

Maternal Mortality: A Review of Aetiology in a Lassa Fever Endemic Region of Nigeria

Oboh SA^{1,*}, Eifediyi RA¹, Yaya O¹, Okoeguale J¹, Ikheola JO¹, Njoku I.A², Ajekweneh A¹, Mojeed M¹, Eigbefoh J¹, Okogbenin SA¹, Olugbenga E.O¹, Oboh CO¹

¹Department of obstetrics and gynaecology Irrua Specialist Teaching Hospital, Irrua, Nigeria, ²Department of obstetrics and gynaecology College of Medicine, AAU, Ekpoma, Nigeria

Abstract: Background: Maternal deaths are a subset of all female deaths; they are defined as any deaths that occur during pregnancy or childbirth or within 42 days after the birth or termination of a pregnancy. The Nigeria National Demographic Health Survey of 2018 (NDHS) reported that the lifetime risk of maternal death was 0.029, which indicated at the time of this report that 1,000 women (one in 34 women) would die before the age of 50 during pregnancy, during childbirth, or within 2 months of childbirth. Maternal mortality reduction is one of the key goals of the safe motherhood initiative which Nigeria endorsed and also one of the UN millennium development goals. Reducing maternal mortality in Nigeria has been a topical issue, efforts have been futile, and the scourge of maternal deaths have defiled many interventional attempts. In this study, a survey of pregnant women and hospital births in Irrua, South-South Nigeria was undertaken to examine factors associated with the trend of maternal mortality during or up to 42 days after pregnancy. **Objective:** To determine the trends in maternal mortality in ISTH, identify the background, socio- cultural factors and major causes of maternal death. **Materials and Methods:** This was a retrospective cross sectional study of all pregnancy related deaths between January 2008 and December 2018. Case folders with complete information of interest were retrieved and relevant data obtained for analysis. **Results:** The maternal mortality ratio (MMR) for the period under review was 531 per 100,000 live births. There were annual fluctuations in MMR with the highest ratio of 708 per 100,000 live births recorded in the year 2011. Obstetric Haemorrhage, Eclampsia and viral haemorrhagic fever (Lassa fever) contributed 28%, 18% and 16% respectively to maternal mortality respectively. Teenagers and advanced maternal age, illiteracy and non-utilization of the services of skilled birth attendants were risk factors for maternal death. **Conclusion:** This study reported high mortality ratio, but a downward trend from the last review in 2007. Obstetrics haemorrhage, eclampsia, and viral haemorrhagic fever (Lassa fever) were the highest contributors to maternal mortality in this study. Teenagers and advanced maternal age, illiteracy and non-utilisation of the services of a skilled birth attendant were risk factors for maternal death.

Keywords: Maternal mortality, ISTH Irrua, Obstetrics haemorrhage and eclampsia and Lassa fever.

INTRODUCTION

Maternal deaths are a subset of all female deaths; they are defined as any deaths that occur during pregnancy or childbirth or within 42 days after the birth or termination of a pregnancy. Maternal deaths do not include deaths due to accidents or violence¹. Reports of Allan Rose Field and Deborah Maine published in 1985 [2], alerted the world about the huge numbers of preventable maternal deaths. Despite subsequent initiatives put in place to address the tragedy [2], a significant number of women still die in Nigeria from pregnancy related complications. Nigeria currently has one of the highest rates of maternal mortality in the world and few programs are available to address maternal mortality in Nigeria [4][5]. However, deaths are only a part of the tragedy as millions develop chronic disability.

Nigeria, presently has 2% of the world's population, but accounts for 19% of the world's maternal deaths [6][7]. The 2013 National Demographic and Health Survey (NDHS) data suggests that the ratios are different in the six geopolitical zones of the country. In Northern Nigeria, an average staggering figure of 2,420 (ranging between 1,373 and 4,477) per 100,000 live births has been recorded in some

instances [9]. A previous study at Irrua Specialist teaching Hospital (ISTH) in 2007 [10] reported a maternal mortality ratio of 1747/ 100,000 live births over the preceding 5 year period. The commonest contributor to maternal mortality was postpartum haemorrhage and delay was associated with 77.8% of all maternal deaths. Poverty and poor living standard was a major indirect contributor to maternal mortality and the study concluded that improved social infrastructures, expansion of health insurance scheme as well as retraining of health personnel were important in reducing maternal mortality. Another study which utilized State Specialists Hospitals in Bauchi, Northeastern Nigeria [11] the Maternal Mortality Ratio (MMR) for the period under review was 1,732 per 100, 000 live births. The major causes of deaths were eclampsia 31.9%, haemorrhage 19.2% and sepsis 10.4%. Amongst the indirect causes of maternal death, anaemia was the leading cause accounting for 12.1%. This study recommended the provision of more functional healthcare facilities, to include both basic and comprehensive antenatal care facilities to reduce maternal mortality in these areas. Maternal morbidity and mortality has remained unarguably high in urban and rural communities in Nigeria and many other developing nations [12][13].

