PREVALENCE OF PRE-ECLAMPSIA AND ECLAMPSIA AND MATERNO-FETAL OUTCOMES AT A HEALTH FACILTY IN DELTA STATE, NIGERIA

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ABSTRACT

BACKGROUND: Globally, pre-eclampsia and eclampsia complicate up to 4.6% and 1.4% of pregnancies respectively, but disproportionally account for nearly 18% of all maternal deaths worldwide, with an estimated 62,000 to 77,000 deaths per year.

OBJECTIVE: This study determined the prevalence of pre-eclampsia and eclampsia, and compared outcomes.

METHODS: This was a retrospective cross-sectional study utilizing the case files of women admitted to the maternity ward of the obstetrics and gynecology unit in Central Hospital, Ughelli, Delta State, Nigeria, from 1st August 2020 to 30th July 2022. Socio-demographic characteristics, maternal and fetal complications and outcomes, prevalence rate of preeclampsia and eclampsia, were presented as frequencies and percentages.

RESULTS: Of the 6291 mothers which were delivered of their babies in the maternity ward of the obstetrics and gynecology department, 120 (1.9%) were diagnosed with pre-eclampsia and eclampsia; only 108 which had complete documentation, were used for the study. Age range of the participants was 16-45 years. The majority, 88 (81.5%) were married, 70 had secondary education and higher, (64.8%); 42 (38.9%) were nulliparous at admission and 67 (62%) were unbooked at the antenatal clinic. Fifty three (49.1%) had preeclampsia, while 55 (50.9%) had eclampsia. The majority, 107 (99.1%), were discharged home alive and 75 (69.4%) had no maternal complications. Number of fetuses delivered were 114, 95 (83.3%) were born alive, 68 (59.6%) weighed less than 2500g, and 91 (95.8%) neonates had a good APGAR score at the 5th minute.

CONCLUSION: The prevalence of pre-eclampsia and eclampsia was low, however there were high rates of perinatal deaths and occurrence of unfavourable materno-fetal complications.

KEYWORDS: Pre-eclampsia, Eclampsia, Prevalence, Materno-fetal outcomes, maternal complications, fetal complications.

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INTRODUCTION

Pre-eclampsia (PE) is a kind of pregnancy-induced hypertension that is characterized by substantial proteinuria with or without edema and usually resolves by the 12th post-partum week[1]. It is a potentially fatal multisystem disorder of pregnant women and a major cause of perinatal morbidity and death[2,3].

Around 25% of all preeclampsia cases are severe[4]. In its most severe form, the illness can cause hepatic and renal failure, as well as "disseminated intravascular coagulopathy (DIC) and central nervous system (CNS) problems." Preeclampsia-associated seizures indicate that the illness has advanced to eclampsia. Eclampsia, a complication of severe pre-eclampsia, is typically characterized as new onset grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with pre-eclampsia signs or symptoms[5].

Pre-eclampsia/eclampsia (PE/E) complicate up to 4.6% and 1.4% of pregnancies worldwide, respectively, but cause approximately 18% of all maternal fatalities globally, with an estimated 62,000 to 77,000 deaths per year [3]. Perinatal health suffers as well, with an estimated 500,000 newborns dying each year from PE/E [6]. The prevalence and mortality linked with PE/E vary by region. Women in low-resource nations have a greater chance of getting preeclampsia than women in high-resource countries[6]. They are also at a higher risk of maternal and perinatal morbidity and death from these conditions due to a lack of prenatal care, access to hospital care, a lack of resources, and inappropriate diagnosis and management of patients with PE/E in developing countries[7].

No study has documented the prevalence of PE/E in Delta State in the past. However, previous studies in other parts of Nigeria have reported rates as high as 3.6% and 4.0%[8,9]. This study provides a baseline understanding of the prevalence of pre-eclampsia and eclampsia at the health facility and also helps identify the materno-fetal outcomes after the launch of free maternal and child care services in the State in line with one of the Sustainable Development goals.

METHODS

Study design

This was a retrospective cross-sectional study. The required information was extracted from the patient's case folders using a proforma.

Study setting

The study was undertaken at the Obstetrics and Gynecology Department (O & G) at Central Hospital, Ughelli. The department offers obstetrics and gynecology care. Central hospital, Ughelli is a State-owned health care facility.The hospital is in Ughelli, Delta State, which is within the south-south region of Nigeria. The hospital provides secondary healthcare services to the residents of the town.

Population

The study was carried out using medical records of all women managed for pre-eclampsia and eclampsia between August 2020 and July 2022 in the facility.

