

A CLINICAL STUDY OF MATERNAL AND PERINATAL OUTCOME IN PREECLAMPSIA

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ABSTRACT

Background and Objective

“The challenge to human rights principles is to make the promise of safe motherhood real. The opportunity of advancement through ensuring respect for human rights has been recognised nationally and internationally, and the language of human rights has come to define the best enjoyments of life that countries can offer their populations.” Hypertensive disorders complicating pregnancy continue to be rampant globally and is responsible for majority of maternal and fetal morbidity and mortality. Preeclampsia though still obstetric enigma, it has almost been eradicated from the developed world. More women die due to pregnancy induced hypertension in India than anywhere else in the world. The objective of this study was to analyse the cases of preeclampsia complicating pregnancy and its maternal and perinatal outcome in relation to preterm delivery, IUD/ still birth, and early neonatal death and also the management of preeclampsia in pregnancy.

Method

A prospective study conducted on 100 pregnant women between 30 – 40 weeks gestation admitted to the hospitals attached to JJM Medical College, Davangere during the two year study period (2012-2014). The study had 2 groups – 50 pregnant women with preeclampsia as cases and 50 normal pregnant women as controls. Statistical methods like Chi-square test and Independent samples ‘t’ test were employed for the study.

Results

In the present study, the overall incidence of hypertensive disorders is 18.46%, out of which the incidence of preeclampsia accounted for 15.3%. The number of preterm deliveries were 17 (34%) and IUGR were 6 (12%). Perinatal mortality was seen in 12% of the cases, with prematurity as the most commonest cause of mortality. Caesarean section rate was 46%. Commonest maternal complications were Atonic PPH and Abruptio placenta. There was 1 maternal mortality due to Acute pulmonary edema.

Conclusion

Though the incidence of preeclampsia and eclampsia is on the decline, still it remains the major contributor to poor maternal and perinatal outcome. The fact that preeclampsia is largely a preventable disease is established by the negligible incidence of preeclampsia with proper antenatal care and prompt treatment of preeclampsia. The early use of antihypertensive drugs, optimum timing of delivery and strict fluid balance, anticonvulsants in cases of eclampsia will help to achieve successful outcome. Early transfer to specialist centre is important and the referral centres should be well equipped to treat such critical patients. Training and continuing medical education of the attending staff and structuring management protocols relevant to local needs also is an important part in the prevention and management of preeclampsia.

Keywords: Preeclampsia, Prematurity

INTRODUCTION

Hypertensive disorders of pregnancy complicate about 8% of all gestations and are responsible for significant maternal and perinatal morbidity and mortality.¹

Preeclampsia is a common pregnancy specific syndrome that originates in the placenta and accounts for a considerable proportion of both maternal and perinatal deaths, while hypertension without proteinuria generally has a far more benign course.² It usually develops after 20 weeks of gestation and resolves after delivery of the placenta. Several classifications of hypertension in pregnancy have been used, of which the classification of hypertensive disorders by the Working Group of the National high blood pressure education program [NHBPEP] (2000) has widest acceptance.³

It affects 3-5% of all the pregnancies.² In India, there is 5-15% incidence of Preeclampsia.² It causes 10-15% maternal deaths in the developing countries.² The reason for increased maternal mortality and morbidity in developing countries are social deprivation, lack of access to trained birth attendants, lack of education, late referral to tertiary centres, lack of transport, unbooked status of the patient, nulliparity, prolonged state of unconsciousness and multiple seizures prior to admission.⁴

Preeclampsia affects both the mother and the fetus. Despite several decades of research, while etiology remains elusive, the definitive treatment is clear termination of pregnancy. As termination of pregnancy is the only effective treatment or cure for preeclampsia, it is always the treatment of choice for the mother. However, for the fetus remote from term, prolongation of pregnancy might be more appropriate in certain cases. Traditionally this approach of balancing the interests of the mother and the fetus has been adopted in the management of preterm pregnancies with mild preeclampsia. On the other hand, women with severe preeclampsia have been delivered without delay, regardless of fetal considerations.⁵ This aggressive management with immediate delivery of a fetus remote from term leads to high perinatal mortality and morbidity resulting from prematurity. Consequently hospitalisation in NICU is prolonged and some surviving infants may have long term disabilities.^{6,7}

As severe preeclampsia became known as a heterogenous condition and the methods improved for monitoring maternal and fetal wellbeing, some challenged the view that patients with severe preeclampsia must always be delivered expeditiously. To address this question, several prospective studies were conducted to assess the potential maternal risks and neonatal benefits of delaying delivery. Because immediate delivery is always the optimal management for the mother, demonstrable benefit to the newborn is essential to justify the postponement of delivery.

