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■ Original Research Article

Prevalence and Determinants of Hypertension in Pregnancy (Hip) in Benue South Senatorial Zone

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ABSTRACT

Background: Hypertension in pregnancy (HIP) represent a major cause of maternal and perinatal morbidity and mortality globally, especially in Sub-Saharan Africa. There is paucity of reported study on prevalence and determinants of HIP in Benue South. Aim: To determine the prevalence and the determinants of HIP in Benue South, Nigeria. Materials and Methods: This was a descriptive cross-sectional study among 275 consenting pregnant women with HIP attending the antenatal clinics in General hospitals in 4 selected Local Government Areas (LGAs) in Benue South. Ethical clearance was obtained from the ethical committee of the committee of the Federal University of Health Sciences Otukpo (FUHSO). Data was collected using a pretested structured online questionnaire and analysed with SPSS software version 20.0. The result was presented in textual forms, charts and tables. Results: Out of 275 study participants 14 had HIP given a prevalence 5.1%. The median gestational age at diagnosis was 17 weeks. The determinants of HIP in Benue South in this study were the age groups 16-25 (aOR=0.00,CI=0.00-0.55,p-vaue=0.029) and 26-35 (aOR=0.00,CI=0.00-0.79), history of chronic hypertension (aOR=0.01, CI=0.00-0.43,p-value=0.016) and family history of HIP (aOR=0.02,CI=0.00-0.409, p-value=0.012). Conclusion: This present study demonstrated high prevalence of HIP. There is need for continuous education on the risk factors of HIP for the public and the caregivers. Policy needs to be put in place on strategies to prevent the disease as well as its adverse pregnancy outcomes

Key Words: prevalence, hypertension in pregnancy, determinants, Benue South.

INTRODUCTION

Hypertensive disorders represent one of the most common problems of pregnancy and causes of increased maternal and perinatal morbidity and mortality globally, particularly in developing countries like Nigeria[1]. The prevalence of hypertension in pregnancy (HIP) varies in the range of 1-35% around the world[2]. In United States of America, the prevalence of HIP was reported as at the range of 10.3%-28.1% [3]. In another study in the same country the authors reported the overall prevalence of HIP to be 8.6%, with chronic hypertension (1.9%), gestational hypertension (6.5%), and eclampsia (0.3%)[4]. The prevalence of HIP in Bengaluru, Southern India was at 13.9% and HIP was mostly

due advance maternal age, moderate to low social support and obesity[5]. In China it was documented to be 7.3%; 3.3% for gestational hypertension, 4.5% for preeclampsia, 2.0% for mild preeclampsia, 0.6% for chronic hypertension (CH), and 9.6% for chronic hypertension with superimposed preeclampsia in the study conducted by Fang et al[6]. Estimates of prevalence of HIP and the clinical subtypes varied substantially by region and residential area, with the highest among women of Western, and Northern China women with affluent lifestyle and in women who were age 35 and above, overweight or obese[6].

In a work done by Gemechu *et al* in sub-saharan Africa (SSA) they found out that the pooled prevalence of HIP in SSA was 8%, with preeclampsia 4.1% and gestational hypertension 4.1%, chronic hypertension (0.9%) and eclampsia (1.5%) being the less common types of hypertension in pregnancy[7]. It was also reported in Sokoto, Northwest of Nigeria, to be 17% and with preeclampsia 6%[1]. In another study in Nigeria, southwest, a prevalence of 7.2% was documented, among whom 55.9% were preeclampsia-eclampsia, 35.3% as gestational hypertension, 5.9% as chronic hypertension and 2.9% as preeclampsia superimposed on chronic hypertension [8]. In a study carried out in Abuja; North central, Nigeria, the author reported that HIP was mostly determined by family history of preeclampsia, past history of preeclampsia, multifoetal gestation, and chronic hypertension[9].

According to a recent report from the World Health Organization (WHO), hypertensive disorders of pregnancy (HDP) are the leading cause of maternal mortality in some African Countries [10]. Globally, 2.73% of women suffer from HDP while the incidence of chronic hypertension, preeclampsia, and eclampsia are 0.29%, 2.16% and 0.28%, respectively[11]. HDP have contributed 14% to maternal mortality worldwide[12]. In addition, HDP also contribute to adverse fetal outcomes, increased the risk of preterm birth, stillbirth, small for gestational age, neonatal death and exposes the mother to an emergency cesarean section [13-15].
Evidence on the factors that determines HIP globally is limited[16] and there is also paucity of reported study on prevalence of HIP in Benue State, Nigeria. This study therefore becomes necessary to determine the prevalence of HIP and its determinants in Benue South Senatorial District.

