

Chronic Hypertension after delivery among Patients with Preeclampsia/Eclampsia at Komfo Anokye Teaching Hospital: A retrospective cross-sectional design

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Research Article

Keywords: preeclampsia, eclampsia, chronic hypertension, postpartum, blood pressure

Posted Date: August 11th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10618825/v1>

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Additional Declarations: No competing interests reported.

Abstract

Background

Globally, pre-eclampsia and eclampsia complicate about 5%-8% of all pregnancies. Pre-eclampsia is characterized by hypertension (blood pressure > 140/90mmHg) and proteinuria (proteins in urine) after 20 weeks of gestation whilst eclampsia is characterized by preeclampsia and seizures or convulsions. Preeclampsia are pregnancy disorders that put women at increased risk for heart diseases as well as stroke and high blood pressure later in life. In view of this, the study sought to determine the pregnancy outcome of patients with pre-eclampsia/eclampsia during pregnancy, chronic hypertension after delivery and postpartum monitoring at Komfo Anokye Teaching Hospital from January to June 2019.

Method

The study employed a retrospective cross-sectional study design that involved a review of medical records of patients admitted and discharged between January and June 2019 at Komfo Anokye Teaching Hospital. The data generated were keyed into Microsoft Excel Spreadsheet 2007 after manual verification and cleaning. It was then exported to statistical package for social sciences (SPSS) software version 27. Categorical and continuous variables were expressed as frequencies (percentages) and means $\pm$ SD, respectively and were presented in tables and charts.

Results

A total of 218 medical records were reviewed, of which 7.8% were teenagers and 55.5% were older than 30 years of age. 10 (4.59%) had eclampsia. 208 had preeclampsia, with 59.17% presenting with severe preeclampsia and 36.24% with mild preeclampsia. 61% of deliveries were done through caesarean section. The prevalence of chronic hypertension was 3.08% of those who were reviewed at 8 weeks postpartum and 1.54% had referrals to the hypertension clinic at 10 weeks postpartum.

Conclusion

The study demonstrates hypertensive disorders of pregnancy, particularly severe preeclampsia, constituted a substantial proportion of obstetric admissions at Komfo Anokye Teaching Hospital. Strengthening early detection, appropriate clinical management and structured postpartum surveillance for women with hypertensive disorders of pregnancy may involve maternal outcomes and reduce the risk of cardiovascular complications.

INTRODUCTION

Nearly 75% of all maternal deaths during pregnancy and delivery is caused by high blood pressure and complications associated with it (Say et al., 2014). Pre-eclampsia and eclampsia complicate about 5%-8% of all pregnancies worldwide (Garovic & August, 2013). Preeclampsia, as defined by the international society for the study of hypertension in pregnancy, is having a blood pressure of at least 140/90mmHg on two separate occasions $> / = 4$ hours apart with proteinuria of at least 0.3g within 24hour collection of urine (or > 30 g/mmol protein that arising after 20 weeks of gestation in a previously normotensive woman and resolving completely 6weeks after delivery (postpartum) (English et al., 2015). A study on the prevalence of hypertensive phenotypes after preeclampsia by Ditisheim et al. revealed 50% of women with preeclampsia remained hypertensive on ambulatory blood pressure monitoring during the postpartum period, out of these, 24.3% were still under antihypertensive treatment. They concluded that ambulatory blood pressure monitoring at 6 to 12 weeks after delivery reveals a high rate of masked or hidden hypertension after preeclampsia (Ditisheim et al., 2018). There is evidence suggesting preeclampsia is linked with increased risks for hypertension and cardiovascular disease later in life. The risk for developing future hypertension and cardiovascular disease in affected women may increase because preeclampsia may induce irreversible metabolic and vascular changes. The mechanisms responsible for the increase in the risk for future hypertension are not well understood. Further studies need to be conducted to elucidate the underlying associations. Preeclampsia history may help offer a preventive strategy, timely screening and other treatment options for women who may have cardiovascular disease risk early in life (Garovic & August, 2013).

However, after delivery, most of these women could not be tracked for appropriate follow-ups, even if their hypertension persisted after delivery or not, much attention has not been given to it (Frischer, 2018).

In developing countries, the impact of preeclampsia is severely felt because cases are presented, making medical interventions ineffective (Osungbade et al., 2011). Many women who previously had preeclampsia/eclampsia get to know they are hypertensive during their next pregnancy. Others who may not give birth again may find out they are hypertensive when complications like cardiovascular accident set in.

