

Hypertensive Disorders in Pregnancy: Experience with 442 Recent Consecutive Cases in Benin City, Nigeria.

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SUMMARY

Objective: To determine the incidence, pattern, and outcome of pregnancies complicated with hypertensive disorders at a major university teaching hospital in Nigeria.

Methods: A descriptive review of 442 consecutive cases of hypertensive disorders in pregnancy. Statistical analysis was with Fisher's exact test, Relative risk, and 95% Confidence interval.

Results: The incidence of hypertensive disorders was 11.6% of all deliveries. Gestational hypertension contributed 20.8% of cases, pre-eclampsia 33.0%, eclampsia 5.7%, chronic hypertension 4.5% while 36.0% could not be classified with certainty at presentation. Nulliparity ($P < 0.0001$), age 35-39 years ($P = 0.01$) and greater than or equals 40 years ($P < 0.0001$) were the risk factors for hypertensive disorders in pregnancy in this study. The caesarean section rate was more than twice that in the general obstetric population (45.5% versus 22%). Women unbooked for antenatal care in our centre had significantly higher incidence of severe disease ($P = 0.009$), eclampsia ($P < 0.0001$), and worse maternal and perinatal outcome.

Conclusion: Hypertensive disorders in pregnancy in this study were associated with nulliparity, age above 35 years, high caesarean section rates and women unbooked for antenatal care had worse maternal and perinatal outcome.

Niger Med J. Vol. 48, No. 4, Oct. – Dec., 2007: 94 – 98.

Keywords: Pregnancy induced hypertension, maternal morbidity and mortality, perinatal morbidity and mortality, outcome

INTRODUCTION

Hypertensive disorders of pregnancies are a major cause of maternal and perinatal morbidity and mortality in developing countries¹⁻⁴. Twelve percent of all maternal mortalities worldwide are due to hypertensive disorders of pregnancy⁵.

Pregnancy induced hypertension and its sequelae, eclampsia are a common feature of obstetric practice in Nigeria and major causes of maternal and perinatal morbidity and mortality^{1,6,7}. In Nigeria, incidences as high as 21.6 to 26.2% of

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all deliveries have been reported in hospital based studies^{1,3}. A recent national survey found that eclampsia contributed 13.0% of all obstetric complications of pregnancy and 16.7% of all maternal deaths in public sector referral facilities². This poor picture is due largely to the inadequacy, inaccessibility as well as under-utilization of existing health care facilities. It has been found that the majority of women of reproductive age still prefer antenatal and intrapartum care by traditional birth attendants to orthodox maternity services because it is cheaper, readily accessible, and considered culturally more acceptable².

Hypertensive disorders of pregnancy have been classified in different ways⁸⁻¹⁰, but that based solely on the occurrence of hypertension and proteinuria, by Davey and MacGillivray, is widely used in Nigeria⁸. This classifies hypertensive disorders in pregnancy into three broad categories: pregnancy induced hypertension, chronic hypertension and chronic renal disease, and unclassified hypertension and/or proteinuria.

Management of hypertensive disorders in pregnancy in UBTH

At the University of Benin Teaching Hospital, management of hypertensive disorders in pregnancy varies with the class, severity of disease, gestational age at diagnosis and presence or absence of complications. All cases of mild pregnancy induced hypertension diagnosed at term, before the onset of labour, are offered an elective induction of labour in the absence of contraindications to vaginal delivery and pre-induction ripening of the cervix done when the cervix is unfavorable. Cases of mild pregnancy induced hypertension diagnosed before term are managed conservatively while monitoring for maternal and fetal complications closely. Conservative management is terminated if significant proteinuria is detected, signs of imminent eclampsia develop, or other evidence of systemic involvement like deranged liver enzymes and disseminated intravascular coagulopathy are found. Cases of severe pregnancy induced hypertension or pre-eclampsia/eclampsia have an emergency induction of labour or emergency caesarean section depending on the Bishop's score and presence or absence of contraindications to vaginal delivery. Cases of essential hypertension are placed on oral antihypertensives and allowed to continue till 40 weeks of gestation if blood pressure control is good and no complications occur, elective or emergency induction of labour or caesarean section is done in the presence of superimposed pre-eclampsia or systemic complications as appropriate at term or before term. Indeterminate cases are managed as done in cases of pregnancy-induced hypertension.

