

MATERNAL AND FETAL OUTCOME IN CASES OF PREECLAMPSIA AND ECLAMPSIA IN TERTIARY CARE CENTER OF NEPAL

Manoj Lamsal,¹ Deepanjali Sharma,¹ Narayan GC,¹ Jigyasha Subedi,¹ Tara K.C,¹ Hasina Banu,¹ Bekha Laxmi Manandhar¹

ABSTRACT

INTRODUCTION

Hypertensive disorders of pregnancy includes Gestational Hypertension, Preeclampsia and Eclampsia, Chronic Hypertension and Preeclampsia superimposed in Chronic Hypertension. These condition complicates around 5 to 10 percent of pregnancies and have significant contributions on maternal and fetal adverse outcome. This study was done to find out the maternal and fetal outcome in cases of Preeclampsia and Eclampsia.

MATERIAL AND METHODS

It was a hospital based cross sectional observational study done in department of Obstetrics and Gynecology of Universal College of Medical Sciences from August 2021 to March 2022. Maternal and fetal outcome in Preeclampsia and eclampsia were studied in 116 cases.

RESULTS

Incidence of diseases was 5.94%, preeclampsia 33 (28.4%), eclampsia 23 (19.8%) and severe preeclampsia 60 (57.7%). Adverse maternal outcome were HELLP (Hemolysis, Elevated liver enzyme and Low platelets counts) syndrome 15 (12.93%), Abruptio placenta 7 (6.03%), need of blood transfusion 20 (17.24%), Pulmonary Oedema 3 (2.58%), Post-Partum Hemorrhage 3 (2.58%) and one case had maternal death. Total 121 babies were born, 42 (34.71%) admitted in NICU, 10 (8.26%) were intra uterine fetal death (IUFD), 3 (2.48%) were neonatal death (NND), 10 (8.26%) refused treatment and leave against medical advice. Common fetal morbidities were intra uterine growth restriction (IUGR) 29 (23.76%), preterm Low birth weight 22 (18.18%), anomalous baby 3 (2.48%) and congenital pneumonia 1 (0.83%).

CONCLUSION

Proper Antenatal care and screening, timely referral and prompt management favoured the outcome in positive way.

KEYWORDS

Preeclampsia, Eclampsia, Preterm labour, Vaginal delivery, APGAR score

1. Department of Obstetrics and Gynaecology, Universal College of Medical Science, Bhairahawa, Nepal.

<https://doi.org/10.3126/jucms.v11i02.57894>

For Correspondence

Dr. Manoj Lamsal
Department of Obstetrics and Gynaecology
Universal College of Medical Science
Bhairahawa, Nepal.
Email: manojlamsal2004@gmail.com

INTRODUCTION

Hypertensive disorders complicate 5 to 10 percent of all pregnancies, and contributes greatly to maternal morbidity and mortality.¹ Hypertensive disorders of pregnancy includes gestational hypertension (GHTN), pre-eclampsia (PE) and eclampsia, chronic hypertension and pre-eclampsia superimposed in chronic hypertension. Incidence of PE in developing countries is approximately seven times higher than in developed countries (on average 2.8% of live births versus 0.4%).² Nepal is a developing country and pre-eclampsia/eclampsia is second leading cause of maternal morbidity and mortality in Nepal.³

Eclampsia is one of the serious obstetric emergencies seen in our sub-region and it is defined as new onset of grand mal seizure activity and/or unexplained coma during pregnancy or postpartum in a woman with signs or symptoms of preeclampsia. It often presents with few warning signs and might occur in a patient with previously mild disease and therefore predicting its occurrence is as difficult as predicting the timing. The incidence of pre-eclampsia/eclampsia varies from one part of the world to another. The incidence however remains high in the developing countries like Nepal, because of poor antenatal care attendance especially in the rural areas.⁴

With proper antenatal care, early recognition of pre-eclampsia, and timely intervention, the development of eclampsia and its associated complications can be prevented. However, in few patients where eclampsia develops without any preceding features of pre-eclampsia, the proper management of eclampsia rather than its prevention is vital in improving maternal and fetal outcomes.⁵ Universal College of Medical Sciences (UCMS) is tertiary referral center of these region, most of cases of such types being treated here. The burden of diseases is increasing day by day. Also the outcome of the diseases vary, depending upon the time lapsed during referral or severity at the time of admission. So this research was done to study the maternal and fetal outcome in pre-eclampsia and eclampsia, and to formulate new plan for minimizing the burden upon the health system.

