



Maternal and Perinatal Outcomes of Severe Preeclampsia and Eclampsia at the Federal Medical Centre, Abeokuta: A Three-Year Retrospective Review

Nimotallah Ojugbele*, David Awonuga, Hadijat Aremu, Ibrahim Sule-Odu, Omotola Oladosu-Aderolu

Department of Obstetrics and Gynaecology Federal Medical Centre, Abeokuta Abeokuta, Ogun state Nigeria

ABSTRACT

Severe preeclampsia and eclampsia remain major pregnancy-related conditions contributing significantly to maternal and perinatal morbidity and mortality, particularly in developing countries.

Objective: This study aimed to determine the incidence of severe preeclampsia and eclampsia at the Federal Medical Centre, Abeokuta, identify associated risk factors, evaluate maternal and perinatal outcomes, and propose measures to reduce complications related to these conditions.

Materials and Methods: A retrospective descriptive study was conducted involving women managed for severe preeclampsia and eclampsia at the Federal Medical Centre, Abeokuta, between January 1, 2016, and December 31, 2018. Cases were identified from labour ward, theatre, and medical records, and relevant case notes were retrieved. Data extracted included maternal age, parity, antenatal booking status, gestational age at presentation and delivery, blood pressure records, complications, mode of delivery, neonatal outcomes, birth weight, Apgar scores, and neonatal intensive care unit admissions. Data were coded and analyzed using Statistical Package for Social Sciences (SPSS) version 20. Chi-square test was used to test associations, with statistical significance set at $p \leq 0.05$. Ethical approval was obtained from the hospital's Research Ethics Review Committee.

Results: During the study period, 2,712 deliveries were recorded. Severe preeclampsia and eclampsia accounted for 4.2% and 2.2% of deliveries respectively. Most affected women were aged 25–29 years, with a mean age of 29.6 ± 5.7 years, and were predominantly unbooked and nulliparous. Caesarean section was performed in 80.7% of cases, while 28% developed complications, with acute renal failure being the most frequent. The mean gestational age at delivery was 34.2 ± 4.2 weeks, and 41.4% of newborns had low birth weight. Perinatal asphyxia occurred in 3.5% of neonates, and 63.4% required neonatal intensive care admission. The maternal case fatality rate was 2.1%, while perinatal mortality stood at 23.4%.

Conclusion: Severe preeclampsia and eclampsia remain prevalent at the Federal Medical Centre, Abeokuta, and are associated with considerable maternal and perinatal complications. Most affected women were unbooked nulliparous mothers. Strengthening policies that improve access to and utilization of antenatal care, particularly for first-time mothers, is essential. Early diagnosis and prompt referral of preeclamptic patients to tertiary centres are recommended to reduce adverse outcomes.

Keywords: Severe preeclampsia, Eclampsia, maternal outcomes, perinatal outcomes.

INTRODUCTION

Pre-eclampsia is one of the most frequent complications of pregnancy and remains a significant contributor to maternal morbidity and mortality worldwide [1]. It is a multisystem disorder of uncertain origin, characterized by the onset of hypertension—defined as blood pressure of 140/90 mmHg or higher—accompanied by proteinuria occurring after the 20th week of gestation in a woman who was previously normotensive and without proteinuria [2]. The condition is classified as severe when systolic blood pressure reaches or exceeds 160 mmHg, or diastolic blood pressure is 110 mmHg or higher. Additional indicators of severity include heavy proteinuria (≥ 5 g in 24 hours), visual disturbances, pulmonary oedema, impaired liver function, and thrombocytopenia. If not properly managed, pre-eclampsia may progress to eclampsia, a life-threatening condition marked by the occurrence of generalized seizures [3]. Preeclampsia affects 2–10% of pregnancies globally⁴, with rates of 4–8% in developing countries.^{5,6} In Nigeria, incidence ranges between 5.6–7.6% in Southern Nigeria and 40% in northern Nigeria [5,7,8].

The World Health Organization estimates that hypertensive disorders of pregnancy account for approximately 14% of maternal deaths worldwide and are also associated with an increased risk of neonatal mortality [1]. In Nigeria, as in many developing countries, preeclampsia remains one of the leading causes of maternal death [3]. Eclampsia further elevates maternal mortality risk, with reported fatality rates ranging from 0.5% to 1.8% in developed countries and reaching up to 15% in developing nations [4]. In addition, the condition significantly contributes to medically indicated preterm delivery, perinatal mortality, and fetal growth restriction, particularly in cases involving early-onset disease [3].

