



## **Feto-Maternal Outcome of Pregnancy Complicated with Preeclampsia**

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### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author QJI designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors AJ managed the analyses of the study. Authors ZAM and NS managed the literature searches. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Pre-eclampsia is the disorder of extensive vascular endothelial malfunctioning and vasospasm. Both pregnant females and her fetus can develop different complications in the presence of preeclampsia. So we conducted this descriptive cross-sectional study to find the frequency of fetal and maternal outcomes in females having pre-eclampsia. After meeting the inclusion criteria 200 females were enrolled. Patients were followed from 32 weeks of gestation till the end of pregnancy. Inclusion and exclusion criteria were strictly followed. The outcome variable was recorded as per operational definitions. All patients were efficiently managed as per standard protocols. All the data was entered and then analyzed in SPSS v. 22. In this study the mean age of the patients was  $28.93 \pm 6.75$  years, the mean BMI of the females was  $27.46 \pm 1.48$  kg/m<sup>2</sup>. Partial HELLP syndrome noted in 51 (25.5%) females, maternal mortality occurred in 17 (8.5%) females, while eclampsia, prematurity, perinatal mortality and low birth weight were noted in 26 (13%), 106 (53%), 35 (17.5%) and 78 (39%) females respectively. This study concluded that the most common fetomaternal outcome was prematurity, low birth weight babies, partial HELLP syndrome, perinatal mortality, eclampsia and maternal mortality in patients with pre-eclampsia.

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## 1. INTRODUCTION

Pre-eclampsia is the disorder of extensive vascular endothelial malfunctioning and vasospasm. It usually develops after 20 weeks of gestational age and can continue up to 4 to 6 weeks after delivery. Clinically, it is defined as hypertension along with proteinuria, whether the pathological edema is present or not.[1] It can complicate the 2-6% of pregnancies, especially the primigravida females. Among all the pregnancies complicated with preeclampsia, about 10% of cases, preeclampsia develop before 34 weeks of gestational age. The worldwide incidence of preeclampsia in pregnancy is reported to be 5-14% complicating the healthy pregnancy.[1]

According to a survey by the World Health Organization (WHO), 16% of pregnant females die because of hypertensive disorders in pregnancy, being the 3<sup>rd</sup> main factor that leads to maternal mortality in developing nations.[2] Roughly, more than 10% of pregnancies are complicated by hypertensive disorders in the world. Along with haemorrhage and infection, pre-eclampsia leads to a triad accounting for significant maternal and fetal morbidity and mortality.[3] Both pregnant females and her fetus can develop different complications in the presence of preeclampsia. Intensely, preeclampsia can be converted into eclampsia, or HELLP syndrome also can lead to ischemic or hemorrhagic stroke, liver injuries and dysfunctions, acute renal failure, or respiratory distress syndrome in the neonate.[4]

Sometimes, HELLP syndrome leads to hemorrhage and disseminated intravascular coagulation. [5] Reduced blood supply to fetus in presence of preeclampsia can lead to reduced nutrients supply, which can cause intrauterine growth restriction and reduced neonatal weight at birth. It has also been hypothesized that fetal under-nutrition is associated with coronary heart diseases later in life owing to the unbalanced growth.[6] Singh A, et al. reported various maternal and fetal outcomes in pre-eclampsia patients like partial HELLP syndrome in 37.5% females, DIC in 3.6% females, eclampsia, pulmonary edema in 4% females, prematurity in 67.9% females, 21.4% neonates had birth asphyxia and perinatal mortality in 12.5% cases.[7] Minire et al. observed liver failure has been observed in 5% while renal failure in

12.3%, and pulmonary edema (5.6%) in mothers [8].

Pre-eclampsia is the most prevalent complication of pregnancy. It leads to significant morbidity and even mortality, so this survey was planned to determine the adverse fetomaternal consequences of pre-eclampsia. Early diagnosis and prompt management of pregnancy-induced hypertension and pre-eclampsia and its common complications in pregnant females, can decrease morbidity and mortality of mothers and their fetus, thus decreasing hospital stay and treatment cost.

## 2. MATERIALS AND METHODS

This descriptive cross-sectional study was conducted at the Department of Obstetrics and Gynecology, Services Hospital. Lahore. Sample Size of 200 by keeping Confidence level = 95%, margin of error = 4% and neonatal deaths percentage = 9.1%[9].

### 2.1 Inclusion Criteria

Females aged 18 - 40 years meeting the operational definition of pre-eclampsia attending the antenatal care clinics > 32 completed weeks of gestational age were included in the study.

### 2.2 Exclusion Criteria

Women with a diagnosed molar pregnancy, chronic kidney disease, SLE, connective tissue disorder, thyroid disease, epilepsy, chronic hypertension, obesity and diabetes, fetal malformations or multiple gestations, uterine abnormalities, twins, placenta previa, low lying placenta abruptio placenta, thrombocytopenia with platelet count less than 80,000/cm<sup>3</sup> eclampsia, and previous one Caesarean section, history of severe anaemia (haemoglobin < 7 mg/dl), depression, smoking or drug abuse.

