

EARLY ONSET PREGNANCY INDUCED HYPERTENSION/ECLAMPSIA IN BENIN CITY, NIGERIA

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ABSTRACT

Context: Pregnancy induced hypertension/eclampsia is a major cause of maternal and perinatal morbidity and mortality in Nigeria. There have been very few studies focussed on early onset pregnancy induced hypertension/eclampsia in Nigerian women

Objectives: To determine the incidence, clinical features and outcome of cases of early onset pregnancy induced hypertension /eclampsia in a Nigerian tertiary hospital, and compare maternofetal outcome in early and late onset disease.

Methods: A retrospective study of all cases of early onset pregnancy induced hypertension/eclampsia seen over a five-year period in a tertiary hospital.

Main outcome measures: Severity of disease, rates of induction of labour, caesarean section rate, maternal mortality, abruptio placenta, still births, severe birth asphyxia and early neonatal deaths.

Results: Early onset pregnancy induced hypertension/eclampsia contributed 6.3% of all cases of hypertensive disorders in pregnancy with an incidence of 1:141 deliveries. Most cases presented at between 28-32 weeks gestation (78.3%) The disease was severe at presentation or rapidly progressive in 39 cases (84.8%) leading to delivery within 72 hours of presentation. Caesarean section was the mode of delivery in 58.7% of cases. The perinatal survival rate was 34.0%. Early onset pregnancy induced hypertension was associated with significantly higher risk of presenting with eclampsia, having induction of labour and worse perinatal outcome than late onset disease.

Conclusion: Most cases of early onset pregnancy induced hypertension in the study population presented with severe and rapidly progressive disease and were associated with significantly higher risk of obstetric intervention and worse perinatal outcome than late onset disease.

Key Words: Early onset pregnancy induced hypertension/eclampsia, Maternal outcome, Perinatal outcome, Morbidity, Mortality. *(Accepted 30 November 2009)*

INTRODUCTION

Pregnancy induced hypertension/eclampsia is a major cause of maternal and perinatal morbidity and mortality in developing countries including Nigeria¹⁻⁵. Many Nigerian studies indicate that late onset pregnancy induced hypertension accounts for most cases of hypertension in pregnancy/eclampsia and that early onset cases (presenting at or before 32 completed weeks of gestation) are relatively rare compared to Caucasian populations^{1, 2, 6}. The reason for this difference is not known but with most studies in Nigeria being hospital based and mainly in tertiary health institutions and most deliveries still being taken outside the formal health system by traditional birth attendants, the findings may not be truly reflective of the prevalence of early onset pregnancy induced hypertension in the general obstetric

population. However, a recent study by Onah and Iloabache suggests that the incidence of early onset pregnancy induced hypertension may be on the increase in Nigerian women⁶.

Early onset pregnancy induced hypertension poses a peculiar challenge to the obstetric team in economically disadvantaged countries. Recent studies advocate conservative management of cases of severe preeclampsia. Conservative management entails admission into a referral centre with facilities for close monitoring of the mother and foetus, and the use of oral antihypertensives⁷. This is however not possible in most Nigerian hospitals because of lack of facilities for adequate laboratory monitoring of maternal full blood count, urea and electrolytes, liver function tests and 24-hour protein excretion. Also, close antenatal foetal surveillance involving the use of serial umbilical/cerebral artery Doppler velocimetry, biophysical profile scoring, continuous foetal heart rate monitoring, is not possible in most

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Nigerian hospitals. Prognosis for the mother and foetus is made worse by the fact that utilization of modern antenatal care services remains poor compared to Caucasian populations hence presentation and diagnosis is often late. Aggressive management, in contrast, involves stabilisation and early delivery when a definitive diagnosis of severe preeclampsia is made.

Currently, there is a dearth of information on the peculiarities of early onset pregnancy induced hypertension/eclampsia in Nigerian women. This study was designed to determine the incidence, pattern of presentation, and maternal and fetal outcome of cases of early onset pregnancy induced hypertension /eclampsia in a Nigerian tertiary hospital, and also to compare selected measures of maternofetal outcome in early and late onset cases of pregnancy induced hypertension/eclampsia.