Although the precise cause of preeclampsia remains unclear, two pathological features are consistently observed: abnormal trophoblastic invasion of the uterine vasculature and widespread endothelial dysfunction. These abnormalities help explain why maternal clinical improvement typically occurs only after delivery of the placenta. Several hypotheses have been proposed to explain the development of preeclampsia, including abnormal placentation, immune maladaptation between

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Corresponding Author: **Nimotallah Ojugbele**

Email Address: **nimahmodupeojus@gmail.com**

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maternal and fetoplacental tissues, nutritional deficiencies, and genetic susceptibility.

A variety of risk factors, many linked to genetic and immunological mechanisms, have been associated with the condition. These risk factors are broadly categorized into general, pregnancy-related, and those related to pre-existing medical conditions. General risk factors include primigravida, extremes of maternal age, low socioeconomic status, a new paternity, and personal or family history of preeclampsia.^{9,10} Pregnancy-related factors include multiple gestation and molar pregnancy. Medical conditions associated with increased risk include obesity, chronic hypertension, renal disease, thrombophilia, gestational diabetes mellitus, vascular and connective tissue disorders, and systemic lupus erythematosus. Preeclampsia can result in numerous maternal complications, including preterm labour, acute renal failure, pulmonary oedema, adult respiratory distress syndrome, cardiac failure, haemolysis elevated liver enzymes low platelet (HELLP) syndrome, disseminated intravascular coagulation, cerebral haemorrhage, postpartum haemorrhage, placental abruption, hepatic rupture, progression to eclampsia, and maternal death. Fetal and neonatal complications include prematurity, low birth weight, birth asphyxia, fetal growth restriction, intrauterine fetal death, and increased perinatal mortality.

Effective prevention, early detection, and appropriate management of preeclampsia are essential for reducing maternal and perinatal morbidity and mortality. Improved outcomes depend on regular antenatal care attendance, early diagnosis, prompt referral of high-risk cases, timely delivery, and availability of specialized obstetric and neonatal care during and after childbirth. Clinical evaluations of preeclampsia and eclampsia remain important tools for assessing maternal health programs and guiding improvements in safe motherhood initiatives. This study was therefore undertaken to determine the incidence of severe preeclampsia and eclampsia at the Federal Medical Centre, Abeokuta, identify associated factors, evaluate maternal and perinatal outcomes, and propose recommendations aimed at reducing complications and mortality related to these conditions.

MATERIALS AND METHODS

This retrospective descriptive study included women admitted with severe preeclampsia and eclampsia at the Federal Medical Centre, Abeokuta, between 1 January 2016 and 31 December 2018. Cases were identified from hospital medical records, labour ward registers, and operation theatre records, after which corresponding case files were retrieved for review. Data extracted included maternal age, parity, antenatal booking status, gestational age at presentation and delivery, mode of presentation, blood pressure readings at admission and discharge, maternal complications, delivery outcomes, Apgar scores, birth weight, and the need for admission into the Neonatal Intensive Care Unit (NICU). The collected information was coded and entered into a computer database for analysis.

During the study period, women diagnosed with severe preeclampsia in the maternity unit were admitted for stabilization, blood pressure control, and continuous maternal and fetal monitoring to prevent complications and plan delivery. Blood pressure control was achieved using oral antihypertensive agents such as nifedipine or methyldopa, administered singly or in combination depending on clinical need. In cases of severe hypertension (blood pressure exceeding 160/110 mmHg), initial treatment with intravenous

hydralazine or labetalol was administered before transitioning to oral therapy. Magnesium sulphate was routinely administered for seizure prophylaxis. Delivery was planned once fetal lung maturity was considered adequate in patients with severe preeclampsia, whereas women presenting with eclampsia were immediately resuscitated, stabilized, and delivered by the safest and most expedient route.

Statistical analysis was performed using Statistical Package for Social Sciences (SPSS) version 20.0 software (SPSS Inc., Chicago, IL, USA). Associations between variables were tested using the Chi-square test, with statistical significance set at $p \leq 0.05$. Ethical approval for the study was obtained from the hospital's Research Ethics Review Committee.

