Severe preeclampsia and eclampsia: A 6-year review at the Federal Teaching Hospital, Abakaliki, Southeast Nigeria

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ABSTRACT

Introduction: Severe preeclampsia and eclampsia are pregnancy-specific diseases associated with increased maternal and perinatal morbidity and mortality.

Objective: To evaluate the prevalence and outcomes of pregnancies complicated by severe preeclampsia and eclampsia in the Federal Teaching Hospital Abakaliki (FETHA).

Materials and Methods: This was a retrospective study of patients managed for severe preeclampsia/eclampsia from 1st January 2012 to 31st December 2017. Registers were reviewed, and the patient’s case files were retrieved. Sociodemographic data, risk factors, and fetomaternal outcomes were extracted using a pro forma. The data were collated, imputed, and analyzed using Epi Info (Atlanta, USA) version 7. The proportion and outcomes of pregnancies complicated by preeclampsia and eclampsia within the period were estimated. A Chi-squared test was used to compare the relationship between the severe disease and sociodemographic characteristics and fetomaternal outcome at 5% level of significance. Ethical clearance was obtained from the research and ethics committee of FETHA.

Results: The overall prevalence of severe preeclampsia/eclampsia was 4.0% with severe preeclampsia accounting for 3.4% and eclampsia 0.6%. The peak prevalence was in 2017, 5.2%. The majority of the patients were between 20 and 34 years, mean age was 27.3 ± 5.2 years. The majority of the patients were rural dwellers 130 (51.4%). About 107 (51.4%) attained secondary level of education. Only 93 (36.6%) were booked in FETHA. Primigravidity was the commonest risk factor 76 (29.9%). More women had cesarean section 124 (48.8%). The mean gestational age was 35 weeks and mean birth weight was 2.4 ± 0.8 kg. Maternal and perinatal deaths were recorded in 0.8% and 29.1% of the parturient, respectively.

Conclusion: The prevalence of preeclampsia and eclampsia was high in this study and there was increased maternal and perinatal morbidity and mortality. There is an urgent need for wider antenatal coverage, timely diagnosis, and prompt intervention to reverse this trend.

Key words: Eclampsia; morbidity; mortality; preeclampsia; pregnancy.

Introduction

Globally, the hypertensive disorders of pregnancy especially preeclampsia-eclampsia make up one of the top three leading causes of maternal and perinatal morbidity and mortality.[1-3] They remain a major obstetric challenge despite significant investment in understanding its...
pathophysiology. Preeclampsia is a multisystemic disease characterized by gestational hypertension and significant proteinuria from the second half of pregnancy in a previously normotensive and aprotinemuric woman. Eclampsia, on the other hand, is an extreme spectrum of preeclampsia, it is defined as new onset of generalized tonic-clonic seizure during pregnancy or puerperium in a patient with features of preeclampsia.

Worldwide, preeclampsia is estimated to complicate about 2–10% of pregnancies, this incidence is estimated to be seven times higher in developing countries (2.8% of live births) compared to developed countries where it constitutes 0.4% of live births. It accounts for over 63,000 maternal deaths annually with about 98% of such deaths occurring in developing countries. Studies done in Nigeria report an incidence of between 2 and 16% but in Abakaliki, Ajah et al. found an incidence of 1.75% at the defunct Federal Medical Centre, Abakaliki.

The high maternal mortality and fetal wastages associated with preeclampsia and eclampsia remain a huge public health issue. Poor health systems, lack of trained staff, poor quality of care, low levels of education, patriarchal culture and poverty are some of the factors contributing to the vulnerability of pregnant women to the major complications of preeclampsia-eclampsia. This study was conceived to explore the prevalence, trends, patient characteristics, and pregnancy outcomes of patients managed for preeclampsia-eclampsia since the inception of FETHA in January 2012.

