

Factors Affecting Antihypertensive Adherence Among Pregnant Women Receiving Antenatal Care At A Private Hospital, Ghana

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Abstract

Introduction: Hypertension is a chronic medical condition of elevated blood pressure (systolic/diastolic of 140/90 mmHg or more). Gestational hypertension is hypertension that occurs after 20 weeks of gestation in pregnant women with previously normal blood pressure. Adherence to antihypertensive treatment is crucial for effectively managing hypertension during pregnancy.

Aim: The aim of this study was to elucidate the factors affecting antihypertensive adherence among women receiving antenatal care.

Methods: This cross-sectional study used questionnaires to collect data on adherence to medications during pregnancy. Inclusion criteria were women attending antenatal care clinic at Family Health Hospital. Data collected were analyzed using the Statistical Package for Social Sciences (SPSS) version 27 and the results were summarized using frequency tables, percentages, pie charts, mean and standard deviation.

Results: There were 150 respondents. Risk factors of hypertension in pregnancy included salt intake 147 (98.0%), obesity 144 (96.0%), advanced maternal age 137 (91.3%), and family history 40 (26.7%). Almost all (149, 99%) of the respondents knew untreated hypertension risked maternal and fetal health. Most participants knew symptoms of high blood pressure included (148, 98.7%) and severe headache (124, 82.7%). Using scores (mean $\pm$ standard deviation) factors influencing medication non-adherence included forgetfulness (3.02 ± 0.39 of 5), concern about safety of medication mean 2.99 ± 0.433 and cost of the medications (2.93 ± 1.2).

Conclusion: The participants of the study were aware of the prevalence and risks of hypertension in pregnancy. Forgetfulness, safety concerns about medications and financial barriers caused non-adherence to antihypertensive during pregnancy. Education to ensure adherence to treatment is key as this ensures optimal blood pressure levels, a key element in the management of hypertension during pregnancy.

Keywords: Adherence to antihypertensive, chronic medical conditions, eclampsia, pregnancy-induced hypertension

Introduction

Hypertension is a chronic medical condition characterized by elevated blood pressure (systolic and diastolic blood pressures of 140/90 mmHg or more).¹ It is becoming more prevalent, and as such,

is emerging as one of the most important chronic conditions of public health concern.² The key element in the management of hypertension is adherence to treatment to ensure optimal blood pressure levels.³ Antihypertensive medications and diet are the first line in the management of high blood pressure.³

Pregnancy-Induced Hypertension (PIH) refers to conditions characterized by blood pressure rising during pregnancy and it is classified into gestational hypertension, preeclampsia, and eclampsia.¹⁻⁴ Pregnancy-induced hypertension or Gestational hypertension is defined as hypertension occurring after 20 weeks of gestation in women with previously normal blood pressure.^{2,3} Preeclampsia without severe features is characterized by systolic blood pressure ≥ 140 mmHg or diastolic blood pressure ≥ 90 mmHg or both and mostly with proteinuria.¹ Preeclampsia with severe features involves systolic blood pressure ≥ 160 mmHg or diastolic blood pressure ≥ 110 mmHg or both, or related symptoms and laboratory abnormalities.² Eclampsia is a severe type of pregnancy-induced hypertension involving elevated blood pressure and associated seizures, and it happens in about 1 in 1,600 pregnancies.^{2,4} Pregnancy-induced hypertension is a major contributor to maternal and perinatal morbidity and mortality. In the United States, about 15% of maternal deaths are attributable to hypertension, making it the second leading cause of maternal mortality.⁵ In Ghana, hypertensive disorders were found to complicate 12.7% of pregnancies in a major hospital, making it one of the most common medical disorders during pregnancy.⁶ Pregnancy complicated with hypertensive disorder is related to an increased risk of adverse fetal, neonatal and maternal outcomes.⁷ Severe hypertension increases the mother's risk of cardiac failure, heart attack, renal failure and cerebral vascular accidents.⁵ In addition, the fetus is at increased risk from complications like poor placental transfer of oxygen, growth restriction, preterm birth, placental abruption, stillbirth and neonatal death.⁵ Globally, hypertensive disorders represent the most common medical complications of pregnancy with a reported incidence of 5–10%.⁸ The World Health Organization estimates that at least one woman dies every seven minutes from complications of pregnancy-induced hypertension disorders.⁹