RESULTS

During the study period, 2,712 deliveries were recorded, with 175 cases of severe preeclampsia and eclampsia (4.2% and 2.2% incidence, respectively). Of these, 145 case notes were retrieved (82.9% retrieval rate), comprising 102 severe preeclampsia and 43 eclampsia cases. Analysis was based on these files.

Table 1 presents the socio-demographic features of the participants. The mean age was 29.6 ± 5.7 years, with most (35.9%) aged 25–29. Most of the participants were nulliparous accounting for 31.0% of cases. Over half (51.0%) delivered after 37 weeks. The majority (82.8%) were unbooked at FMC, Abeokuta. The mean gestational age at delivery was 34.2 ± 4.2 weeks.

Table 1: Sociodemographic characteristics of respondents (n=145)

VARIABLES	Frequency (f)	Percentage (%)	
AGE GROUP	<20	11	7.6
	20-24	10	6.9
	25-29	52	35.9
	30-34	47	32.4
	≥35	25	17.2
	Mean ± SD	29.6 ± 5.7yrs	
PARITY	0	45	31.0
	1	34	23.4
	2	33	22.8
	3	22	15.2
	4	9	6.2
	≥4	2	1.4
BOOKING STATUS	Unbooked	120	82.8
	Booked	25	17.2
GESTATIONAL AGE AT DELIVERY (IN WEEKS)	28-33 weeks	22	15.2
	34-37 weeks	46	31.7
	>37 weeks	74	51.0
	Unknown	3	2.1
	Mean ± SD	34.2 ± 4.2	

SD= Standard Deviation.

NB-The gestational ages of three of the patients that presented with postpartum eclampsia could not be ascertained and was therefore classified as unknown.

The systolic blood pressure distribution at admission and discharge is presented in table 2. Most women (86.9%) had admission systolic blood pressures ≥ 160 mmHg, while at discharge, only 0.7% had systolic blood pressures ≥ 160 mmHg. The mean systolic blood pressure was 175.1 ± 20.4 mmHg at admission and 124.1 ± 11.6 mmHg at discharge.

Table 2: Systolic blood pressure at admission and discharge (n=145)

Systolic Blood Pressure (mmHg)	Frequency (%)	
	Admission	Discharge
<120	0 (0)	34 (23.6)
120-139	0 (0)	85 (59.0)
140-159	19 (13.1)	24 (16.7)
>159	126 (86.9)	1 (0.7)
Mean ± S. D	175.1 ± 20.4	124.1 ± 11.6

Table 3 shows the diastolic blood pressure distribution at admission and discharge. Most participants (64.4%) had admission diastolic blood pressures between 90- 110mmHg while 33.8% had values above 110mmHg, and 1.4% were below 90mmHg. At discharge, no participant had diastolic blood pressure above 110mmHg. Most participants (85.5%) were discharged with diastolic blood pressure below 90mmHg. Mean diastolic blood pressure was 112.6 ± 14.9 mmHg at admission and 77.6 ± 7.6 mmHg at discharge.

Table 3: Diastolic Blood Pressure at admission and at discharge (N=145)

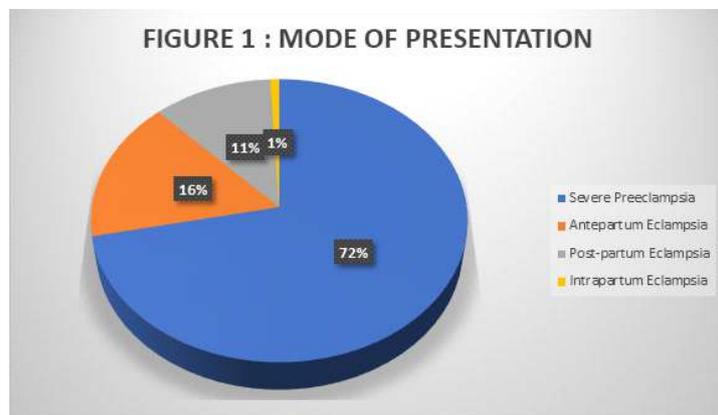
Diastolic Blood Pressure (mmHg)	Frequency (%)	
	Admission	Discharge
<90	2 (1.4)	124 (85.5)
90-110	94 (64.4)	21 (14.5)
>110	49 (33.8)	0 (0)
Mean ± S. D	112.6 ± 14.9	77.6 ± 7.6

The distribution of proteinuria at presentation is presented in table 4. Most participants (100 (69.0%)) had 2+ proteinuria, 32 (22.1%) had 3+, 11(7.6%) had 4+ while only 2 (1.4%) had 1+ proteinuria (which was classified as significant since in both cases, the specific gravity was < 1.010).