Preeclampsia is associated with increased risk of maternal mortality and maternal morbidities like convulsions, abruptio placenta, acute renal failure, cerebrovascular and cardiovascular complications, liver hemorrhage, disseminated intravascular coagulation and stroke.⁸

The infants of preeclamptic mothers have a significantly higher incidence of prematurity, somatic growth retardation, thrombocytopenia, low apgar scores, delayed adaptation, patent ductus arteriosus and gastrointestinal hypomotility. Prematurity is the most important factor responsible for increased perinatal morbidity and mortality.

How pregnancy incites or aggravates hypertension remains unsolved dispute decades of intensive research. It is hence a challenge to be addressed and overcome if there is to be any

significant improvement in maternal and perinatal health. Recent research, in offering the possibility of prophylaxis as well as improved methods of medical and obstetric management has given us a better understanding of the etiopathology of preeclampsia. Currently there are exciting prospects of preventing preeclampsia through the modulation of vasoactive, intravascular events relatively using simple medical therapy.

The management of preeclampsia has gone through many changes and has achieved good results with the introduction of Newer Antihypertensives, Different regimes of Anticonvulsants and also increased awareness of the people.

The present study is undertaken to analyse the cases of preeclampsia, consequences in relation to the mother and the fetus and management aspect of the same.

OBJECTIVES

Ensuring safety of the mother and the fetus is the aim of Obstetric practice.

- 1) To study the maternal outcome in preeclamptic pregnant women between 30 weeks to 40 weeks with reference to age, parity, severity, mode of delivery, maternal complications and maternal mortality.
- 2) To study the perinatal outcome with reference to birth weight, Apgar score, NICU admission, perinatal complications and perinatal mortality.

MATERIALS AND METHODS

Source of data

This study is a prospective study conducted on pregnant women between 30 to 40 weeks admitted to Chigateri General Hospital, Women and Child Hospital and Bapuji Hospital, Davangere during the period of July 2012 to June 2014 after obtaining clearance from Hospital Ethical Committee.

Method of collection of data

Sample size – 100 pregnant women.

The study will include two groups:

1. The case group:

It will include 50 preeclamptic pregnant women with the following criteria:-

Inclusion criteria:

1. Pregnant women between 30 – 40 weeks of gestation.
2. Birth weight more than 1 kg.
3. Blood pressure >140/90mm of Hg with proteinuria.
4. Single intrauterine pregnancy.

Exclusion criteria:

1. Pregnant women <30 weeks and >40 weeks of gestation.
2. Gestational Hypertension.
3. Chronic Hypertension.
4. Placenta Previa.
5. Presence of Diabetes mellitus.
6. Heart diseases.
7. Renal diseases.
8. Babies with Congenital Malformations.

2. The control group:

It will include 50 normotensive pregnant women between 30 weeks to 40 weeks of gestation.

Selection of cases

Both booked and unbooked, and all patients who were diagnosed to have preeclampsia and admitted to Chigateri General Hospital, Women and Child Hospital and Bapuji Hospital, Davangere were studied. All patients were between 30 weeks to 40 weeks of gestation.

The patients were selected irrespective of parity, consanguinity and from all socio-economic classes. Detailed history, period of gestation, last menstrual period of and expected date of delivery, history of previous pregnancies, results of present study were noted in the proforma.

STATISTICAL METHODS APPLIED IN THIS STUDY

Following statistical methods were applied in the present study

- Chi-square test
- Independent samples 't' test

RESULTS

A total number of 31072 deliveries were conducted in the three hospitals (Bapuji Hospital, Chigateri General Hospital and Women and Children's Hospital, Davangere) attached to JJM Medical College during the period July 2012- June 2014. Hypertensive disorders in pregnancy was seen in 5748 cases admitted to the hospital with a incidence of 18.46%.

