

Review of Medically Indicated Preterm Births Due to Hypertensive Disorders in Pregnancy at a Tertiary Hospital in Abuja: Maternal Characteristics and Neonatal Outcome.

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Abstract

Background: Preterm birth is the delivery of a baby before 37 weeks of gestation. Hypertension in pregnancy has been found to be the most common cause of medically indicated preterm birth leading to significant neonatal mortality and morbidity.

Objective: To evaluate the prevalence of medically indicated preterm births due to hypertension in pregnancy, the pattern of maternal characteristics and the immediate neonatal outcome.

Study Design: A descriptive cross-sectional study of all medically indicated preterm births due to hypertensive disorders in pregnancy at National Hospital Abuja from 1st January 2008 to 31st December 2012.

Results: The total number of births over the five year period was 9055 with preterm births contributing 1075(11.9%), 523(48.7%) were spontaneous while 552(51.3%) were medically indicated. Hypertension in pregnancy was the indication for 254(23.6%) of the overall preterm births and 46% of medically indicated preterm births. Preeclampsia was the diagnosis in 77.1% of the cases of hypertensive disorders, 33.5% deliveries were between 34-36 weeks gestational age and the mean birth weight was 1.82kg.

Conclusion: Hypertensive disorder was a major contributor to medically indicated preterm birth in this study with Preeclampsia as the predominant form. Proper preconception and antenatal care with institution of preventive measures for preeclampsia will help prolong gestation in at risk mothers to ensure better survival for neonates.

Keywords: Preterm Birth; Medically Indicated; Hypertension in Pregnancy.

Introduction

Preterm birth is defined by WHO as all births before 37 completed weeks of gestation or fewer than 259 days from the first day of a woman's last menstrual period. Every year an estimated 15 million babies are born preterm.^[1] Prematurity complicates about 10-15% of all pregnancies with a higher incidence in developing countries.^[2] It is the number one cause of neonatal morbidity and mortality and causes 75% of neonatal deaths that are not due to congenital anomalies. There has been an increase in preterm birth in the past 20 years due to increases in medically indicated preterm birth.^[3] This may be as a result of increases in average maternal age, underlying

maternal health problems and increased use of assisted reproductive technology with attendant multiple gestation.

Preterm birth is a syndrome with a variety of causes and can be classified as spontaneous preterm birth following premature rupture of membranes or preterm labour and medically indicated following induction of labour or caesarean birth for maternal or fetal indications before 37 completed weeks of gestation.^[4]

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The most common diagnoses associated with medically indicated preterm births are hypertensive disorders, antepartum haemorrhage and acute or chronic fetal compromise (fetal distress or intrauterine growth restriction)^[2,8,9,10] About two-thirds of preterm births are spontaneous; these births follow preterm labour and preterm premature ruptured membranes, or related diagnoses, such as cervical insufficiency.^[11,12,13] Efforts to address medically indicated preterm births are traditionally regarded separately from those for spontaneous preterm births.

To be born prematurely is a potentially serious hazard. Morbidity and mortality rates are inversely proportional to the maturity of organ systems especially the lungs, brain and gastrointestinal tract.^[14,16,17]

Despite improvement in neonatal care, infants born prematurely have increased rates of mortality and those who survive may have neuro-developmental and medical disabilities and these proportions are higher with lower gestational ages.^[17,18,19] Inequalities in survival rates abound with less survival in low income settings.

Hypertensive disorders in pregnancy, especially preeclampsia, remain a major cause of maternal and infant morbidity and mortality worldwide. Hypertensive disorders are the most common medical disorders in pregnancy and common cause of iatrogenic prematurity accounting for between 15% to 43% of preterm births.^[22,23,24] Though the pathophysiology of preeclampsia has not been fully elucidated, evidence from clinical trials shows that low dose aspirin and calcium supplementation is of value in preventing preeclampsia in selected patients.^[20,21] The most definite treatment strategy remains delivery in cases where the disorder is severe.^[22,23]

In the management of preeclampsia, with few exceptions, maternal interests are best served by immediate delivery. The decision to proceed with immediate delivery versus expectant management is based upon several factors, including disease severity, fetal maturity, maternal and fetal condition and cervical status.