SUBJECTS AND METHODS

Study Area

Benue State is one of the North Central States in the middle belt region of Nigeria. The state occupies a landmass of 34,059 square kilometers with the geographic coordinates as longitude 7o 47' and 10o 0' East, Latitude 6o 25' and 8o 8' North, and an estimated population of 4,253,641 in the 2006 census. Benue State is inhabited predominantly by the TIV, Etulo, Idoma and Igede speaking people.

Benue State has 23 Local Governments Areas (LGA) and it's divided into three (3) Senatorial Districts. They are Benue Northwest Senatorial District, Benue North East Senatorial District, and Benue South Senatorial District. Benue South Senatorial District has nine (9) LGAs, namely: Ado Local Government Area, Agatu Local Government Area, Apa Local Government Area, Obi Local Government Area, Ogbadibo Local Government Area, Oju Local Government Area, Ohimini Local Government Area, Okpokwu Local Government Area and Otukpo Local Government Area.[24]

This study was conducted in 3 General Hospitals and 1 Missionary Hospital (Saint Mary's Hospital Okpoga) in four Local Government Areas (LGAs) [Otukpo, Okpoga, Ohimini, and Agatu] of Benue South Senatorial district.

Study Design

This was a health facility based descriptive cross-sectional study design.

Study Population

The study population comprises all pregnant women attending antenatal clinics in the selected health facilities.

Inclusion Criteria

All pregnant women were included in this study.

Exclusion Criteria

- Pregnant women who were critically ill were excluded from the study.
- Pregnant women who did not give consent.

Sample Size Calculation

The sample size was calculated using the formula for cross-sectional study when parameters are in normal proportion[17].
$N=Zn^2 \times PQ/E^2$
Where;
N= sample size
Zn^2 = normal deviation for two-tailed alternative hypothesis at 5% level of significance which is 1.96.
P= Prevalence or proportion (prevalence of hypertension in pregnancy 17% from previous study in Sokoto (UDUTH), Northwest Nigeria) [1].
E= Precision or the margin of error, which is taken as 0.05(5%).
Therefore, $N= (1.96)^2 \times 17 \times 83/ (5)^2$
=216.8
Using a non-response rate of 10% the total sample size will be N=238.

A total of 275 study participants was recruited for this study.

Sampling Technique

A purposive sampling technique was used to select the hospitals for the study, while a convenient sampling technique was used to recruit the study participants. The study participants were consecutively recruited from the selected hospitals' antenatal clinics until the required sample size was met.

Ethical Clearance and Consent

An informed consent was obtained from each of the study participants and the ethical clearance was obtained from the Ethical Committee of Federal University of Health Sciences Otukpo (FUHSO-HREC/02/05/2023-03/05/2023).

Hypertension in Pregnancy (HIP)

HIP was defined as high blood pressure (≥140/90mmHg) in pregnancy, measured 2 times, (six hours apart by trained data collectors with or without significant proteinuria. In this study, significant proteinuria was defined as proteinuria of ++ or more (≥ 100mg/dl) on dip stick urinalysis test using a clean catch urine.

Data Collection

Data was collected from patient's medical records, interview and measurements using pretested structured on-line questionnaire using Kobocollect by trained researcher. In addition to the biodata, other information collected include determinants of Hypertension in Pregnancy such as the literacy level and socio-economic status, history of chronic hypertension, history of preeclampsia in the previous pregnancy(ies), family history of hypertension in pregnancy, family history of chronic hypertension, parity, Age of the pregnant women and the number of fetus.

The Blood pressure of the study participants were measured while seated upright on a chair. The non-dominant arm was supported at the level of the heart on a table ensuring that no tight clothing constricts the arm. The cuff of the mercury sphygmomanometer (Accoson brand) was placed on the arm with the center of the bladder over the brachial artery. The lower edge of the cuff was placed 2-3 cm above the point of the pulsation of the brachial artery. The bladder encircled at least 80% of the arm. The systolic blood pressure was estimated by palpating the radial artery and inflating the cuff until pulsation disappears. The cuff was then deflated, and systolic blood pressure estimated. The sphygmomanometer was then inflated 30mmHg above the estimated systolic needed to occlude the pulse. A stethoscope diaphragm was then placed over the brachial artery and deflated at a rate of 2-3 mmHg/second until regular tapping sounds were heard. The systolic blood pressure was estimated at the level when the first sound was heard and diastolic blood pressure was estimated at the level when the sound muffled (Korotkoff phase IV) and these were measured to the nearest 2 mmHg.