Preeclampsia cases were 4756 which accounted for 15.3% of the deliveries conducted.

The eligible cases for the study is 50 pregnant women without preeclampsia as controls i.e, Group A and 50 pregnant women with preeclampsia as cases i.e, Group B.

Table 1: Maternal Outcome

Parameters	Controls	Preeclampsia
Age in years	23.2 ± 3.6	23.8 ± 3.1
Booked cases	42(84)	34(68)
Parity		
1. Multigravida	25(50)	22(44)
2. Primigravida	25(50)	28(56)
Gestational Age in weeks	38.4 ± 1.92	36.8 ± 2.59

Table 2: Laboratory Parameters

Parameters	Controls	Pre-eclampsia
Platelet count		
1. < 1.5 lakh/Cumm	4(8)	17(34)
2. > 1.5 lakh/Cumm	46(92)	33(66)
Blood Urea		
1. Normal	50 (100)	49 (98)
2. Raised	0	1(2)
Serum Creatinine		
1. Normal	50(100)	49(98)
2. Increased	0	1(2)
Liver function Test		
1. Normal	50(100)	37(74)
2. Abnormal	0	13(26)

Serum Uric Acid		
1. Normal	50(100)	6(12)
2. Increased	0	44(88)
Fundoscopy		
1. Normal	50(100)	45(90)
2. Abnormal	0	5(10)
Doppler Study		
Abnormal	1(2)	10(20)

Table 3: Delivery Outcome

Parameters	Controls	Preeclampsia
Induction of Labour	3 (6)	16 (32)
Caesarean Section	8 (16)	23 (46)
Vaginal delivery	38 (76)	21 (42)
Instrumental delivery	4 (8)	6 (12)

The major indication for LSCS in Group B was fetal distress, abruption, Failed induction, Low BPP and others. Atonic PPH and Abruptio Placentae are the most commonest complications in the women in Group B followed by Acute renal failure, HELPP syndrome, traumatic PPH and Acute pulmonary edema. One patient in the Preeclamptic Group B died due to Acute pulmonary edema.

Table 4: Perinatal Outcome

Parameters	Controls	Pre-eclampsia
Sex		
1. Male	24 (48)	22 (44)
2. Female	26 (52)	28(56)
Weight		
1. >3kg	11(22)	10(20)
2. 2-3kg	37(74)	29(58)
3. 1-2kg	2(4)	11(22)
4. Mean	2.71 ± 0.48	2.45 ± 0.71
APGAR		
1. <7	10 (20)	21 (42)
2. >7	40 (80)	29 (58)
NICU Admission	10 (20)	22 (44)
Preterms	8 (16)	17 (34)

Prematurity is the major perinatal complication (34%), followed by Low birth weight, Respiratory distress syndrome and meconium aspiration syndrome in Group B. The incidence of perinatal complications is more in the preeclamptic group and is statistically significant. There were 6 perinatal deaths in preeclamptic group due to prematurity compared to 2 deaths in the control group.

DISCUSSION

Incidence

Hypertensive disorder in pregnancy is a common condition which is responsible for the majority of maternal and perinatal morbidity and mortality.

The incidence of hypertensive disorder in pregnancy (especially preeclampsia) and the total number of deaths from the same have come down dramatically in developed countries. This is totally attributed to the improvements in developed countries like health education, booked status of the patient, timely access to transport, trained birth attendants and resources and early referral to tertiary centres.

However, in developing countries it still stands one of the major complications of pregnancy.

- In this study, the overall incidence of hypertensive disorders was 18.46%
- According to ACOG 2013, Hypertensive disorders complicate 10% of the pregnancies.
- According to Rathore R et al 2008, Hypertensive disorders complicate 12-22% of all pregnancies in India.⁴
- According to Shirish N Daftary it is 10-15%.

Incidence in this study, it is on the higher side which may be attributed to lack of access to trained birth attendants, lack of education, late referral to tertiary centres, lack of transport and higher unbooked status of the women.