Materials and Methods

Ebonyi State is one of the five states in the Southeast geopolitical zone of Nigeria. It was created in 1996 from the largely rural areas of the preexisting Enugu and Abia States with Abakaliki as its headquarters. It has an estimated population of 4.3 million people and occupies a landmass of 6400 km², sharing boundaries in the West with Enugu State, Abia State in the Eastern border, Cross River in the South, and Benue State in the North. The vegetation characteristic of the area is the tropical rain forest with an average annual rainfall of 1600 mm and an average atmospheric temperature of 36°C. Igbo is the predominant ethnic group in Ebonyi state and majority practice Christianity.

Study setting

The Federal Teaching Hospital Abakaliki (FETHA) is a federal government-owned tertiary health institution established in December 2011 when the federal government acquired then Ebonyi State University Teaching Hospital Abakaliki and merged it with the former Federal Medical Centre, Abakaliki. FETHA is located within the center of the state capital. It provides tertiary level obstetric care and trains postgraduate medical specialists. It receives referral from the general hospitals, mission hospitals, and primary health centers, as well as privately owned hospitals and clinics. It also receives referral from neighboring states.

Study population/design

This was a retrospective study involving all the cases of preeclampsia and eclampsia managed at the Federal teaching hospital Abakaliki between the 1st of January 2012 and December 31st 2017.

Definition of terms

Hypertension is defined as blood pressure recorded on at least two occasions 4 h apart measuring ≥140/90 mmHg or a single recording of 160/110 mmHg or more.

A urine dipstick test of 2+ of proteinuria or more pluses without evidence of urinary tract infection was considered significant proteinuria for the diagnosis of severe preeclampsia while new-onset grand mal seizures in a patient with preeclampsia were considered eclampsia.

Data collection

Information on the total number of patients who delivered their baby during the period was retrieved from the obstetric registers in the labor ward, postnatal ward, antenatal ward, accident and emergency, and the theatre. The case notes of the patients who were diagnosed as having preeclampsia and eclampsia were retrieved from the records department. Using a pro forma, information on sociodemographic characteristics, booking status, gestational age on delivery, risk factors identified, complications (premature delivery, eclampsia, abruptio placenta, perinatal death, and maternal deaths) were extracted. Diagnosis, blood pressures, and urinalysis results on admission, neonatal APGAR scores, birth weights, and neonatal complications were also documented.

Data analysis

Data were sorted and analyzed using Epi Info (Atlanta, USA) version 7. The descriptive analysis of the patients’ sociodemographic characteristics was presented in tables as frequency, proportions, and means. Severe disease was defined as a case with systolic BP of ≥160 mmHg and diastolic of ≥110 mmHg. The relationship between severe disease and sociodemographic and other clinical characteristics was evaluated using Chi-squared test at 5% level of significance.
Ethical approval
Ethical approval was obtained from the research and ethics committee of FETHA.

Results
During the period under review, a total of 14,181 deliveries were recorded. Of these numbers, 568 women were managed for preeclampsia and eclampsia thereby giving a period prevalence of 4.0%. Preeclampsia was 487 (3.4%) while Eclampsia was 81 (0.6%). The annual prevalence showed a range of 2.9–5.2% with a peak of 5.2% in 2017 [Table 1]. Only 254 patients’ case notes out of 568 (44.7%) had complete information and were used for data analysis.

The mean age of the patients was 27.3 ± 5.6 years. The modal age group was 25–29 years (93, 36.6%). The majority of the patients were rural dwellers 130(51.4%), had secondary level of education 107 (42.1%). Seventeen (6.7%) of the patients had no formal education. Only 93 (36.6%) of the patients were booked in our facility while the rest either didn’t get any antenatal care or registered elsewhere [Table 2].

Among the risk factors, primigravida 81 (31.9%), previous history of hypertension 37 (14.6%), and family history of hypertension 23 (9.1%) were the common ones [Table 3].

