

The Prevalence of Pre-Eclampsia and Eclampsia in Pregnant Women Attending Major Medical Facilities in Southeast Nigeria.

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Abstract:

Preeclampsia (PE) is a pregnancy induced disease while Eclampsia (EC) represents the extreme complication or severe preeclampsia. The present study was aimed at evaluating the prevalence of pre-eclampsia and eclampsia in South Eastern Nigeria. The study was designed as a retrospective case control study covering major public health facilities in two randomly selected states (Abia and Imo) in South Eastern Nigeria. It was executed with pregnant women who were at least 20 weeks of gestation, attending the major public health facilities in the two states namely Federal Medical center Umuahia and Abia State General Hospital, Umuahia from Abia State and Federal Medical Center Owerri (Now Federal University Teaching Hospital) and Imo State specialist Hospital Owerri) from Imo State. The health facilities represent the major public health facilities in the two states. Factors of SES considered in the study include age and family factors, income class, educational status, and employment/ occupational category. A validated questionnaire was used to obtain data on SES. Other parts of the data were obtained at the health facilities of study. Obtained data were analysed using descriptive and inferential statistical techniques. Descriptive statistic techniques used include summary statistics such as mean and standard deviations. Others are construction of frequency

distributions and distributional charts. All inferential tests were performed at 5% level of significance and Chi-square test method was applied to test for association between the rates of occurrence of preeclampsia/eclampsia with socio-economic status of the women covering the study period. The result of the study shows that data was obtained equally in both states from a total of 3010 pregnant women. A total of 261 (8.7%) of the women have preeclampsia. Among the pregnant women that had preeclampsia, 61.6% were mild to moderate preeclampsia while 38.4% were severe preeclampsia. The overall rate of occurrence of eclampsia for the study period was 0.87% in the study area. Preeclampsia occurred most among women of aged 35 - 49 years (OR= 2.64, 95% CI = 1.83 - 3.79) but was found lowest among the 20 - 34 years old women at (6.7%). Preeclampsia-eclampsia still remained a devastating pregnancy challenge in the study area and the role of the SES in the occurrence of the disease is yet to be fully addressed.

Keywords: prevalence; preeclampsia; eclampsia; pregnant women; major public facilities in southeast.

Introduction:

Eclampsia and pre-eclampsia are considered to be significant issues in the field of obstetrics because they are amongst the main reasons for increased maternal

and perinatal mortality and morbidities which can occur in 3-8% of pregnancies. Preeclampsia (PE) is a toxic condition unique to pregnancy and the postpartum period which involves the mother and her fetus [1]. This comes usually after 20 week gestation, and also by hypertension, which is defined as a systolic blood pressure of more than 140mmHg or a diastolic of more than 90mmHg accompanied by proteinuria of more than 0.3gm in a 24-hour specimen. Preeclampsia among maternal and postpartum women as noted earlier has risen by over 25% in the last 20 years worldwide [2]

Eclampsia is characterized by extreme spectrum of preeclampsia which is known as new onset of generalized seizure, and /or unexplained coma manifested during pregnancy or during puerperium in a patient with features of preeclampsia. Preeclampsia and eclampsia are a chronic severe disease that implies an accelerated course with increased blood pressure and proteinuria with potential severe disease outcomes, death and disability among mothers and their newborns [3]

All over the world, preeclampsia-eclampsia is ranked amongst the three major contributing factors to maternal and perinatal mortality and morbidity. Preeclampsia itself, current to about 2-8% pregnancies on a global dimension [4]

There are side effects that are quick and there are others that are long term effects of preeclampsia and eclampsia diseases. It may have an effect on the mother and the unborn child. These fund effects may include changed fetal size that makes the fetus more compressible Fetal health as also weight is significantly affected and different levels of fetal morbidities and fetal damage occur [5].

