

Maternal mortality associated with eclampsia in Sokoto, Nigeria

Original Article

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ABSTRACT

Background: Eclampsia is a well recognised major cause of maternal death particularly in developing countries where illiteracy, poverty, lack of prenatal care, late referral, lack of efficient transport system and delay in hospitalization abound.

Objective: To determine the proportion of maternal mortality associated with eclampsia together with the demographic and clinical characteristics that influence death in eclampsia.

Methods: Records of all the maternal deaths due to eclampsia at Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto between January 2005 and December 2009 were reviewed, retrospectively. Their social demography, mode of delivery, type of eclampsia, Glasgow coma score at presentation and fetal outcome were extracted for analysis. The data were processed with SPSS version 10. Chi square was used to analyse some of the results and the confidence limit was set at 95%.

Results: There were 277 maternal deaths during the five-year period and eclampsia accounted for 117 (42.2%) deaths, with a case fatality of 31.7%. The case fatality from the condition was relatively higher in mothers whose age was less than 20 years (36.2%), of first delivery (33.8%), with no formal education (32.4%), with no prenatal care (32.3%) and with Glasgow coma score of ≤ 5 at presentation (46.1%) than their opposite numbers. However, it was only in Glasgow coma score that a significant difference in case mortality was observed ($p = 0.000$). The perinatal death associated with eclampsia was 24.7%, and 61.5% of them occurred amongst mothers who died from eclampsia.

Conclusion: Eclampsia is a major contributor to maternal mortality in the centre. Measures to reduce maternal death from eclampsia include female education, promotion of utilization of family planning and prenatal/delivery services and health education on features of severe pre-eclampsia and early presentation to the hospital at the least suspicion.

Keywords: Eclampsia, maternal mortality, Sokoto

INTRODUCTION

Eclampsia is a serious complication of hypertensive disorders of pregnancy, accounting for about 50,000 maternal deaths per year worldwide, and majority of these deaths (99%) occur in developing countries.^{1,2} Eclampsia occurs in 1 to 100/1700 deliveries in developing countries while in Europe, USA and other developed countries it is a

complication of childbirth in 1/2000 deliveries, and in United Kingdom it is a contributory factor to 10% of maternal deaths.^{1,3,4} In Nigeria, it is the 3rd leading cause of maternal mortality³ while in South Africa, Jamaica and Pakistan it is the most common cause of maternal death.^{5,6,7,8} In Nguru (North-East Nigeria), it is the most common cause of maternal mortality while in

Benin (South-South Nigeria) and Sokoto (North-West Nigeria), it is the 2nd leading cause of maternal death.^{9,10,11} The relatively high maternal mortality associated with eclampsia in developing countries like Nigeria has been attributed to the lack of prenatal care, late referral, lack of efficient transport system, delay in hospitalization and occurrence of multiple seizures prior to admission.^{6,12,13} The objective of this study is to determine the proportion of maternal mortality attributable to eclampsia at Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto together with the demographic and clinical characteristics that influence death amongst the eclamptics.

METHODOLOGY

Case records of 117 patients that died from eclampsia amongst 277 total maternal deaths between January 2005 and December 2009 at Usmanu Danfodiyo University Teaching Hospital Sokoto were sought in the Central Medical Records Library. Ninety-six case notes (82.1%) were available while the relevant information pertaining to the remaining 21 patients (17.9%) were obtained from the nurses' and monthly departmental mortality review records. The information sought included the age, parity, ethnic group, level of education, number of fits prior to admission, Glasgow coma score at presentation, mode of delivery and foetal outcome. The data were processed with SPSS, version 10. Chi square was used to analyse some of the results and the confidence limit was set at 95%.

RESULTS

During the period under review, the total deliveries were 13,178 and there were 369 cases of eclampsia, giving the prevalence of the latter as 2.8%. Magnesium sulphate was the sole anti-convulsant agent used in all the patients. The total maternal death within the period was 277 and eclampsia was responsible for 117 (42.2%), and the case

fatality from eclampsia was 31.7%. Ninety-two patients (78.6%) were of Hausa ethnic group, 9 (7.7%) Fulani and 5 (4.3%) Zabarma. The rest were from ethnic groups that were not indigenous to the study area.

One hundred and two patients (89.7%) were moslems. Table 1 depicts the age/parity distribution, literacy level and utilization of prenatal services by the subjects. The modal case fatality occurred in the age group less than 20 years (36.2%) and during the 1st delivery (33.8%). Similarly, the case fatality was relatively higher in subjects with no formal education (32.4%) and those who did not have prenatal care (32.3%) compared to their opposite groups. However, the differences in case fatality with relation to age, parity, literacy level and prenatal care were not statistically significant ($p > 0.05$). As shown in table 2, the case fatality from eclampsia was significantly higher in subjects with Glasgow coma score of ≤ 5 (46.1%) than their opposite group ($p=0.000$).