More women were delivered by cesarean section 124 (48.8%). The mean gestational age at delivery was 35 weeks. The mean birth weight was 2.4 ± 0.8 kg [Table 4]. Abruptio placenta was the commonest maternal complication while a low APGAR score at 5 min was the most common fetal complication [Table 5]. Maternal and perinatal deaths were recorded in 0.8% and 29.5%, respectively.

There was no statistically significant association between sociodemographic characteristics and severe preeclampsia and eclampsia, P value >0.05 [Table 6]. There was a significant association between severe preeclampsia/eclampsia and the development of pulmonary edema and stroke, P value <0.05 [Table 7].

Discussion
Preeclampsia and eclampsia remain a threat to maternal and fetal health with the greatest burden borne by developing countries. This problem is made worse by the mysterious nature of its etiology and strategies to prevent its occurrence. Reports from a recent multicenter study identified preeclampsia and eclampsia as the leading cause of maternal mortality and a major cause of fetal wastage in Nigeria, overtaking obstetric hemorrhages and sepsis. This underscores the need for urgent interventions to reverse this emerging trend.

The prevalence of preeclampsia from this study was 3.6% while eclampsia was 0.6%. The prevalence of preeclampsia from the present study is higher than a prevalence of 0.99% earlier reported by Ajah et al. in Abakaliki, while the prevalence of 0.6% which we found for eclampsia is close to 0.76% reported by Ajah. It appears a lower incidence of preeclampsia about 6 years earlier reported by Ajah et al. was because the study was conducted in one of the institutions

| Year of delivery | Total deliveries | Preeclampsia/eclampsia | Percent (%) |
|------------------|------------------|------------------------|-------------|
| 2012             | 2418             | 84                     | 3.5         |
| 2013             | 2761             | 79                     | 2.9         |
| 2014             | 2173             | 94                     | 4.3         |
| 2015             | 2299             | 103                    | 4.5         |
| 2016             | 2379             | 96                     | 4.0         |
| 2017             | 2151             | 112                    | 5.2         |
| Total            | 14,181           | 568                    | 4.0         |

| Variable            | Frequency | Proportion |
|---------------------|-----------|------------|
| Age                 |           |            |
| 15-19               | 13        | 5.1        |
| 20-24               | 65        | 25.6       |
| 25-29               | 93        | 36.6       |
| 30-34               | 53        | 20.9       |
| 35-39               | 23        | 9.0        |
| = >40               | 7         | 2.8        |
| Mean age            | 27.3 ±5.6 |            |
| Place of residence  |           |            |
| Rural               | 130       | 51.4       |
| Urban               | 123       | 48.6       |
| Education           |           |            |
| None                | 17        | 6.7        |
| Primary             | 71        | 28.0       |
| Secondary           | 107       | 42.1       |
| Tertiary            | 59        | 23.2       |
| Respondent’s occupation |     |            |
| Artisan             | 13        | 5.1        |
| Civil Servant       | 56        | 22.0       |
| Farmer              | 43        | 16.9       |
| Trader              | 69        | 27.2       |
| Unemployed          | 68        | 26.8       |
| Others              | 5         | 2.0        |
| Parity              |           |            |
| Nulliparous         | 81        | 32.0       |
| Multipara           | 140       | 55.3       |
| Grand multipara     | 32        | 12.7       |
| Mean                | 2.0       |            |
| Booking status      |           |            |
| Booked              | 93        | 36.6       |
| Unbooked            | 161       | 63.4       |