*Address correspondence to this author at the Department of obstetrics and gynaecology Irrua Specialist Teaching Hospital, Irrua, Nigeria; Email: asem4live@gmail.com

Gender inequality in many developing Nations have unarguably played a role in this menace. The contributions of delays to these mortalities are significant. Inability of the female folks to contribute to decision making, consent to caesarean deliveries or hysterectomies have invariable contributed remarkably. Although teaching hospital statistics do not represent national maternal mortality ratios, they are usually more accurate and can usefully be compared with ratios in similar institutions in developed countries. Also, these hospitals are often the only tertiary centers sub serving large populations, hence may actually be a crude representation of actual figures. Data obtained can be used for developing policies for reducing maternal mortality ratios by increasing the quality of prenatal and obstetric care and for determining trends over a period of time. The magnitude of maternal mortality will therefore be more appreciated if there are periodic reviews of the various causes. In this review these causes of maternal deaths are discussed and preventive measures suggested.

MATERIALS AND METHODS

The study was a hospital based retrospective analysis, carried out to determine the trend of maternal mortality in Irrua Specialist Teaching Hospital (ISTH), Edo State, over eleven year period and to identify the leading causes of maternal death. The study population included patients who delivered at ISTH, those who had early or late pregnancy complications or were referred from other centers with pregnancy related complications. Data were identified by reviewing all maternal deaths that occurred in ISTH from January 2008 to December 2018, and those whose folders could not be traced, were excluded from the analysis. Cases were identified through labour ward, labour ward theatre, main theatre, post natal ward, Intensive Care Unit and accident and emergency records. The case notes were retrieved from the central records library. Data collected included the booking status, age, gravidity, parity, educational status, area of residence, ethnic group, the date and time from hospital admission until death, clinical management of the patient, causes of death, and circumstances surrounding the deaths as recorded in the patient's folder. When there was more than one possible cause of death, priority was given to the primary obstetric cause judged on the basis of available clinical information, assessment and diagnosis. Over this period, about 98 maternal death has been recorded, however on initial review of the case records, we found 82 records of maternal deaths for whom documentation of information of interest were sufficiently complete for inclusion in this study. Findings were recorded on a pre-formed format sheet designed for the study and data were coded and transferred into an IBM compatible PC and analyzed using SPSS statistical package. The maternal mortality ratio was calculated by dividing the number of maternal deaths by the total number of live births recorded within the same period multiplied by 100,000. The results were presented by simple statistical tables.

RESULTS

Table 1 shows yearly variation of maternal mortality ratio over eleven year period.

Table 1: Annual trends of Maternal Mortality Ratio.

Year	Total birth	Total death	MMR/100000 Live birth
2008	1296	6	463
2009	1384	8	578
2010	1392	7	502
2011	1411	10	708
2012	1356	7	516
2013	1384	8	578
2014	1470	6	408
2015	1457	5	343
2016	1398	7	501
2017	1497	10	668
2018	1412	8	567
Total	15,457	82	531

Overall maternal mortality over the 11 years period was 531/100,000 live births.

Table 2: Selected Maternal Socio-Demographic Characteristics.

Characteristics AGE (YEARS)	Number	Percentage
14 – 19	16	19.5
20 – 24	12	14.6
25 – 29	11	13.4
30 – 34	15	18.3
35 & >	28	34.1
Total	82	100
PARITY		
0	24	29.3
1 – 4	21	25.6
≥ 5	37	45.1
Total	82	100
EDUCATION		
None	31	38.8
Primary	21	25.6
Secondary	18	22.0
Tertiary	12	14.6
Total	82	100
BOOKING STATUS		
Unbooked	41	50.0
Booked elsewhere	25	30.5
Booked at ISTH	16	19.5
Total	82	100

Table 3: Associated Factors.

1. Place of residence from ISTH

Place/distance (km)	Number	Percentage
Irrua / 1-2	10	12.2
Ekpoma/3	08	9.8
Uromi/8	09	11.0
Ubiaja/12	06	7.3
Ewohimi/35	07	8.5
Sabogida/38	08	9.8
Auchi/54	11	13.4
Okpila/59	07	8.5
Ebudin/17	04	4.9
Igueben/17	03	3.7
Ehor/15	05	6.1
Kogi/103	02	2.4
Benue/287	02	2.4
Total	82	100

2. Facility of initial presentation.

Health facility	Number	Percentage
TBA	9	11.0
PHC	31	37.8
Secondary/general hospitals	13	15.9
Private hospital	20	24.4
Tertiary hospital	09	11.0
Total	82	100

Causes of Maternal Death among the 82 cases.