Data Analysis

Data was analyzed with the Statistical Package for Social Sciences (SPSS) software version 20.0. Frequencies and percentages were calculated. Variables with p-value less than 0.25 in binary logistic regression analysis was subjected to multivariable logistic regression analysis to control confounders. Odds ratio with 95% confidence interval was used to examine associations between dependent and independent variables. P-value less than 0.05 was considered significant. Finally, the result was presented with tables, charts and textual forms.

Outcome Measures

1. The Prevalence of hypertension in pregnancy in Benue South.
2. Determinants of Hypertension in Pregnancy (HIP) in Benue South.

RESULTS

Out of a total of 275 study participants, 14 had HIP giving a prevalence of 5.1%.

Table 1 shows the sociodemographic characteristics of the study participants. The mean age was 27.47±6.43. Majority of the study participants were in the age group 26-35(58.5%), Idoma (86.5%), Christians 251 (91.3%) and with secondary level of education113 (41.1%). Most of the study participants were of small-scale business 98(35.6%) and monthly income of < 30,000 (68.7%). Agatu local Government Area account for the majority of the study population of 100(36.4%).

Table 2 shows the clinical characteristics of the study participants. Most of the study participants with previous pregnancies, miscarriages, and previous deliveries belongs to 1-4 group (46.2%), no miscarriages (82.2%), and multipara 143 (52.0%) respectively. Majority of the study participants had anaemia 192(69.8%). Most of the study participants, 199 (92.6%) had spontaneous vaginal delivery (SVD). Majority, 184 (66.9%) had not used contraception previously while the most frequently used method of contraception was implants 29(32.2%) among the study participants.

Table 3 shows the laboratory characteristics of study participants. The majority, 257(93.5%) of the study participants at booking had negative urinalysis for protein, glucose 271(98.5%), nitrites 271(98.5%), and blood 275 (100%). Most of the study participants at diagnosis had urinalysis negative for protein 261(94.9%), glucose 273(99.3%), nitrites274 (99.6%), and blood 275(100%). For

those with proteinuria, 11(4.0%) had one plus (1+) of protein and 13 (4.7%) had mild degree of proteinuria

Table 1 Sociodemographic Characteristics of Study Participants (n=275)

Variables	Frequency	Percent
Age (in years)		
16-25	90	32.7
26-35	161	58.5
36-45	15	5.5
46-55	9	3.3
Mean Age =27.47±6.43		
Tribe		
Idoma	238	86.5
Tiv	8	2.9
Igbo	15	5.5
Hausa	9	3.3
Yoruba	2	.7
Others	3	1.1
Religion		
Christianity	251	91.3
Islam	24	8.7
Level of Education		
Tertiary	74	26.9
Secondary	113	41.1
Primary	57	20.7
None	31	11.3
Occupation		
Small scale business	98	35.6
Large scale business	11	4.0
Junior civil servant	40	14.5
Student/full time housewife	67	24.4
Farming	59	21.5
Income per Month		
≤30000	189	68.7
30001-50000	18	6.5
50001-80000	44	16.0
80001-110000	17	6.2
>110000	7	2.5
Median Income=20,000		
Local Government Areas		
Okpokwu	67	24.4
Agatu	100	36.4
Otukpo	59	21.5
Ohimini	49	17.8
Hospitals		
ST Mary's Hospital Okpoga	67	24.4
GH Otukpo	59	21.5
GH Idekpa	49	17.8
GH Obagaji	46	16.7
CHC Obagaji	54	19.6

Table 2 Clinical Characteristics of Study Participants(n=275)

