



BURDEN OF SEVERE PREECLAMPSIA AND ECLAMPSIA IN A TERTIARY CARE CENTER IN CHHATTISGARH; A SHORT-TERM RETROSPECTIVE ANALYSIS

Obstetrics & Gynaecology

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ABSTRACT

Hypertensive disorders of pregnancy (HDP) particularly, pre-eclampsia and eclampsia have remained one of leading causes of maternal and perinatal morbidity and mortality worldwide. There is lack of adequate information about prevalence, demographic features, and obstetric outcome in pregnant women with HDP from central India. To add more information to existing data about HDP, we conducted a short-term retrospective analysis to find out the prevalence, to analyze various demographic characteristics and to evaluate fetal-maternal outcome in women who were diagnosed with severe PE & eclampsia. This preliminary analysis showed that majority of these women belonged to rural areas and low-income groups with poor literacy rates. Prevalence of eclampsia was found to be 7.95%. Most of the cases had no antenatal visit and therefore, they had no antenatal investigations or obstetric ultrasound at the time of delivery. ICU admission rate was 18.1% for eclampsia. 18 cases with severe pre-eclampsia-eclampsia needed ventilatory support postpartum. Severe preeclampsia-eclampsia contributed for 21% of all maternal mortalities. 11% pregnancies got complicated with intrauterine fetal demise. Total live birth rate was 88.4% and there were 12 % neonatal deaths. Based on observations from our study, it can be concluded that certain factors like poverty, illiteracy, lack of awareness, distant health care facilities, cultural practices etc are the main hinderance in achieving optimal obstetric outcome and in reducing maternal and perinatal deaths from HDP. These issues need to be addressed at earliest.

KEYWORDS

hypertensive disorders of pregnancy, HDP, Severe pre-eclampsia, Eclampsia, maternal mortality, perinatal mortality

INTRODUCTION

Hypertensive disorders in pregnancy affect approximately 10% of all women globally. HDP includes gestational hypertension, pre-eclampsia (mild or severe) and eclampsia and chronic hypertension. These disorders have been associated with severe acute maternal morbidity (SAMM), long term disability, maternal deaths, increased perinatal morbidity and mortality¹. Maternal deaths from HDP is nearly one tenth of all maternal deaths in Asia and Africa². Commonly observed risk factors include obesity, chronic hypertension, diabetes, nulliparity, adolescent pregnancy, multiple gestation and pre-existing auto-immune disorders or renal disorders etc^{3,4,5}.

Maternal complications due to endothelial dysfunction include eclampsia, HELLP syndrome, placental abruption, DIC, pulmonary oedema, postpartum hemorrhage, acute renal failure, shock, intracranial hemorrhage, and death. Fetal complications are usually placenta mediated and they include fetal growth restriction, oligohydramnios, intrauterine fetal demise, prematurity (mostly iatrogenic) and increased perinatal morbidity and mortality due to preterm birth or growth restriction or low birth weight⁶.

Early antenatal registration, implementation of first trimester pre-eclampsia screening programs, starting aspirin for preeclampsia prevention, , prevention of severe HTN and its complications by judicious use of antihypertensive drugs, eclampsia prevention with MgSO₄ therapy, serial laboratory monitoring of PIH profile to assess maternal organ dysfunction, antepartum fetal surveillance with serial obstetric doppler and growth monitoring with early identification of deteriorating maternal medical and fetal condition etc are most widely used effective strategies to optimize maternal and perinatal outcome. The only definitive treatment for severe PE/Eclampsia is termination of pregnancy^{7,8,9,10}.

Only few studies have been done on central Indian women with HDPs till date. Therefore, to add further information to the existing data, we decided to conduct a retrospective study to analyze various demographic characters and contributory risk factors associated with poorer obstetric outcome in our patients coming to our emergency unit and to evaluate maternal and perinatal outcome in all pregnant women with severe PE and eclampsia.