METHODS

This was a descriptive study of all cases of early onset pregnancy induced hypertension/eclampsia seen at the University of Benin Teaching Hospital, Benin City over a five-year period (March 1st 2000 to February 28th 2005). Only cases where the gestational age of the woman was certain, based on a record of the last normal menstrual period or an ultrasound scan before 20 weeks of gestation, were included in this study. Information bordering on sociodemographic variables, clinical presentation, management and maternofetal outcome were extracted from the departmental obstetric data sheets (QCAs) and patients' case notes. A systematic random sample of 200 out of a total of 437 women with a definitive diagnosis of late onset pregnancy induced hypertension/eclampsia seen over the same period was done using a list of all cases of pregnancy induced hypertension/eclampsia made from the obstetric data sheets of all deliveries during the study period. Severity at presentation, selected measures of fetal outcome (severe birth asphyxia, abruptio placenta, still births and early neonatal deaths) as well as obstetric interventions (induction of labour and caesarean section rate) and maternal mortality were compared between early onset and late onset cases of pregnancy induced hypertension/eclampsia. Diagnosis of hypertension was based on the finding of two consecutive measurements of diastolic blood pressure of > 90mmHg 4 hours or more apart, one measurement of diastolic blood pressure of 110mmHg or more or a rise of 30mmHg or 15mmHg 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 300mg and more or two random clean catch or catheter urine specimens with 1+(0.3g Albumin/L) or more on a reagent strip⁸. Classification of hypertension in pregnancy followed the recommendations of Davey and MacGillivray⁸. Statistical analysis was with the INSTAT statistical package and tests of significance done using the Fisher's exact test (P-value less than 0.05 was taken as significant). The relative risk and 95% Confidence interval were also determined.

Management of early onset pregnancy induced hypertension/eclampsia in UBTH.

During the study period, all patients with severe preeclampsia of early onset (onset at a gestational age of less than or equal to 32 weeks) seen at the University of Benin Teaching Hospital were managed aggressively involving stabilisation and delivery. The anticonvulsant therapy used was intravenous Diazepam administered in an infusion of 5% Dextrose in water (40mg in 500 mls) titrated against the patient's level of consciousness. While Magnesium Sulphate was recognised as the anticonvulsant of choice during the period under review, the department had not commenced its use because of difficulties with getting a source for steady supply of the drug at prices that were affordable by most patients. The routine use of Magnesium Sulphate was commenced after the period of this study.

Admission and expectant management was done in cases of mild gestational hypertension (with no proteinuria). Cases of severe gestational hypertension (no proteinuria) were placed on antihypertensive drugs and managed expectantly in the absence of other features of systemic disease. For both groups, expectant management was abandoned in the presence of maternal or foetal complications defined by detection of significant proteinuria, signs of imminent eclampsia/eclampsia, or other evidence of systemic involvement like deranged liver enzymes, hyperuricemia and disseminated intravascular coagulopathy. Delivery involved emergency induction of labour or emergency caesarean section depending on the Bishop's score and presence or absence of contraindications to vaginal delivery and the clinical state of the mother and foetus.

RESULTS

During the study period (March 1st 2000 to February 28th 2005), there were 6493 deliveries. Of this, 734 were complicated by hypertension in pregnancy and pregnancy induced hypertension of early onset (occurring at or before 32 completed weeks of gestation) contributed 46 cases (6.3% of all cases of hypertensive disorder in pregnancy and 0.7% of all deliveries or 1 in 141 deliveries).

More than half of the women (56.5%) were booked for antenatal care in our centre while the rest were either referred or presented because of complications. Table 1 shows that most of the women were aged 25-29 years (30.4%) and 30-34 years (47.8%), about two-fifth (39.1%) were nullipara, and the majority presented as cases of severe preeclampsia (32.6%) and eclampsia (30.4%). Also, most cases presented at between 28-32 weeks gestation (78.3%).

Patients who had essential hypertension with superimposed preeclampsia contributed 15.2% of cases while 13.0% and 8.7% had had pregnancy induced hypertension and early onset pregnancy induced hypertension respectively in the previous pregnancy.

The disease was severe at presentation or rapidly progressive in 39 cases (84.8%) leading to delivery within 72 hours of presentation. Expectant management was done in 7 cases (15.2%) with a resultant delay of delivery for an average of 10.9 days, range 4-37 days. Of the cases managed expectantly, 5 were delivered by caesarean section while 2 had induction of labour and vaginal delivery, 57.1% of them had good perinatal outcome while 42.9% had early neonatal death.

Caesarean section was the mode of delivery in 58.7% of the study population, with 47.8% having a caesarean section without prior induction of labour. Twenty four (52.2%) had induction of labour with Misoprostol or Oxytocin, out of which 5 (20.8%) had failed induction necessitating a caesarean section.

Measures of perinatal outcome showed that 31.9% of the babies had severe birth asphyxia; the still birth rate was 27.7% and early neonatal death rate, 38.3%. The perinatal survival rate was 34.0%.

