for 8.9%, 3.6% and 1.8% respectively. Conclusion: Maternal mortality ratio is still high in JUTH. It was found to be lower in those that had tertiary education and in booked patients. HIV/AIDS appears to be emerging as one of the leading causes of maternal mortality in this study.

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1. Introduction

The estimated number of maternal deaths worldwide in 2000 was 529,000. These deaths were almost equally divided between Africa (251,000) and Asia (253,000), with only about 22,000 occurring in Latin America and the Caribbean, and less than 1% (250) in the more developed countries [1]. Maternal mortality ratio is a major reproductive health index and could indeed be rightly considered to be a measure of the socio-economic development of any nation. It is unfortunate that over the past three decades and half, Nigeria has progressively paraded one of the most abysmally poor reproductive health indices in the world, maternal mortality ratio inclusive [2]. Nigeria constitutes 1.76% of the world population but contributes 10% of the maternal deaths and statistics in Nigeria show that rather than improving, death rates are probably increasing in more recent times[3-5]. In fact,

recent reports from various health institutions in Nigeria indicate an increasing rate of maternal mortality [6-9], which is a sad reminder that unless things are better organized, Nigeria may not be able to achieve the maternal health related Millennium Development Goals [10].

Maternal mortality statistics provide one of the worst differentials in health indices between the developed and developing world. Maternal mortality ratio has been found to be lowest in Sweden (5/100,000), 7.1 for USA, and 870 for Africa globally [11]. In Nigeria, it is not equally distributed. It has been reported to be 735 in Jos[12], 1776 in Port Harcourt[13], 309 at Ibadan[14], 852 in Lagos[14] and 2138 in Sokoto [15].The drawback of these statistics is that almost all of them are hospital based studies and therefore may not be a true reflection of the general population.

Sadly, the high maternal mortality in the tropics is further plagued by under reporting and misclassification of maternal deaths, poor case identification and recording as well as poor data collection and storage and also, methods used to calculate

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maternal death rates are often complex and costly to use [15]. 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 [16]. An earlier review of maternal mortality done at the Jos University Teaching Hospital Jos revealed increasing rates over a 5-year period [17].

Although two publications have been reported on maternal mortality in JUTH (the last was in 2001), this study was revisited to find the maternal mortality ratio and ascertain the causes of death.

2. Materials and Methods

This was a prospective study of all maternal deaths at the Jos University Teaching Hospital between June 1, 2006 and May 31, 2008. The hospital situated in Jos, Plateau State serves as a referral centre for the state and most parts of the north central region of Nigeria. The institution is funded and run by the Federal Ministry of Health. The hospital offers a full spectrum of obstetric care services including antenatal, intrapartum and postpartum care. With the exception of a few clients on National Health Insurance Scheme, most patients have to pay user fees. In emergency situations, the hospital offers care within the limits of available resources until the patient is able to secure funds. The hospital runs a blood bank with limited stock. Not infrequently, patient relatives are requested to donate blood when stocks are out.

A maternal death was defined using the tenth revision of the WHO International Classification of Diseases (ICD-10) [18]. A maternal death was defined as death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the site or duration of pregnancy, from any cause related to, or aggravated by the pregnancy or its management, but not from accidental or incidental causes. Direct maternal deaths are those resulting from complications of the pregnant state (pregnancy, labour and puerperium), from interventions, omissions, incorrect treatment, or from a chain of events arising from any of the above while indirect maternal deaths are those due to previously existing disease or disease that develop during pregnancy, and not due to direct obstetric causes but which was aggravated by the physiological effects of pregnancy [18].

Relevant information retrieved during the study period included age, parity, booking status, level of education, causes of death and duration of hospital stay before demise.

The circumstances surrounding each maternal death were discussed during departmental meetings. A consensus was reached as to the clinical causes of death. Post-mortem examination was done for only one of the patients in this study.

The information retrieved was analyzed using Epi-info 2000 statistical software.

3. Results

During the study period, there were 4443 live births and 56 maternal deaths at the Jos University Teaching Hospital giving a maternal mortality ratio of 1260/100,000 live births.

There were 15 deaths among 81 unbooked patients giving a maternal mortality ratio of 18518/100,000 live births. Twenty-five deaths occurred among those who booked elsewhere (2969/100,000 live births) and 9 deaths among those who booked in JUTH with a maternal mortality ratio of 256/100,000 live births (table 1).