MATERIAL AND METHODS

This short-term retrospective observational study was conducted in

department of obstetrics and gynecology in a tertiary care center in Bilaspur, Chhattisgarh after obtaining permission from Institutional ethics committee of CIMS, Bilaspur from January 2020 till June 2020. Main objectives of this analysis were to find out the prevalence of eclampsia and evaluation of various demographic characters & fetal-maternal outcome in pregnancies affected with severe PE-eclampsia. We included all pregnant women (aged between 18-45 years) who attended our emergency obstetric unit and got diagnosed with severe PE or eclampsia (as per ACOG criteria) at the time of admission and delivered with us subsequently. All pregnant women not fulfilling age criteria, with gestational hypertension or mild pre-eclampsia, postpartum, carrying malformed fetus or who had incomplete or lost data were excluded. Data was obtained from medical case records of all participants. Maternal outcome was analyzed in terms of antepartum/intrapartum/postpartum complications, need for ICU admission, duration of ICU stay, need for resuscitation, blood or blood products transfusion, treatment related complications, and incidence & cause of maternal death. Perinatal outcome was assessed in terms of live birth rate, still birth rate, low APGAR score at birth, low birth weight, incidence of preterm birth, need for NICU admission, neonatal complications, duration of NICU stay, cause of neonatal death. In this study descriptive statistics was used and correlation analysis was done. Outcome measures were analyzed as percentage and proportions.

RESULTS

There were 3,256 deliveries between January 2020 and June 2020 at our institution. We encountered 259 cases of eclampsia in the study duration. Prevalence of eclampsia was found to be 7.95% in our study population. We present here data of 121 pregnant women affected with severe pre-eclampsia-eclampsia who satisfied our inclusion criteria. Due to lack of complete information of cases or lost records, details of other cases have not been included in our analysis. 72.7% women (88, n=121) were in age group between 18-25 years and 4.1% (5, n=121) were elderly gravida. Majority (90.9%) were unbooked cases. Nearly all (98.3%) belonged to rural and remote areas. As per modified socioeconomic scale by Kuppuswamy, 72% were classified under lower class. Majority of study participants (88.6%) were not adequately educated (21% were illiterate and 67.6% were educated below or up to high school level) (table no.1).

61.1% were primigravids. Out of 121, almost half delivered at preterm gestation. 21% delivered before 32 weeks. Majority of these preterm births were iatrogenic. Of 121, 30.5% (37) had eclampsia and 69.4%

(84) had severe pre-eclampsia. 56.1% had cesarean delivery. 83% (31, n=37) of all eclamptic women needed cesarean delivery for indication being poor maternal medical condition and unfavorable cervix in majority. There were 120 (0.03%, n=3256) obstetric admissions (all postpartum) in ICU in our study duration. Severe pre-eclampsia-eclampsia contributed for 44% (53, n=120) of all ICU admissions. Of 259 eclamptic women, 18% (47) needed ICU care. 33.9% (18, n=53) required ventilatory support. Maternal mortality ratio was noted to be 603 per one lakh live births in our study duration. Out of 19 maternal deaths, 4 (21%) were caused by severe preeclampsia and eclampsia. Pulmonary edema, DIC, hemorrhage and acute kidney injury were found as most important contributory causes of death in these women. Perinatal mortality ratio was 70.8 per 1000 live births in the study period. Upon data analysis of 121 deliveries, we found 88.4% (107, n=121) live births whereas 11.5% (14, n=121) were IUFD. 13 (12.1%) had neonatal death, due to prematurity, low birth weight, sepsis or birth asphyxia. 87.8% (94, n=107) babies went home alive. 41.1% (44, n=107) babies needed NICU admission. Nearly half of newborns were low birth weight and preterm. (table no.2)

Table no.1- Demographic characteristics (n=121)