The issue concerns the number of women who acquire preeclampsia or eclampsia during pregnancy and continue to exhibit hypertension six weeks postpartum. How are they monitored to decrease the risk of acquiring further cardiovascular problems in the future? At what gestational age and maternal age do women get preeclampsia or eclampsia? The study aims to address the aforementioned concerns. A prior occurrence of preeclampsia during pregnancy is a risk factor for preeclampsia/eclampsia. It is essential to monitor such individuals to implement strategies that prevent recurrence in future pregnancies. Numerous women with a history of pre-eclampsia or eclampsia discover they are hypertensive in subsequent pregnancies. Individuals who may not conceive again may discover they are hypertensive when complications such as a cardiovascular accident occur.

METHOD

Study Design

The study employed a retrospective cross-sectional study design conducted between January and June, 2019 at the Komfo Anokye Teaching Hospital, Kumasi, Ghana with a quantitative approach.

Study Setting

Komfo Anokye Teaching Hospital, KATH, the second largest teaching hospital in Ghana located in Kumasi, the regional capital of the Ashanti Region. It has a bed capacity of 1,200 and serves as a referral Centre for all the Northern Regions (Namely, Northern, Upper East and Upper West Regions), Brong Ahafo, Central, Western, Eastern and parts of Volta Region. The Obstetrics and Gynaecology directorate is responsible for the management of pregnant women both pre and postnatal.

Study Population

The study consists of all pregnant women who were admitted to the block A High Dependency Unit (A1H DU) ward between the period of January and June, 2019 at the Komfo Anokye Teaching Hospital.

Eligibility Criteria

Inclusion Criteria

The study included all pregnant women who were diagnosed with preeclampsia/eclampsia after 20 weeks of gestation and delivered before discharge, as well as patients who had postpartum preeclampsia/ eclampsia.

Exclusion Criteria

Patients who had chronic hypertension before pregnancy, those with other co morbidities e.g. diabetes, renal impairment, liver diseases, as well as patients who died on admission were excluded from the study.

Data Collection Procedures

A census technique was adopted. All Patient that met the inclusion criteria were used for the study via records review of patient's folders. In effect, 218 patient records were retrieved that met the criteria for the study. A data collection tool was developed based on the study objectives and was used to extract data from patient folders. The data collection tool was developed with consultation of Senior Specialists and Consultants at the Obstetrics and Gynaecology Department at Komfo Anokye Teaching Hospital to check for instrument validity and reliability. The tool was pretested at Kwame Nkrumah University of

Science and Technology Hospital (Tech-Hospital) to check for the accuracy and consistencies of the research instrument to remove errors.

Folders of these patients were retrieved from the Komfo Anokye Teaching Hospital Obstetrics & Gynaecology medical records in consultation with the person in charge of patients medical records. After the retrieval of folder, the age of patient, gestational age, outcome of pregnancy, mode of delivery, incoming BP, discharge BP, BPs during postnatal reviews were recorded using the data collection form indicated in appendix1 through these criteria; maximum of 10weeks postpartum monitoring/ reviews were done. The patients' records revealed that if the patient had blood pressure $\leq 120/90$ mmHg, the antihypertensive was withdrawn for two weeks. If it remains less than 140/90mmHg till the sixth week without the antihypertensive, she is discharged from postnatal reviews. However, if the blood pressure remained $\geq 140/90$ mmHg, the medication is maintained and/or dosage increased. If after 8weeks the blood pressure is still raised, the patient is asked to bring along records of home monitoring blood pressure for comparison, then referred to hypertension clinic

Data Analysis

The data generated were keyed into Microsoft Excel Spreadsheet 2007 after manual verification and cleaning. It was then exported to statistical package for social sciences (SPSS) software version 27. Categorical and continuous variables were expressed as frequencies (percentages) and means $\pm$ SD, respectively and were presented in tables and charts.

RESULTS

Baseline characteristics of the study population

The study involved 218 patients of which 7.8% were teenagers and 55.5% were older than 30years of age. The study results revealed that, the youngest patient diagnosed with pre-eclampsia was 13 years of age whilst the oldest patient was 48years of age. The average age was 30.32years (95% C.I. 23.48, 37.16) and a standard deviation of 8.34years. About 60% of the patients had parity between 1 & 3.10(4.59%) had eclampsia. 208 had preeclampsia with 59.17% presenting with severe preeclampsia and 36.24% with mild preeclampsia. The highest systolic blood pressure from the study was 260mmHg whilst the highest diastolic was 142mmHg. This can be found in the Table 1.0 below.

Severity and interventions for preeclampsia/ eclampsia

Blood pressure ranging between 140/90-159/109mmHg was classified as mild preeclampsia whilst severe preeclampsia blood pressure was $\geq 160/110$ mmHg. It was reported that, 36.24% had mild preeclampsia, 59.17% had severe preeclampsia and 4.59% had eclampsia respectively.

Information about the intervention given to the patients through delivery (either through spontaneous vaginal delivery or caesarean section). Outcome of pregnancies that is either the pregnancy was

terminated, the fetus died or fetus was safely delivered through caesarean section/spontaneously, is shown in the table 2.0.