- The incidence of pre-eclampsia was 15.3%.
- According to ACOG 2013, the incidence is 10%.
- According to S Kishwara et al 2011, the incidence is 5-15% in India.²
- William's Obstetrics 23rd edition quotes the incidence as 3-10%.³

In this study, the incidence of pre-eclampsia is on the higher side due to lack of education, lack of available resources and higher unbooked status of the women.

Socio-economic status

In this study most of the women (76%) had come from the low socio-economic status. This indicates that poor socio-economic status, poor nutrition and inadequate ante-natal care have a close relationship with preeclampsia.

Antenatal care

In this study, unbooked cases were 32% in the women with preeclampsia and 16% in normal pregnant women. It might be the reason for the high incidence of preeclampsia. It has been universally accepted that the adequate standard antenatal care has immense value in reducing the incidence of preeclampsia by its early detection and its prompt treatment.

Maternal Age and Parity

In this study, 62% were in the age group of 21-25 years with mean age of 23.8 years in the women with preeclampsia. Whereas 52% of women in the control group were in the age group of 21-25 years with a mean age of 23.2 years.

According to A.P.M.C 2008, frequency of disease increased at either ends of maternal age, with highest number of cases between 20-25 years.

Though the number of cases were only slightly more in primigravidas than multigravidas according to this study, maternal complications were more in younger primigravida and elderly primigravida.

Gestational Age

The mean gestational age of women in the control group is 38.04 ± 1.92 weeks and in the preeclamptic group is 36.8 ± 2.59 weeks. According to this study, women with preeclampsia presents at lesser gestational age at labour or for induction of labour in comparison to controls which is statistically significant. According to S Kishwara et al (2011)², the mean gestational age of the mother with pre-eclampsia was 36.9 weeks. The mean gestational age of this study matches other studies.

Laboratory Parameters

The platelet count was found to be < 2.5 lakhs/cumm in 80% of the women with pre-eclampsia and 54% of the women in control group. Majority of women among the cases had platelet count less than 1.5lakh/cumm.

According to Vitthal G Kuchake (2011)¹⁴, the mean count of platelets in pre-eclamptic group was 2.19 lakhs/cumm.

The degree of thrombocytopenia reflects the severity of pathology.

This study shows that Renal function test was raised only in 1 patient who went into Acute renal failure among pre-eclamptic group who went for dialysis. The renal function test was normal in the control group.

Liver function tests were raised significantly in 26% patients of the women in pre-eclamptic group.

Serum Uric acid levels were significantly raised in 44% of the women in pre-eclamptic group where as it was normal in the control group. Raised serum uric acid level indicates renal involvement as it is secreted by renal tubules, High level of serum uric acid is found to correlate with the severity of pre-eclampsia, volume contraction and fetal jeopardy.

Fundoscopy and Doppler studies

Fundoscopy was abnormal in 5 women with preeclampsia with arteriolar changes and papilledema. All the women belonged to severe preeclampsia.

Ten women in preeclamptic group had abnormal Doppler studies. Signs of IUGR was seen in 3 women who underwent LSCS. Absent end diastolic flow was seen in 3 women, out of which 1 was induced and the rest was taken for Emergency Caesarean section. Remaining 6 women had S/D ratio raised who underwent induction of labour. Abnormal Doppler is more in women with severe preeclampsia than mild preeclampsia.

Induction of labour

Most of the women in the preeclampsia group 32% had to be induced with labour with preeclampsia as the major indication for induction.

Only 3 women in control group were induced for PROM. These women were induced as the definitive treatment of preeclampsia is termination of pregnancy.

Mode of delivery

In this present study, the number of vaginal deliveries were 26 (54%) and Caesarean sections were 21 (46 %) among the women with preeclampsia.

The vaginal deliveries were 42 (84 %) and Caesarean sections were 8 (16 %) among the women in the control group. Instrumental deliveries were more in the preeclamptic group (12%).

Caesarean section rate was high in women with preeclampsia with fetal distress as the most common indication, followed by Low BPP, failed induction, Abruption placenta and others.