MATERIAL AND METHODS

It was a hospital based cross-sectional observational study done in department of Obstetrics and Gynecology of UCMS from August 2021 to March 2022 after approval from institutional Review Committee (UCMS/IRC/099/21). The sample size was estimated by considering the global prevalence rate of 5-10%¹ (Taken 7.5% as a prevalence rate in this study) with margin of error of 5% and confidence interval of 95% by using the formula $n = z^2pq / e^2$. The sample size calculated was 107.

All pregnant women beyond 20 weeks of gestation complicated by hypertensive disorders of pregnancy (HDP) mainly preeclampsia and eclampsia, both booked and un-booked, admitted/managed and delivered in our institute were included in the study. Also, those who got delivered at other institute/referred due to comorbidities or delivered at home and having complication sequel of the diseases was also included in the study.

Pre-eclampsia was diagnosed in women with a blood pressure of 140/90 mmHg or above on two occasions at least

four hours apart after 20 weeks of gestation with proteinuria or in those without proteinuria by the presence of thrombocytopenia (less than 100,000/microlitre), impaired liver function (serum liver transaminases to twice the normal level), new-onset renal insufficiency (serum creatinine more than 1.1 mg/dL or doubling of serum creatinine without any other renal pathology, presence of pulmonary edema, or new-onset visual disturbances or cerebral symptoms). Severe preeclampsia was diagnosed when the blood pressure was 160/110 mmHg and above besides thrombocytopenia, progressive renal dysfunction, impaired liver function, pulmonary edema, and new-onset cerebral or visual disturbances, as already described, with the presence of severe and persistent right upper quadrant or epigastric pain not responsive to medication and other causes excluded. The rest were classified as having mild preeclampsia. Eclampsia was diagnosed where a seizure developed in women with hypertension, which was not attributed to any other cause.

A detailed history of present and previous pregnancies, including last menstrual period, expected date of delivery, and period of gestation were recorded in the proforma. All clinical management, such as decisions regarding induction of labor, mode of delivery, fetal monitoring, medication etc., were done as per departmental protocol and standard operating procedure.

Maternal outcomes were measured in terms of variables like need of antihypertensive (single Vs multiple drugs), need of magnesium sulphate (MgSO₄), mode of delivery, need of elective Vs emergency caesarean section, need of blood transfusion, Intensive Care Unit (ICU) stay and maternal comorbidities like pulmonary oedema, renal injury, HELLP (Hemolysis, Elevated Liver enzymes and Low Platelets count) syndrome, Cerebrovascular accident (CVA), cardiac lesions, operative complication and maternal death. Fetal outcome were measured in terms of APGAR (Appearance, Pulse, Grimace, Activity, Respiration) score of newborn, NICU (Neonatal intensive care Unit) admission, fetal distress, prematurity, Low Birthweight (LBW), Intrauterine Growth retardation (IUGR), congenital anomalous baby, intrauterine fetal death (IUFD), still birth and neonatal death.

Data was collected for eight month from August 2021 to march 2022. Out of 2222 deliveries 132 cases were diagnosed, however only 116 cases were enrolled in study, 16 cases didn't fulfil the criteria. All the data collected as according to proforma were entered in Microsoft Excel (Microsoft Corporation, Redmond, WA) and analyzed with the Statistical Package for the Social Sciences (SPSS) software version 21 (IBM Corp. Armonk, NY).

RESULTS

This study included 116 cases (total 132 cases of preeclampsia and eclampsia out of 2222 deliveries), the incidence was 5.94% and mean age was 25±4.73 (mean±2SD).

Table 1. Frequency of hypertensive disorders in pregnancy.

Maternal condition	Frequency	Percentage
Preeclampsia	33	28.4
Eclampsia (antepartum, intrapartum and postpartum)	23	19.8
Severe preeclampsia including impending signs	60	51.7

Among the cases of eclampsia, antepartum 15(12.9%) cases was seen twice more common than post-partum which was 8(6.9%). Number of severe PE cases having impending

signs were 21(35%). Two cases of post-partum eclampsia was delivered outside and referred to this center for management, rest delivered at UCMS.