Average blood pressures of sample of patients

Table 3.0 shows the mean systolic and diastolic blood pressures of participants from admission to subsequent postpartum follow-up visits. At admission, participants exhibited significantly elevated blood pressure, with a mean systolic blood pressure of 167.07 mmHg and a mean diastolic blood pressure of 106.68 mmHg, indicative of severe hypertension at presentation. At discharge, there was a significant decrease in blood pressure, with the mean systolic pressure reduced to 132.91 mmHg and the mean diastolic pressure to 88.15 mmHg.

During postpartum follow-up, numerous women exhibited persistently raised blood pressure levels beyond the optimal range. During the initial assessment (n = 130), the average blood pressure recorded was 136.9/95.2 mmHg.

During the second review (n = 39), the average blood pressure was 134.5/99.2 mmHg, with systolic pressure remaining essentially constant while diastolic pressure exhibited an additional increase. During repeated evaluations, the mean blood pressure exhibited a progressive increase. The third review (n = 13) documented a mean blood pressure of 142/98 mmHg, the fourth review (n = 6) documented 151/98.4 mmHg, and the fifth review (n = 2) documented 159/102 mmHg.

Postnatal reviews of study participants

Patients were given an appointment to start postnatal review in two weeks after discharge. However, 59.67% honoured their review appointment and 40.33% did not honoured their review appointment as shown in figure 1.0.

Figure 1.0: Postnatal reviews of study participants

Prevalence of persistent hypertension during reviews

During postpartum reviews, blood pressures were checked and documented. Depending on the BP recorded, medications would be reviewed (either continued, withdrawn or dosage reduced).

In the study, some presented with BP>140/90mmHg during their reviews although on antihypertensive. The percentage of patients who had BP>140/90mmHg and those with BP<140/90mmHg for each review after delivery is shown in figure 2.0. The percentages were calculated based on the number of patients who attended that particular review.

Figure 2.0: Prevalence of persistent hypertension during reviews

Prevalence of chronic hypertension among the sampled participants

If a patient is reviewed for 6 weeks after delivery without antihypertensive and the BP is consistently below 140/90 mmHg, the patient is then discharged from postpartum reviews. However, if the BP rises again after withdrawal of antihypertensive or is persistently above 140/90 mmHg although on antihypertensive after 6 weeks postpartum, she is classified as having chronic hypertension and referred to the medical team for further management. Some of the patients BP are monitored for 10 weeks if it keeps on fluctuating between reviews before referral to medical team as shown in figure 3.0 below.

Figure 3.0: Prevalence of chronic hypertension among the sampled participants

DISCUSSION

According to the study, patients who presented with preeclampsia/ eclampsia were aged between 13 years and 48 years with an average age of 30.32 years (95% C.I. 23.48, 37.16). However, the number of patients under 20 years who were diagnosed with preeclampsia were 7.8% which is the lowest among the various age groups. On the other hand, 55.5% of the patients were over 30 years with 29.36% of them over 35 years. The majority of the pregnant women diagnosed with preeclampsia/ eclampsia were over 30 years according to this study.

However, most studies indicate that both teenagers and advanced pregnant women are the age groups mostly diagnosed with preeclampsia/eclampsia. As reported by (La-Orpipat & Suwanrath, 2019), young primigravidae less than 20 years and all patients over 30 years of age have an increased risk of hypertension. Kuman et al. study in 2016 also indicated that the teenage age group and after 30 years of age are more prone to the development of Preeclampsia (Kuman et al., 2016). This is consistent with the findings of our study. However, whilst the above studies show that both extreme age groups are at higher risk of being diagnosed with preeclampsia/eclampsia, a study by Lamminpää et al shows otherwise. In that study, they compared obstetric outcomes in women with preeclampsia aged under 35 and those who are 35 years. They found that women of advanced maternal age (AMA) exhibited more preeclampsia (9.4%) than younger women (6.4%) and concluded that preeclampsia is more common in women with advanced maternal age (Lamminpää et al., 2012). Although maternal and placental factors are considered to be involved in the aetiology of preeclampsia/eclampsia, the exact cause of the disease is unknown. It has been suggested that the primary predisposing factors for late-onset preeclampsia are maternal factors, whilst placental factors are strongly associated with early-onset preeclampsia (Wójtowicz et al., 2019). Early-onset and late-onset preeclampsia are defined as preeclampsia that develops before 34 weeks and after 34 weeks of gestation, respectively (Raymond & Peterson, 2011).