In view of the devastating consequences of prematurity, there is need to quantify the magnitude of the contribution of hypertensive disorder to its burden. This study was set out to determine the prevalence of medically indicated preterm births due to

hypertensive disorders of pregnancy in National Hospital Abuja, the characteristics of the mothers and immediate neonatal outcome.

Methodology

This was a descriptive cross sectional study of medically indicated preterm births due to hypertensive disorders in pregnancy in National Hospital Abuja from January 1st 2008 to December 31st 2012.

The Hospital is a tertiary health facility within the metropolis of the Federal Capital Territory, Abuja Nigeria. It delivers specialized care in obstetrics and gynaecology, paediatrics, surgery, internal medicine, radiology, laboratory medicine, anaesthesiology, radiotherapy & oncology and radiation physics. It receives referrals from hospitals within and outside the city. The Hospital has a functional neonatal intensive care unit manned by trained neonatologists. Preterm delivery was defined in this study as all deliveries between 28 weeks and 36 weeks, 6 days and medically indicated deliveries defined as all non spontaneous deliveries.

All medically indicated preterm deliveries due to hypertensive disorders in pregnancy were included in this study.

Hypertensive disorders during pregnancy was classified in this study based on the National High Blood Pressure Education Program Working Group on High Blood Pressure recommendations.²⁵

The classes are

- (1) Chronic hypertension: Defined as blood pressure that either precedes pregnancy, is diagnosed within the first 20 weeks of pregnancy, or does not resolve by the 12-week postpartum.
- (2) Preeclampsia-eclampsia- Defined as a multiorgan disease process of unknown etiology characterized by the development of hypertension and proteinuria after 20 weeks of gestation. Eclampsia is the development of convulsions in a pre-existing preeclampsia or it may appear unexpectedly in a patient with minimally elevated blood pressure and no proteinuria
- 3) Preeclampsia superimposed on chronic hypertension: Defined as manifestation of features of preeclampsia in a patient with pre-existing chronic hypertension.

4) Gestational hypertension- Defined as elevated blood pressure (systolic ≥ 140 or diastolic ≥ 90 mm Hg) in the second half of pregnancy in a patient with previously normal blood pressures in the absence of protein in the urine with no manifestations of preeclampsia/eclampsia.

The requisite information was extracted from the Labour ward delivery register and Obstetric theatre register. Information obtained include maternal age, parity, booking status and gestational age at delivery. Indication for delivery, mode of delivery, birth weight and Apgar scores were also obtained. Confidentiality was maintained in this study by identifying the patients with serial numbers.

Categorical variables were reported as percentages while continuous variables were reported as means and standard deviation. The generated data was analysed using Microsoft Excel 2013.

Results

During the study period, there were 9055 deliveries in National hospital of which 1075 (11.9%) were preterm. Spontaneous preterm birth accounted for 523 (48.7%) while 552 (51.3%) were medically indicated. Hypertension in pregnancy constituted 23.6% of the total preterm births and 254 (46%) of the medically indicated preterm births were due to hypertension in pregnancy. There were 262 babies from 254 births. Singletons were 249 and there were four twin gestation and a quadruplet gestation. Majority (64.6%) were unbooked while 90 (35.4%) were booked. Female babies accounted for 149(56.9%) while the rest were males 113 (43.1%). Specialized neonatal care was needed in 187(71.4%) of the babies while 75(28.6%) were nursed with their mothers, 5(1.96%) of the deliveries were vaginal, secondary to induction of labour while 249(98.4%) were delivered by caesarean section. The rest of the results are presented in Tables 1-3 and Figures 1-2

Table 1: Background Demographic and Obstetric Profile of the Patients

Variable	Frequency n=254	Percentage
Age Range		
15-19	3	1.2
20-24	22	8.7
25-29	85	33.5
30-34	78	30.7
35-39	56	22.0
40-45	10	3.9
Gestational Age		
28-29	42	16.5
30-31	50	19.7
32-33	77	30.3
34-36	85	33.5

