Perinatal Outcome of Babies Delivered to Eclamptic Mothers: A Prospective Study from a Nigerian Tertiary Hospital

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ABSTRACT

Background: Eclampsia is a leading cause of maternal and perinatal mortality in Nigeria. Preventive and interventional measures have been shown to reduce maternal mortality and morbidity with no significant beneficial effect on neonatal outcomes. The aim of this study is to assess the perinatal outcome of eclampsia at the University of Port-Harcourt Teaching Hospital (UPtH). Materials and methods: This prospective, cross-sectional study was conducted on 88 consecutive patients presenting with antepartum eclampsia at the UPtH between 1st January 2007 and 31st December 2008. A protocol was developed and used to collect information about socio-demographic characteristics, mode of delivery, perinatal complications and outcome. Data collected was entered into a spread sheet using SPSS 15.0 for Windows® statistical software which was also used for analysis. Chi square was used to test relationship between variables. P value<0.05 was considered statistically significant. Results: There were a total of 5488 deliveries at the University of Port-Harcourt Teaching Hospital from January 2007 to December 2008. Of these, 5,310 were live births while 404 were perinatal deaths giving perinatal mortality rate of 73.6 per 1000 live births. Eighty eight (1.6%) of the mothers were eclamptic. Eight (9.1%) were booked, 80 (90.1%) were unbooked. The mean gestational age at delivery was 35.1 ± 4.2 weeks. The main mode of delivery was by emergency caesarian section in 49 (55.7%) of the patients. Others were spontaneous vertex delivery (34.1%), assisted vaginal breech delivery (6.8%) and instrumental vaginal delivery (3.4%). Fifty four babies (61.4%) were admitted into the Special Care Baby Unit. Indications for admission include prematurity (n=23), low birth weight (n=10), severe birth asphyxia (n=12), neonatal jaundice (n=4) and neonatal sepsis (n=5). There were 37 perinatal deaths giving a perinatal mortality rate of 411 per 1000 live births. Of the mortalities, 19 were intrauterine foetal deaths, while 18 were early neonatal deaths. Causes of death include severe birth asphyxia (n=6), respiratory distress syndrome (n=4), prematurity (n=4), neonatal jaundice (n=1) and sepsis (n=3). Conclusion: Eclampsia is a major contributor of perinatal mortality and morbidity in Nigeria. Detection and appropriate management of pre-eclampsia is critical to reduce the risk of eclampsia. (Int J Biomed Sci 2009; 5 (4): 390-394)

Keywords: perinatal outcome; eclampsia; antenatal care

INTRODUCTION

Perinatal mortality is an important indicator of the status of maternal and child health, the conditions of obstetric care and the level of economic development of a community (1). It includes stillborn babies (SB) of more than
28 weeks of gestation and deaths occurring within the first week of life (early neonatal deaths) (1). The perinatal mortality rate (PMR) reflects both the characteristics of reproductive health and the quality of antenatal care, delivery, and newborn care (2). At the global level, an estimated 7.5 million perinatal deaths take place each year, most of which are in developing countries (3, 4). The perinatal mortality varies between different regions for instance, it ranges from less than 10 per 1,000 in most developed countries to up to 60 per 1,000 in certain regions of Asia and Africa (3, 4).

Eclampsia is defined as the occurrence of fit or seizure in a patient with signs and symptoms of pre-eclampsia in the absence of underlying neurologic disease (5). It is known to contribute significantly to maternal and perinatal mortality in developing countries like Nigeria (6). It is, however, a rarity in developed countries. For example in the United States, an incidence of 4.3/10000 was reported while 4.9/10000 was reported in England (7, 8). This is not the case with developing nations where the incidence is much higher (6). The incidences increases with deprivation and lack of maternal healthcare organization (9). For instance, the incidences reported in a study conducted in Nigeria and South-Africa are 42/10000 and 36/10000 respectively (10, 11). A ten year study in a rural hospital in Benin, Nigeria gave a case fatality rate of 15% and a perinatal mortality rate of 195 per 1000 births (12). Several institutions in Nigeria have reported maternity mortality rates of 330 per 100,000 contributing 21.1% of the maternal deaths and a perinatal mortality rate of 16.3% (13). The high rate of complications in developing countries has been attributed to lack of antenatal and intrapartum care for many of the obstetric population.