Non-adherence to medication can contribute significantly to treatment failure.¹⁰ Adverse effects, complex dosage schedules, and lack of understanding

of the condition are some of the topmost factors associated with poor adherence to anti-hypertensive medications in the general population and also in pregnant women.³ Good adherence to treatment for chronic hypertension and for pregnancy-induced conditions of elevated blood pressure, such as gestational hypertension, is important to optimize health outcomes for the mother and the fetus.¹¹ Thus, the objectives of the study are to assess adherence to anti-hypertensive medication by pregnant women and to identify the factors associated with adherence or non-adherence.

Methods

This cross-sectional descriptive study was done in the Family Health Hospital, located in Teshie, the Greater Accra region, Ghana from 4th to 31st March, 2023. The study population comprised of pregnant women who attended Antenatal Care (ANC) clinic at the Family Health Hospital at the time of the study. The inclusion criteria were pregnant women who were able to provide informed consent to participate in the study. The exclusion criteria were women who were unable to read the questionnaire, understand the written English or the explanation in the local language provided by the principal investigator or the research assistant helping in administering the questionnaire. The purpose of the study was explained to all participants who signed a consent form. Data was collected using self-administered questionnaire or an interviewer-administered questionnaire to participants who were less fluent in English and needed explanation in the local language of choice to help them answer correctly. The questionnaire included question about socio-demographics, knowledge on risk factors of hypertension, treatment, reasons for non-adherence to medications and the effect of hypertension on pregnancy outcome. Results were analyzed using SPSS version 27 and data was summarized using frequencies, percentages, pie charts, mean and standard deviation. Approval for the study was granted by the Ethical and Protocol Review Committee of the Department of Community Health, Family Health Medical School FHUC-EPRC-005/2023).

Results

One hundred and sixty of the 200 women approached met the inclusion criteria for the study. 152 agreed to participate and 2 were excluded for incomplete sociodemographic data. The sociodemographic data

of participants is shown in table 1. The majority of the participants (60.7%) were in the 19–28 years old range, most were married and all of them were religious. Eighty percent of the participants had more than primary education and 52% were self-employed.

Table 1 Sociodemographic Characteristics of study participants

Variable		Frequency	Percent
Age	<18	15	10
	19-28	91	60.7
	29-38	42	28
	39-48	2	1.3
Religion	Christian	102	68
	Muslim	48	32
Marital status	Married	118	78.7
	Single	17	11.3
	Cohabiting	15	10
Education level	No formal education	10	6.7
	Primary school	20	13.3
	Junior high school	22	14.7
	Senior High school	73	48.7
	Tertiary	25	16.7
Occupation	Unemployed	20	13.3
	Self-employed	78	52
	Government employee	48	32
	Private employee	4	2.7

Perceived risk factors for hypertension included salt intake 147 (98.0%), obesity 144 (96.0%), advanced maternal age 137 (91.3%) and family history 40 (26.7%). Most of the participants (124, 82.7%), believed hypertension can occur in pregnancy and

symptoms that can be associated with hypertension during pregnancy include: high blood pressure (98.7%), swelling (80.7%) and headaches (82.7%) (Table 2)

Table 2 Knowledge of symptoms associated with hypertension during pregnancy

Variable N (%)	True N (%)	False N (%)	Uncertain N (%)
High Blood Pressure	148 (98.7)	2 (1.3)	-
Swelling of hand and feet	121 (80.7)	29 (19.3)	-
Severe Headache	124 (82.7)	24 (16.2)	2 (1.3)
Blurred vision	40 (26.7)	84 (56.0)	26 (17.3)

Abbreviation: N, Frequency; %, Percentage of response

The majority (135, 90%) of respondents had ever been prescribed antihypertensive medications during pregnancy or lactation, in the previous or current pregnancy. Key factors that contribute to non-adherence to antihypertensive are shown in Table 3. The table includes mean scores (range of scores from 1 to 5) and standard deviations for each reason. The three most prominent reasons for medication non-adherence were forgetfulness (mean 3.02, SD 0.392), concerns about medication safety for the baby (mean 2.99, SD 0.433), and cost of medication (mean 2.93, SD 1.202).