Sample size determination

Sample size was determined by the formula used by previous authors[10];

$$n = \frac{Z^2 p[1-p]}{d^2}$$

Where;

"n= the sample size"

"Z= the statistic corresponding to level of confidence (at 5% type 1 error, $P < 0.05$) = 1.96"

"p= expected prevalence (that can be obtained from same studies or a pilot study conducted by the researchers)"

"d= precision (corresponding to effect size) =0.05"

The expected prevalence (p) =3.6% for pre-eclampsia based on a previous study in Abuja, North-central Nigeria[9].

Therefore, the sample size for this study was 53.Bearing in mind an attrition of 15% attributable to inability of accessing case folders, the sample size was approximated to be 61.However, the total

sample size population used for this study was 120 because with good access to the medical records of all women managed for PE/E, all case files of patients who came to the facility between August 2020 and July 2022 were included in the study.

Criteria for inclusion

Pregnant women managed in the O & G unit of Central Hospital, Ughelli, during the study period for pre-eclampsia and eclampsia.

Exclusion criteria

Women who had chronic hypertension prior to their pregnancy or before the 20th week of pregnancy.

Instrument for data collection

A proforma was used to extract the required information from the patient's case folders. The proforma consisted of the section on socio-demographic data, occurrence of pre-eclampsia and eclampsia, as well as the section on maternal and fetal complications.

Data analysis

A descriptive analysis of the rates of pre-eclampsia and eclampsia, as well as the frequencies of all factors were done. The prevalence was calculated "by dividing the number of pregnant women with PE/E by the total number of deliveries during the study period, and maternal and fetal outcomes were assessed using medical records with documentation of the variables of interest (age, parity, estimated gestational age, booking status, antenatal clinic attendance, maternal outcomes, and fetal outcomes)." The predominant "maternal outcome was maternal death, while stillbirth was the primary fetal outcome. Parity, gestational age at delivery, fetal birth weight, and APGAR (Appearance, Pulse, Grimace, Activity, and Respiration) scores were recorded during the first and fifth minutes of life." Data analysis was aided with Microsoft excel.

Ethical consideration

Ethical approval was obtained from the Ethical committee in Central Hospital, Ughelli, before we started the study.

RESULTS

During the period under review, a total of 6,291 deliveries were recorded in the hospital, of which 120 were women managed for pre-eclampsia and eclampsia, thus giving an overall prevalence of 1.91% (PE =1.02%, E=0.89%). However, 108 (90%) of the cases had proper documentation of information and were included in the study. The age range of participants was 16 to 45 years. The majority were married, 88 (81.5%), had secondary or tertiary education 70(64.8%), and 42 (38.9%) were nulliparous at admission into the maternity ward. 67(62%) were unbooked and did not attend antenatal care; details of socio-demographics are shown in Table 1. Of the 108 women with PE/E, 53 (49.1%) had preeclampsia while 55 (50.9%) had eclampsia; 75 (69.4%) had no maternal complications and 107 (99.1%) were discharged home alive (Table 2). Number of fetuses were 114 which included six twin gestations.68 (59.6%) weighed less than 2500g. The majority, 95 (83.3%) were born alive and 91 (95.8%) had a good APGAR score in the 5th minute after birth (Table 3). Maternal complications in women with PE recorded in the study included abruptio placenta 6 (10.9%), pulmonary edema 5 (9.1%), organ damage 1 (1.9), thrombocytopenia 2 (3.8), PROM 2 (3.8%), altered mental status 1 (1.9%), visual scomata 1 (1.9%), and peripheral sepsis 2 (3.8%). Complications in women with eclampsia included abruptio placenta 2 (3.8%), pulmonary edema 1 (1.9%), organ damage 1 (1.9), thrombocytopenia 2 (3.8), stroke 2 (3.8%), altered mental status 3 (5.5%), peripheral sepsis 2 (3.8%) and cortical blindness 1 (1.9%) (Table 4). Fetal complications in women with PE included preterm birth 21 (36.8%), low birth weight 26 (45.6%), oligohydramnios 9 (15.8%), fetal distress 1 (1.8%) and IUFD 6 (10.5%). Additionally, fetal complications in women with eclampsia recorded were pre-term birth 29 (50.0%), low birth weight 42 (73.7%), oligohydramnios 13 (22.8%), fetal distress 3 (5.3%), IUFD 3 (5.3%) and admission to ICU 1 (1.8%) (Table).