Analysis of the perinatal outcome in women presenting with live foetuses according to mode of delivery showed that a total of 34 women (73.9% of all cases) presented with live foetuses, of these 22 (64.7%) had caesarean section, 7 (20.6%) had induction of labour and vaginal delivery while 5 (14.7%) had failed induction and caesarean section. Among the 22 women that had caesarean section (23 foetuses), 12 (52.1%) survived while 11 (47.8%) had early neonatal deaths. In the group that had induction of labour and vaginal delivery, 2 (28.6%) survived, 3 (42.9%) had early neonatal deaths and 2 (28.6%) had fresh still births. Among women with failed induction, 2 (40%) survived, while the rest had early neonatal death.

An assessment of the effect of birth weight on perinatal survival showed that among the 16 surviving foetuses 8 (50%) had birth weight of 1.5 kg and above and 15 (93.8%) had birth weight of 1 kg or above. In contrast among the 19 foetuses that presented alive but had fresh still births or early

neonatal deaths, only 1 (5.3%) weighed 1.5 kg or above while 11 (53.9%) weighed 1 kg and above. These differences were statistically significant. Hence babies were more likely to survive the higher their birth weight with the chances significant higher when they weighed 1.0 kg and above ($P=0.02$, $RR=5.2$, $CI=0.8-33.9$) and 1.5 kg and above ($P=0.005$, $RR=2.9$, $CI=1.6-5.4$).

Table 2 shows a comparison of severity at presentation and selected measures of maternofetal outcome among cases of early onset and late onset pregnancy induced hypertension/eclampsia. Early onset pregnancy induced hypertension had an almost 5-fold higher risk of presenting with eclampsia, about 2-fold increased risk of induction of labour and about 5-fold increased risk of still births and almost 7-fold increased risk of early neonatal deaths compared to cases of late onset pregnancy induced hypertension/eclampsia. There were no maternal mortalities in both groups.

Table 1: Age, Parity, Gestational Age at Presentation and Severity of Cases of Early Onset Pregnancy Induced Hypertension.

Parameter	Freq. (n=46)	%
Age(years)		
<20	2	4.3
20-24	2	4.3
25-29	14	30.4
30-34	22	47.8
>34	6	13.0
Parity		
0	18	39.1
1	8	17.4
2	8	17.4
3	6	13.0
4	5	10.9
>4	1	2.2
Gestational age at diagnosis (weeks)		
<24	4	8.7
24-28	6	13.0
>28-32	36	78.3
Severity of disease at presentation		
Mild gestational hypertension	8	17.4
Severe gestational hypertension	9	19.6
Severe preeclampsia	15	32.6
Severe preeclampsia (Imminent eclampsia)	7	15.2
Eclampsia	14	30.4

Table 2: A Comparison of Presentation and Materno-Fetal Outcome in Early and Late Onset Pregnancy Induced Hypertension.

Parameter	Early onset PIH (n=46) Number (%)	Late onset PIH (n=200) Number (%)	P-value	RR	CI
Diagnosis at presentation					
Mild PIH	8(17.4)	102(51.0)	<0.0001*	0.2	0.1-0.5
Severe PIH/Pre-eclampsia	24(52.2)	92(46.0)	0.2	1.4	0.8-2.3
Eclampsia	14(30.4)	6(3.0)	<0.0001*	4.5	3.0-6.8
IOL	2(52.2)	65(32.5)	0.02*	1.9	1.2-3.2
Caesarean sections	27(58.7)	86(43.0)	0.04*	1.7	1.04-2.9
Abruptio placenta	4(8.7)	5(2.5)	0.01*	3.0	1.6-5.4
	(n=47 neonates)	(n=211 neonates)			
Severe birth asphyxia	15(31.9)	10(4.7)	<0.0001*	3.9	2.5-6.0
Still births	13(27.7)	6(2.8)	<0.0001*	4.8	3.1-7.4
Early neonatal deaths	18(38.3)	4(1.9)	<0.0001*	6.7	4.5-9.9

Key: PIH=Pregnancy induced hypertension, IOL=Induction of labour, RR=Relative risk, CI=95% Confidence interval.

DISCUSSION

The incidence of early onset pregnancy induced hypertension/eclampsia found in this study is in agreement with the reports of most previous reviews of hypertension in pregnancy in Nigeria which show that early onset disease is relatively less common in Nigerian women compared to Caucasians^{1,2,6}. Our results, however, differ with the report of Onah and Ilobachie who found a higher incidence of 23.4% of all cases of hypertensive disorders in pregnancy in eastern Nigeria⁶. Most cases in this study, presented with severe or rapidly progressive disease necessitating delivery within 72 hours of presentation. This is in contrast with late onset cases seen over the same period where a significantly higher proportion of cases presented with mild disease and the risk of presenting with eclampsia was significantly lower. A previous study of cases of early onset pregnancy induced hypertension in South Africa noted that the disease was more rapidly progressive in black women compared to women from other racial groups⁹.