Table 1. Maternal Deaths And Booking Status

Booking status	Number of births	Number of deaths	Maternal mortality ratio(Per 100,000 live births)
Unbooked	81	15	18518
Booked elsewhere	842	25	2969
Booked in JUTH	3504	9	256
Not stated	16	1	6250
Total	4443	50	

Maternal mortality ratio was highest among the age group 40-49 (8045/100,000) and least among the age group of 25 -29 (768/100,000) as shown in table 2 above.

Table 2. Distribution of obstetric deaths by age group

Age (years)	Number of births	Number of deaths	Maternal mortality ratio(Per 100,000 live births)
< 15	1	-	-
15 -19	180	3	1667
20 - 24	501	8	1597
25 - 29	1824	14	768
30 - 34	1002	10	998
35 - 49	800	7	875
40 - 44	87	7	8045
> 44	49	1	2040
Total	4443	50	-

Table 3. shows that maternal mortality decreases with increasing educational status

Table 3. Educational Status Distribution of Obstetric Deaths

Educational status	Number of births	Number of deaths	Maternal mortality ratio(Per 100,000 live births)
None	1008	18	1786
Primary	740	13	1757
Secondary	1903	10	525
Tertiary	700	7	100
Not stated	92	2	2174
Total	4443	50	-

Table 4. Distribution of Maternal Deaths By Parity

Parity	Number of births	Number of death	Maternal mortality ratio(Per 100,000 live births)
0	1001	15	1499
1	1016	10	984
2	724	4	553
3	665	2	301
4	130	6	4615
>4	905	13	1437
Not stated	2	-	
Total	4443	50	-

The maternal mortality ratio related to parity was higher among the primigravidae (1,499) and para 4 (4,615).

Table 5: Clinical Causes of Maternal Mortality

Cause of death	Number of births	Percentage mortalities(%)
Direct causes		
Eclampsia	16	28.6
Haemorrhage	13	23.1
Unsafe abortion	5	8.9
Embolism	3	5.4
Infections	1	1.8
Ectopic pregnancy	1	1.8
Indirect causes		
AIDS	8	14.3
Anaemia	5	8.9
Anaesthesia	2	3.6
Thyrotoxicosis	1	1.8
Diabetes	1	1.8
Total	56	100

Table 5. shows that eclampsia was the commonest cause of maternal death (28.6%). Other common causes were haemorrhage (23.1%), AIDS (14.3%), unsafe abortion (8.9%) and Anaemia (8.9%).

Table 6: Duration of Hospital Stay Before Death

Duration of hospital stay	Number of patients	Percentage
≤ 24 hours	32	57.1
> 24 hours	24	42.9
Total	56	100

Table 6 shows that 57.1% of the patients died within 24 hours of admission while 42.9% died after 24 hours.

4. Discussion

This study revealed high maternal mortality ratio (MMR) of 1260/100,000 live births in JUTH, which is higher than the last study, conducted in the same hospital (740/100,000) [1]. This value is also higher than that reported in studies done in Ibadan [13] (309/100,000) and Lagos [14] (852/100,000). This might be a reflection of better health care and living standards in the Western part of Nigeria (Lagos) as compared to Jos. Also women are more educated in the western Nigeria and are more likely to utilize antenatal services than their counterparts in Jos. The maternal mortality ratio of 1260/100,000 live births is higher than the national maternal mortality ratio of 800/100,000 [1,14] but lower than that reported in Port Harcourt and Sokoto, 1776/100,000 and 2138/100,000 respectively [15]. Aside from the fact that the values are higher than the national figures, maternal mortality is on the increase in JUTH. This may warrant a follow up study as we could not ascertain the reasons for this trend in the present review.

The association between maternal mortality and antenatal care cannot be downplayed as seen in this study. The maternal mortality ratio of 18518/100,000 was higher in unbooked patients compared to 256/100,000 of those who booked in JUTH. These findings also agrees with other studies done elsewhere [16,17].

It was observed that maternal mortality ratio was highest in those with no formal education compared to those with secondary and tertiary education. This was also similar to the previous study done in JUTH by Ujah et al [17].