The pathophysiology attributed to this condition is as seen in pre-eclampsia. Virtually every organ is affected in the woman. Risk factors to the fetus and eventual perinatal death are intrauterine growth restrictions, low birth weight and prematurity as result of placental insufficiency and chronic hypoxia (due to the underlying pre-eclampsia rather than the eclampsia itself). Other risk factors are sepsis, birth asphyxia and its sequelae, and abruptio placenta.

There are few published data on perinatal mortality as a result of eclampsia. This study, therefore, was done to determine the perinatal outcome following eclampsia at the University of Port-Harcourt Teaching Hospital (UPTH), Port-Harcourt. Vital statistics obtained from this study may serve an important source of information to guide the public health policy makers and health care providers.

**MATERIALS AND METHODS**

This prospective, cross-sectional study was conducted on 88 consecutive patients presenting with ante partum eclampsia at the University of Port Harcourt Teaching Hospital between 1st January 2007 and 31st December 2008.

Diagnosis of eclampsia was based on diastolic blood pressure measurement greater than 90mmHg, proteinuria and convulsion (5).

All perinatal deaths including stillbirths (SBs) and early neonatal deaths (ENNDs) within 0-7 days of birth were included and pregnancies less than 24 weeks were excluded from this study.

A protocol was developed and used to collect information about socio-demographic characteristics, mode of delivery, perinatal complications and outcome. Data collected was entered into a spreadsheet using SPSS 15.0 for Windows® statistical software which was also used for analysis. Chi square was used to test relationship between variables. P value <0.05 was considered statistically significant.

**RESULTS**

The total number of deliveries at UPTH from January, 2007 to December, 2008 was 5488, 5310 of these were live babies while 404 were perinatal deaths giving a perinatal mortality rate of 73.6 per 1000 live births.

Eighty eight women presented with eclampsia over the study period resulting in an incidence of eclampsia of 16 per 1000 deliveries (1.6%). Unbooked patients who had received inadequate or no antenatal care comprised 90.9% of the women who presented at our hospital with eclampsia (Table 1).

The mean gestational age at presentation was 35.04 ± 4.21 weeks with a range of 24 weeks - 43 weeks and 57.1% of them presenting preterm (Table 2).

Caesarean delivery was the commonest mode of delivery 49 (55.7%) among the subjects with eclampsia as shown in table 2.

The total number of births in our series was 90, which included 86 singleton births and 2 sets of twins with a mean birth weight of 2.44 ± 8.18 Kg and a range 0.7 Kg-4.0 Kg.

Fifty four babies (61.4%) were admitted into the Special Care Baby Unit. The indications for admission were; prematurity (n=23), low birth weight (n=10), severe birth asphyxia (n=12), neonatal jaundice (n=4) and neonatal sepsis (n=5).
There were 37 perinatal deaths, giving a perinatal mortality rate of 411.1 per 1000 live births of babies born to eclamptic mothers. These included 19 still births (51.4%) and 18 early neonatal deaths (48.6%). Birth asphyxia (33.3%), respiratory distress syndrome (22.2%) and prematurity (22.2%) were the commonest causes of neonatal deaths (Table 3).