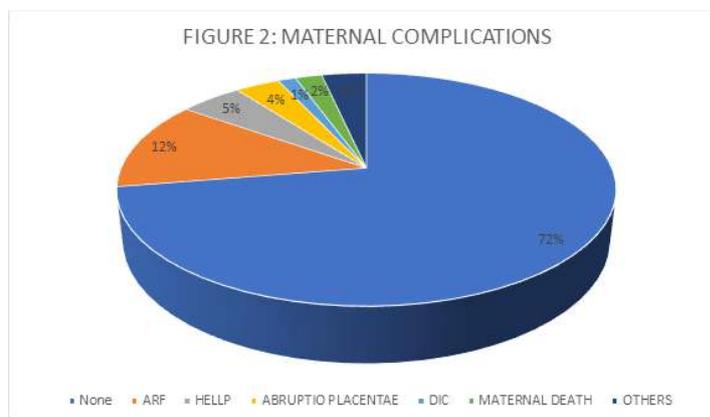
Table 4: Degree Of Proteinuria Among Respondents (N=145)

Proteinuria	Frequency (f)	Percentage (%)
+	2	1.4
++	100	69.0
+++	32	22.1
++++	11	7.6

Figure 1 shows most women presented with severe pre-eclampsia (102), while 43 had eclampsia, predominantly antepartum.



Most women with severe preeclampsia and eclampsia delivered by caesarean section (80.7%), while 19.3% had vaginal delivery. Figure 2 shows the distribution of maternal complications. Maternal complications were uncommon; 72% had none. Three maternal deaths (2%) were recorded. The most frequent complication was acute renal failure (12%), followed by HELLP syndrome (5%), abruptio placentae (4%), DIC (1%), and others (4%) such as temporary visual loss, pulmonary oedema, aspiration pneumonia, cerebrovascular accident, cardiac failure, and sepsis.



The foetal outcomes are summarised in Table 5. About half (51.1%) of babies were delivered at term, and 76.6% were born alive and discharged. Stillbirth or early neonatal death occurred in 23.4%, while 3.5% had perinatal asphyxia (Apgar score <6 at 5 minutes).

Table 5: Fetal outcome (n=145)

VARIABLES	Frequency (f)	Percent (%)
Gestational Age at Delivery	28-33 weeks	15.2
	34- <37 weeks	31.7
	≥37 weeks	51.0
	Unknown	2.1
Delivery Outcome	Live	76.6
	Dead	23.4
APGAR Score at 1min	1-3	7.6
	4-6	17.9
	7-10	60.0
	Does not Apply	14.5
APGAR Score at 5min	1-3	1.4
	4-6	2.1
	7-10	82.1
	Does not Apply	14.5
Need for NICU Admission	Yes	63.4
	No	28.3
	Does not Apply	8.3
Birth Weight	Unknown	9.7
	≤2.5kg	41.4
	>2.5kg	48.9

NB: Apgar scores for 21 babies were unavailable as they were either not delivered at the centre or were stillborn (12). NICU admission was not assessed in the 12 stillborn cases.

Table 6 highlights the association between delivery mode, booking status, blood pressure severity, proteinuria, and perinatal outcomes. A significant relationship was found between mode of presentation and perinatal outcomes, with severe pre-eclampsia having better outcomes than eclampsia. Booking status showed no significant relationship with perinatal outcomes. Systolic blood pressure severity was associated impacted on perinatal outcomes. Degree of proteinuria did not significantly impact perinatal outcome.