| Variable            | Frequency | Proportion |
|---------------------|-----------|------------|
| Age                 |           |            |
| 15-19               | 13        | 5.1        |
| 20-24               | 65        | 25.6       |
| 25-29               | 93        | 36.6       |
| 30-34               | 53        | 20.9       |
| 35-39               | 23        | 9.0        |
| = >40               | 7         | 2.8        |
| Mean age            | 27.3 ±5.6 |            |
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| Education           |           |            |
| None                | 17        | 6.7        |
| Primary             | 71        | 28.0       |
| Secondary           | 107       | 42.1       |
| Tertiary            | 59        | 23.2       |
that formed the present Federal Teaching Hospital, Abakaliki. Certainly the defunct hospital had less patient load. Our finding compares with 3.3% reported in Enugu but more than 1.2% reported in Calabar, and less than 4.2% reported from Ethiopia. While Enugu compares with Abakaliki in terms of socioeconomic and cultural characteristics, Calabar is more developed, a situation that might explain the lower incidence. In this study, we found a progressive rise in the annual incidence of preeclampsia with the least incidence recorded in 2013, 2.9% and the highest incidence of 5.2% was recorded in 2017. This could be due to increased awareness and improved health-seeking behavior. This is evident from Ajah’s study reported earlier where 83.1% of their patients were unbooked, 70% had none or at most primary education compared with 36.6% booking rate in our study and 93.3% literacy rate in this study. We also found that 48.6% of patients in this study were urban dwellers unlike 12.6% reported by Ajah and 10.5% reported in Okolobiri. Preeclampsia and eclampsia were high among primigravidae in this study, 32.0%, Ajah reported 59.4% while 49.3% was reported in Enugu and 44.1% was found in Calabar. This is not surprising because preeclampsia is theorized to be a disease of primigravidae, but this may not always be the rule as found in this study. Other notable risk factors in the patients were advanced maternal age, family, and previous histories of hypertension and multiple pregnancies. Similar associations were reported in other studies.

Despite advances in the understanding of this disease and the introduction of novel therapies in the management of preeclampsia, delivery remains the only cure thereby making it a major cause of iatrogenic prematurity, accounting for 15% of all premature births and approximately one out of five very low birth weight babies. More often than not, pregnancy termination is the case in severe preeclampsia and eclampsia because the risk of continuing such pregnancy far outweighs any potential or real benefit of continuing it, due to the progressive nature of this disease. In this study, 60.2% of the babies were delivered preterm. Low birth weight as a result of preterm delivery and intrauterine growth restrictions are known complications of severe preeclampsia. The average birth weight from this study was 2.4 ± 0.8 kg. Also, these patients present before the onset of labor with an unfavorable cervix thereby making them candidates for emergency cesarean sections with

| Variable                          | Frequency | Proportion |
|-----------------------------------|-----------|------------|
| Family history of diabetes mellitus |           |            |
| Yes                               | 5         | 2.0        |
| No                                | 249       | 98.0       |
| Family history of hypertension    |           |            |
| Yes                               | 23        | 9.1        |
| No                                | 231       | 90.9       |
| Diabetes                          |           |            |
| Yes                               | 1         | 0.4        |
| No                                | 253       | 99.6       |
| Molar pregnancy                   |           |            |
| Yes                               | 2         | 0.8        |
| No                                | 252       | 99.2       |
| Multiple gestations               |           |            |
| Yes                               | 18        | 7.1        |
| No                                | 236       | 92.9       |
| Nulliparity                       |           |            |
| Yes                               | 81        | 31.9       |
| No                                | 173       | 68.1       |
| Previous history of hypertension  |           |            |
| Yes                               | 37        | 14.6       |
| No                                | 217       | 85.4       |
| Renal disease                     |           |            |
| Yes                               | 2         | 0.8        |
| No                                | 252       | 99.2       |
| Advanced maternal age             |           |            |
| Yes                               | 12        | 4.7        |
| No                                | 242       | 95.3       |