Table 3 Key factors that contribute to non-adherence to antihypertensive medications

Variable	Mean score	STD
Forgetfulness	3.02	.392
Concerns about medication safety for the baby	2.99	.433
Cost of medication	2.93	1.202
Lack of understanding of adherence importance	2.13	.877
Cultural or religious beliefs	2.09	.827
Side effects experienced	1.80	.927

Abbreviation: STD, Standard Deviation

Using cross tabulation, there was no significant association between age group, religion, marital status, and occupation ($p > 0.05$) in this study (Table 4). However, knowledge level shows a significant association with adherence ($p = 0.02$). Individuals with high knowledge levels tend to have better adherence compared to those with average or low knowledge levels.(Table 5)

Table 4 Bivariate and multivariate analysis of risk factors

Variable	Good Adherence N (%)	Poor adherence N(%)	p-value
Age group			0.72
<18	4(26.7)	11(73.3)	
19-28	38(41.8)	53(58.7)	
29-38	17(40.5)	25(59.5)	
39-48	1(50.0)	1(50.0)	
Religion			0.17
Christian	23(47.9)	25(57.1)	
Muslim	37(36.3)	65(53.7)	
Marital Status			0.91
Single	7(41.2)	10(58.8)	
married	53(39.8)	80(60.2)	
Education			0.49
No formal Education	5(50)	5(50)	
Primary	8(40)	12(60)	
Junior High School	12(54.5)	10(45.5)	
Senior High School	25(34.2)	48(65.8)	
Tertiary	10(40.0)	15(60.0)	
Occupation			0.77
Government em- ployed	21(43.8)	27(56.3)	
Private employed	1()26.0)	3(75.0)	
Self employed	29(45.0)	49(62.8)	
Unemployed	9(45.0)	11(55.0)	
Knowledge			0.02*
High	42(47.7)	46(52.3)	
Average	15(34.9)	28(65.1)	
Low	3(15.8)	16(84.2)	

Abbreviation: N, Number or respondents; % percentage participants; *, Significance ($p < 0.05$)

The multiple regression analysis (bivariate and multivariate) between various independent variables and adherence to anti-hypertensive medication shows only knowledge of participants have significant association with adherence with anti-hypertensive medication with Crude Odds Ratio (COR) of 5.0 (95% C.I. 1.10-47.1) and an Adjusted Odds Ratio (AOR) of 4.7 (95% C.I. 1.14-38.50) (Table 5).

Table 5 Bivariate and multivariate analysis of risk factors

Variable	COR (95% C.I)	AOR (95 % C.I)
Age group		
>28	1.03(0.51-2.15)	1.05(0.47-2.28)
≤28		
Religion		
Christian	1.01(0.80- 3.24)	1.01(0.81- 3.15)
Muslim		
Marital status		
Single	1.06(0.37-2.84)	1.08(0.39-2.91)
Married		
Education		
No Formal Education	1.54(0.42-5.56)	1.59(0.41-4.54)
Formal Education		
Employment		
Unemployed	1.26(0.49-3.27)	1.25(0.48-3.25)
Employed		
Knowledge		
Poor	5.0(1.10-47.1)	4.7(1.14-38.50)
Good		

Discussion

Adherence to treatment for chronic and pregnancy-induced hypertension is important to optimize health outcomes for the mother and the fetus. Most pregnant women in this study knew that hypertension occurs in pregnancy, they were able to correctly identify some symptoms and risk factors associated with hypertension in pregnancy, and knew that untreated hypertension could affect both the mother and baby. High levels of knowledge (82.7%), majority of the respondents revealed that they did receive information or education about hypertension during pregnancy from a healthcare professional.