Table 6: Association Between Mode of Presentation, Booking Status, Severity of Blood Pressure and Proteinuria of Respondents, and Perinatal Outcome (Dead or Alive)

		Perinatal		Chi-Square	P value
		Baby Alive	Baby Dead		
Mode of presentation	Severe Pre-Eclampsia	91 (89.2%)	11 (10.7%)	24.936	0.005*
	Antepartum Eclampsia	4 (17.3%)	19 (82.6%)		
	Intrapartum Eclampsia	3 (75.0%)	1 (25.0%)		
	Postpartum Eclampsia	13 (81.3%)	3 (18.8%)		
Booking Status	Unbooked	106 (88.3%)	14 (9.2%)	2.596	0.273
	Booked	22 (88.0%)	3 (12.0%)		
Systolic Blood Pressure	140-159mmHg	10 (52.6%)	9 (47.4%)	13.894	0.001*
	≥160mmHg	101 (80.2%)	25 (19.8%)		
Diastolic Blood Pressure	<90mmHg	2 (100%)	0 (0%)	4.41	0.353
	90-109mmHg	85 (85.0%)	15 (15.0%)		
	≥110mmHg	43 (69.4%)	19 (30.6%)		
Degree of Proteinuria	1+	2 (100%)	0 (0%)	1.423	0.994
	2+	88 (88.0%)	12 (12.0%)		
	3+	18 (56.3%)	14 (43.8%)		
	4+	3 (27.3%)	8 (72.7%)		

DISCUSSION

The incidence of severe preeclampsia and eclampsia recorded in this study were 4.2% and 2.2% respectively. This is similar to the study carried out by Lamina et al in the South Western part of Nigeria where the incidence of preeclampsia was found to be 4.2%[11]. The incidence of eclampsia in this study was similar to those in Osogbo(2.1%) and Sagamu(1.7%), both sharing the same South west geo-political zone as the study location.^{12,13} However, a lower incidence of 1.3% was recorded in Abuja¹⁴ while a higher incidence of 5% was recorded in Kano, Nigeria[15]. The lower incidence at Abuja could be due to the fact that the women studied were mostly educated and empowered, and so, could have benefited from proper antenatal care. The high rate of early marriage and limited health care access in the North could explain the higher incidence in Kano. The mean age of participants was 29.6 ± 5.7 years, similar to that in Sagamu (29.7 ± 6.5 years)⁹ but higher than Enugu (24.5 ± 2.9 years).¹⁶ Nulliparity is a known risk factor for preeclampsia Most were nulliparous (31.0%) and unbooked (82.8%), reflecting findings from other studies [9,11,12,13,14,15]and highlighting the role of antenatal care in early detection and timely intervention.

The high caesarean section rate (80.1%) among patients with severe preeclampsia and eclampsia is likely due to the urgent need for delivery to prevent complications, especially when the cervix is unfavourable. This rate aligns with findings from Ile-Ife and Abakaliki (81.4%),^[18,19] but is much higher than in Kano (29.4%) [15], possibly reflecting cultural differences towards caesarean deliveries.

The mean gestational age at delivery in this study was 34.2 ± 4.2 weeks, which is comparable to the 34.9 ± 3.9 weeks reported in Sagamu. Low birth weight occurred in 41.4% of the newborns, a figure slightly lower than the rates of 44.9% and 58.54% reported in studies from Abakaliki, Nigeria, and Tanzania, respectively.^{20,21} Low birth weight in preeclampsia is commonly attributed to intrauterine growth restriction resulting from placental insufficiency, as well as medically indicated preterm delivery undertaken to prevent maternal and fetal complications.

A large proportion of neonates (63.4%) required admission to the neonatal intensive care unit for conditions such as prematurity, low birth weight, birth asphyxia, respiratory distress syndrome, and presumed neonatal sepsis.

This high rate of neonatal admission may be related to the fact that many mothers were unbooked and therefore did not benefit from adequate antenatal monitoring, increasing the likelihood of fetal compromise prior to delivery.

Antepartum eclampsia accounted for 53.5% of cases in this study, a proportion lower than the 76% and 91.7% reported in Nnewi and Jos, respectively, but higher than the 43.7% documented in Kano.^{15,23,24} These findings are generally consistent with reports from other parts of Nigeria but differ from patterns observed in developed countries, where postpartum eclampsia is more frequently encountered. This difference has been attributed to improved prenatal care, early detection, and timely management of preeclampsia in those settings. The most common maternal complication observed in this study was acute renal failure, consistent with findings from previous studies conducted in Osogbo and Abuja.^{13,14} A significant association was observed between the timing of presentation and perinatal outcomes, with antepartum eclampsia associated with the poorest outcomes. This finding highlights the importance of early detection, timely intervention, and prompt referral to tertiary care facilities in improving both maternal and neonatal outcomes within the study population.