MATERNAL AND PERINATAL OUTCOME IN HYPERTENSIVE DISORDERS IN NIGERIAN WOMEN

The objective of this study was to determine the incidence, pattern, and outcome of pregnancies complicated with hypertensive disorders at a major tertiary hospital in Nigeria.

MATERIALS AND METHODS

Study setting

This study was done in the department of Obstetrics and Gynaecology, University of Benin Teaching Hospital, Benin City. It provides in-patient and outpatient antenatal, intrapartum and postnatal obstetric care and is a major referral centre covering parts of Edo, Delta and Ondo states. It has an annual delivery rate of 1700. With 12 consultant specialist personnel, it is accredited for both training of house officers and residents in Obstetrics and Gynaecology.

Subjects

This was a descriptive review of all cases of hypertensive disorders of pregnancy seen over a 27-month period, March 1st 2002 to 31st May 2004 in the department. Diagnosis of hypertension was based on the finding of two consecutive measurements of diastolic blood pressure of ≥ 90 mmHg 4 hours or more apart, one measurement of diastolic blood pressure of 110 mmHg or more or a rise of 30 mmHg or 15 mmHg above the normal pre-pregnancy systolic and diastolic blood pressures respectively after the 20th week of pregnancy using an appropriate sized cuff and korotkoff phase V (disappearance of sound) as the diastolic blood pressure⁸. Significant proteinuria was defined by one 24-hour urine collection with total protein excretion of 300 mg and more or two random clean catch or catheter urine specimens with 1+(0.3 g Albumin/L) or more on a reagent strip⁸.

Procedure

All cases of hypertensive disorder of pregnancy were identified using the departmental obstetric data sheets (Quality care assessment sheets, (QCA)). Information on the booking status, age, parity, class of hypertensive disorder, time of diagnosis, induction of labor, mode of delivery, maternal and perinatal outcome were extracted from the obstetric data sheets

and patients' case notes and fed into the computer. Data analysis was with the INSTAT statistical package. The Fisher's exact test was used to determine level of statistical significance set at P-value equal to or less than 0.05. The Relative risk and 95% confidence interval were also determined.

RESULTS

During the 27-month period under review (March 1st 2002 to 31st May 2004), there were 3825 deliveries and 442 cases of hypertensive disorders of pregnancy giving an incidence of 11.6% of all deliveries. The incidence of eclampsia was 0.6% of all deliveries. Figure 1 and Table 1 show the trend of hypertensive disorders with parity and indicate that nullipara had the highest incidence of 17.3%. Figure 2 and Table 1 show the trend of hypertensive disorders with maternal age. Women aged 40 years and above had the highest incidence of 27.2% while teenagers had the lowest incidence of 6.3%.

Analysis of time of diagnosis showed that 54.8% (242) cases were diagnosed antepartum, 38.3% (169) intrapartum and 7.1% (31) postpartum. Women with pre-eclampsia contributed 33.0% (146), gestational hypertension 20.8% (92), eclampsia 5.7% (25), chronic hypertension 4.5% (20) while 36.0% (159) of cases could not be classified with certainty at the time of presentation.

Table 2 is a comparison of parity and age in women with hypertensive disorders in pregnancy and the women without the disease (non-cases). Nulliparity ($P < 0.0001$, RR=2.1), age 35-39 years ($P = 0.01$, RR=1.4) and age greater than or equal to 40 years ($P < 0.0001$, RR=2.4) placed women at significantly increased risk of having hypertensive disorders in pregnancy. Table 3 shows the effect of booking status on mode of delivery, severity of disease at presentation and perinatal outcome. The caesarean section rate was high (45.5%) compared to the rate in the general obstetric population, during the study period, which was 22% of all deliveries. Women who did not book for antenatal care in our centre were at a significantly greater risk of presenting with severe disease and eclampsia. Similarly, their babies had significantly worse perinatal outcome.