Variables	Frequency	Percent
Total number of previous pregnancies		
0	53	19.3
1-4	127	46.2
>=5	95	34.5
Number of miscarriages/abortions		
0	226	82.2
1	32	11.6
2	13	4.7
3	2	.7
>3	2	.7
Number of previous deliveries		
Nullipara	65	23.6
Multipara	43	52.0
Grandmultipara	67	24.4
Body Mass Index		
Underweight	3	1.1
Normal Weight	168	61.1
Overweight	76	27.6
Obesity	28	10.2
Mean BMI (kg/m2) =24.97±3.78		
Mean Weight (Kg)=69.47±10.69		
Mean Height(metres)=1.67±06		
Anaemia in Pregnancy		
Yes	192	69.8
No	83	30.2
Mode of of previous delivery		
SVD	199	92.6
CS	16	7.4
History of post-partum complications		
Nil	245	89.1
Bleeding	15	5.5
Fever	11	4.0
Anaemia	4	1.5
Ever used family planning?		
No	184	66.9
Yes	91	33.1
Previous Methods of Family Planning Used		
Injectable	14	15.6
Implants	29	32.2
Oral contraceptive pills	12	13.3
Condoms	25	27.8
IUCD	7	7.8
Injectables IUCD Implants	1	1.1
Implants condoms	1	1.1
Injectables Implants	1	1.1

Table 4 shows the sociodemographic determinants of hypertension in pregnancy. The age (Fishers Exact Test= 12.774, p-value=0.003), LGAs (Fishers Exact Test=19.359, p-value<0.001, occupation (Fishers Exact Test= 9.275, p-value=0.032) and monthly income (Fishers Exact Test= 14.600, p-value=0.003) were statistically significant with p-value < 0.05 on bivariate analysis.

Table 5 shows the clinical determinants of hypertension in pregnancy. The total number of previous pregnancies (Fishers Exact Test= 8.625, p-value=0.008), BMI (Fishers Exact Test= 11.533, p-value=0.007), history of chronic hypertension (Fishers Exact Test= 17.912, p-value=0.000), history of preeclampsia(Fishers Exact Test= 31.778, p-value<0.001), family history of hypertension in pregnancy(Fishers Exact Test= 18.621, p-value<0.001) and family history of chronic hypertension(Fishers Exact Test=

5.652, p-value=0.017) were statistically significant on bivariate analysis (p-value <0.05).

Table 6 shows multiple logistic regression analysis of the determinants of hypertension in pregnancy. Only the study participants in the age groups 16-25 (aOR=0.00, CI=0.00-0.55,p-vaue=0.029) and 26-35 (aOR=0.00,CI=0.00-0.79), history of chronic hypertension (aOR=0.01, CI=0.00-0.43,p-value=0.016) and family history of hypertension in pregnancy (aOR=0.02,CI=0.00-0.409, p-value=0.012) were statistically significant.

Table 3 Laboratory Characteristics of Study Participants (n=275)

Variables	Frequency	%
Urinalysis at booking (protein)		
Negative	257	93.5
Positive	18	6.5
Urinalysis at booking (glucose)		
Negative	271	98.5
Positive	4	1.5
Urinalysis at booking (nitrites)		
Negative	271	98.5
Positive	4	1.5
Urinalysis at booking (blood)		
Negative	275	100.0
Urinalysis at diagnosis of hypertension (protein)		
Negative	261	94.9
Positive	14	5.1
Proteinuria at Diagnosis of Hypertension		
- Neg	261	94.9
+ Pos	11	4.0
++ Pos	2	.7
+++ Pos	1	.4
Degree of Proteinuria		
Mild	13	4.7
Severe	1	.4
Urinalysis at diagnosis of hypertension (glucose)		
Negative	273	99.3
Positive	2	.7
Urinalysis at diagnosis of hypertension (nitrites)		
Negative	274	99.6
Positive	1	.4
Urinalysis at diagnosis of hypertension (blood)		
Negative	275	100.0

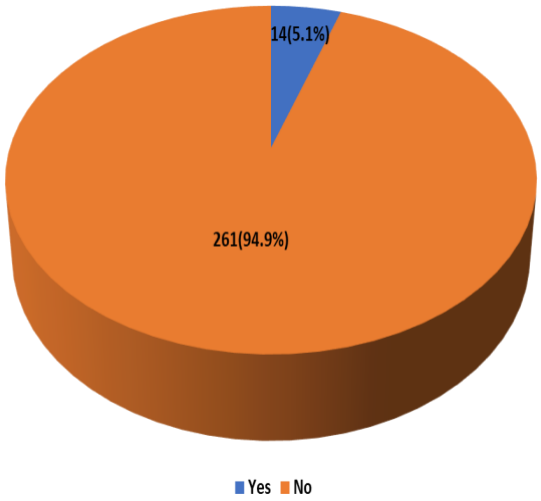

Figure 1: Prevalence of Hypertension in pregnancy in Benue South Senatorial District.