This study also demonstrated a significant association between the admitting systolic blood pressure and the perinatal outcome. However, surprisingly, a worse outcome was seen in women with admitting systolic blood pressure less than 160mmHg compared to those with blood pressure of 160mmHg and above. This could be attributed to the fact that those with lower blood pressures could have been placed on antihypertensives which might have reduced maternal blood pressure and at the same time, reduced uteroplacental perfusion, hence, impacting negatively on the perinatal outcome.

Three maternal deaths were recorded during the study period, all occurring among unbooked women with eclampsia, resulting in a case fatality rate of 2.1%. This rate is lower than the figures reported in Osogbo (8.3%) and Abuja (8.5%) but higher than the outcome reported in Sagamu, where no maternal deaths were documented [9,13,14]. The perinatal mortality rate of 23.4% associated with preeclampsia and eclampsia in this study is comparable to the 24.1% reported in Osogbo but exceeds the 17.4% recorded in Abuja.

The relatively high mortality observed may be largely attributed to the predominance of unbooked patients, who represent a major high-risk group for maternal deaths in Nigeria. 14 Such patients often present at health facilities only after complications have become severe or life-threatening. Several factors contribute to delayed hospital presentation, including financial limitations, cultural and social barriers, poor transportation and communication systems, and low levels of education. In addition, reliance on unregulated maternity homes and some religious centres further delays timely access to appropriate medical care. These findings underscore the critical importance of antenatal care in facilitating early detection, prevention, and effective management of preeclampsia and eclampsia, thereby improving both maternal and perinatal outcomes.

CONCLUSION

Severe preeclampsia and eclampsia are still common complications of pregnancy associated with significant maternal and perinatal morbidity and mortality in the Federal Medical Centre, Abeokuta. Majority of the patients with preeclampsia and eclampsia are unbooked nullipara. Caesarean section rate is still high among women with severe preeclampsia and eclampsia. Antepartum eclampsia appears to be associated with the worst perinatal outcome, thus, emphasizing the importance of prevention, early detection as well as early and timely intervention to reduce the scourge of this pregnancy specific condition.

It is recommended that government develop policies aimed at reducing barriers to antenatal care attendance, with the goal of promoting early utilisation of antenatal services, particularly among primigravidae. Patients that are found to be preeclamptic should be promptly referred to tertiary centres for optimal care due to the recognized increased risk of maternal and perinatal morbidity and mortality.

REFERENCES

1. WHO U. UNFPA, the World Bank, and the United Nations Population Division. Trends in Maternal Mortality: 1990 to 2013. World Health Organization. 2014;201456.
2. Dutta DC. Hypertensive disorders in pregnancy. In Konar H (ed) Textbook of Obstetrics, 9th edition. Jaypee Brothers Medical Publishers(P) Ltd New Delhi/London. 2020; 207-227
3. Akeju DO, Vidler M, Oladapo OT, Sawchuck D, Qureshi R, von Dadelszen P, Adetoro OO, Dada OA, CLIP Nigeria Feasibility Working Group. Community perceptions of pre-eclampsia and eclampsia in Ogun State, Nigeria: a qualitative study. *Reproductive health*. 2016;13(1):57-62.
4. Wagnew M, Dessalegn M, Worku A, Nyagero J. Trends of preeclampsia/eclampsia and maternal and neonatal outcomes among women delivering in Addis Ababa selected government hospitals, Ethiopia: a retrospective cross-sectional study. *The Pan African medical journal*. 2016; 25(2):12-14.
5. Olowokere AE, Olofinbiyi RO, Olajubu AO, Olofinbiyi BA. Prevalence, risk factors and foetomaternal outcomes associated with pre-eclampsia among pregnant women in Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria. *Nigerian Journal of Health Sciences*. 2017;17(1):7-11.
6. Brown MA, Magee LA, Kenny LC, Karumanchi SA, McCarthy FP, Saito S, Hall DR, Warren CE, Adoyi G, Ishaku S. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis, and management recommendations for international practice. *Hypertension*. 2018; 72(1):24-43.