The leading direct causes of maternal mortality found in this study include eclampsia, haemorrhage, unsafe abortion, embolism and infections. This is similar to what has been reported from other parts of sub-Saharan Africa and other parts of the world [17,19] although the order of frequency may vary. Obstructed labour, which was rare in this study, was found to be common (4.0%) with a maternal mortality ratio of 605/100,000 live births in a study done in Gombe [19].

HIV/AIDS seems to be emerging as a leading indirect cause of maternal mortality in JUTH. HIV/AIDS may influence maternal mortality in several ways. Women living with this disease may be more susceptible to direct and indirect obstetric causes of maternal mortality such as postpartum haemorrhage, puerperal sepsis and complications of caesarean section [20]. AIDS-related deaths may be incidental to pregnancy or may be through direct causes of maternal mortality where the infection itself or opportunistic infections such as tuberculosis progress faster in pregnancy [21]. The contribution by HIV/AIDS to indirect causes of maternal mortality in this study was 14.3%. This finding in our study is consistent with an earlier study in Malawi that showed that HIV/AIDS was emerging as the leading cause of maternal mortality [21]. As the HIV/AIDS epidemic spreads in Nigeria, the contribution of the infection to maternal mortality will certainly increase. Therefore, programmes to prevent mother to child transmission (PMTCT) of HIV should be greatly expanded so as to allow women easy access to counseling, testing and treatment.

The high maternal mortality ratio found in this study and that contributed by HIV/AIDS may be due to the fact that JUTH is also a principal regional referral centre for the management of HIV/AIDS in Nigeria. A bigger population based study in future will shed more light on this.

Unsafe abortion was the leading cause of gynaecological deaths (8.91%) while ectopic pregnancy contributed 1.8%. These results are similar to those obtained in studies around sub-Saharan Africa [22,23]. Pulmonary embolism was one of the leading causes of maternal mortality in this study which was similar to that obtained in the Port Harcourt study.

It was found that about 57.1% patients died within 24 hours of admission with 8.9% of them dying within an hour of admission. This is similar to studies done in Jos [17,23] and other parts of Africa [24-27].

Most of the preventable deaths were due to obstetric haemorrhage, eclampsia and unsafe abortion. Haemorrhage for example can be anticipated or prevented, therefore early diagnosis and prompt treatment of this condition remains central to averting maternal deaths. This is one of the components of emergency obstetric care. The other preventable deaths like eclampsia and unsafe abortions were due to delays in patients coming to hospital and late referrals from primary health centres and some general hospitals [28,29].

This study was however not without notable limitations. Principally, there was only one postmortem examination to ascertain the true cause of demise in the study due mainly to sociocultural and religious inhibitions.

Therefore, antenatal booking, to detect pregnancies at risk, health education of the populace and early referral of these patients as well as girl child education will help in management and prevention of complications which ultimately contribute to the presently high maternal deaths in Jos, Nigeria.

