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Prevalence rate for hypertensive disorders of pregnancy and correlates for women admitted to the maternity ward of a tertiary hospital in Zambia

Siphiwe Shaba*, Seter Siziya

School of Medicine, The Copperbelt University, Ndola, Zambia

ABSTRACT

Background: Hypertensive disorders of pregnancy are one of the leading causes of morbidity and mortality amongst pregnant women. The objectives of the study were to determine the prevalence rate and correlates for hypertensive disorders of pregnancy. **Method:** The study was a cross sectional study done at Ndola Central Hospital in Zambia. The statistical tests used in the analysis of the data were Chi square and Fisher's exact test. The level of significance was 0.05. **Results:** Records were extracted for 248 pregnant women with mean (SD) age of 25.6 (6.96) years and BMI of 25.4 (4.09) Kg/m^2. About a third (35.1%) was of gravida 1 and 8.9% had a family history of hypertension. The prevalence rate of hypertensive disorders of pregnancy was 17.7%. For every unit change of BMI, respondents were 1.17 (95% CI [1.08, 1.27]) times more likely to develop hypertensive disorders of pregnancy. Respondents who had negative family history of hypertension were 58% (AOR=0.42(95% CI [0.26, 0.69]) less likely to develop hypertensive disorders compared to respondents who had a positive family history of hypertension. **Conclusion:** The prevalence rate of hypertensive disorders of pregnancy was high. Regular monitoring of BMI may help to curtail the magnitude of these disorders.

Keywords: Correlates, Disorders, Hypertensive, Pregnancy, Prevalence, Zambia

Introduction

Reduction of maternal death is a high priority for the international community. One of the leading causes of maternal morbidity and mortality are a group of diseases referred to as hypertensive disorders of pregnancy. These hypertensive disorders include a wide spectrum of diseases including; pregnancy induced hypertension, preeclampsia, eclampsia, preeclampsia superimposed on hypertension. Hypertensive disorders of pregnancy can affect normotensive individuals as well as hypertensive individuals. Hypertensive disorders of pregnancy are diseases that usually occur in the second half of pregnancy (gestational age of greater than 20 weeks). Worldwide, hypertension disorders of pregnancy have been estimated to affect 6-8% of all pregnancies [1]. Some studies have estimated the prevalence of hypertensive disorders to be higher, 15% in Harare Zimbabwe [2] and 17% in Nigeria [3].The exact cause of hypertensive disorders of pregnancy is unknown.

**Correspondence*
Siphiwe Shaba
School of Medicine, The Copperbelt University, Ndola, Zambia.
E Mail: siphiweshaba@yahoo.com

However, various risk factors have been attributed to the development of these disorders. These risk factors include extreme of age, gravidity [4], preexisting hypertension [5], diabetes [6], multiple pregnancy [7], obesity [8] and long inter-pregnancy and race [4]. Other factors include smoking, socioeconomic level, diet, season and climate [9].Obesity has been shown to increase the risk of developing hypertensive disorders of pregnancy [10, 2, 11]. Another study noted that obese women were at a higher risk of preeclampsia compared to those with a normal BMI [12].Similar studies have been done in Zambia however, these studies focused on mainly preeclampsia in Lusaka (one of the hypertensive disorders) [13]. Hence to our knowledge this is the first study done in Zambia encompassing all the hypertensive disorders of pregnancy. The general objective of the study was to determine the prevalence rate and risk factors for hypertensive disorders in women admitted to the maternity ward of Ndola Central hospital.

Method

The study was a hospital based cross sectional study. Data was collected from patients' medical records.

These records were reviewed for the period December 2014 to February 2015.

Study site

The study was carried out at Ndola Central Hospital. Ndola Central Hospital is a tertiary institution; hence it serves as a referral Centre. It is the second largest hospital in Zambia. The hospital is located in Ndola city the provincial capital of the Copperbelt province. It is the second largest city after Lusaka, the capital city of Zambia

Sample size and sampling method.

The total number of files reviewed was 248 determined using Startcalc in EpiInfo version 6.The parameters used in the computation of the sample size were population size 700, prevalence 50+5% (since no prevalence was known) and confidence level of 95%.

Data collection tool, data entry method and analysis

Data collection tool used in the study was the data sheet which had clinical diagnosis, maternal age, gravidity, BMI and family history of hypertension. Data was entered using Microsoft Excel 2010. Data was then exported to SPSS for windows version 16.0 for analysis. Frequencies of risk factors were compared using Chi square test and Fisher's exact test, where appropriate. Multivariate logistic regression analysis was done to assess the independence of the variables in the study namely maternal age, gravidity, BMI and family history of hypertension in their association with the outcome (hypertensive disorders of pregnancy). The cut off point for standard significance was set at 5%.Adjusted odds ratios and their 95% confidence intervals were reported.

Results

Out of 248 patients' records that were reviewed, 44 (17.7%) patients had various types of hypertensive disorders of pregnancy as the clinical diagnosis.

Table 1 shows that the mean (SD) age of women who were involved in the study was 25.6 (6.96) years. The mean (SD) body mass index was 25.4(4.09) Kg/m^2. About a third (35.1%) of women in the study had their first pregnancy and 18.1% had more than 5 pregnancies. Twenty two (8.9%) women had a positive family history of hypertension.