Preeclampsia is an obstetrical disorder that is defined by the presence of hypertension and the manifestations of end-organ dysfunction for example liver or kidney dysfunction, cerebral impairment American College of Obstetricians and Gynecologists. The symptoms of preeclampsia may include moderate to severe headache, change in vision, upper abdominal pain, decrease in output, vomiting, shortness of breath, liver dysfunction, low level of platelets in the blood as well as sudden increase in weight and facial swelling [6]

A headache is one of the characteristic signs of preeclampsia and it may be present as a boring, pounding pain that may be constant or a sharp and

intense. The permanent changes in the vision are also distinguishable, it can be a short-term loss of vision, blurring of vision or any increase in sensitivity to light. It is believed that these vision changes are due to the destruction of the blood vessels within the eye [7]

Preeclampsia is characterized by pain, as well as nausea and vomiting which may be severe enough to result to dehydration. Dyspnea is one of the clinical manifestations of preeclampsia, it can be resulted from fluid accumulation in the lungs (Pulmonary edema). One of the symptoms of preeclampsia includes liver complications and this may cause damage to the liver. Thrombocytopenia which is characterised by a platelet count of less than 150,000 platelets per microlitre of blood is common in preeclampsia and is associated with increased risk of bleeding (American Society of Hematology, 2020). Eclampsia an obstetric complication characterized by sudden weight gain and swelling is caused by fluid retention [8]

Data from the American College of Obstetricians and Gynecologists, or ACOG, show that preeclampsia complicates 2-8% of all pregnancies globally. It is not clear what leads to preeclampsia but it is understood that it is associated by faulty placentation and inadequate blood flow to the placenta [9]

It has also been reported that women who experienced preeclampsia are at a higher risk of developing cardiovascular disease at some other time (American Heart Association, 2019). Also, there are evidences that preeclampsia is one of the leading causes of maternal and perinatal mortality globally. This clearly shows that early identification and intervention in preeclampsia is vital in order to avert adverse effects on the patients' health [10].

The risk factors of preeclampsia include young age, nulliparity, first pregnancy after the age of 35 years, obesity before the current pregnancy, previous history of preeclampsia, diabetes and hypertension. New variables that maybe associated with Preeclampsia/Eclampsia includes, thus; Environmental/Socioeconomic factors. Others are socioeconomic factors such as poverty and level of education which have been estimated at up to 27% attributable risk to maternal deaths from preeclampsia. There was a positive correlation which has been revealed between young age mothers and preeclampsia of which higher risk of the disease was noted especially with women who were below 20 years

of age. On the other hand; the findings of studies have reveal that the risk of developing preeclampsia increases with the age of the woman especially those women who are above 35 years of age. Other potential causes of preeclampsia include illiteracy and low levels of education among pregnant woman. It has been found that the disease occurs more often and with a higher severity if it is in women with low education level [11].

In the present study, therefore, no statistical significant association between occupation and preeclampsia was determined. In contrast, a meta-analysis study established that physically demanding job was a strong significant risk factor for preeclampsia. Long working hours or occupational fatigue have been found to increase chances of preeclampsia since they can interfere with regular prenatal care leading to preeclampsia, eclampsia and other pregnancy related complications [12].

Preeclampsia is responsible for up to 11% maternal mortalities in the entire country. But the current rate of preeclampsia/eclampsia in proportion to the economical status of the pregnant women have not been ascertained in Nigeria. Thus, this study determined the incidence of preeclampsia/eclampsia on the socioeconomic condition of the pregnant women in South East Nigeria [13].

In the world, severe preeclampsia and eclampsia are diseases that occur uniquely in pregnancy, that are complicated by high morbidity and mortality among mothers and newborns. This is because the two diseases vary in incidence and deaths rate in different regions of the world. Low resource countries have predisposing factors that raise the risk of developing preeclampsia more than those in high resource countries National population council, thereby, asserting that several developing nations including Nigeria and many other African countries have a higher rate of the disease. Some of the reasons contributing to the high prevalence were described as lack of resources, lack of appropriate prenatal care and lack of access to proper hospital care [14]

However, relatively more attention has been paid to preeclampsia trends and association in the recent years but there are inconsistencies, time variations and even gaps of conceptual framework in some cases

Materials and Methods:

Study Design:

This study employed a health facility-based retrospective design, utilizing data extracted from hospital records via a proforma. The proforma captured information on pregnant women who attended the study health facilities between 2016 and 2021. The design aimed to collect and utilize data from various health facilities, focusing on the occurrence of preeclampsia/eclampsia and other characteristics of pregnant women who visited the facilities during the specified period. By adopting this design, the study leveraged existing data to explore trends and patterns in preeclampsia/eclampsia cases, thereby providing valuable insights into the maternal health landscape within the study region.