| Variable                          | Frequency | Percentage |
|-----------------------------------|-----------|------------|
| Mode of Delivery                  |           |            |
| Cesarean section                  | 124       | 48.8       |
| Instrumental delivery             | 12        | 4.7        |
| Spontaneous vaginal delivery      | 118       | 46.5       |
| Gestational age at delivery (Weeks) |          |            |
| <34                               | 79        | 31.1       |
| 34-36                             | 74        | 29.1       |
| ≥37                               | 101       | 39.8       |
| First Min APGAR score             |           |            |
| <4                                | 49        | 23.3       |
| 4-6                               | 41        | 19.5       |
| = >7                              | 120       | 57.2       |
| Second Min APGAR score            |           |            |
| <4                                | 39        | 18.6       |
| 4-6                               | 18        | 8.6        |
| = >7                              | 153       | 72.8       |
| Asphyxiated                       |           |            |
| Yes                               | 75        | 35.7       |
| No                                | 135       | 64.3       |
| Fetal outcome                     |           |            |
| Alive                             | 179       | 70.5       |
| Dead                              | 75        | 29.5       |
| Birth weight (Kg)                 |           |            |
| <2.5                              | 122       | 48.0       |
| 2.5-3.5                           | 111       | 43.7       |
| 3.6-3.9                           | 8         | 3.2        |
| = >4                              | 13        | 5.1        |
| Mean birth weight±SD              | 2.4±0.8   |            |
Table 5: Maternal complications

| Variable               | Frequency | Percentage |
|------------------------|-----------|------------|
| Abruptio placenta      |           |            |
| Yes                    | 30        | 11.8       |
| No                     | 224       | 88.2       |
| HELLP syndrome         |           |            |
| Yes                    | 5         | 2.0        |
| No                     | 249       | 98.0       |
| Maternal death         |           |            |
| Yes                    | 2         | 0.8        |
| No                     | 252       | 99.2       |
| Renal failure          |           |            |
| Yes                    | 6         | 2.4        |
| No                     | 248       | 97.6       |
| Pulmonary edema        |           |            |
| Yes                    | 5         | 2.0        |
| No                     | 259       | 98.0       |

HELLP: hemolysis, elevated liver enzyme levels, and low platelet levels

Table 6: Sociodemographic and clinical factors associated with severe disease

| Variable         | Severe disease | Unadjusted odds ratio | 95% CI   | P     |
|------------------|----------------|-----------------------|----------|-------|
| Place of residence |                |                       |          |       |
| Rural            | 106 (81.5)    |                       | 1.2      | 0.67‑2.30 0.478 |
| Urban            | 96 (78.1)     |                       | Ref 0.35‑2.58 0.929 |
| Parity           |                |                       |          |       |
| Nulliparous      | 59 (76.6)     | 1.0                   | 0.35‑2.58 0.929 |
| Multiparous      | 112 (83.6)    | 1.5                   | 0.57‑3.87 0.419 |
| Grand multiparous| 24 (77.4)     | Ref                   |          |       |
| Education        |                |                       |          |       |
| Primary or less  | 74 (84.1)     | 1.5                   | 0.77‑2.99 0.227 |
| Secondary or more| 129 (77.7)    | Ref                   |          |       |
| Marital Status   |                |                       |          |       |
| In a union       | 180 (79.3)    | 0.7                   | 0.22‑2.02 0.470 |
| Not in a union   | 23 (85.2)     | Ref                   |          |       |
| Booking Status   |                |                       |          |       |
| Unbooked         | 133 (83.6)    | 1.6                   | 0.84‑2.91 0.159 |
| Booked           | 70 (74.3)     | Ref                   |          |       |
| GA at delivery   |                |                       |          |       |
| <34              | 64 (81.0)     | 0.8                   | 0.36‑1.55 0.441 |
| 34-36            | 62 (83.8)     | 1.2                   | 0.53‑2.79 0.654 |
| =>37             | 77 (76.2)     | Ref                   |          |       |

its own unique complications. In this study, more women were delivered by cesarean section 48.8% compared to 46.5% who had vaginal delivery. The rest (4.7%) had assisted vaginal delivery with vacuum or forceps. These findings are supported by the management principle of stabilizing women with severe preeclampsia and delivering by the most expeditious route. The 48.0% low birth weight and 48.8% of women who had cesarean section in this study are close to 51.69% and 44.9%, respectively reported by Ajah.[9] The incidence of cesarean section in this study is similar to findings reported in Okolobiri,[10] Ibadan,[20] and Ethiopia.[21] but lower than 71.2% reported in Calabar,[9] and 65.9% in Ghana,[11] while the incidence of low birth weight is less than 58.2%, 58.54%, and 71.43% respectively reported in Enugu,[12] Tanzania,[21] and India[24] but more than 17.74% in Calabar[9] and 28.9% in Zimbabwe.[2]