Table 2. Maternal variables

Age	Pre eclampsia n=33 (28.4%)	Eclampsia n=23 (19.8%)	Severe pre-eclampsia n=60 (51.7%)	n=116 (100%)
≤20	5 (29.40)	9 (52.90)	3 (17.6)	17 (14.65)
21-25	15 (32.60)	9 (19.60)	22 (47.8)	46 (39.65)
26-30	12 (34.30)	2 (5.70)	21 (60.0)	35 (30.17)
31-35	1 (5.90)	3 (17.60)	13 (76.50)	17 (14.65)
≥36			1 (100)	1 (0.87)
Gravida status				
Primigravida	15 (26.79)	18 (32.14)	23 (41.07)	56 (48.27)
Multigravida	18 (31.03)	3 (5.18)	37 (63.79)	58 (50.0)
Delivered case		2 (100)		2 (1.73)
Gestational age(weeks of gestation)				
Term(≥37-≤42)	16 (27.10)	12 (20.30)	60 (51.70)	59 (50.90)
Preterm(<37)	15 (27.80)	11 (20.40)	28 (51.90)	54 (46.60)
Postterm(>42)	2 (66.70)		1 (33.30)	3 (2.60)
No of pregnancy				
Single	32 (27.93)	23 (20.72)	57 (51.35)	111 (95.69)
Multiple	2 (40)		3 (60)	5 (4.31)
Mode of delivery				
VBAC			1 (100)	1 (0.9)
SVD	7 (30.50)	5 (21.70)	11 (47.80)	23 (19.80)
IVD	8 (40)	3 (15)	9 (45)	20 (17.20)
Em LSCS	18 (25.70)	15 (21.40)	37 (52.90)	70 (60.30)
EL LSCS			2 (100)	2 (1.70)
Medication				
Single antihypertensive	15 (48.40)		16 (51.6)	31 (26.70)
Multiple antihypertensive	7 (41.20)		10 (58.80)	17 (14.70)
MgSO4+Single antihypertensive	2 (9.10)	10 (45.50)	10 (45.50)	22 (19)
MgSO4+ Multiple antihypertensive	1 (3.0)	11 (33.33)	21 (63.63)	33 (28.50)
MgSO4 alone		2 (100)		2 (1.7)
None	8 (72.70)		3 (27.30)	11 (9.50)
Place of admission				
Maternity ward	33 (30)	21 (14.10)	56 (50.90)	110 (94.80)
ICU		2 (33.33)	4 (66.70)	6 (5.2)
Maternal outcome				
Discharged (normal/DOPR)	33 (28.94)	23 (20.17)	58 (50.88)	114 (98.27)
Maternal death			1 (100)	1 (0.86)
Referred to other center			1 (100)	1 (0.86)
Adverse maternal outcome (multiple adverse outcome were noted in single patient)				
HELLP syndrome	2 (13.33)	2 (13.33)	11 (73.34)	15 (12.93)
Abruptio placenta	1 (14.28)	1 (14.28)	5 (71.43)	7 (6.03)
PPH	1 (33.33)		2 (66.67)	3 (2.58)
Pulmonary Oedema		1 (33.33)	2 (66.67)	3 (2.58)
Blood transfusion	5 (25)	3 (15)	12 (60)	20 (17.24)
DIC			1 (100)	1 (0.86)
AFLP			1 (100)	1 (0.86)
AKI	1 (50)		1 (50)	2 (1.72)
Relaparotomy for Bowel Injury		1 (100)		1 (0.86)
Maternal death			1 (100)	1 (0.86)
Impending signs	2 (9.52)	2 (9.52)	17 (80.95)	21 (18.10)

Maternal variables

Eclampsia was more common in age group of up to 25, however preeclampsia and severe symptoms were common in age group between 20 to 30 as in table 2. Age group 20 to 30 had almost 70% of diseases load. Incidence of diseases was nearly equal in primi as well as in multigravida. Term pregnancy with hypertensive disease was more common than preterm. In both singleton and multiple pregnancy severe preeclampsia were common. Emergency Lower Segment caesarean Section (Em LSCS) was done in 60% of the case, 40% delivered either via spontaneous vaginal delivery (SVD) or induced vaginal delivery (IVD). One case had undergone vaginal birth after caesarean section (VBAC). Magnesium Sulphate (MgSO₄) was the choice of drugs for eclampsia and drugs like Labetolol, Nifedipine, and Amlodipine were used either singly or in combination to control blood pressure. Nearly 30% need MgSO₄ and

multiple antihypertensive drugs for treatment whereas 11(9.5%) cases didn't took either of the drugs for treatment. And 50% need MgSO₄ either singly or in combination with other antihypertensive drugs. Six cases were managed in intensive care unit (ICU), one maternal death occurred during study period due to severe preeclampsia with other associated co-morbidities and one was referred to higher center for further management. Common maternal morbidities were HELLP syndrome, abruption placenta, need of blood transfusion(BT), pulmonary oedema, acute kidney injury (AKI), post partum hemorrhage (PPH). Maximum nine pint of blood was transfused in one case of severe PE. One case of eclampsia had undergone relaparotomy for bowel ischemia at multiple sites and one case had disseminated intravascular coagulation (DIC) and Acute fatty liver of pregnancy (AFLP). These morbidities were present either singly or in combination even in same cases.