Table 2 shows association of various risk factors with the occurrence of hypertensive disorders of pregnancy. A positive occurrence had a mean (SD) age of 25(6.5) years and 28.5 (8.4) years was a mean of negative occurrence. A positive occurrence mean (SD) body mass index was 27.7 (5.4) kg/m^2 compared to 24.9 (3.6) of negative occurrence. The lowest positive occurrence was observed in women who were gravida 2(8.3%).Family history of hypertension as a risk factor reviewed that 45.5% of the women with a positive family history of hypertension developed hypertensive disorders of pregnancy compared to 15% of women with a negative family history of hypertension. Table 3 revealed only two of the factors in the study was significantly associated with development of hypertensive disorders of pregnancy. These were BMI with an adjusted odds ratio of 1.17 (95% CI [1.08, 1.27]). Hence for every unit change in BMI women were 1.17 times more likely to develop hypertensive disorders. Women with negative family history of hypertension had an adjusted odds ratio of 0.42 (95% CI [0.26, 0.69]). These women were 58% less likely to develop hypertensive disorders compared to those with a positive family history.

Table 1: Description of the sample by risk factors

Risk Factor	Mean	Standard Deviation
AGE (years)	25.6	6.96
BMI	25.4	4.09
	Frequency	Percentage
GRAVIDITY (number of pregnancy)		
1	87	35.1
2	60	24.2
3-4	56	22.6
5+	45	18.1
FAMILY HISTORY OF HYPERTENSION		
Positive	22	8.9
Negative	226	91.1

Table 2: Associations of Age, BMI, gravidity and family history of hypertension with occurrence of hypertensive disorders of pregnancy

Factor	Total		Occurrence				P-Value
			Positive		Negative		
			Mean(SD)		Mean(SD)		
Age	248		25.0 (6.5)		28.5 (8.4)		0.012
BMI	248		27.7 (5.4)		24.9 (3.6)		0.001
	n	(%)	n	(%)	n	(%)	
Gravidity							0.024
1	87	(100)	14	(16.1)	73	(83.9)	
2	60	(100)	5	(8.3)	55	(91.7)	
3-4	56	(100)	45	(19.6)	11	(80.4)	
>5	45	(100)	14	(31.1)	31	(68.9)	
Family history of hypertension							0.001
negative	226	(100)	34	(15.0)	192	(85)	
positive	22	(100)	10	(45.5)	12	(54.5)	

Table 3: Multivariate adjusted odds ratios of body mass index and family history of hypertension for hypertensive disorders

Factor	Adjusted Odd Ratio	95% confidence interval
Body Mass Index	1.17	1.08, 1.27
Family history of hypertension		
Negative	0.42	0.26, 0.69
Positive	1	

Discussion

To our knowledge this is the first study of its kind done in Ndola, Zambia. The prevalence rate of hypertensive disorders of pregnancy was observed to be 17.7% with significant risk factors being maternal body mass index and family history of hypertension. The prevalence of hypertensive disorder of pregnancy in the current study is similar to the prevalence of 17% found in a longitudinal study done in Nigeria [3] and Finland [14] but higher than that reported worldwide figure of 6-8% [1]. Study in Ethiopia and China also reported lower prevalence rates of 8.5% [15] and5.22 % [16] respectively. Reasons for the current studies to have a higher prevalence rate of hypertensive disorders is that the study was done from a hospital which is a referral Centre that receives among others complicated cases of pregnancy, including hypertensive disorders. The study done in Nigeria was also done at a referral Centre [3]. However, the Ethiopian study was done at a specialized health institution [15] and the one in China encompassed 30 different hospitals both secondary and tertiary institutions in all 14 provinces [16].The current study reports that one became 1.17 times more likely to develop hypertensive disorders of pregnancy with a unit change of body mass index. Similar results were noted in a study by Singh et.al, who found that BMI >27 kg/m^2 was significantly associated with the risk of the development of Hypertensive disorders of pregnancy [3]. Another study stated that the risk of preeclampsia (one of the hypertensive disorders of pregnancy) typically doubled with each 5–7 kg/m^2 increase in pregnancy body mass index [9]. A similar finding to the current studies was found in white

women with BMI of 25-30 in a study by Bodnar [17].Family history of hypertension also had a significant relationship with hypertensive disorders of pregnancy in the study. Women with a negative family history of hypertension were less likely to develop hypertensive disorders of pregnancy than those with a positive family history. A study done in Ghana showed that women with a positive family history of hypertension had an increased risk of developing hypertensive disorders [12]. Similar findings were also reported in a study done in China [16], Nigeria [18] and Ethiopia [19] which revealed that family histories of hypertension was a risk factor of developing hypertensive disorders of pregnancy.

Limitations

In this study women who took part in the study were of gestation ages above 28 completed weeks. However hypertensive disorders of pregnancy are diseases of the 20 weeks onwards. Women with gestational ages above 20 weeks but below 28 weeks were not included. This is because the women admitted to the maternity ward of the named institution are only those above the age of viability of the country which is 28 week. Women with pregnancies less than 28 weeks are admitted to a different ward. The prevalence rate of hypertensive disorders of pregnancy could be higher than that reported if all women with gestational age of more than 20 weeks were included. The current study was relied on the information obtained from the case record file. Missing data could have introduced bias in our findings. Another limitation is that it was an on-random sample whose results cannot be generalized. However, it is the belief participants in the study were not different from those who were not added.

Conclusion

In conclusion, the prevalence rate of hypertensive disorders of pregnancy was high. Women should have their BMI monitored regularly to reduce the magnitude of this condition.

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