The study revealed that 134 of the women representing 63.81% had late onset of preeclampsia, whilst 76 representing 36.19%, had early onset of preeclampsia. The highest gestational age at which preeclampsia occurred was 42 weeks + 2 days, and the average gestational age was 35.86 weeks (95% C.I. 33.68, 36.56). This showed that the majority of the women presented to the hospital with preeclampsia after 34 weeks gestation, thus late onset of preeclampsia/ eclampsia. This is similar to a study by Lisonkova et al. who compared early- and late-onset preeclampsia rates of 115 women, which

were 0.38% and 2.72%, respectively. 12% of the women delivered at a gestation of 34 weeks or longer, that is early onset preeclampsia in the study. However, risk and protective factors common to both early- and late-onset preeclampsia included unmarried status, older maternal age, and male foetus. They therefore concluded that early-onset and late-onset preeclampsia differ in several risk factors but share some etiological features, and may lead to different outcomes. From a prognostic and etiological standpoint, the two types of preeclampsia should be treated as distinct entities (Lisonkova & Joseph, 2013). For women with severe preeclampsia, delivery is recommended not after 34weeks gestation. Currently, delivery is recommended for women who develop preeclampsia at 37 gestational weeks, irrespective of disease. Recent evidence shows that infants born between 34 to 36 weeks of gestation are physiologically immature compared to term infants (HERG, 2014).

The results indicate that most deliveries occurred at or after 35weeks (63.81%). However, 36.19% of deliveries occurred at 34weeks or below, depending on the severity of the preeclampsia/eclampsia. This indicates that most of the babies were born near term or at term, reducing the number of complications associated with preterm delivery of both mother and baby. Close maternal and foetal evaluation is essential between 32-36weeks of gestation. It is assumed these women have no labour or membrane rupture; otherwise, delivery is indicated at 34 weeks or beyond (Dimitriadis et al., 2023). Delivery is recommended for women with severe preeclampsia not after 34weeks gestation. (HERG, 2014). In a study by Obaid et al, 30% deliveries were done through spontaneous vaginal delivery while 70% were through caesarean section for pregnant women who presented with preeclampsia and eclampsia (Obaid et al., 2013).

According to this study, 60.95% deliveries were made through caesarean section whilst 30.95% were through spontaneous vaginal delivery. Additionally, 14 of these pregnancies resulted in intrauterine foetal death (IUFD). Two pregnancies were terminated at 23 and 24weeks gestation because of severe complications. Eight patients had already delivered before they were referred for further management due to postpartum preeclampsia and eclampsia. A caesarean section is indicated in patients with recurrent seizures refractory to medical management, refractory severe hypertension ($> 160/110\text{mmHg}$), maternal or foetal deterioration without impending delivery and severe preeclampsia with unfavourable cervix (Shravya, 2019). The study reveals that, 59.17% of the patients presented with severe preeclampsia, others had maternal or foetal deterioration and an unfavourable cervix, and hence the percentage of caesarean section can be justified. Additionally, 14 of these pregnancies resulted in intra-uterine foetal death (IUFD). Two pregnancies were terminated at 23 and 24weeks gestation because of severe complications. The recovery rate from preeclampsia/ eclampsia vary; for some the signs and symptoms of preeclampsia stopped almost immediately after birth, for others it may take a few days or weeks, while for some it takes a few months (HERG, 2014). After being discharged home, women continued to have check-up access if there were any issues related to their having preeclampsia. These postnatal check-ups or follow-up clinics were done for six weeks. Thus 1–2 weeks' follow-ups after deliveries to evaluate the patients for BP control and any residual defects from the eclamptic seizure. If patients have persistent hypertension after 8weeks puerperium or neurologic changes then there would be the need for medical referral (Al-Safi et al., 2011). Hypertension in Pregnancy guidelines provided by

the American College of Obstetricians and Gynaecologists (ACOG) recommends blood pressure monitoring for at least 72 hours postpartum whether on admission or discharged and repeated from 7 to 10 days after delivery in women in whom a hypertensive disease of pregnancy is diagnosed (Garovic et al., 2022).