Table 1. Socio-demographic characteristics of the patients

Age group (years)	Cases of eclampsia	Number of deaths	Case fatality (%)
< 20	105	38	36.2
20-29	230	71	30.9
30-39	34	8	23.8
Total	369	117	31.7
Parity			
1 st delivery	308	104	33.8
2-4	52	11	21.2
≥ 5	9	2	22.2
Total	369	117	31.7

Literacy level

Yes	11	1	9.1
No	358	116	32.4
Total	369	117	31.7

Prenatal care

Yes	10	1	10.0
No	359	116	32.4
Total	369	117	31.7

Ninety-nine patients (84.6%) had, at least, five fits at home before presenting to the hospital. Table 3 depicts the types of the eclampsia. Fifty-six percent of eclamptic deaths occurred in patients with antepartum eclampsia.

Table 2. Glasgow coma scale at presentation

Coma scale	Cases of eclampsia	Number of death	Case fatality (%)
3-5	102	47	46.1
6-10	197	64	32.5
11-15	70	6	8.6
Total	369	117	31.7

Table 3. Types of eclampsia

Types	No (%)
Ante-partum	66 (56.4)
Intra-partum	42 (35.9)
Post-partum	9 (7.7)
Total	117 (100)

As demonstrated in table 4, about 34% of the subjects had spontaneous vaginal delivery while 25% died undelivered. Jaundice, intravascular coagulopathy, cerebro-vascular accident, acute renal failure and aspiration pneumonitis were present in 7.6%, 19.4%, 29.1%, 39.8% and 42.3% of the subjects, respectively. The total perinatal death associated with eclampsia during the period was 91 (24.7%) and 56 (61.5%) of them occurred amongst the deceased mothers.

Table 4. Mode of delivery

Mode	No (%)
Spontaneous vaginal	40 (34.2)
Assisted vaginal	17 (14.5)
Caesarean section	31 (26.5)
Undelivered	29 (24.8)
Total	117 (100)

DISCUSSION

The contribution of eclampsia to total maternal death during the period under review was 42.4%. This figure is lower than 46.4% reported in Nguru but much higher than 21.1% in Nnewi (South-East Nigeria), 12.4% in Benin (South-South Nigeria) and 10% in United Kingdom.^{4,9,10} In addition, it is the leading cause of maternal mortality during the period under review. This is in contrast to the previous study in the same centre where ruptured uterus was the most common cause of maternal death.¹¹ Introduction of a 'pack system' for the management of ruptured uterus in the centre in 2002 resulted in dramatic fall in the case fatality of the condition; from 38% to 11%.¹⁴ This in turn led to relative rise in the percentage contribution of eclampsia to maternal mortality in the centre. The 'pack'

contains all the surgical items required for emergency laparotomy and can be given on loan to indigent patients so as to minimize delay in surgical intervention.

Unlike in North-West and North-East Nigeria, the leading cause of maternal mortality in developed countries like United Kingdom and United States of America, is thromboembolism.^{9,16} Widespread utilization of antenatal care services, effective antenatal screening programmes and improved diagnostic/therapeutic criteria in developed countries have made eclampsia a rare complication of pregnancy and thus a lesser contributor of maternal mortality when compared to developing countries.^{7,16}

The case fatality from eclampsia in this data (31.7%) is higher than that reported in India (7.8%) and other parts of Nigeria (10.7-22.3%).^{17,18,19,20,21} This may be related to the condition of the patients at presentation in this study as 46.1% of them were admitted with Glasgow coma score of ≤ 5 . In addition, 42.3% of them had aspiration pneumonitis at presentation. Sawhney and co-workers in India, and Moodley in South Africa, had reported that maternal condition and associated complications on admission were the major determinants of maternal outcome in eclamptics.^{22,23} Maternal age less than 20 years and 1st delivery were associated with higher case fatality than their opposite group. This may be due to the likelihood of more repeated fits at home amongst the teenage eclamptics emanating from a particular Hausa culture called *goyonciki* (in which a woman is expected to have her 1st delivery in her parent's residence) together with the presence of cephalo-pelvic disproportion to which they are predisposed.^{2,24}

Interestingly, 25% of the subjects in this study died undelivered. This is similar to 21% reported in Nguru and a reflection of the culture of late presentation amongst our

patients, and underscores the importance of female education in the study area. Female education will bring about women empowerment and positive attitudinal change including utilization of prenatal services, hospital delivery, early health seeking behaviour and rejection of harmful cultural practices. Studies have demonstrated that early diagnosis and effective management of pre-eclampsia can prevent its progression to eclampsia.^{2,6}

CONCLUSION

This study has shown that eclampsia is the major contributor to maternal mortality in our centre, and illiteracy, 1st delivery amongst teenagers, lack of prenatal care and low Glasgow coma score at presentation, adversely influence maternal outcome. Thus, promotion of female education, utilization of family planning and prenatal/intra-partum services and early presentation to hospital when a complication is suspected will help to minimize maternal death from eclampsia.

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