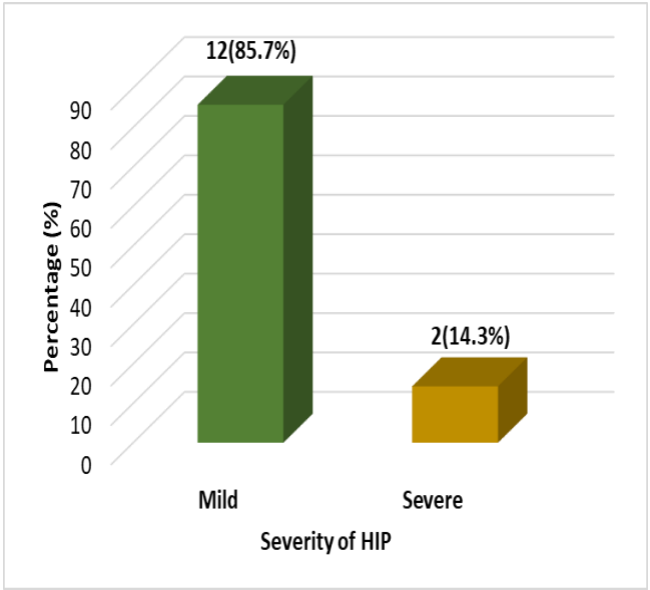

Figure 2: Severity of hypertension in pregnancy in Benue South. Majority, 12(85.7%), had mild HIP.

Table 4 Determinants (sociodemographic risk factors) of Hypertension in Pregnancy

Variable	Hypertension in Pregnancy		χ2	df	p-value
	Yes n(%)	No n(%)			
Age (in years)			Fisher's Exact Test =12.774		0.003*
16-25	1(1.1)	89(98.9)			
26-35	8(5.0)	153(95.0)			
36-45	3(20.0)	12(80.0)			
46-55	2(22.2)	7(77.8)			
Marital Status			Fisher's Exact Test=1.358		1.000
Married	14(5.2)	254(94.8)			
Single	0(0.0)	6(100.0)			
Widowed	0(0.0)	1(100.0)			
Tribe			Fisher's Exact Test=9.262		079
Idoma	11(4.6)	227(95.4)			
TIv	0(0.0)	8(100.0)			
Igbo	0(0.0)	15(100.0)			
Hausa	2(22.2)	7(77.8)			
Yoruba	0(0.0)	2(100.0)			
Others	(33.3)	2(66.7)			
Religion					
Christianity	12(4.8)	239(95.2)	χ2=0.572		0.449
Islam	2(8.3)	22(91.7)			
Local Government Areas			Fisher's Exact Test=19.359		<0.001*
Okpokwu	2(3.0)	65(97.0)			
Agatu	0(0.0)	100(100.0)			
Otukpo	10(16.9)	49(83.1)			
Ohimini	2(4.1)	47(95.9)			
Level of Education			Fisher's Exact Test=4.891		0.146
Tertiary	7(9.5)	67(90.5)			
Secondary	6(5.3)	107(94.7)			
Primary	1(1.8)	56(98.2)			
None	0(0.0)	31(100)			
Occupation			Fisher's Exact Test=9.275		0.032*
Small scale business	4(4.1)	94(95.9)			
Large scale business	2(18.2)	9(81.8)			
Junior civil servant	2(5.0)	38(95.0)			
Student/full time housewife	6(9.0)	61(91.0)			
Farming	0(0.0)	59(100.0)			
Income per Month			Fisher's Exact Test=14.600		0.003*
≤30000	7(3.7)	182(96.3)			
30001-50000	2(11.1)	16(88.9)			
50001-80000	0(0.0)	44(100.0)			
80001-110000	3(17.6)	14(82.4)			
>110000	2(28.6)	5(71.4)			