In this study, a maximum of 10 weeks postpartum monitoring/ reviews were done. The patients' records revealed that if the patient had blood pressure $\leq 120/90$ mmHg, the antihypertensive was withdrawn for two weeks. If it remains less than 140/90 mmHg till the sixth week without the antihypertensive, she is discharged from postnatal reviews. However, if the blood pressure remained $\geq 140/90$ mmHg, the medication is maintained and/or dosage increased. If after 8 weeks the blood pressure is still raised, the patient is asked to bring along records of home monitoring blood pressure for comparison, then referred to hypertension clinic. However, the number of patients reduced drastically from the first review schedule to next even if their blood pressure were high and on medications or not. As indicated in Fig. 1, 50.33% of the patients discharged home after delivery came for the review whilst 49.67% did not honour their postpartum reviews. Out of the patients reviewed, 68.42% came for 1st review whilst 20.53%, 6.84%, 3.16% and 1.01% came for 2nd, 3rd, 4th and 5th reviews respectively. This indicates clearly that most of the women defaulted their postpartum review appointments. A study by Hirsberg et al. showed that postpartum clinic, which occurred every other week, had an average of only 30% attendance over a 2-year period although it was staffed by maternal-fetal medicine specialists. Moreover, approximately 50% of patients were on readmissions in the first 7 days' post discharge due to hypertension-related problems. This was clearly before the scheduled clinic visit. Another strategy that was found to be ineffective was phone call reminders, because the women did not respond to calls and voice messages left by the practice. In fact, follow-up phone calls after discharge from the postpartum monitoring were not effective reminders (Hirshberg et al., 2017). The study revealed that one of the likely reasons for major decrease in postpartum surveillance was the fact that 85% of these patients were referrals from other regions and peripheral hospital according to their records, hence their postpartum monitoring could not be honoured in this hospital. However, there were no systems in place to find out how these patients were being monitored in the facilities they would be attending postnatal clinic in their respective regions or districts or if they did not honour it at all. It should however, be mentioned that even some of the patients who had their routine antenatal clinic at KATH did not honour their review appointment.

There is a need for close monitoring of women with severe hypertension on postpartum because of the risk of life threatening conditions such as intracranial haemorrhage, stroke, or reversible cerebral vasoconstriction syndrome (Bramham et al., 2013).

A study conducted by Cairni et al. states that home-based monitoring seems to have better prognostic value in essential hypertension than office BP measurement. Postnatal self-management could lead to better BP control, a reduced burden of healthcare visits and might improve women's long-term cardiovascular health. This trial showed that postnatal self-monitoring results in low BP postpartum and hence has a significant place in the postpartum management of hypertension disorders in pregnancy (Cairni et al., 2018). The average incoming BP in this study was 167.07/109.68 mmHg with 95% C.I of

[162.71, 171.43] and [103.12, 116.24] for systolic and diastolic blood pressures respectively. The average discharge blood pressure was 132.91/88.15mmHg with about 90% being on antihypertensive (nifedipine ± methyldopa). However, 26.15% of women reviewed after two weeks had blood pressure greater than 140/90mmHg. The prevalence of chronic hypertension, according to this study, of the reviewed patients was between 3.08% at 8 weeks, which corresponds with an estimation of 0.3%-28% incidence of new-onset postpartum hypertension in women (Bramham et al., 2013). The prevalence of chronic hypertension could even be higher if all study participant had honoured all their reviews. Even though some of them had raised blood pressure whilst on medication, they still could not complete their scheduled appointments, implying they might not know the importance of the reviews and the risk of having chronic hypertension. Those who were found to be hypertensive were referred to the hypertensive clinic for further management. These patients could be prevented from complications associated with uncontrolled hypertension.

CONCLUSION

The study revealed that pre-eclampsia primarily impacted women aged 30 and older, with the majority of participants being multiparous (parity 1–3) and presenting during late pregnancy (35–39 weeks' gestation). Severe pre-eclampsia was the predominant clinical manifestation, although eclampsia was observed in a minor percentage of patients. Upon admission, participants exhibited significantly increased blood pressure, which reduced considerably by discharge after therapy. Nevertheless, blood pressure remained elevated above the prescribed threshold in numerous women during postpartum follow-up, signifying that hypertension often persisted after delivery.

The results indicated that emergency caesarean section was the predominant obstetric intervention, highlighting the severity of the condition upon presentation. Despite the recommendation for postpartum blood pressure monitoring, only approximately sixty percent of women attended their planned postnatal review, leading to significant loss to follow-up. A significant percentage of individuals who returned for evaluation still exhibited hypertension despite receiving antihypertensive therapy, with some advancing to chronic hypertension necessitating referral for prolonged medical management.

In conclusion, although inpatient management effectively lowered blood pressure before discharge, a considerable number of women suffered from persistent postpartum hypertension, and inadequate attendance at postnatal follow-up may have hindered the timely identification and management of ongoing hypertension. These findings underscore the necessity of continuous postpartum blood pressure surveillance and compliance with follow-up care for women experiencing pre-eclampsia and eclampsia.

Nonetheless, it will be recommended that,

1. Healthcare facilities ought to establish organized postpartum follow-up systems, incorporating appointment reminders, telephonic follow-ups, and community-based monitoring, to enhance attendance at postnatal evaluations for women with pre-eclampsia and eclampsia.