- In the study by M R Datta, Luna Pant (2002), 42% were vaginal deliveries and caesarean section rate was 68%. Labour indication was required in 54% of the cases. Success rate was 68%.

- According to Shymala et al (2005), the caesarean delivery was resorted in 57% of cases.
- According to Vitthal G Kuchake et al (2010), the most of pregnancy were observed as caesarean mode of delivery in pre-eclampsia. The caesarean section rate was 65.75%.

FETAL OUTCOME

1. Maturity of the baby

- Total number of preterm deliveries were 8 (16%) and term deliveries were 42 (84%) in the control group.
- Total number of preterm deliveries were 17 (34%) and term deliveries were 33 (66%) in the women with preeclampsia. The incidence of prematurity is high in women with Severe preeclampsia.
- This clearly proves that severity of disease is directly related to maturity of the baby.

2. Apgar Score

- 21 babies (42%) in the preeclamptic group had Apgar score < 7 at 5 minutes of age and 10 (20%) in the control group had Apgar score < 7 at 5 minutes.
- According to Attiya Ayaz et al (2009), 42.2% of the babies with preeclampsia had Apgar score < 6.
- According to Mamta R Datta et al (2002), 14% of the babies had Apgar score < 6 at 5 minutes.

This study also shows similar findings.

3. Birth Weight

- In this present study, the majority of babies were in the birth weight of > 2.5kg (76 %) in the control group. Compared to controls, 22 babies (44%) were weighing < 2.5kg in the women with preeclampsia.
- The mean weight of the babies in the preeclamptic group is 2.45 ± 0.71 kg which is almost similar to study by S Kishwara (2011)² 2.46 kg.

4. NICU Admissions

The NICU admissions were more in the women with preeclampsia 44%. The most common reason being prematurity and low birth weight.

5. Perinatal Complications

- Prematurity (34%) is the most common complication among the preeclampsia group followed by IUGR (12%), RDS (10%) and MAS (8%).
- Though prematurity (16%) is the commonest complication in the control group, the incidence is less compared to the cases.
- IUGR and Prematurity is more common in Severe preeclampsia.

6. Perinatal Mortality

- Perinatal mortality in the women with preeclampsia is 6 (12%) i.e, 120 /1000 live births.
- Perinatal mortality in the control group is 2(4%) i.e, 40/ 1000 live births.
- According to the study by Shazia et al (2008), the perinatal mortality rate is 30%.
- The most common cause of death in this study is prematurity.
- So the present study was quite similar to other studies. All patients who were diagnosed to have preeclampsia before 34 weeks had the worst prognosis.

Maternal Morbidity

Total number of women with Abruptio placenta in preeclamptic group were 3(6%). It was the commonest complication of preeclampsia.

Other complications are Atonic PPH, Acute renal failure, HELPP syndrome, Pulmonary edema and Traumatic PPH. So early detection of preeclampsia and its complications and its prompt treatment reduces both maternal and perinatal morbidity and mortality.

Maternal Mortality

- There was only one maternal death in the women with preeclampsia due to Acute pulmonary edema.
- So, the incidence of maternal mortality in this study is 2%.
- In some centres it has become zero.
- COG (2002) gives an incidence of maternal mortality due to preeclampsia as 0-13.9%.

CONCLUSION

Hypertensive disorders complicating pregnancy is one of the most extensively researched subjects in obstetrics. Still the etiology remains an enigma to us.

Preeclampsia still remains a major problem in developing countries. Though the incidence of preeclampsia and eclampsia is on the decline, still it remains the major contributor to poor maternal and perinatal outcome.

The fact that preeclampsia is largely a preventable disease is established by the negligible incidence of preeclampsia with proper antenatal care and prompt treatment of preeclampsia.

In preeclampsia, the pathology should be understood and that it involves multiorgan dysfunction should be taken into account.

The early use of antihypertensive drugs, optimum timing of delivery and strict fluid balance, anticonvulsants in cases of eclampsia will help to achieve successful outcome.

Early transfer to specialist centre is important and the referral centres should be well equipped to treat such critical patients.

Training and continuing medical education of the attending staff and structuring management protocols relevant to local needs also is an important part in the prevention and management of preeclampsia.

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