*p-value<0.05

Table 5 Determinants (clinical risk factors) of Hypertension in Pregnancy

Variables	**Hypertension in Pregnancy**		**χ2**	**df**	**p-value**
	Yes n(%)	**No n(%)**			
Total number of previous pregnancies			Fisher's Exact Test=8.825		0.008*
0	0(0.0)	53(100.0)			
1-4	12(9.4)	115(90.6)			
>=5	2(2.1)	93(97.9)			
Number of miscarriages/ abortions			Fisher's Exact Test=4.364		0.353
0	11(4.9)	215(95.1)			
1	1(3.1)	31(96.9)			
2	2(15.4)	11(84.6)			
3	0(0.0)	2(100.0)			
>3	0(0.0)	2(100.0)			
Number of previous Deliveries			Fisher's Exact Test=3.733		0.150
Nullipara	1(1.5)	64(98.5)			
Multipara	11(7.7)	132(92.3)			
Grandmultipara	2(3.0)	65(97.0)			
Body Mass Index (Kg/m²)			Fisher's Exact Test= 11.533		0.007*
Underweight	0(0.0)	3(100.0)			
Normal Weight	3(1.8)	165(98.2)			
Overweight	7(9.2)	69(90.8)			
Obesity	4(14.3)	24(85.7)			
Anaemia in Pregnancy			χ2=0.214	1	0.643
Yes	9(4.7)	183(95.3)			
No	5(6.0)	78(94.0)			
History of Chronic Hypertension			χ2=17.912	1	<0.001*
Nil	11(4.1)	256(95.9)			
Yes	3(37.5)	5(62.5)			
History of eclampsia			χ2=0.108	1	0.742
Nil	14(5.1)	259(94.9)			
Yes	0(0.0)	2(100.0)			
History of pre-eclampsia			χ2=31.778	1	0.000*
No	11(4.1)	259(95.9)			
Yes	3(60.0)	2(40.0)			
History of Diabetes			χ2=0.273	1	0.601
No	14(5.2)	256(94.8)			
Yes	0(0.0)	5(100)			
Family history of hypertension in pregnancy			χ2=18.621	1	<0.001*
No	10(3.8)	252(96.2)			
Yes	4(30.8)	9(69.2)			
Family history of chronic hypertension			χ2=5.652	1	0.017*
No	12(4.5)	254(95.5)			
Yes	2(22.2)	7(77.8)			
History of multiple pregnancy			χ2=0.562	1	0.453
No	11(4.7)	224(95.3)			
Yes	3(7.5)	37(92.5)			
History of miscarriages/ Abortions			χ2=0.717	1	0.397
No	11(4.6)	226(95.4)			
Yes	3(7.9)	35(92.1)			

*p-value<0.05

Table 6 Multivariate logistic analysis of the determinants of Hypertension in pregnancy

Variable	aOR	95% CI	p-value
Age group			
16-25	0.00	0.00-0.55	0.029*
26-35	0.01	0.00-0.79	0.038*
36-45	0.29	0.01-11.62	0.516
46-55	Reference		
LGA			
Okpokwu	0.00	0.00-4.84	0.126
Agatu	0.00	-	0.997
Otukpo	3.67	0.10-129.41	0.475
Ohimini	Reference		
BMI			
Underweight	Reference		
Normal weight	0.00	0.00-.	0.999
Overweight	0.02	0.00-1.37	0.070
Obesity	0.18	0.01-3.37	0.254
Income per month			
≤30000	0.96	0.01-114.80	0.988
30001-50000	0.29	0.00-72.38	0.660
50001-80000	0.00	-	0.993
80001-110000	0.68	0.00-167.57	0.892
>110000	Reference		
History of chronic Hypertension			
No	Reference		
Yes	0.01	0.00-0.43	0.016*
History of preeclampsia			
No	Reference		
Yes	0.00	-	0.999
Family history of hypertension in pregnancy			
No	Reference		
Yes	0.02	0.00-0.409	0.012*
Family history of chronic hypertension			
No	Reference		
Yes	1.05	0.03-32.38	0.977

Note: *p-value <0.05, Omnibus Tests=77.77, df= 17, p=0.000, Hosmer and Lemeshow Test $\chi 2=2.89$, p=0.894, Nagelkerke R2=0.743

DISCUSSION

To the best of our knowledge, this is the first base-line study to characterize hypertension in Pregnancy in Benue South Senatorial District of Nigeria, aimed at generating data among common diseases in this part of Nigeria.

The prevalence of hypertension in pregnancy in the study was 5.1%. This suggests a high burden of the disease in Benue South but consistent with the global prevalence range of 5-10% of all pregnancies [2, 6,18]. The prevalence of hypertension in pregnancy in this study is also similar to the pooled prevalence of 8 % in the Sub-Saharan Africa which is high when compared to other regions of the world [7]. Millogo et al in Burkina Faso reported a similar prevalence rate of 9.6% [19].