2. Women treated for pre-eclampsia or eclampsia should undergo regular blood pressure testing for at least 6–10 weeks postpartum to assist early detection and management of persistent hypertension and chronic hypertension.
3. Healthcare providers must deliver thorough counseling on the significance of attending planned postnatal reviews, complying with prescribed antihypertensive drugs, identifying warning signals of persistent hypertension, and promptly seeking medical attention when symptoms arise.
4. Healthcare institutions must create and regularly apply defined clinical guidelines for the monitoring, modification, or cessation of antihypertensive treatment, as well as for the prompt referral of women with persistent hypertension to specialized medical care.
5. Considering the majority of women exhibited severe pre-eclampsia and many necessitated emergency caesarean sections, antenatal care services ought to enhance routine blood pressure monitoring, facilitate early diagnosis, and ensure prompt management of hypertensive disorders of pregnancy to mitigate disease severity and enhance maternal outcomes.

Abbreviation

KATH	Komfo Anokye Teaching Hospital
BP	Blood pressure
ACOG	American College of Obstetricians and Gynaecologists
IUFD	Intra-Uterine Foetal Death
CI	Confidence Interval
AMA	Advanced Maternal Age
mmHg	Millimetres Mercury
SPSS	Statistical Package for Social Sciences
A1HDU	A High Dependency Unit

Declarations

Ethical approval and consent to participate

Ethical Consideration

Ethical approval was sought from the Komfo Anokye Teaching Hospital Institutional Review Board (KATH-IRB) with reference number KATH-IRB/AP/044/20 and permission was sought from the Komfo Anokye Teaching Hospital, Research and Development unit as well as the Head of Department of

Obstetrics and Gynaecology. The information obtained from the research was used for the intended purpose only.

Consent to participate in this study is not applicable to this study because, the study used data already gathered on human subject. Data already gathered on human subject (patients) were retrieved from the records of patient database called Light-wave Health Information Management System (LHIMS) through institutional approval from Komfo Anokye Teaching Hospital, Kumasi, Ghana.

Consent for publication

Not applicable

Availability of data and materials

Data for this study is available upon reasonable request through the corresponding author.

Competing interests

The Authors declare that they have no competing interests

Funding

Self –funded

Author's Contributions

C.Y conceptualize the study title, study design and write up. D.A analyzed the data and interpreted the findings. I.A.Y did data extraction from patients medical records whereas M.N.A.O.A supervised and edited the final manuscript. All authors read and approved the final manuscript.

Acknowledgement

My greatest gratitude goes to the Almighty God for this opportunity given to me, and for His grace and mercy.

My sincere thanks go to Dr (Mrs.) Mercy Opare -Addo, my supervisor, for her encouragement and invaluable advice.

Special thanks go to Emmanuel Appiah Whajah, staff of the medical records unit, Komfo Anokye Teaching Hospital, for his immense support in retrieving patient folders and relevant information that formed the basis of the research.

I am also grateful to all Obstetrics and Gynecology Pharmacy staff for their support.

I also wish to thank my family for their outstanding support and prayers.