Socio-economic status as per modified Kuppuswamy scale			
Total score	Socio-economic class	n	%
26-29	upper class	0	0
16-25	upper middle	3	2.4%
10-15	lower middle	30	24.7%
5-10	upper lower	88	72.7%
Below 5	lower	0	0
Literacy level			
Education level of patient	n	%	
Professional degree	4	3.3	
Graduate	0		
Intermediate	19	15.7	
High school	49	40.4	
Middle school	5	4.1	
Primary school	28	23.1	
Illiterate	26	21.4	
Total	121	100%	

Table no.2- Distribution according to gestational age at birth (n=121) and birth weight (n=107)

Gestational age at birth	n	%
<28 weeks (extreme preterm)	6	4.9%
28-31.6 weeks (very preterm)	20	16.5%
32-37 weeks (moderate-late preterm)	35	28.9%
>37 weeks	60	49.5%
Birth weight	n	%
<1 kg (extremely low birth weight)	1	0.9%
1-1.5 kg (very low birth weight)	17	15.8%
1.51-2.5 kg (low birth weight)	39	36.4%
>2.5 kg	50	46.7%

DISCUSSION

Despite the advancement in management of hypertensive disorders in pregnancy and improved antenatal and postnatal care, the ongoing significantly increased maternal and perinatal morbidity and mortality attributed by HDP still remains an area of concern for managing clinicians worldwide. In a systemic analysis of maternal deaths by WHO, HDPs accounted for 14% deaths^{9,11}. In developing countries, Eclampsia alone accounts for 12% of all maternal mortalities². In our study, we found 21% maternal deaths caused by severe pre-eclampsia and eclampsia.

International society for the study of hypertension in pregnancy (ISSHP) has classified hypertensive disorders of pregnancy into 2 broad categories; hypertension known before pregnancy or present in the first 20 weeks (further classified into chronic HTN either essential or secondary, white coat HTN, masked HTN) and hypertension arising de novo at or after 20 weeks (further classified into transient gestational HTN, gestational HTN, preeclampsia de novo or superimposed on chronic hypertension)¹².

Pre-eclampsia typically affects 2-5% of pregnant women. Globally 76000 women and 5 lakh babies die from this disorder every year. It is characterized by onset of hypertension and significant proteinuria after 20 weeks of gestation in previously normotensive women. PE can be subclassified into early onset PE (delivery at <34weeks), preterm PE

(delivery at <37 weeks), late onset PE (delivery at ≥34 weeks) and term PE (delivery at ≥37 weeks)⁸. According to a large-scale cross-sectional Indian study, prevalence of PE was found to be higher in women living in rural areas than those living in urban areas (11.3% vs 7.4%). The odds of convulsions were significantly higher in women residing in central India (OR 1.5; 95%CI 1.31-1.74) with reference to their counterparts. The prevalence of reported convulsions was found to be 10.3%⁴.

In a data analysis (1980-2015) by Nobis et al, the incidence of eclampsia in India has been reported as about 1.5% and there was no reduction in incidence of eclampsia and perinatal mortality noted over the last decades. Author also observed that majority of these eclamptic women were nulliparous (79%), uneducated (48.5%) and had no antenatal visit (93.6%)¹³. However, we found higher prevalence of eclampsia in our study population (7.9%). Demographic features were also found to be largely similar in our study.

Two stage theory for etiopathogenesis of PE suggests faulty trophoblastic invasion of spiral arteries in first stage which leads to endothelial dysfunction and imbalance between angiogenic and antiangiogenic factors provoking maternal response in second stage and resulting into clinical manifestation of disorder. Therefore, early intervention in first trimester itself to improve placentation in women identified to be at high risk of developing PE may help reduce the prevalence of the disease^{8,9}.