Table 1: Influence of parity and age on incidence of hypertensive disorders in pregnancy

Parameter	Total number of deliveries	Number with hypertensive disorders in pregnancy	Percentage
Parity			
0	1341	232	17.3
1	796	74	9.3
2	698	49	7.0
3	398	31	7.8
4	359	28	7.8
≥ 5	233	28	12.0
Total	3825	442	
Age			
<20	64	4	6.3
20-24	591	65	11.0
25-29	1333	152	11.4
30-34	1360	136	10.0
35-39	396	63	15.9
≥ 40	81	22	27.2
Total	3825	442	

There were 24 cases of twin gestation (5.4%), 20 were in booked and 4 in unbooked women. Of the cases of eclampsia, in 54.2% of cases, the first convulsion occurred antepartum, 37.5% intrapartum and 8.3% occurred postpartum. Analysis of the distribution of the antepartum and intrapartum cases by gestational age showed that most presented at term (73.5%), 2.9% presented before or at 32 weeks of gestation while 23.5%

were diagnosed after 32 completed weeks but before 37 completed weeks of gestation. There were two maternal mortalities, both unbooked women that presented late with eclampsia giving a case fatality rate of 8.0% for eclampsia, 0.5 per thousand for all cases of hypertensive disorders in pregnancy and 17.5 per thousand for unbooked cases.

Table 2: A Comparison of Parity and Age in Cases of Hypertension in Pregnancy and Non-Cases

Parameter	Cases (n=442) %(number)	Non-cases (n=3383) %(number)	P-value	RR	CI
<i>Parity</i>					
0	52.5(232)	32.8(1109)	<0.0001*	2.1	1.7-2.4
1	16.7(74)	21.3(722)	0.03	0.8	0.6-1.0
2	11.1(49)	19.2(649)	<0.0001	0.6	0.4-0.7
3	7.0(31)	10.8(367)	0.02	0.7	0.5-0.9
4	6.3(28)	9.8(331)	0.02	0.7	0.5-0.9
>=5	6.3(28)	6.1(205)	0.9	1.0	0.7-1.5
<i>Age</i>					
<20	0.9(4)	1.8(60)	0.3	0.5	0.2-1.4
20-24	14.7(65)	15.6(526)	0.7	0.9	0.7-1.2
25-29	34.4(152)	34.9(1181)	0.9	1.0	0.8-1.2
30-34	30.8(136)	36.2(1224)	0.03	0.8	0.7-1.0
35-39	14.3(63)	9.8(333)	0.006*	1.4	1.1-1.8
≥40	5.0(22)	1.7(59)	<0.0001*	2.4	1.7-3.5

Key: RR=Relative risk, CI=95% Confidence interval, * =Statistically significant higher risk of hypertensive disorders.

Table 3: Booking status and outcome.

Parameter	Percentage (number)	Booked (n=328) %(number)	Unbooked (n=114) %(number)	P-value	RR	CI
<i>Mode of Delivery</i>						
Induction of labour	32.6(144)	37.5(123)	18.4(21)	0.0001**	0.5	0.3-0.7
Spontaneous						
Vaginal delivery	44.6(197)	48.7(160)	32.5(37)	0.003*	1.2	1.1-1.3
Instrumental Delivery	10.0 (44)	8.5(28)	14.0(16)	>0.05	0.8	0.7-1.1
Caesarean Section	45.5(201)	42.7(140)	53.5(61)	>0.05	0.9	0.8-1.0
<i>Severity of disease at presentation</i>						
Mild	44.7(198)	51.8(170)	24.6(28)	<0.0001*	1.3	1.2-1.5
Severe	49.6(219)	40.8(146)	58.8(67)	0.009**	0.9	0.8-0.97
Eclampsia	5.7(25)	1.8(6)	16.7(19)	<0.0001**	0.2	0.2-0.6
<i>Perinatal outcome</i>						
Severe birth		(n=348 neonates)		(n=118 neonates)		
Asphyxia	9.4(44)	7.2(25)	16.1(19)	0.006 **	0.7	0.6-0.96
MSB	3.9(18)	1.7(6)	10.2(12)	0.0002**	0.4	0.2-0.8
FSB	2.2(10)	2.5(3)	5.9(7)	0.003**	0.4	0.2-1.0
ENND	3.2(15)	1.1(4)	9.3(11)	< 0.0001**	0.4	0.2-0.8
LBW	31.6(147)	25.9(90)	48.3(57)	<0.0001**	0.8	0.7-0.9
SCBU Admission	37.8(176)	32.8(114)	52.5(62)	0.0002**	0.8	0.7-0.9

Key: MSB=Macerated still births, FSB=Fresh stillbirths, ENND=Early neonatal deaths, LBW=Low birth weight neonates, SCBU=Special care baby unit.