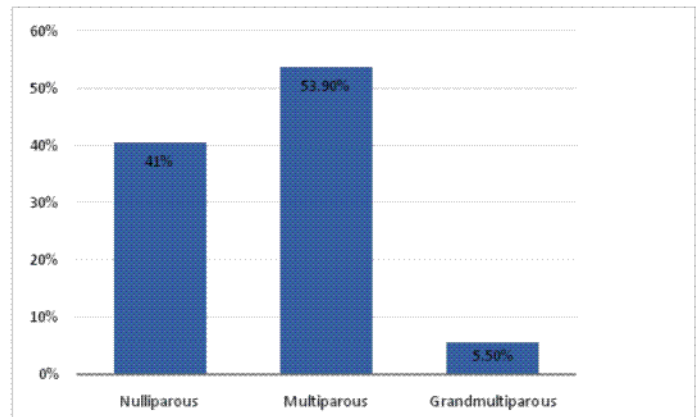


Figure 1: Bar Chart Showing the Parity of the Mothers

Table 2: Birth Weight of the Babies

Birth Weight	Frequency n=262	Percentage
Extremely Low Birth Weight(<1)	42	16
Very Low Birth Weight(1-1.49)	61	23.3
Low Birth Weight(1.5-2.49)	81	30.9
Birth Weight(>2.5)	78	29.8

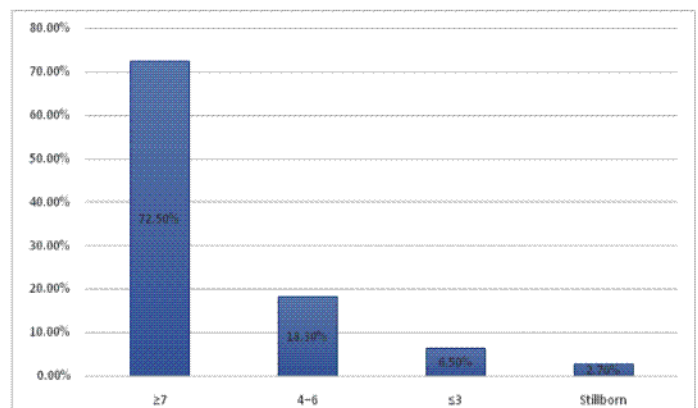


Figure 2: Bar Chart showing the Apgar Scores at 5 Minutes

Table 3: Distribution of the Hypertensive Disorders among the Preterm Births

Variable	Frequency n=254	Percentage
Chronic Hypertension	0	0
Superimposed Preeclampsia on Chronic Hypertension	6	2.4
Gestational Hypertension	18	7.1
Severe Preeclampsia	196	77.1
Eclampsia	34	13.4

Discussion

Preterm birth is the leading cause of infant morbidity and mortality in the world with long term adverse health consequences.^[1] Out of 9,055 deliveries in National Hospital within the study period, there were 1075 preterm births giving a preterm birth rate of 11.9%. This is comparable to the global preterm birth rate of 11.1% but was slightly lower than the rate of 12.5% quoted by authors in Illorin.^[1,26] However it is comparatively higher than the rate of 8.5% in Calabar, 6.3% reported in Benin and 9.3% in Korle Bu Teaching hospital Ghana.^[12,27,28] An explanation of the higher rate could be that the study done in Ghana was for singleton births only and that in Benin for neonatal unit admissions so multiple births and babies not admitted into the neonatal unit were excluded from these studies.^[27,28]

This study had demonstrated that hypertension in pregnancy as a major contributor to medically indicated preterm delivery with a hospital based prevalence rate of 26.2% of all preterm deliveries and 46% of medically indicated deliveries. This finding agrees with studies done by Rao et al in India which gave an incidence of 21.4% of preterm deliveries due to hypertensive disorders but differs from studies done by Shretsha et al in which the commonest cause of medically indicated preterm birth was antepartum haemorrhage with hypertension contributing 13.3%.^[13,16] The prevalence of 46% of medically indicated preterm delivery is also lower than 77.5% quoted by some authors in Ghana.^[28] Mokuolu et al in Illorin also found hypertension in pregnancy to be significantly associated with preterm birth most especially iatrogenic preterm birth.^[26]