Table 1: Clinical features and characteristics of women presenting with Preieclampsia and Eclampsia at Central hospital, Ughelli between August 2020 and July 2022

Characteristics	Pre-eclampsia (%)	Eclampsia (%)	Total (n=108)
Age;			
≤ 19	4 (7.6)	13 (23.6)	17 (15.7)
20 – 24	8 (15.1)	16 (29.1)	24 (22.2)
25 – 29	14 (26.4)	7 (12.7)	21 (19.4)
30 – 34	14 (26.4)	5 (9.1)	19 (17.6)
≥ 35	13 (24.5)	14 (25.5)	27 (49.1)
Education			
No formal education	2 (3.8)	7 (12.7)	9 (8.3)
Primary education	3 (5.7)	5 (9.1)	8(7.4)
Secondary education	23 (43.4)	30 (54.6)	53 (49.0)
Tertiary education	22 (41.5)	8 (14.5)	30 (27.8)
Not documented	3 (5.7)	5 (9.1)	8 (7.4)
Parity			
Nulliparous	19 (35.8)	23 (41.8)	42 (38.9)
Primiparous	9 (17.0)	10 (18.2)	19 (17.6)
Multiparous	19 (35.8)	13 (23.6)	32 (29.6)
Grand multiparous	6 (11.3)	9 (16.4)	15 (13.9)
Marital status			
Single	5 (9.4)	15 (27.3)	20 (18.5)
Married	48 (90.6)	40 (72.7)	88 (81.5)
Antenatal attendance			
Yes	30 (56.6)	11 (20.0)	41 (38)
No	14 (26.4)	38 (69.1)	52 (48.1)
Not documented	3 (5.7)	2 (3.6)	5 (4.6)
Referred	6 (11.3)	4 (7.3)	10 (9.3)
Booking status			
Booked	30 (56.6)	11 (20)	41 (38)
Unbooked	23 (43.4)	44 (80)	67 (62)

Table 2: Maternal Outcomes of pregnant women presenting with pre-eclampsia and eclampsia at Central hospital, Ughelli between August 2020 and July 2022

Characteristics	Pre-eclampsia (%)	Eclampsia (%)	Total (n = 108)
Maternal complications			
Yes	11 (20.8)	22 (40)	33 (30.6)
No	42 (79.2)	33 (60)	75 (69.4)
1^0 maternal outcome			
"Maternal death"	0 (0)	1 (1.8)	1(0.9)
Alive	53 (100)	54 (98.2)	107 (99.1)
"Route of delivery"			
"Vaginal delivery"	23 (43.4)	10 (18.2)	33 (30.6)
Caesarian section	30 (56.6)	46 (81.8)	75 (69.4)

Table 3: Fetal Outcomes of pregnant women presenting with pre-eclampsia and eclampsia at Central hospital, Ughelli between August 2020 and July 2022

Characteristics	Pre-eclampsia (%)	Eclampsia (%)	Total (n = 114)
Fetal outcomes			
Stillbirth	7 (12.3)	12 (21.1)	19 (16.7)
Alive	50 (87.7)	45 (78.9)	95 (83.3)
APGAR Scores 1^{st} minute			
< 7	10 (20.0)	30 (66.7)	40 (42.1)
≥ 7	40 (80.0)	15 (33.3)	55 (57.9)
APGAR scores 5^{th} minutes			
< 7	1 (2.0)	3 (6.7)	4 (4.2)
≥ 7	49 (98.0)	42 (93.3)	91 (95.8)
Birth weight			
< 1000g	0 (0)	1 (1.8)	1 (0.9)
1000 – 1499g	2 (3.5)	3 (5.3)	5 (4.4)
1500 to < 2500g	24 (42.1)	38 (66.7)	62 (54.4)
2500 to < 4000g	30 (52.6)	15 (26.3)	45 (39.5)
≥ 4000	1 (1.8)	0 (0)	1 (0.9)

Table 4: Maternal Complications in women presenting with pre-eclampsia and eclampsia at Central hospital, Ughelli between August 2020 and July 2022

Characteristics	Pre-eclampsia (%)	Eclampsia (%)	Total (n = 114)
Fetal outcomes			
Stillbirth	7 (12.3)	12 (21.1)	19 (16.7)
Alive	50 (87.7)	45 (78.9)	95 (83.3)
APGAR Scores 1st minute			
< 7	10 (20.0)	30 (66.7)	40 (42.1)
≥ 7	40 (80.0)	15 (33.3)	55 (57.9)
APGAR scores 5th minutes			
< 7	1 (2.0)	3 (6.7)	4 (4.2)
≥ 7	49 (98.0)	42 (93.3)	91 (95.8)
Birth weight			
< 1000g	0 (0)	1 (1.8)	1 (0.9)
1000 – 1499g	2 (3.5)	3 (5.3)	5 (4.4)
1500 to < 2500g	24 (42.1)	38 (66.7)	62 (54.4)
2500 to < 4000g	30 (52.6)	15 (26.3)	45 (39.5)
≥ 4000	1 (1.8)	0 (0)	1 (0.9)

Table 5: Fetal Complications in newborns delivered by pregnant women presenting with pre-eclampsia and eclampsia at Central hospital, Ughelli between August 2020 and July 2022