Regarding risk factors of hypertension, the majority of respondents believed obesity is a potential cause of hypertension during pregnancy, which is in tandem with the findings of Bellamy who stated that obesity is a risk factor for PIH.¹² The majority of respondents did not perceive PIH to be genetic or have a link to family history, which

opposes the findings of Zhang et al., which says PIH may be influenced by genetics.¹³ However, this study agreed with Zhang et al., and Roberts et al. that advanced maternal age was associated with PIH.^{13,14} Another risk factor is the high intake of salt, highly perceived by the respondents in this study to be a risk factor for PIH, in agreement with Heaman et al., who mentioned bad eating habits as a risk factor.¹⁵ Regarding symptoms that can be associated with hypertension during pregnancy, most participants identified high blood pressure, swelling in the hands and feet and severe headaches as symptoms of PIH which is true according to the Magee and American College of Obstetricians and Gynecologists (ACOG).^{2,3} However, in contrast to what these authors mentioned, this study had the majority having mixed feelings of blurred vision being a symptom of hypertension.

In contrast to a study by Kaufman and Birks, respondents in this study reported high rates of counseling from healthcare providers.¹⁶ This difference may be due to the attention patients receive from this private hospital which specializes in maternal health care with high level obstetricians and gynecologists.

The average knowledge on the potential side effects of anti-hypertensive which include dizziness, nausea, fatigue, and birth defect, were very low as compared to what was shared by the Mayo Clinic.¹⁷

The study revealed that majority of the pregnant women missed their prescribed antihypertensive medication during pregnancy as a result of forgetfulness just as Kaufman and Birks postulated.¹⁶ A common reason medication that was prescribed was missed could be attributed to negligence. Another factor that may contribute to missed medication is concerns about medication safety for the baby. The study reported an average level of concern. This suggests that some pregnant women have reservations regarding the safety of antihypertensive medication for their babies, which may influence their adherence behaviour. This assumption that medication non-adherence is based exclusively on lack of knowledge fails to recognize

that there are other factors which need to be considered to give a broader picture of the problem of non-adherence such as patient's beliefs.¹⁸ The lack of understanding about the importance of medication adherence suggested a low level of understanding among respondents, indicating that some pregnant women may not fully comprehend the significance of adhering to their prescribed antihypertensive medication regimen.¹⁸ Finally, the cost of medication emerged as a potential barrier to adherence. This indicates that the financial burden associated with obtaining antihypertensive medication may vary significantly among pregnant women, potentially influencing their ability to consistently adhere to their prescribed treatment.

The limitation of the study was the inability to distinguish between the types of antihypertensives which were used by the respondents making it seem that over 90% of the participants were on antihypertensives. This was not anticipated during the pretest and could have affected the prevalence of hypertension among pregnant women. However, the focus of the current study was on factors affecting the adherence so the knowledge that most of them had ever been prescribed antihypertensive treatment was an added value, knowing respondents have experience on the subject matter. The strength of the study is the fact that it reported respondents' real experiences and motives for adherence or non-adherence to antihypertensive in pregnancy.

The results suggest that many pregnant women, for lack of understanding of the benefits of antihypertensives, may default on management leading to adverse pregnancy outcomes. We therefore, recommend extensive explanation of the benefits of adherence to antihypertensive treatment in pregnancy to help increase adherence for positive outcome.

Conclusion

The study revealed that majority of pregnant women recognized that hypertension can occur during pregnancy. The study identified symptoms associated with hypertension during pregnancy, including high blood pressure, Swelling of hands and feet, and severe headaches. Respondents strongly affirmed that untreated hypertension during pregnancy poses risks to both the mother and the baby. The study emphasized that non-adherence to prescribed medication was influenced by factors beyond lack of knowledge, such as forgetfulness. Thus, further studies must be conducted to properly elucidate more factors affecting antihypertensive adherence in order to effectively manage hypertension and increase positive outcomes among women during pregnancy.

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Conflict of Interest

The authors declare that they have no competing interest.

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