The commonest hypertensive disorder in this study was preeclampsia (77.1%), this is in consonance with findings from studies done in Nnewi, Nigeria and Ghana.^[23,28]

The modal maternal age group was 25-29 years. This concurs with the study by Ibhanebhor et al in Benin City which showed the modal age group to be between 26-30 years.^[26] However this was in contrast to studies done by Astolfi et al which showed an increased frequency of preterm birth with increasing maternal age.^[29] However a study done by Etuk et al in Calabar showed that maternal age did not significantly influence the incidence of preterm delivery.^[12]

Most of the patients in this study were unbooked (64.6%). This is because this centre is a tertiary

institution that gets referrals from secondary and primary health centres within and outside the city. The need for specialized neonatal care influenced these referrals. A study done at Illorin showed that booking status was the strongest determinant of preterm delivery as risk factors for preterm delivery like hypertensive disorders are not usually detected on time to allow proper management to be instituted thus increasing the chances of preterm delivery.^[27]

The most common mode of delivery was caesarean section (98.7%) and this agrees with studies by Alexander et al and Nasser et al.^[30, 31] The high caesarean section rate is as a result of management practices in our hospital where caesarean section is the option for complicated hypertensive disorders in pregnancy unless the cervix is favourable for induction of labour which rarely is the case in preterm pregnancies. This is to expedite delivery and avoid untoward maternal and even fetal complications. This also agrees with a study in Ghana which gave a Caesarean section rate of 88.8%.^[28] The modal gestational age of 34-36 weeks is as expected as hypertensive disorders in pregnancy is usually a late event with complications mandating delivery usually arising in most cases in late 3rd trimester.

Most of the babies (31.1%) were in the low birth weight category (1.5 to 2.49kg). This is not as expected considering the fact that the modal gestational age was 34-36 weeks but could be explained by the fact that hypertensive disorders in pregnancy are associated with placental insufficiency which results in intrauterine growth restriction.^[32, 33, 34] The mean birth weight of 1.82kg also shows the impact of hypertension in pregnancy on birth weight especially when it is complicated by preterm birth and this has an effect on neonatal survival.

71.6% of the babies had 5 minute Apgar scores greater than seven. This is as a result of the fact that 68.8% of the deliveries were at least 32 weeks gestational age at delivery and the mothers were stabilized before delivery. Deliveries were also attended by neonatologists with adequate resuscitation given to those babies asphyxiated at birth. However 5.5% of the babies had Apgar scores of less than 4 at 5 minutes and run a risk of severe neonatal morbidity or even mortality. 71.4% of the babies required specialized neonatal care as prematurity is associated with short and long term complications and adequate neonatal

care is imperative especially for those with birth weight less than 2.5kg. This puts a great strain on the neonatal care facilities.

The greater percentages of the women were multiparous and this is in contrast to some studies that show nulliparity to be a risk factor for preeclampsia.^[23]

An explanation for this is that this study was limited to deliveries between 28-36 weeks and will not likely reflect the true prevalence.

There was a female preponderance among the neonates, this varies with worldwide incidence which shows a higher male gender incidence among preterm neonates and also contradicts with studies done in Benin and Bayelsa state by Ighanesebhor et al and Kunle-Olowu et al respectively which showed male predominance and equal sexes respectively.^[27,32]

Conclusion

Findings from this study shows that hypertension in pregnancy was the predominant cause of medically indicated preterm birth with attendant high risk of surgical intervention, low birth weight and neonatal admission. Efforts should be geared towards early detection of hypertension and proper management with preventive measures put in place where applicable. Early antenatal booking is also recommended to enable timely prophylaxis in at risk mothers.

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Authors' contribution:

ACE: Conceptualization, Design, Data extraction/analysis, Literature review, Manuscript writing. **KWD** and **COA:** Design, Literature review and Manuscript writing

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