Risk factors for PE described in various studies are maternal age >35years, nulliparity, previous history of PE, short (<12 months) or long (>72months) interpregnancy interval, family history of PE (daughters/sisters of women with PE), obesity (BMI≥30kg/m²), Afro-Caribbean and South Asian race & ethnicity, presence of medical comorbidities e.g. pregestational DM, gestational DM, pre-existing chronic hypertension, renal disease, and autoimmune disorder like SLE and APS^{8,9}.

Common serious complications of PE include abruptio, pulmonary edema, acute renal failure, respiratory distress syndrome, intracranial hemorrhage, HELLP syndrome. Intracranial hemorrhage is the most common cause of death in women with PE. Short term perinatal complications include fetal growth restriction, oligohydramnios, intrauterine fetal demise, preterm birth, low Apgar score, fetal distress during labour and NICU admission. Cerebral palsy, low IQ, hearing loss, visual impairment, insulin resistance, DM, CAD and hypertension are long term complications^{8,9}.

FIGO recommends the first trimester risk-based screening for singleton pregnancies based on maternal characteristics, medical and obstetric history, MAP measurement, biochemical markers screening (PLGF, PAPP-A), uterine artery pulsatility index at 11-13.6 weeks and combined screening methods¹.

Current preventive strategy for PE is to start low dose aspirin at 75mg or 81mg daily in high risk women as locally defined. This is based on findings from various studies that LDA administration (50-150mg/d) at less than or equal to 16 weeks of gestation in high risk women had significant reduction in PE, particularly preterm PE and they also found 50% risk reduction for FGR and 60% risk reduction for perinatal death as additional benefits of early aspirin prophylaxis. Based upon findings from ASPRE trial, FIGO recommends first trimester screening and assessment for preterm PE and women identified as high risk to receive aspirin prophylaxis commencing at 11-14+6 weeks at a dose of around 150mg every night until either 36 weeks or when delivery occurs or when PE is diagnosed^{8,9}.

Mortality data from a tertiary care hospital from Bastar, Chhattisgarh shows that 46 (38.3 %) out of 120 women died due to complications of HDPs followed by ruptured uterus in 18 and sepsis in 12 cases¹⁴. In another study from Bastar, authors noted incidence of eclampsia to be 4.7%. out of 250 cases of eclampsia in one and half years, 28 died (11.2%). Factors contributing poor outcome were delay in delivery time from the time of onset of convulsion. 70% cases delivered preterm and 34% had IUFD. 80% had antepartum eclampsia and majority were young unbooked primigravids and referred cases¹⁵.

A five-year retrospective study from our institution was conducted by Murthy et al to evaluate maternal and perinatal outcome in women with eclampsia. Authors reported incidence of eclampsia as 3.5%. 542 cases needed ICU admission. Eclampsia contributed for 8% of all maternal deaths. Causes of deaths included puerperal sepsis (11%),

oliguria (8.1%), pulmonary edema (5.9%), PPH (3.6%) and CVA (1.1%)¹⁶.

Early detection by effective antenatal care and timely intervention by administering drugs e.g. MgSO₄ & institutional delivery in PE/HDPs may prevent life-threatening complications including eclampsia. Regions of Africa and Asia have low numbers of skilled health care workers making it difficult for them to serve remote areas. Certain factors that prevent women in these areas to seek antenatal or postnatal care are poverty, distance to health care facilities, lack of awareness, illiteracy, cultural beliefs and practices and inadequate or poor-quality health services. These issues need to be addressed at both societal and health system levels for improving maternal health services^{1,2}.

CONCLUSION

In this modern era, where the focus is shifting towards prediction and prevention of preeclampsia in first trimester and risk-based antenatal management and intense fetomaternal surveillance in women identified to be at high risk, it can be concluded that our population is still struggling to receive adequate antenatal, intrapartum and postpartum care owing to their social or cultural beliefs, poor literacy levels and inability to access distantly located health care centers. Addressing these issues and implementation of newer preventive approaches simultaneously may allow us to achieve optimal fetomaternal outcome in pregnancies at high risk for HDP.

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