Newer studies encourage conservative management of cases of severe pre-eclampsia in contrast to the aggressive approach characterised by early delivery as practiced in our centre^{10, 11}. Compared to the findings of our study, a previous Nigerian study showed that conservative management was associated with increased maternal morbidity and mortality, because of institutional delays and non-availability of Magnesium sulphate⁶. Other workers have also reported increased risk of maternal morbidity with conservative management^{9,12}. However, in a randomised controlled trial, Sibai and colleagues did not find any significant difference in

maternal outcome between women managed aggressively and those managed conservatively¹⁰. But this must be viewed in the context of ready availability of facilities for close maternal monitoring and prompt intervention when indicated. In economically disadvantaged settings like ours, with most women presenting with rapidly progressive disease and relatively poor facilities for close maternal monitoring, our results suggest that aggressive management may hold better prognosis for the mother. Only one patient developed acute renal failure but there were no cases of HELLP syndrome, disseminated intravascular coagulopathy or maternal deaths. This contrasts sharply with the results of the study by Onah and Ilobachie, which showed that conservative management in Nigerian women, was associated with increased risk of HELLP syndrome, renal failure and maternal mortality⁶. The higher incidence of HELLP syndrome, renal failure and maternal deaths reported by Onah and Ilobache is most likely due to the higher number of cases managed conservatively (175 cases and for longer duration, 8.8 +/- 1.5 weeks) compared to our study where more than four-fifths had delivery within 72 hours and only 15.2% had conservative management for an average of 10.9 days.

The risk of perinatal morbidity and mortality was markedly higher in early onset compared to late onset disease. This would be expected due to the effects of prematurity and the increased risk of intrauterine growth restriction in early onset pregnancy induced hypertension/eclampsia. Our results are similar to the findings of Onah and Ilobachie who found a four fold increased risk of perinatal mortality in early onset cases managed conservatively compared to

disease of late onset⁶. For women presenting with live foetuses, the foetal loss rate in our series is similar to the findings of a South African study⁹ where the fetal loss rate following conservative management was 48%. However, most reports show that conservative management of severe preeclampsia is associated with marked improvement in perinatal outcome because of higher gestation at delivery, higher birth weight and lower incidence of neonatal complications¹⁰⁻¹³. In a recent study in the United States of America¹³, conservative management of severe preelampsia was associated with a low perinatal mortality rate of 5.4%.

Decision on whether to allow a vaginal delivery may be a difficult one in early onset pregnancy induced hypertension presenting with a live foetus because of concern that the time for induction of labour and vaginal delivery may result in worsening of maternal and perinatal outcome. This may explain the high caesarean section rate in our study as has been reported by other authors^{14, 15}. However, while induction of labour is the obvious option for delivery of women with dead foetuses in the absence of contraindications, it is noteworthy that in women presenting with a live foetus that had induction of labour in this study, the chance of achieving a vaginal delivery was 58.3%. This suggests that there is a place for induction of labour in carefully selected cases with close maternal and fetal monitoring and resort to caesarean section if maternal or fetal complications supervene. Nassar et al similarly concluded that labour induction should be considered a reasonable option for patients with severe preeclampsia at less than or equal to 34 weeks based on the finding that 48% of women who had induction of labour in their series successfully delivered vaginally¹⁴.

It was observed that for women presenting with a live foetus, the perinatal outcome was better for cases that had caesarean section, 52.1% survival rate, compared to 40% for those that had failed induction and caesarean section and 28.6% for women with induction of labour and vaginal delivery. These results must be interpreted with caution since the patients were not randomly selected for different mode of deliveries. In contrast, with the poor facilities for neonatal care and hence the poor chances of survival of extreme low birth weight babies in our setting, the major principle was that babies considered subjectively to have a high chance of survival by virtue of gestational age and estimated birth weight were offered a caesarean section. Hence babies presenting at earlier gestations usually less than 30 weeks or foetuses estimated to weigh less than 1 kg were offered induction because of the poorer chances of neonatal survival. This explains the higher survival rate for babies having a caesarean

section. This was borne out from the results of analysis of the effect of birth weight on perinatal outcome which showed that the chances of neonatal survival increased significantly with birth weight with the chances higher with babies weighing 1kg or above.

Implication of findings

The results of our study indicate that aggressive management of cases of severe preeclampsia of early onset is associated with good maternal but poor perinatal outcome. Clinicians in hospitals with poor facilities and personnel for close antenatal maternal and fetal surveillance should adopt an aggressive approach to management. Conservative management should be reserved for centres that are equipped with facilities for close antenatal maternal and fetal monitoring as well as the capacity for rapid response when urgent delivery is indicated. To improve perinatal outcome, there is an urgent need to establish regional centres with state of the art facilities for antenatal maternal and fetal monitoring where cases can be referred to for optimum care.

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