Study Area:

The study was carried out in South Eastern region, Nigeria. South Eastern region is one of the six geopolitical zones in Nigeria representing both a geographic and political region of the country's inland southeast. It comprises five states – Abia, Anambra, Ebonyi, Enugu and Imo.

Study Setting:

The study settings are-The Federal Medical Centres (FMCs) and State General Hospitals in Imo and Abia. The FMCs are federal government-owned health institution established in each state of Nigerian Federation to fulfill the health policy of the nation which stipulates that tertiary health care and service delivery programme come from the Federal Government.

Study Population:

The study population consisted of all documented antenatal records of pregnant women who attended the study health facilities during the period of January 2016 to December 2021. The hospital register revealed a total of 2887 pregnant women who were over 20 weeks of gestational age and attended the antenatal units at Federal Medical Centres and state General Hospitals in Abia and Imo States.

The records of these pregnant women included information on any instances of preeclampsia and eclampsia. The study only included pregnant women who had complete and documented records within the study period. Any information on pregnant women that were not evidently documented within the study period was excluded from the study.

Sampling frame:

The study sampling frame consisted of all medical records of women managed for preeclampsia/eclampsia (PE/E) between January 2016 and December 2021, retrieved from the study health facilities. This included a total of 2887 pregnant women who were over 20 weeks of gestational age and attended the antenatal units at Federal Medical Centres and state General Hospitals in Abia and Imo States.

Sample Size and Sampling Methods:

The data was not collected directly from the mothers through primary sampling methods. Instead, it was obtained as secondary data, gathered from pre-existing documented records at the study health facilities, spanning the study period of 2016 to 2021. To ensure data integrity and avoid duplication, only reputable public health facilities in the selected states of southeastern Nigeria were utilized for data extraction in this study. This approach enabled the researchers to tap into existing information, minimizing the risk of data duplication and ensuring a reliable dataset for analysis. By leveraging secondary data from trusted sources, the study optimized efficiency and accuracy in its investigation of preeclampsia and eclampsia cases within the specified region and timeframe.

Inclusion and Exclusion criteria:

Information pertaining to all pregnant women, including those diagnosed with preeclampsia (PE) and eclampsia (E), who attended the Obstetrics and Gynaecology unit of the selected study health facilities during the study period spanning from 2016 to 2021, was comprehensively included in the study. This encompassed a thorough examination of medical records, ensuring that data on all pregnant women who received care at the participating facilities during the specified timeframe was incorporated into the study. By casting a wide net and capturing data on all relevant cases, the study aimed to provide a holistic understanding of PE and E occurrences within the study population, facilitating a more accurate and generalizable analysis of these conditions.

Included Cases:

The cases included were pregnant women diagnosed with pre-eclampsia after the 20th week of gestation, (i.e systolic blood pressure ≥ 140 mmHg or diastolic ≥ 90 mmHg) on two occasions at least four hours apart and

proteuria defined as urinary protein ≥ 300 mg in 24hr period or $\geq 1+$ on a urine dipstick on two occasions of up to 4 hours apart without urinary tract infection. This included pregnant women attended the study health facilities within the period February to April, 2021.

Severe preeclampsia was taken as Systolic blood pressure ≥ 160 mmHg/Diastolic blood pressure ≥ 110 mmHg, presence of pulmonary edema. epigastric pain and proteinuria; persistent (2gm/24 hours or $\geq 2+$ dipstick). Others include progressive renal insufficiency and oliguria, elevated liver enzymes, new onset cerebral or visual disturbance and low platelets count $<100,000$ /ml.