Characteristics	Pre-eclampsia (%)	Eclampsia (%)	Total (n = 114)
Pre term birth	21 (36.8)	29 (50.0)	50 (43.9)
Low APGAR score			
1st minute	10 (17.5)	30 (52.6)	40 (35.1)
5th minute	1 (1.7)	3 (5.3)	4 (3.5)
Low birth weight	26 (45.6)	42 (73.7)	68 (59.6)
Oligohydramnios	9 (15.8)	13 (22.8)	22 (19.3)
Fetal distress	1 (1.8)	3 (5.3)	4 (3.5)
IUFD	6 (10.5)	3 (5.3)	9 (7.9)
Admission to ICU	0 (0)	1 (1.8)	0 (0.9)

DISCUSSION

Overall prevalence of preeclampsia and eclampsia was lower than obtained in previous studies in Nigeria with rates as high as 3.6% and 4.0%[8,9]. This marked variation could have resulted from the previous studies aside covering wider time gap, were also done in tertiary healthcare facilities likely with more referrals from other centers. Prevalence of preeclampsia was also lower than seen in previous studies which reported a range of 2.3% -3.2% in China, Sweden, Norway, and Pakistan[11-13]; 3.02% and 3.53% in Abuja and Bayelsa respectively [8,14]; but higher than the rate of 1.2% reported in Calabar[15]. Prevalence of eclampsia in this study is, however, comparable to 0.91%[16] but higher than 0.28%[17] and 0.58%[8] reported in previous Nigerian studies. A plausible explanation to this could be due to the high proportion of unbooked women in this study as suggested by Esike and colleagues.[15] The prevalence of eclampsia does fall, within the range of 0.2% and 1.42% found in a study conducted across sub-saharan Africa, India and Haiti[18] and is far lower than the 6% reported in an Ethiopian healthcare facility[19]. According to WHO, pregnant women should receive at least eight antenatal care contacts in order to have a positive pregnancy experience[20]. Unfortunately, only 67% of pregnant women in Nigeria receive antenatal care from a qualified practitioner, with just 57% receiving at least four antenatal appointments[21].

Maternal fatality was lower than a range of 1.6% to 3.9% in previous studies,[8,16,18,19] but higher than in a Pakistani study where no maternal deaths occurred among pre-eclamptic women. Low fatality rates could have been as result of low prevalence of eclampsia in the study population or adequate management of severe cases. An Ethiopian study with high prevalence of eclampsia reported low maternal fatality as a result of specialized care at the facility[19]. Maternal complications were comparable with those which occurred in previous studies with abruption of the placenta accounting for the most frequent of all. Unfavourable maternal outcomes resulting from PE/E such as abruptio

placenta, HELLP syndrome, pulmonary edema, thrombocytopenia, organ damage, stroke, altered mental status, premature rupture of membranes (PROM), peripheral sepsis, and visual scotomata, were higher than in a previous report where between 14.6% and 18.1% developed these complications[8,9].

Caesarian delivery rates in this study are within the range of 48.82 to 71.20% previously reported[9,14,15,22] due mainly to the fact that the majority of the women were unbooked and referred late from other hospitals. The attributing factor to the high rate of caesarian section in this study was because of other complications of PE/E, requiring caesarian section for optimal maternal and fetal outcome.

The stillbirth rate, though lower than the findings in some studies,[9,14] where rates of 36.8% and 29.1% were observed, was however higher than reported in the Abuja study of 10.7%[8]; these further depict the impact of pre-eclampsia and eclampsia on perinatal mortality.

This study has improved the body of knowledge because there is paucity of studies on the prevalence of E/PE in our locality. This is of paramount importance because the Delta State government, in a bid to reduce maternal mortality, flagged off the free maternal care in 2007 which has provided free Medicare to pregnant women in the State. This study has therefore revealed how well these health indices have improved.

Although this study might be limited by its single center and short time frame, it provided insight into the area of interest and further research should focus on a wider coverage in the State.

CONCLUSION

The prevalence of preeclampsia was 1.02% and eclampsia was 0.89% respectively. There were high perinatal deaths and occurrence of unfavourable materno-fetal complications.

Authors' Contributions

Ogheneovo Clement Aghoja and Delight Weluche Oliseyenum conceived and designed the study. Data collection was done by Delight Weluche Oliseyenum and Ogheneovo Clement Aghoja. The data was analyzed by Ufuoma Ahwinahwi and John Edjophe Arute. Manuscript was initially drafted by Delight Weluche Oliseyenum and the corrected draft was made by Ogheneovo Clement Aghoja and Ufuoma Shalom Ahwinahwi. The manuscript was reviewed by John Edjophe Arute and Ogheneovo Clement Aghoja, all the authors read and approved the final manuscript.

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Conflict of Interest

The authors declare that there is no conflict of interest.

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