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Tables

Tables 1 to 3 are available in the supplementary files section

Figures

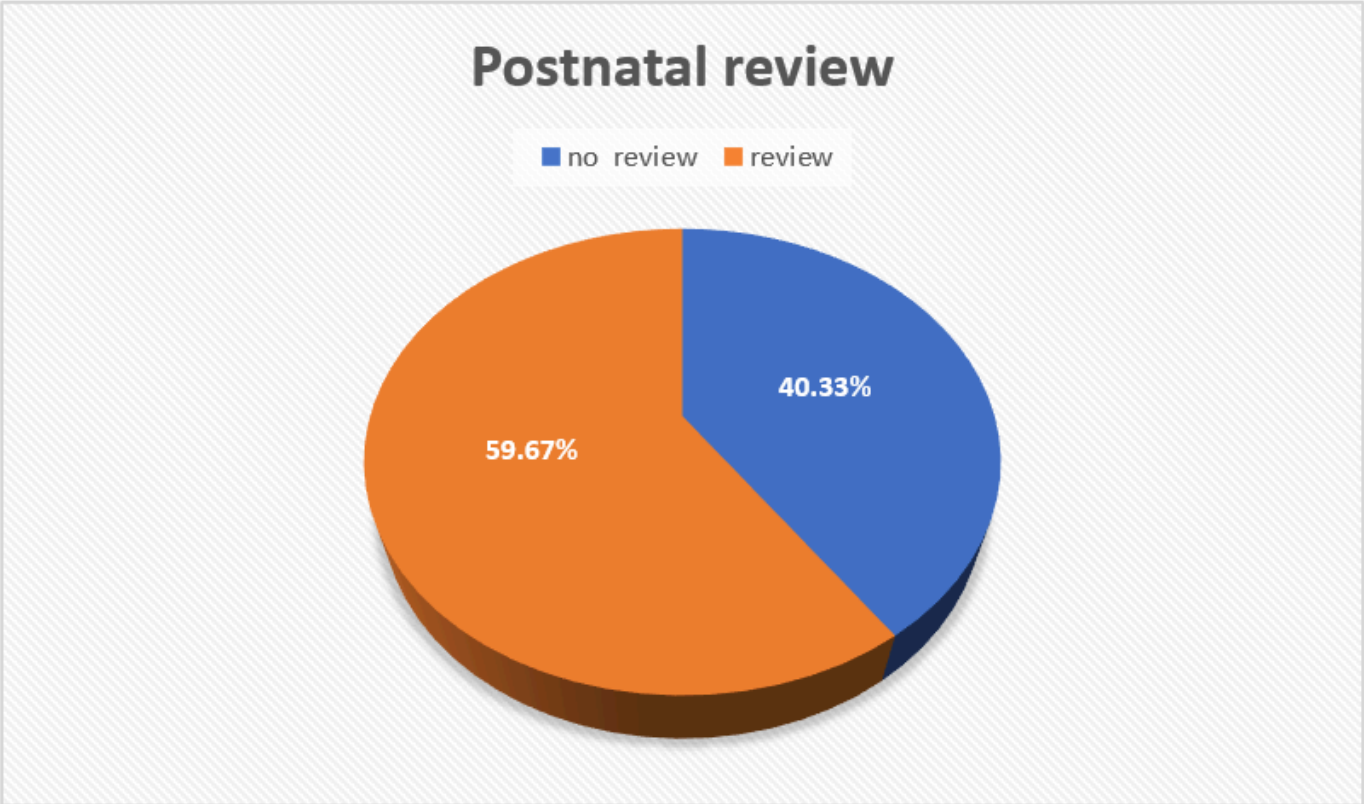


Figure 1

Postnatal reviews of study participants

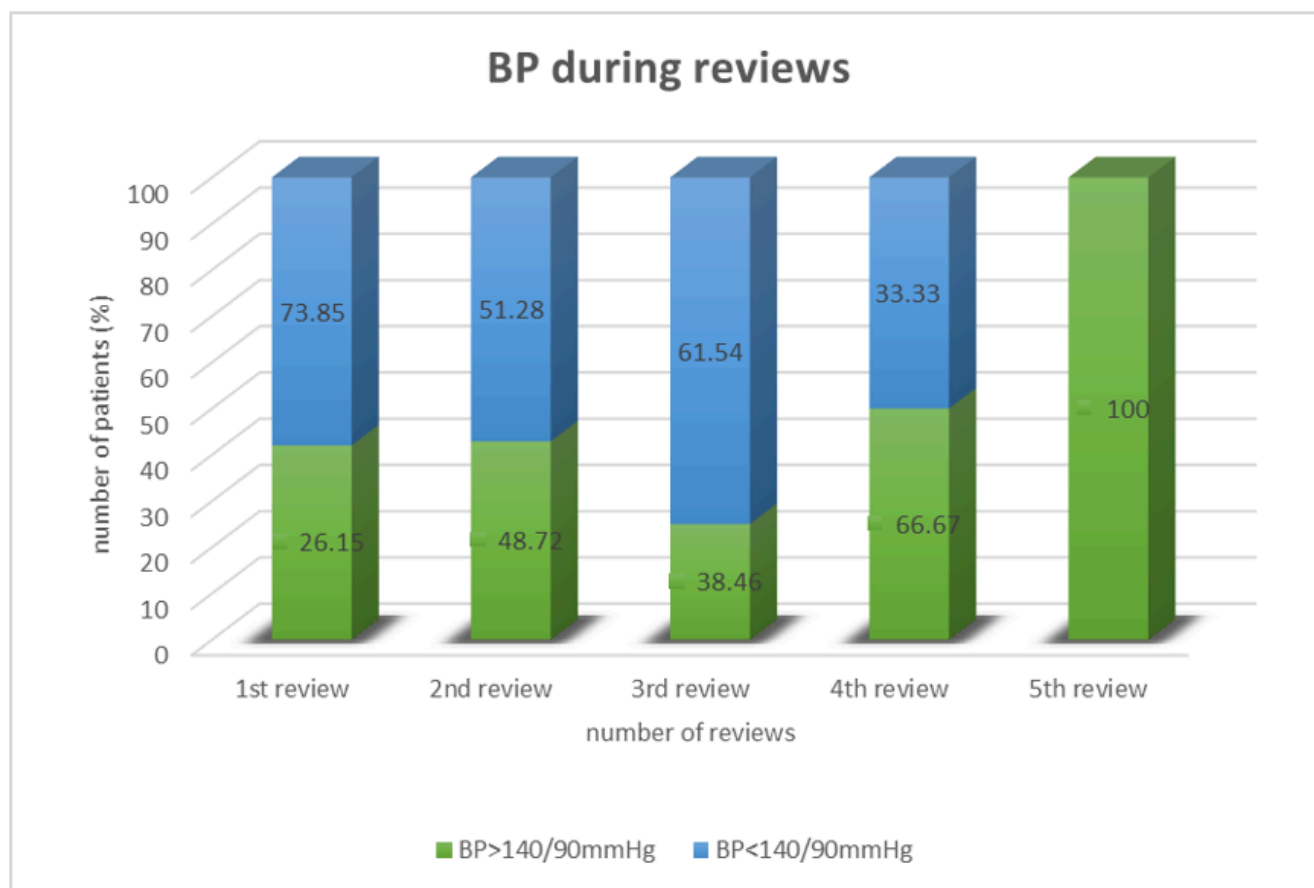