Table 3. Fetal variables

Sex	Pre eclampsia n=33 (28.4%)	Eclampsia n=23 (19.80%)	Severe preeclampsia n=60 (51.70%)	Total n=121 (100%)
Singletone				
Male	14 (25.9)	15 (27.80)	25 (46.30)	54 (44.63)
Female	17 (29.81)	8 (14.0)	32 (56.10)	57 (47.12)
Twin sets				
male/male set	2			4 (3.30)
male/female set			2	4 (3.30)
female/female set			1	2 (1.65)
Birth weight in grams				
≥2500-3999(Normal)	19 (37.3)	9 (7.6)	23 (45.10)	51 (44)
≥1500-2499(LBW)	11 (22)	10 (20)	29 (58)	50 (43.10)
≤1000-1499(very LBW)	3 (33.33)	2 (22.2)	4 (44.4)	9 (7.8)
≤1000 (Critical LBW)		2 (50)	2 (50)	4 (3.4)
≥4000 (Macrosomia)			2 (100)	2 (1.7)
Place of treatment of baby/status after delivery				
Mother site	20 (35.71)	14 (25)	22 (39.28)	56 (46.28)
NICU admitted				
Observation for weak cry, meconium aspiration	7 (33.33)	2 (9.52)	12 (57.14)	21 (17.35)
IUGR	2 (40)		3 (60)	5 (4.13)
Preterm LBW	1 (14.28)	3 (42.85)	3 (42.85)	7 (5.78)
Respiratory distress			3 (100)	3 (2.47)
Low APGAR		1 (20)	4 (80)	5 (4.13)
Congenital pneumonia			1 (100)	1 (0.82)
NND+ IUFD				13 (10.74)
LAMA				10 (8.26)
Fetal outcomes				
Normal baby	17 (33.30)	10 (19.60)	24 (47.10)	51 (42.15)
IUGR(term and preterm)	6 (20.69)	6 (20.69)	17 (58.62)	29 (23.76)
preterm LBW	5 (22.73)	6 (27.27)	11 (50)	22 (18.18)
IUFD	4 (40)		6 (60)	10 (8.26)
NND		1 (33.33)	2 (66.67)	3 (2.47)
Anomalous baby	2 (66.67)		1 (33.33)	3 (2.48)
Congenital pneumonia			1 (100)	1 (0.83)
Macrosomia	1 (50)		1 (50)	2 (1.65)

Fetal variables

Total number of baby delivered from 116 cases were 121 (including five sets of twin). About 55% of delivered baby having weight less than 2500grams, two cases of macrosomia and rest were of normal weight between 2500 grams to 4000 grams. LBW, Very LBW, Critically LBW population were 50 (43.1%), 9 (7.8%) and 4 (3.4%) respectively. Female babies were more common 57 (44.63%) Vs 59 (47.12%) male baby in singleton deliveries whereas in twin pregnancy male/male and male/female set was maximum in number as shown in table 3. Fiftysix (46.28%) babies were kept with mother after delivery whereas 42 (34.71%) got admitted in NICU for

treatment. Similarly, 13 (10.74%) and 10 (8.26%) were of perinatal death and those who Leave Against Medical Advice (LAMA) respectively. Among NICU admission 21 (17.35%) babies were kept for observation for 24 hours as they were having weak cry, meconium aspiration, grunting, fast breathing and other minor issues at the time of delivery. Preterm LBW, IUGR, Low APGAR and respiratory distress were the main cause for prolonged ICU stay contributing 7 (5.48%), 5 (4.13%), 5 (4.13%) and 3 (2.47%) cases respectively. Regarding fetal outcome 51 (42.15%) babies were normal, 29 (23.76%) were IUGR, 22 (18.18%) were preterm LBW and 3 (2.48%) had congenital anomalies.

DISCUSSION

This study showed a high burden of hypertensive diseases in these communities. The incidence was 5.94% even only in cases of PE and eclampsia, incidence would have far more if cases of GHTN would have been added. Similar studies conducted in other centres too had similar results like 6.43% by Thapa T et al,⁶ 5.22% by Ye C et al⁷ and 7.4% by Panda S et al.⁵ Study by Das S et al⁸ showed 1.8% incidence of preeclampsia and study conducted in South-East Nigeria⁴ showed incidence of preeclampsia with severe symptoms and eclampsia as 0.99% and 0.76% respectively. This study showed incidence of preeclampsia and eclampsia separately as 4.19% and 1.04% respectively. More than 90% were unbooked cases and this center is recognized as a tertiary referral center, so patients from different institutes came to this center for management of complicated pregnancy. This might be the reason for the high magnitude of diseases.