Babies of unbooked mothers accounted for 66.7% of the perinatal deaths. This was significantly higher than the perinatal deaths among babies of booked mothers (p<0.001). Perinatal mortality was also significantly higher among babies delivered vaginally than those delivered by caesarean section (p=0.04; OR=2.27 [0.95 – 5.52]). Low birth weight babies had a significantly higher risk of perinatal mortality than normal weight babies p=0.03; OR=1.41 [0.65 – 3.25])

**DISCUSSION**

Eclampsia is a significant cause of maternal and perinatal morbidity and mortality, particularly in developing countries, where the incidence is still high (6). It is reported to affect 0.015% to 0.05% of the pregnant women in the West, compared (13) to an incidence of 1.6% in our series. This figure is lower than an Indian study which reported an incidence of 2.2% (14) but higher than reports from Africa (0.36% to 0.42%) (6, 11). This high incidence we reported in our series is a reflection of our failure to prevent eclamptic convulsions in a substantial number of pregnant women. It has been shown that physician’s error, patient failures and abrupt or late onset of eclampsia have been reported to be responsible for failure to prevent eclampsia (15). In this study, patient’s failure contributed to the development of eclampsia as most patients were unbooked (90.9%) and had received inadequate or no antenatal care.

The perinatal mortality rate (PMR) has been widely used to assess the outcome of late fetal and early neonatal life and is generally regarded as an index of how well society looks after women in their reproductive years. The PMR of 411 per 1000 live birth due to eclampsia in this study is quite high compared with the overall perinatal mortality rate of 73.6 per 1000 live birth. This shows that

| Risk factor              | Stillbirth | Early neonatal death | PMR/1000 |
|--------------------------|------------|----------------------|----------|
|                          | Total births | Stillbirths (%) | P-value | Live births | ENND (%) | P-value |
| Antenatal care           |             |                     |         |             |          |
| Booked                   | 8           | 0 (0.0)              | <0.001  | 8           | 0 (0)    | <0.001  | 0.0     |
| Unbooked                 | 80          | 19 (23.8)            |          | 61          | 18 (42.9) |          | 411.1   |
| Maternal age (years)     |             |                     |         |             |          |
| 16 – 19                  | 9           | 2 (22.2)             |          | 7           | 2 (28.6) |        | 44.4    |
| 20 – 24                  | 24          | 8 (33.3)             |          | 16          | 5 (31.3) |        | 144.4   |
| 25 – 29                  | 29          | 3 (10.3)             |          | 26          | 5 (19.2) |        | 88.9    |
| 30 – 34                  | 15          | 3 (20.0)             |          | 12          | 3 (25.0) |        | 66.7    |
| 35 – 39                  | 6           | 1 (16.7)             |          | 5           | 2 (40.0) |        | 33.3    |
| ≥40                      | 5           | 2 (40.0)             |          | 3           | 1 (33.3) |        | 33.3    |
| ≤34                      | 77          | 16 (20.8)            | 0.88     | 61          | 15 (24.6) | 0.61    | 344.4   |
| ≥35                      | 16          | 3 (18.8)             |          | 13          | 3 (23.0) |        | 66.7    |
| Maternal Parity          |             |                     |         |             |          |
| 0 – 4                    | 78          | 16 (20.5)            | 0.69     | 62          | 15 (24.2) | 0.58    | 344.4   |
| ≥5                      | 10          | 3 (30.0)             |          | 7           | 3 (42.9) |        | 66.7    |
| Plurality                |             |                     |         |             |          |
| Singleton                | 86          | 19 (22.1)            |          | 67          | 18 (26.9) |        | 411.1   |
| Multiple                 | 4           | 0 (0.0)              |          | 4           | 0 (0.0)  |        | 0.0     |

ENND, Early neonatal death; PMR, Perinatal mortality rate.
eclampsia is a major contributor to perinatal mortality.

Low birth weight (LBW) has been shown to be a key determinant of perinatal mortality (6). In this study LBW babies (Birth weight <2.5 Kg) significantly fared worse than their full sized counterparts. This agrees with most studies (16-18).

Birth asphyxia was the commonest cause of perinatal mortality in our study, accounting for one third of the perinatal deaths. This had been documented previously (19) and it has been suggested that perinatal deaths due to asphyxia, rather than crude PMR, be used as a measure of the efficacy of perinatal care (19).