Instruments for Data Collection:

Instrument of data collection include a questionnaire instrument constructed by the researcher. The questionnaire was prepared by sections. Section A contained the sociodemographic characteristics of the respondents, section B contained information concerning the socio-economic status of the participants while section C contained pregnancy

Validity of Instruments:

Face validity and content validity were utilized to validate all the questionnaires. The study questionnaire was meticulously prepared by the researcher in alignment with the study objectives and subsequently approved by the supervisor after incorporating minor corrections. Furthermore, expert inputs were obtained from two specialists in gynecology and obstetrics, which significantly contributed to refining the final study instruments.

Reliability of Instruments:

The test-retest method was employed to evaluate the reliability of the instruments. This method is a robust approach to assess the reliability of questionnaires. It involves administering the questionnaire twice to a subset of participants from the study population. In this study, a total of twenty-five pregnant women with a gestational age of at least 20 weeks were randomly selected for reliability assessment purposes, but were not included in the main study. The questionnaire was initially administered to them, and then repeated a week later. The results were scored, compared, and analyzed for consistency using the Cronbach Alpha test. A reliability coefficient of 0.731 (not 7.31, assuming a scale of 0 to 1) was obtained, indicating a high level of

reliability. Therefore, the questionnaire instrument was deemed reliable for this study.

Method of Data Collection:

The data collection for preeclampsia and eclampsia cases was conducted through weekly visits to the Obstetrics and Gynecological Department of each study health facility. During each visit, all identified cases that satisfied the inclusion criteria were selected and enrolled as study subjects. The necessary information from the patients' medical records, including their name, age, address, and registration details were obtained.

Once the patients were identified and their information was obtained, they were approached and interviewed for further data collection. A structured questionnaire to collect data on the patients' medical history, pregnancy history, and current health status were used. The questionnaire included questions on the patients' demographic characteristics, such as age, parity, and gestational age, as well as their medical history, including any previous pregnancies complicated by preeclampsia or eclampsia.

Data Analysis Method:

Data analysis was conducted using IBM SPSS Statistics version 25.0 (IBM Corp., Armonk, NY, USA). The initial data analysis employed descriptive statistics, including: Frequencies, Percentages, Means and Standard deviations

Descriptive analysis was utilized to calculate the rates of preeclampsia and eclampsia, as well as the frequencies of various variables.

Results:

Prevailing Rate and classifications of Preeclampsia/ Eclampsia in the study Area:

1. Overall Prevalence of Preeclampsia/ Eclampsia in the study Area:

Table 1 presents the overall rate of preeclampsia/ eclampsia in the study area.

It shows that out of 3010 pregnancies among pregnant women who visited the study health facilities within the study period, a total of 261 (8.7%) were diagnosed of preeclampsia while 26 (0.86%) developed eclampsia.

Preeclampsia/ Eclampsia	Number	%
Preeclampsia (PE)		
Presence of Preeclampsia (PE)	261	8.7
Absesence of Preeclampsia (PE)	2749	91.3
Total	3010	100
Eclampsia (E)		
Presence of Eclampsia (E)	26	0.86
Absesence of Eclampsia (E)	2984	99.14
Total	3010	100

Table 1: Overall Rate of Preeclampsia/ Eclampsia in the study Area.

2. Preeclampsia Classifications among the disease Cases Studied:

There were a total of 261 women diagnosed of preeclampsia/eclampsia in the study health facilities during the study period but 250 (95.8%) met up with the inclusion criteria and were purposely selected and included in the study.

The classification for preeclampsia among the study diagnosed cases of preeclampsia presented in figure 1. It can be observed from the figure that a total of 154 (61.6%) pregnant women among the cases have mild to moderate preeclampsia within the study period, while 96 (38.4%) have severe preeclampsia among the case group.