Causes of death	Number	Percentages
Postpartum Haemorrhage	23	28
Eclampsia	15	18.3
Lassa Fever	13	15.9
Sepsis	8	9.8
Obstructed labour	7	8.5
Antepartum haemorrhage	6	7.3
Abortion Complications	3	3.7
HIV/AIDS	2	2.4
Ectopic pregnancy	2	2.4
Others (Rhabdomyosarcoma DKA, SCD, cardiac disease, Anaemia etc)	3	3.7
Total	82	100

DISCUSSION

The Maternal Mortality ratio (MMR) of 531/100,000 live births reported in this study is comparable to the figures from the Nigeria Demographic and Health Survey (NDHS) which reported 545, 576 and 556 per 100,000 livebirths in 2008, 2013 and 2018 respectively. This is high compared to some other African countries such as Cape Verde and South-Africa reporting maternal mortality rate of 94-122/100000 live births. Furthermore, global estimates of maternal mortality and institutional reporting, although widely divergent, indicates that Nigeria is yet make a significant progress in reducing maternal mortality. A slight drop in mortality rate is noted between 2007¹⁰ and this report. In addition, the MMR in this study showed a somewhat downward trend compared to reports from the Northern region of Nigeria [11][12][13]. Within Nigeria, Maternal Mortality Rate (MMR) figures differs between geo-political zones, with southwestern Nigeria having one of the lowest rates of preventable Maternal and Perinatal deaths according to the National Demographic and Health Survey (NDHS) data in 2004. This may not be unrelated to the difference in educational status, health seeking behavior, gender inequality, lack of manpower and poor state of healthcare facilities. Despite efforts of the safe motherhood initiatives and millennium development goal initiatives, maternal death rate in Nigeria still remain high, defiling all possible interventional attempts.

The most common cause of maternal death in this study was postpartum haemorrhage; and delays invariably played huge role in maternal death. This finding is similar to other reports [14][15][16] however, a key finding was the contribution of Lassa fever to maternal mortality in this study. Lassa fever accounted for about 16% of overall maternal death. This has not been reported in other studies. Lassa fever could actually be a significant but hidden cause of

maternal mortality in Nigeria. This became obvious because, ISTH is a center of excellence for management of Lassa virus disease in Nigeria and the few diagnosed cases in Nigeria where referred from various states to ISTH for management; many of such cases may also have been misdiagnosed as typhoid or resistant malaria until demise. This finding calls for a higher index of suspicion and expansion of investigations for febrile illness in Pregnancy.

In the socio-demographic survey, women above the age of 35 and teenagers were more likely to die compared to those in other categories. The women above the age of 35 where of higher parity and accounted for majority of women who died from antepartum and postpartum haemorrhage. Many of these women also had medical complications including hypertensive disorders and cardiac diseases. Mortality from obstructed labour was more common in teenagers as has been documented in other studies. In all categories, the unbooked patients and those with lower level of education were more likely to die compared to other group. Majority of the women who died were referrals from healthcare facilities with no level of education or lower level of education. Those with tertiary levels were the least affected. Similar findings have been recorded in other studies [5][10][11].

A considerable number of women who died, had home of a traditional birth attendant (TBA), primary health centers and private hospitals as their source of admission or referrals or initial care. The home of a TBA is not an ideal place for antenatal care (ANC) and delivery of a baby because skilled birth attendants are absent and active labour management is lacking [12]. Delivery at the primary care centers or the home of a TBA could be associated with illiteracy, poverty or low socio-economic factors, ignorance, poor attitude to ANC and several others constituting delays towards maternal mortality. Most of these women who are in the high risk categories may have been averse to caesarean deliveries and ending up in TBAs or in primary care centers where skilled birth attendants may not be available. Furthermore many small private facilities are substandard for their lack of formal training in maternal and child health care. This was the case for most of the private hospitals in this study where referrals were made to ISTH.

CONCLUSION

This study reported high mortality ratio from Obstetrics haemorrhage, eclampsia, and viral haemorrhagic fever (Lassa fever). These factors had the highest risk causing maternal death during pregnancy and childbirth. Teenagers and advanced maternal age, illiteracy and non-utilisation of the services of a skilled birth attendant were risk factors for maternal death. There is the need to develop intensive high-level advocacy and sensitization campaign program targeted at policymakers, religious leaders and traditional rulers, with appropriate communication messages, to improve girl child education, expansion of skilled birth attendants through training, early referrals and utilization of comprehensive and tertiary care centers, particularly in high risk pregnancies. Expansion of health insurance to cover the unemployed poor masses is vitally important as this would cover the financial impediment of seeking healthcare.

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