RR=Relative risk, CI=95% Confidence interval,* =Statistically significant increased risk (Booked versus Unbooked subjects), ** = Statistically significant reduced risk

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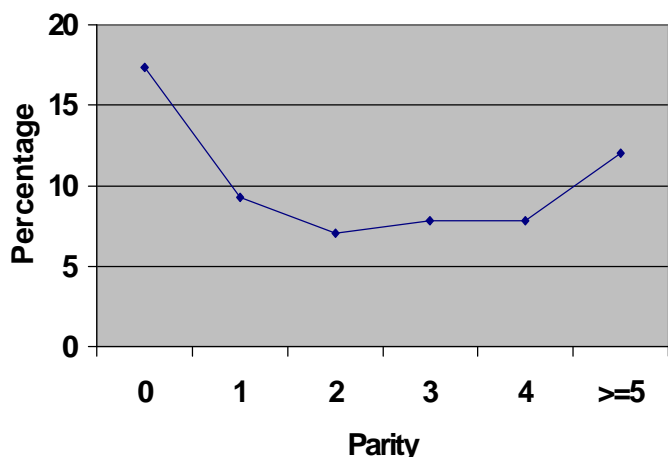


Figure 1: Trend in hypertensive disorders with increasing parity

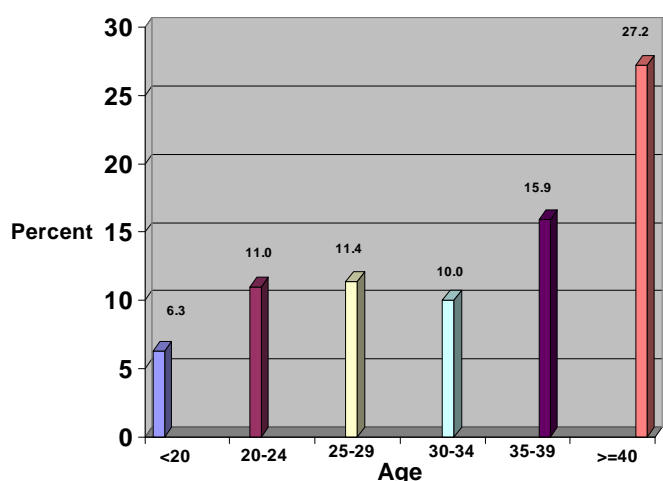


Figure 2: Maternal age and incidence of hypertensive disorders in pregnancy

DISCUSSION

The incidence of hypertensive disorders of pregnancy - 11.6% of all deliveries - found in this study is lower than 26.2% and 21.6% reported from South Western and South-Eastern Nigeria respectively but much higher than the incidence in developed countries^{1,3,11}. The incidence declined with parity reaching its lowest in women who were Para 2 and then increased remarkably after Para 4. Nulliparas, as noted in this study, have been reported by previous workers to be at increased risk of pregnancy-induced hypertension^{1,3}. Similarly, women aged 35 years and above were shown to be at significantly increased risk of having hypertensive disorders in pregnancy. Age 35 years and above has been noted to be associated with an increased risk of essential hypertension. Ogedengbe et al in a recent study reported mean age of grandmultiparous women of 33.3 +/-1.8 years¹³. Similarly, Odukogbe et al reported that the modal age group among grandmultipara was 31-35 years with women aged above 35 years contributing a third of cases¹⁴. Hence the increased incidence among grandmultipara may be explained by advanced maternal age. However, this was not statistically significant.

Most of the cases in this study presented at term. This is consistent with most reports from other parts of the country^{1,3}. Compared to reports from developed countries¹¹, most previous studies show that early onset pregnancy induced hypertension is relatively rare in Nigerians. Our findings show that 2.9% of cases presented at or before 32 weeks of gestation. This is in marked contrast to the findings of Onah and Iloabachie who reported recently that 23.4% of cases in a series presented before or at 30 weeks gestation and suggested that there was an increase in the incidence of early onset pre-eclampsia in Nigerian women¹⁵. A crucial observation was that slightly above a third of the study population could not be classified definitively at presentation. This was either because the women booked late for antenatal care with no previous records of blood pressure prior to pregnancy or they were unbooked and presented with complications. This was made worse by the fact that the vast majority of the women did not present at the post-natal clinic when a definitive diagnosis should ideally be made in unclassified cases. Late booking for antenatal care and non-utilization of antenatal care services continue to be major obstacles to antenatal care in Nigeria^{2,16}. Evidence suggests that ignorance, poverty, a preference for care by traditional birth attendants and inaccessibility of many health facilities are responsible for this².