7. Ekun OA, Olawumi OM, Makwe CC, Ogidi NO. Biochemical Assessment of Renal and Liver Function among Preeclamptics in Lagos Metropolis. *International journal of reproductive medicine*. 2018; 1:1-6.
8. Guerrier G, Oluyide B, Keramarou M, Grais RF. Factors associated with severe preeclampsia and eclampsia in Jahun, Nigeria. *International journal of women's health*. 2013; 5:509-515.
9. Okanlawon SO. Maternal and perinatal outcome of patients with preeclampsia in a teaching hospital in southwest Nigeria. *Tropical Journal of Obstetrics and Gynaecology*. 2015;32(2):58-64.
10. Uzan J, Carbonnel M, Piconne O, Asmar R, Ayoubi JM. Preeclampsia: pathophysiology, diagnosis, and management. *Vascular health and risk management*. 2011; 7:467-471.
11. Lamina MA, Akinsanya AF, Ogunsowo KM. Maternal and perinatal outcome of patients with severe pre-eclampsia in a tertiary health centre in south-western Nigeria: a cohort study. *Research Journal of Health Sciences*. 2015;3(1):53-61.
12. Olatunji AO, Sule-Odu AO. Presentation and outcome of eclampsia at a Nigerian University Hospital. *Nigerian journal of clinical practice*. 2007;10(1):1-4.
13. Adekanle DA, Akinbile TO. Eclampsia and pregnancy outcome at Ladoke Akintola University of Technology teaching hospital, Osogbo, South West, Nigeria. *Clinics in Mother and child health*. 2012;9(1):240-244.
14. Agida ET, Adeka BI, Jibril KA. Pregnancy outcome in eclamptics at the University of Abuja Teaching Hospital, Gwagwalada, Abuja: a 3-year review. *Nigerian journal of clinical practice*. 2010;13(4):394-398.
15. Yakasai IA, Gaya SA. Maternal and fetal outcome in patients with eclampsia at Murtala Muhammad specialist Hospital Kano, Nigeria. *Annals of African medicine*. 2011;10(4):305-309.
16. Ugwu EO, Dim CC, Okonkwo CD, Nwankwo TO. Maternal and perinatal outcome of severe pre-eclampsia in Enugu, Nigeria after introduction of Magnesium sulfate. *Nigerian Journal of Clinical Practice*. 2011;14(4):418-21.
17. Okogbenin SA, Eigbefoh JO, Omorogbe F, Okogbo F, Okonta PI, Ohihoin AG. Eclampsia in Irrua Specialist Teaching Hospital: a five-year review. *Nigerian Journal of clinical practice*. 2010;13(2):149-153.
18. Obi CN, Obi VO, Nwafor JI, Onwe BI, Onuchukwu VU, Ugoji DP, Ibo CC. A comparative study of pregnancy outcome among women with preeclampsia and normotensive at the Alex Ekwueme Federal University Teaching Hospital Abakaliki, Nigeria. *International Journal of Research in Medical Sciences*. 2019; 7(10):3789-3792.
19. Adeosun GO, Charles Davies MA, Ogundahunsi OA, Ogunlewe J, Bello IS. Alteration of Serum Reproductive Hormones and the Risk of Preeclampsia in Pregnancy: A Longitudinal Study in Gravid African Women. *International Journal of Reproductive Medicine and Gynaecology*. 2019; 5(2):59-66.
20. Ajah LO, Ozonu NC, Ezeonu PO, Lawani LO, Obuna JA, Onwe EO. The fetomaternal outcome of preeclampsia with severe features and eclampsia in Abakaliki, South-East Nigeria. *Journal of clinical and diagnostic research*. 2016 Sep;10(9):18-25.
21. Ndaboine EM, Kihunrwa A, Rumanyika R, Im HB, Massinde AN. Maternal and perinatal outcomes among eclamptic patients admitted to Bugando Medical Centre, Mwanza, Tanzania. *African Journal of Reproductive Health*. 2012;16(1):35-41.
22. Charles A, Victor P, Jonathan K, Ishaya P. Eclampsia and Pregnancy Outcome at Jos University Teaching Hospital, Jos, Plateau State, Nigeria. *Journal of Gynecology and Obstetrics*. 2017;5(4):46-49.
23. Echendu DA. Pattern of clinical presentation of eclampsia at Nnamdi Azikiwe university teaching hospital, Nnewi, South-eastern Nigeria. *Nigerian Journal of Medicine*. 2012;21(3):313-6.