Babies delivered by Caesarean section had a better perinatal outcome than their counterparts delivered vaginally. This would suggest that a more generous use of Caesarean section for delivery especially in the circumstance of a stable maternal condition and a live baby would improve perinatal survival and as such is advocated.

| Table 2. The effect of sex, mode of delivery, birth weight and gestational age on Perinatal Mortality Rate |
|----------------------------------|-----------------|-----------------|-----------------|-----------------|
| Risk factor                      | Stillbirth       | Early neonatal death |                  |
|                                 | Total births     | Stillbirths (%)    | P-value | Live births | ENND | P-value | PMR/1000 |
| Sex                              |                 |                   |         |             |      |         |          |
| Male                             | 45              | 14 (31.1)         | 0.06    | 31          | 8 (25.8) | 0.95    | 244.4    |
| Female                           | 45              | 5 (11.1)          |         | 40          | 10 (25.0) | 166.7   |
| Mode of delivery                 |                 |                   |         |             |      |         |          |
| SVD                              | 30              | 13 (43.3)         |         | 17          | 8 (47.1) | 233.3   |
| Emergency C/S                    | 49              | 3 (6.1)           | 0.001   | 46          | 8 (17.4) | 0.04    | 122.2    |
| Breech delivery                  | 6               | 1 (16.7)          |         | 5           | 2 (40.0) | 33.3    |
| Instrumental                     | 3               | 2 (66.7)          |         | 1           | 0 (0.0)  | 22.2    |
| Birth weight (gram)              |                 |                   |         |             |      |         |          |
| <1000                            | 3               | 1 (33.3)          |         | 2           | 2 (100)  | 33.3    |
| 1000 – 1499                      | 11              | 1 (9.1)           |         | 10          | 10 (70.0) | 88.9    |
| 1500 – 1999                      | 10              | 2 (20.0)          |         | 8           | 4 (50.0) | 66.7    |
| 2000 – 2499                      | 17              | 2 (11.8)          |         | 15          | 1 (6.7)  | 33.3    |
| 2500 – 2999                      | 19              | 6 (31.6)          |         | 13          | 1 (7.7)  | 77.8    |
| 3000 – 3499                      | 20              | 5 (25.0)          |         | 15          | 1 (6.7)  | 66.7    |
| 3500 – 3999                      | 7               | 2 (28.6)          |         | 5           | 1 (20.0) | 33.3    |
| ≥ 4000                           | 1               | 0 (0.0)           |         | 1           | 1 (100)  | 11.1    |
| <2500                            | 41              | 6 (14.6)          |         | 35          | 14 (40)  | 222.2   |
| ≥2500                            | 49              | 13 (27.7)         |         | 36          | 4 (11.8) | 0.03    | 188.9    |
| Gestational Age(weeks)           |                 |                   |         |             |      |         |          |
| ≤ 28                             | 6               | 2 (33.3)          |         | 4           | 4 (100)  | 66.7    |
| 29 – 36                           | 26              | 2 (7.7)           | 0.15    | 24          | 7 (29.2) | 0.12    | 100.0    |
| ≥ 37                             | 24              | 5 (20.8)          | 0.24    | 19          | 2 (10.5) | 0.01    | 77.8     |
| Uncertain                        | 32              | 10 (31.3)         |         | 22          | 5 (22.7) | 166.7   |

ENND, Early neonatal death; PMR, Perinatal mortality rate.
Fifty percent of all the perinatal death in our study were stillbirths. All these stillbirths occurred among the unbooked mothers. Thus, we believe that advances in antenatal care and appropriate timing of delivery in eclamp-tics will be effective in increasing perinatal survival rates for infants born to these mothers.

CONCLUSION

Eclampsia remains a major contributor to perinatal mortality in Nigeria. The major avoidable contributing factor is lack or absence of antenatal care. Hence, an improvement in the antenatal care and neonatal care services will be effective in reducing the incidence of eclampsia, as well as the morbidity and mortality associated with it.

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