In a study in Ekiti, Nigeria by Oladele et al, the prevalence of HIP was 7.2% which was in keeping with the findings in our study, however in a similar study by Singh et al in Sokoto and Ayogu et al in Abuja, Nigeria, they reported a higher prevalence of HIP of 17% and 19.4 respectively [1,8,9]. This perhaps, shows regional variations in the burden of hypertension in pregnancy in Nigeria. The higher prevalence in these studies may due to the differences in the study centres, because these studies with higher prevalence were conducted in tertiary hospitals which are all referral centres, where majority of the high-risk pregnancies are managed when compared with the secondary healthcare facilities where this current study were carried out[1,9]. The finding from this study also differs from studies of Walle et al and Johnson et al in Ethiopia with a prevalence of 16.8% and 22.2% respectively[14,20].This may be due to the large sample size used in their study when compared to our study. High prevalence of 13.9% was seen in a similar study in Bengaluru by Nath et al, this may be attributable to the large sample size in their study[5]. The high burden of hypertension in pregnancy is concomitantly associated with significant adverse maternal and perinatal outcomes as shown in previous studies by Endeshaw et al, Nakimuli et al and Browne et al [13,15,18]. Hypertension in pregnancy is the second leading cause of maternal mortality worldwide [18]. Therefore, government of the various tiers in collaboration with non-governmental agencies, both local and international should develop policies that will help to prevent and control hypertension in pregnancy in order to mitigate the adverse pregnancy outcomes associated with the high burden of the disease.

The determinants of hypertension in pregnancy in Benue South as was demonstrated in this study include age group (16-25, and 26-35), history of chronic hypertension and family history of hypertension. Other studies also demonstrated similar risk factors among other determinants of hypertension in pregnancy [9,20-22]. Belayhun et al in a similar study found rural residents, illiterate, history of pregnancy induced hypertension, history of kidney disease and family history of hypertension as the risk factors that are significantly associated with HIP [21]. Ayogu et al associated family history of preeclampsia, previous history of preeclampsia, multiple gestation, chronic hypertension and diabetes as determinants of HIP [9]. Walle et al in their study found family history of hypertension, and alcohol intake drug pregnancy as risk factors associated with HIP [20]. Also, Tesfa et al identified maternal age ≥ 35, twin pregnancy, previous history of preeclampsia, family history of hypertension, family history of diabetes mellitus, BMI ≥ 25, alcohol consumption, urinary tract infection, lack of nutritional counselling during antenatal period, lack of fruits and

vegetable consumption as the determinants of HIP [22]. However, this study differs from the study by Singh et al [1]. They found previous history of preeclampsia, multiple gestation, gestational diabetes, obesity to be significantly associated with HIP among the study population. Also, Nath et al identified employed outside the house, obese respondents, higher maternal age and lower socioeconomic status as the determinants of HIP [5]. This differs from the findings of this present study. Similarly, Zhao et al differs found living in rural areas, older age, lower education, history of caesarean section gestational diabetes and high BMI in the first trimester [23]. Thus, there is need for continuous education on the determinants of HIP to the public, health care giver, and policy makers to strategize ways to prevent and control the risk factors of the disease as well as adverse pregnancy outcomes.

The strength of this study was the multiple secondary health facilities used for this study as against to previous studies which were conducted in tertiary centres and using single centre for the study. Therefore, findings from this study can be inferred to be representative of centres of similar characteristics which could be extrapolated to population with similar qualities. The study findings could be foundational in designing advocacy and awareness creation policies to prevent and control risk factors associated with hypertension in pregnancy and provide treatment options to help clinicians effectively treat this condition so as to prevent adverse pregnancy outcomes. The limitation of the study was that it was a descriptive and cross-sectional, therefore a casual and effect relationship cannot be established using this study design.

In conclusion, the study has provided a background data on hypertension in pregnancy showing a high prevalence (5.1%) of HIP and its determinants of HIP in Benue south Senatorial District of Benue State with age group of 16-25, and 26-35, history of chronic hypertension and family history of hypertension. Therefore, there is the need to develop preventive measures to control these factors in order to reduce the burden of this disease as well as its associated adverse pregnancy outcomes in Benue South Senatorial District of Benue State. It is recommended that a detailed longitudinal study on HIP in Benue south as well as determine the associated adverse pregnancy outcomes.

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