Maximum number of cases were in the age group between 20 to 30, which is comparable to other studies by Thapa T et al,⁶ Das S et al⁸ and Ye C et al.⁷ Incidence of diseases was also similar for age group below 20 and above 30, comparable to the study by Thapa T et al.⁶ However, the study done in China by Ye C et al⁷ showed incidence of diseases in age group 25-30 was similar to age group 30-35 which is contrast to this study. Incidence in multigravida was common in this study which was similar to the study done in china in 2011⁷, however study from other part of Nepal⁶ and Nigeria⁴ showed it is more common in primigravida. Significant number of preterm deliveries (46.4%) were noted in this study, it may be due to preterm termination for severity of diseases. This finding was in contrast to one done in the maternity hospital of Nepal with incidence of only 9.6%⁸. Caesarean section was a common mode of delivery with 62% and rest were delivered either spontaneous or induced vaginal delivery. The results were similar to Thapa T et al⁶ and Ajah L.O et al⁴ but were in contrast to study done by Bridwell M et al⁹ where vaginal delivery was common. MgSO₄ combined with antihypertensive drugs were mainly used for treatment of eclampsia and severe preeclampsia however, preeclampsia cases were mostly treated with only antihypertensive drugs and a similar treatment protocol was used in most of the other studies.

Most of the patients got treatment in the ward. Only a few i.e; 5.2% of total got admitted in ICU. Because of financial constraints less people could afford ICU facilities resulting in more adverse maternal outcomes. Common adverse outcomes include HELLP syndrome, abruption placenta, PPH, need of Blood transfusion, pulmonary oedema and AKI. One case needed relaparotomy and one each had DIC and AFLP. One case of maternal death had occurred in a severe preeclampsia group. There were no cases of heart failure, aspiration pneumonia and CVA during the study period. Similar study done in 402 cases by Panda S et al⁵ in India showed maternal complication like abruption placenta (7.5%), PPH (5.7%), ICU admission (13.4%), pulmonary oedema (3.7%), CVA(3.9%) HELLP (1.96%) and 2.9% having maternal death. The complications were similar however, more cases of maternal death, CVA, ICU admission, and PPH were noted and less number of HELLP syndrome was seen in Indian study. The study done by Ye C et al⁷ in China (5869 cases) also showed similar complication like placental abruption (3.2%), HELLP (1.64%), Heart failure(0.5%), Renal failure (0.27%), CVA (0.34%), pulmonary oedema (0.12%) and DIC (0.12%). The sample size in

the study of China was far larger than ours, so comparing the conclusion was difficult. Besides, maternal mortality in 12.1% and aspiration pneumonia in 5.8% was seen in a study done in Nigeria by Ajah L.O et al⁴ in 207 cases, the result was quite different from the other studies discussed above.

Perinatal mortality in our study was 10.74% higher than that was conducted in other center of Nepal⁶ (3.3%). It was 14.95% in the study done in India⁵, and 17.9% done in Haiti⁹ and 22.7% in Nigeria⁴. About 8% of babies requiring NICU admission couldn't get treatment and went on LAMA due to financial constraints, which might have adverse outcomes. If they were included the mortality data could be higher even. The study showed 54% with birth weight less than 2500 grams, 34.71% needed NICU admission, 23.76% had IUGR, 18.185 were of preterm LBW and 4.13% had low APGAR score and 2% had congenital anomalies. Similar study done by Thapa T, et al⁶ showed 38.5% of IUGR, 38.4% of LBW, 36.3% needed NICU admission and 15.4% had low APGAR. In our study poor fetal outcome was seen among those cases having severe symptoms of preeclampsia. As the study was conducted in limited time and sample size, the scenario might vary if conducted in larger sample size.

CONCLUSION

Pregnancy complicated with hypertension like preeclampsia and eclampsia needs special care and are therefore should be managed in tertiary care center. As UCMS is a tertiary care hospital of western Nepal with both ICU and NICU facilities, many such cases are being managed promptly in this institute. As more cases of preeclampsia and eclampsia is being referred to center, variables outcomes is being encountered ranging from different aspect of maternal and fetal morbidities to mortalities. Larger the burden of complicated cases, more worst is the outcome. Proper antenatal care, timely referral and prompt management may change the outcome to large extent in positive way.

CONFLICT OF INTEREST

None

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