Women with eclampsia constituted 5.7% of the study population and 0.6% of all deliveries. This is consistent with previous reports of incidences in Nigeria^{2,17} but higher than the finding in Western nations where early diagnosis and treatment of hypertensive disorders in pregnancy is the norm¹¹. It was the sole contributor to the two maternal mortalities in this study with a case fatality rate of 8.0%. Studies from other parts of Nigeria show that eclampsia continues to contribute significantly to maternal mortality and that most of the women, as in this study, are unbooked for antenatal care^{17,18}.

Hypertensive disorders of pregnancy were noted to be associated with high obstetric intervention rates. The caesarean section rate in this series was about twice the unit caesarean section rate (45.5% versus 22%) during the study period. This was due to the large proportion of cases of pre-eclampsia and eclampsia. Higher caesarean section rates have been reported from the United States of America and Italy^{11,19}. The differences in caesarean section rates may reflect variation in the attitudes to, and acceptance of, caesarean delivery in the populations studied. The high intervention rates translate to increased cost of obstetric care. Omu et al found that pregnancy-induced hypertension was associated with a five-fold increase in cost of obstetric care despite the worse outcome in Saudi Arabian women²⁰. This constitutes increased financial burden for the families involved and is unwelcome news with the majority of Nigerians living below the poverty line.

Being unbooked for antenatal care resulted in significantly worse maternal and perinatal outcome in this study. The study shows that women who booked for antenatal care were significantly more likely to have induction of labour and achieve a spontaneous vaginal delivery. This may be explained by the fact that significantly more booked women had earlier diagnosis when the disease was mild and were less likely to

present with severe disease and eclampsia compared to women who did not book for antenatal care. However, although a higher percentage of women who were unbooked for antenatal care had caesarean section and instrumental delivery, the differences were not statistically significant. This may be due to the determinants for caesarean section or instrumental delivery on the departmental protocol not being based on booking status. The determinants for caesarean section were the severity of disease, the inducibility of the cervix and timing of presentation (whether in labour or not) as well as presence or absence of severe intrauterine growth restriction or fetal distress. Again, while booked cases presented with milder disease, in many cases the disease was rapidly progressive necessitating resort to caesarean section and all booked women with failed induction of labour ended up with a caesarean section. Similarly, instrumental delivery was done primarily as a prophylactic measure to reduce maternal effort during the second stage of labour, which might result in marked elevation of blood pressure worsening the prognosis for the mother. This was done whenever diastolic blood pressure was equal to or above 100mmHg and placed both booked and unbooked women at similar risk of instrumental delivery and may explain the lack of significant difference in the instrumental delivery rates.

An important finding of this study was that all measures of perinatal outcome were significantly worse in unbooked women compared to booked cases. This is most probably due to the higher proportion of cases of pre-eclampsia/eclampsia among unbooked cases. The presence of proteinuria in association with hypertension is known to increase the risk of intrauterine growth restriction and prematurity. These may explain the higher incidence of perinatal deaths and severe birth asphyxia among unbooked cases. Previous workers have found, similarly, that lack of antenatal care and late presentation in labour were associated with worse maternal and perinatal morbidity and mortality in hypertensive disorders in pregnancy in Nigeria^{2,17,18}.

In conclusion, the results of this study show that nulliparity and advanced maternal age are the risk factors for hypertensive disorders in pregnancy in Nigerian women and that majority of women with hypertensive disorders in this study presented with severe disease leading to high intervention rates and poor pregnancy outcome. The findings of our study suggest that community based measures to promote earlier and wider utilization of antenatal care leading to earlier presentation and diagnoses of hypertensive disorders in pregnancy will go a long way in reducing the current high maternal and perinatal morbidity and mortality associated with the disease. Similarly, there is an urgent need to increase awareness among medical and paramedical personnel on the need for early referral of cases to appropriate levels of health care.

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