The commonest complication found among patients in this study was abruptio placenta 11.5%. Maternal mortality was recorded in 0.8% of the population and 29.5% of babies were lost to perinatal death. Severe preeclampsia and eclampsia are recognized causes of maternal and fetal morbidity and mortality.[2] It is even worse when intervention is offered late as was observed in this study where the patients presented late after patronizing healing homes and religious centers. This was not helped by the low socioeconomic status of women in this environment,[9] thereby making hospital presentation a last resort after significant damage had been done. Morbid avarion for cesarean section was also a major reason for delayed presentation to the hospital among these women, even when they realized the urgent need for it.[23] Fear of cost and the perception of cesarean section as a reproductive failure are known to perpetuate this poor health-seeking behavior.[25,26] Similar complications to ours were reported in other studies.[2,4,16,17,26]

There was no statistically significant association between maternal sociodemographic characteristics and severe preeclampsia and eclampsia. Stroke and pulmonary edema were complications that had a significant association with severe preeclampsia and eclampsia, $P < 0.05$. The reason for this association was not immediately clear but more often than not, the patients were noted to have been overloaded by injudicious fluid administration at the referring facility or may not have received any intervention to control their blood pressure prior to presentation in our facility. These are a recipe for major complications as was observed in this study.

Conclusion

In conclusion, the prevalence of preeclampsia and eclampsia was high with an annual increase from 2012 till it peaked in 2017. The fetomaternal morbidity and mortality also showed a similar trend. Sadly, late hospital presentation with severe disease and compromised health status was a common finding in this study. This makes a strong case for awareness creation on the dangers of preeclampsia, dispelling misconceptions surrounding early hospital presentation and increased training of manpower in the rural areas so as to be able to recognize this disease and make a timely referral. It is important to equip neonatal care units since iatrogenic preterm deliveries are almost always inevitable in the management of severe preeclampsia. Also, the place of universal antenatal coverage cannot be over-stressed if we
Table 7: Relationship between severe disease and the development of complications in mothers and their babies

| Variable                      | Severe disease | No (%) | Unadjusted 95% CI | P     | odds ratio |
|-------------------------------|---------------|--------|-------------------|-------|------------|
| Abruptio placentae            | Yes           | 23 (76.7) | 7 (23.3)          | 0.8   | 0.32-1.99  | 0.636 |
|                               | No            | 180 (80.4) | 44 (19.6)         |       |            |       |
| Renal failure                 | Yes           | 4 (66.7)   | 2 (33.3)          | 0.5   | 0.09-2.76  | 0.412 |
|                               | No            | 199 (80.2) | 49 (19.8)         |       |            |       |
| Stroke/pulmonary edema        | Yes           | 1 (20.0)   | 4 (80.0)          | 0.1   | 0.01-0.53  | <0.001 |
|                               | No            | 202 (81.1) | 47 (18.9)         |       |            |       |
| Neonatal outcome              | Dead          | 61 (81.3)  | 14 (18.7)         | 1.1   | 0.57-2.25  | 0.717 |
|                               | Alive         | 142 (79.3) | 37 (20.7)         |       |            |       |

are to attain sustainable development goals as it pertains to maternal and child health.

Limitation

A major limitation of this study was with retrieving patient case notes. In most cases, the case notes had incomplete documentation especially in the early years following the merger of Ebony State University Teaching Hospital and the Federal Teaching Hospital, Abakaliki to form the Federal teaching hospital, Abakaliki. This makes a strong case for computerization of the health information department of hospitals in the West African subregion.

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Conflicts of interest

There are no conflicts of interest.

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