Figure 2

Prevalence of persistent hypertension during reviews

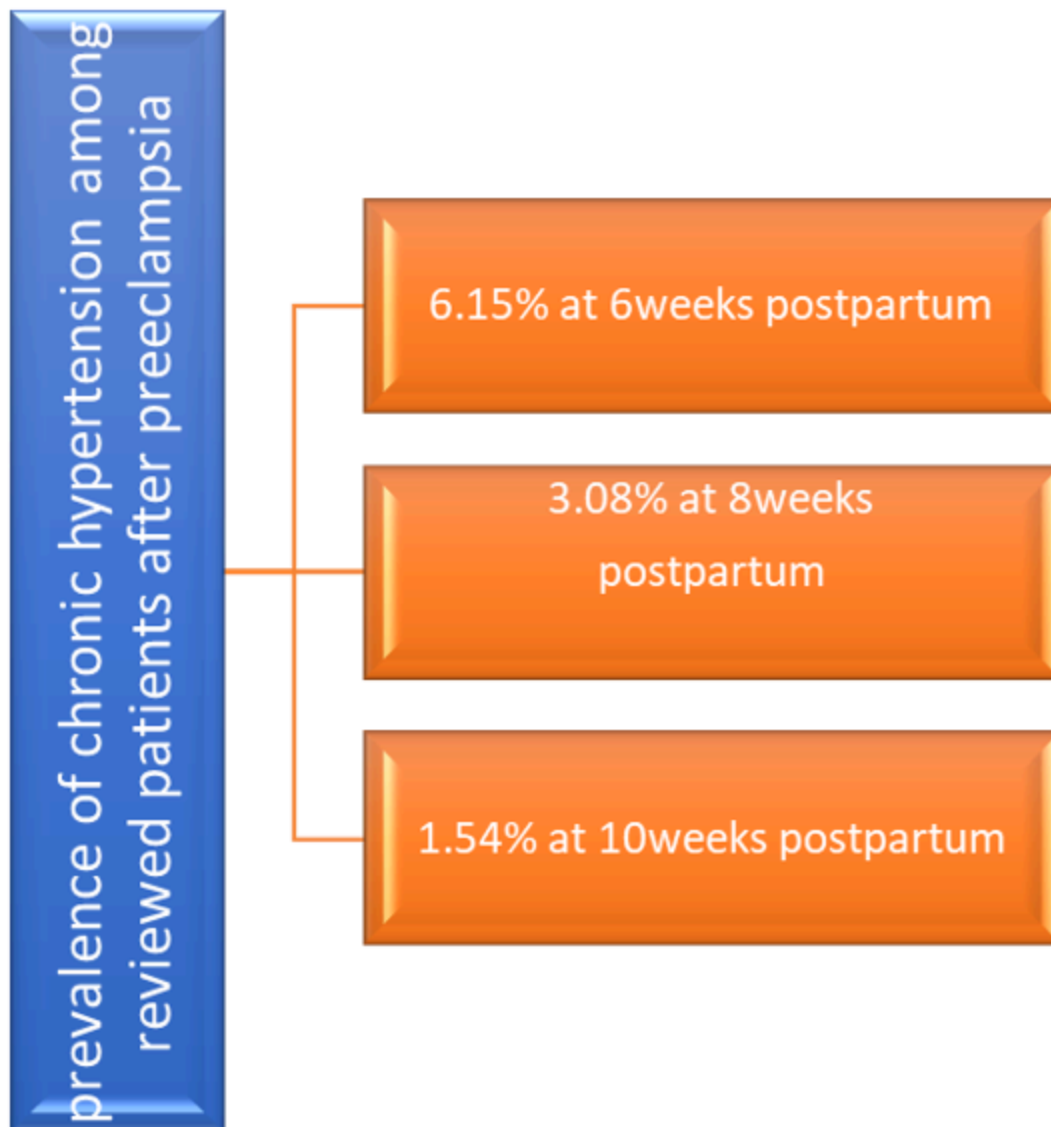


Figure 3

Prevalence of chronic hypertension among the sampled participants

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [APPENDICES.docx](#)
- [Tables.docx](#)