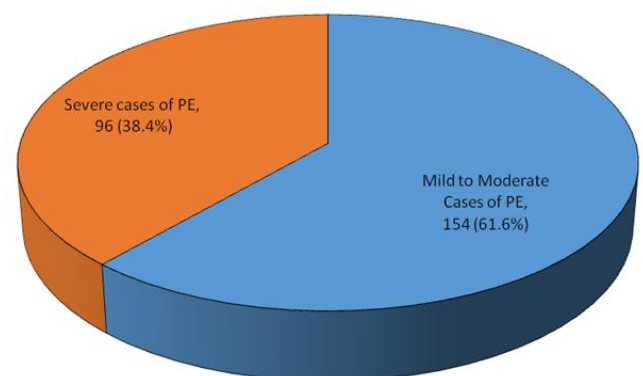


Figure 1: Preeclampsia Classifications among the disease Cases Studied.

Discussion:

Preeclampsia and eclampsia represent major challenge in obstetric health with maternal and perinatal effects

[15,16,17]. They are likely to be influenced by several factors including factors of socio economic status. Therefore this study was primarily aimed at investigating the determinants of preeclampsia and eclampsia prevalence in South-eastern Nigeria.

The study established the prevalence rate of preeclampsia and eclampsia as 8.7% and 0.87 respectively in the study area. These rates are higher than 1% - 4% rates for preeclampsia and 0.6% - 0.75% for eclampsia found in similar south eastern Nigeria studies [18]. They are also higher than 3.02% for preeclampsia and 0.6% for eclampsia reported in Northern part of Nigeria [19] and 1.2% - 1.5% (for preeclampsia) reported in South-South Nigeria [20,21]. The reasons for higher rate in this study can be understandable, considering that the present study included only pregnant women from major health facilities, of which some of them were probably referred from other health facilities as a result of pregnancy related complications.

On the other hand, the findings in the index study showed consistency with 8.8% preeclampsia rate found in the North central Nigerian study [22] and 0.9% rate for eclampsia found in a South Western Nigerian study [23]. It is lower than the general preeclampsia rate of 16.7% prevalence reported for Nigeria [24,25]

The eclampsia rate found in this study is higher than the World Health reported global prevailing rate of 0.3% [26] but was in line with the range within 0.16 - 0.7% rate reported for less developed countries [27,28] It therefore indicates that the eclampsia rate in the study area and likewise in some other developing nations exceeded the reported global prevailing rate for the disease. The rate is lower than the rate for HELLP syndrome of up to 2.2 per 1000 pregnancies has been reported for the African region [29,30,31]. The high rates of preeclampsia and eclampsia found in this study signals that proper attention need to be given on the availability of risk factors of preeclampsia in the study area. Different rates found in parts of Nigeria therefore implies that the challenges posed by the disease in Nigeria are yet to be properly addressed [32].

Further assessment in the study found the rate of severe preeclampsia to be 38.4% among patients diagnosed of preeclampsia and 3.3% in the general study population. These findings are similar and in line with 3.4% rate for severe preeclampsia in another study with south eastern Nigeria [33].

This finding means that preeclampsia-eclampsia still remained a devastating pregnancy challenge in the study area. Apparently the rate of occurrence of preeclampsia seems to vary across several Nigerian studies and one of the likely reasons could be as a result of differences in study characteristic of the subjects such as factors of socio economic status.

Conclusion:

Preeclampsia/Eclampsia is commonly prevalent in south eastern Nigeria. The prevailing rate is yet to be reduced significantly in the study area. Low maternal socioeconomic status is a risk factor for preeclampsia. Factors of maternal socio-economics status such as age, income, employment and occupational category significantly influence the occurrence of eclampsia and preeclampsia in the study area. Also clinical and obstetric factors such as previous history of preeclampsia, chronic hypertension and excessive weight are risk factors of preeclampsia.

Based on the results of the present study, differences in the age have contributory effects in rising prevalence of preeclampsia with women of about 35 years old being at greater risk. Not having formal educational among pregnant women is a risk factor of preeclampsia as well as being unemployed or poor occupational status. No evidence was established in this study that family type (monogamous/polygamous) has contributory effects in the prevalence of preeclampsia. There exist poor documented studies addressing preeclampsia as relates to socioeconomic status in Nigeria, therefore more studies of this kind can be relevant in determining the socio economic factors of preeclampsia.

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