6. References

- [1] Ujah IAO, Aisien OA, Mutahir JT, Glew RH, and Uguru VE. Factors contributing to maternal mortality in North-Central Nigerian: A Seventeen-year Review. *African Journal of Reproductive Health* December. 2005; 9:27-40.
- [2] Harrison KA Maternal Mortality in Nigeria: the real issues. *Afr. J. Reprod. Health* 1997; 1:7-13.
- [3] Chinwuzie J, Okolocha C.A. Pragmatic Approach to Reduction of maternal mortality in Africa. *Trop. J. Obstet Gynaecol.* 1999; 16: 18-20.
- [4] Abouzahr C. Global burden of maternal death and disability. *Br Med Bull* 2003; 67:1-11.
- [5] Chukwudebelu W.O. Maternal Mortality. *Trop. J. obstet. Gynaecol.* 1995; 12: 1-3.
- [6] Adamu YM, Salihu HM, Sathiakumar N, Alexander GR. Maternal mortality in northern Nigeria: a population-based study. *Eur. J. Obstet. Gynecol. Reprod. Biol.* 2003; 109: 153-159.
- [7] Adegoke AA, Lawoyin TO, Ogundeyo MO. Thomson Am. A community based investigation of the avoidable factors in maternal mortality in Nigeria: the pilot experience. *Afr. Health Sci.* 2007; 7(3): 176-181.
- [8] Harrison KA. Reducing Nigeria's high maternal and newborn mortality and morbidity. *BJOG*, 2007; 114(9): 1178.
- [9] Abe E, Lawrence O, Omo-Aghoja (2008). Maternal mortality at the Central Hospital, Benin City, Nigeria: A ten year review, *Afr J Reprod Health.* 12(3): 17-26.
- [10] Omo-Aghoja LO, Aisien OA, Akuse JT, Bergstrom S, Okonofua FE. Maternal mortality and emergency obstetric care in Benin City south south Nigeria. *Journal of clinical medicine and research.* 2010; 2(4): 055-060
- [11] Ghosh MK. Maternal Mortality. A global perspective: *Reprod med* 2001; 46(5): 427-433.
- [12] Wright EA and Disu FR. Maternal Mortality in Jos University Teaching Hospital. *Nig. Med. Pract.* 1988; 15(3):7-59.
- [13] Briggs ND. Maternal death in the booked and unbooked patients: University of Port Harcourt Teaching Hospital experience. *Trop J. Obstet Gynaecol* 1998; 1:26-29.
- [14] Olatunji AD and Abudu OO. A Review of maternal mortality in Lagos University Teaching Hospital. *Nig. Med. Pract* 1996; 31:2-6.
- [15] Ojo OA, Savage VY. A ten-year review of maternal mortalities in University College Hospital, Ibadan, Nigeria. *Am J. Obstet Gynaecol* 1974; 118: 517-522.
- [16] Otolorin E.O. An Overview of Maternal Mortality in Nigeria. In: the proceedings of Workshops on strategies for reduction of maternal mortality. SOGON. 1999:52-64.
- [17] Ujah IAO, Uguru VE, Aisien AO, Sagay AS, and Otubu JAM. How safe is motherhood in Nigeria? The trend of Maternal Mortality in a tertiary health institution. *East Afr Med. J.* 1999; 76 (8): 436-439.
- [18] World Health Organisation: ICD-10 International Statistical Classification of Diseases and related health problems. Tenth Revision, Volume 2, Second edition. Geneva: World Health Organisation; 2004.
- [19] Mela GS, EL-Nafaty AU, Massa AA and Audu B.M. Obstructed labour: a public health problem in Gombe, Gombe State, Nigeria. *J Obstet Gynaecol* 2003; 23(4): 369-373. [20] Swende TZ. Emergency caesarean section in a Nigerian tertiary health centre. *Niger J Med* 2008; 17(4): 396-398
- [21] Adamson SM, Phiri A. Did Maternal Mortality ration increase in Malawi between 1992 and 1998? Review of Malawi Demographic and Health Survey and other data Sources. *Trop Doc* 2003; 33(3): 182-185.
- [22] Geelhoed DW, Visser LE, Asare K, Jules H, Van Leeuwen S and Van Roosmalen J. Trends in Maternal Mortality: a 13-year hospital-based study in rural Ghana. *Euro J. Obstet Gynaecol. Repro Biol* 2003; 107 (2) 135-139.
- [23] National Committee on Confidential Enquiries into Maternal Deaths. A review of maternal deaths in South Africa during 1998. *S Afr Med J.* 2000; 90:367-373.
- [24] World Health Organization. Maternal Mortality; Dimension of the problem. Paper presented at the safe motherhood conference, Nairobi, Kenya, 1987; 10-13.
- [25] Shiffman J. Can poor countries surmount high Maternal Mortality? *Stud Family Planning* 2000; 31: 274-289.
- [26] White F, Saleem S. Maternal Mortality estimates are useful. *Bull World Health Organ* 2001; 79: 900.
- [27] Hoesterman CF, Ogbaselassie G, Wacker J. Maternal Mortality in the main referral hospital in the Gambia, West Africa. *Trop Med int. Health* 1996; (5): 710-7.
- [28] Mutahir JT, Ujah IAO, Sagay AS, Pam IC, Daru PH, Ekwempu CC and Ocheke NG. Maternal Mortality: The Rising Trend of unsafe Abortion as a Contributory factor in Jos, Nigeria. *Trop. J obstet Gynaecol* 2003; 20 (1): 24.
- [29] Otoide V.O Case Reporting of Maternal deaths in Nigeria *Trop. J. obstet Gynaecol* 2002; 19: 30-32.