### 2.3 Data Collection Procedure

After taking approval from the ethical review committee, patients with pre-eclampsia meeting the inclusion and exclusion criteria were enrolled in the study after written informed consent. Patients were followed from 32 weeks of gestation till the end of pregnancy. All the patients were managed by the same consultant in the obstetric ward with regular monitoring.

Lower segment Caesarean Section was defined as the delivery of a baby through an abdominal incision to save the life of the fetus and the mother on the recommendation of the consultant gynecologist. Partial HELLP syndrome was defined as the patient having at least one or two of the features of HELLP syndrome i.e. having any one or two of the following: increased LDH (> 600 U/L), AST (= 70 U/L), and platelets < 150-10/L.[10].

Eclampsia was defined as generalized tonic-clonic seizures and /or unexplained coma in a woman with preeclampsia, not attributed to other causes. Partial HELLP syndrome is a severe complication of pregnancy characterized by hemolysis, elevated liver enzyme and low platelet count. Some pregnant women develop just one or two of the characteristics of this syndrome, which is termed as partial HELLP syndrome.[11] Maternal Mortality was noted if female die while pregnant or within 40 days of termination of pregnancy. Prematurity was defined as a neonate born before 37 completed weeks of gestation according to ultrasound. Low birth weight was defined as a birth weight of a baby < 2.5 kg. Neonatal Mortality was noted if neonate dies within the first seven days of life.

## 2.4 Data Analysis

Data was entered and then analyzed by using the IBM-SPSS v. 22. Quantitative data like age, weight, height, gestational age at the time of delivery and parity was presented by the mean and standard deviation. Qualitative data like parity, maternal and fetal outcomes were presented by frequency and percentages.

## 3. RESULTS

Table 1 showed the descriptive statistics of females. The mean age of females was 28.93 ± 6.75 years. The mean gestational age at the time of delivery was 36.56 ± 2.33 weeks. The mean BMI of females was 27.46 ± 1.48 kg/m<sup>2</sup>. There were 29 (14.50%) primigravida, 32 (16%) females had parity 1, 63 (31.50%) females had parity 2, 49 (24.50%) females had parity 3, 22 (11%) females had parity 4 while 5 (2.5%) females had parity 5.

Table 2 showed that out of 200 females, elective CS did in 108 (54%) females and emergency cesarean section done in 92 (46%) females. In fetomaternal outcome, partial HELLP syndrome noted in 51 (25.5%) females, maternal mortality

noted in 17 (8.5%) females, Eclampsia noted in 26 (13%) females, prematurity noted in 106 (53%) females and perinatal mortality noted in 35 (17.5%) females. Low birth weight babies were 78 (39%). There was an insignificant difference found for the frequency of lower segment cesarean sections in a different age, BMI and parity groups, respectively.

**Table 1. Clinical features of females**

N	200
Age (Years)	28.93±6.75
Gestational Age (weeks)	36.56±2.33
BMI (Kg/m <sup>2</sup> )	27.46±1.48
<b>Parity</b>	
Primigravida	29 (14.5%)
Parity 1-2	95 (47.5%)
Parity 3-5	27 (13.5%)

**Table 2. Outcome of pregnancy with preeclampsia**

Outcome	F (%)
<b>Mode of delivery</b>	
Elective cesarean	108 (54%)
Emergency cesarean	92 (46%)
Partial HELLP syndrome	51 (25.5%)
Maternal Mortality	17 (8.5%)
Eclampsia	26 (13%)
Prematurity	106 (53%)
Perinatal Mortality	35 (17.5%)
Low birth weight	78 (39%)

## 4. DISCUSSION

Preeclampsia is the disorder of pregnancy including hypertension and proteinuria, which may arise in 3-8% of pregnancies. The incidence of preeclampsia is higher in developing countries because of hypo-proteinemia, poor nutritional status and poor obstetrical services. Generally, 10-15% of maternal deaths are directly related to preeclampsia and eclampsia.[12]

In this study the fetomaternal outcome, partial HELLP syndrome noted in 51(25.5%) females, maternal mortality occurred in 17(8.5%) females, Eclampsia noted in 26(13%) females, prematurity noted in 106(53%) females and perinatal mortality noted in 35(17.5%) females and low birth weight babies were 78(39%).

Aabidha et al., did a study on feto-maternal outcomes in preeclamptic females. It was noted that about 46.23% were primigravida, while 48.8% were overweight. The rate of severe

preeclampsia was high in unbooked pregnant females. The most common complication encountered during follow-up was antepartum hemorrhage i.e. in 13.9% cases while premature delivery occurred in 23.65% cases. [2].

Jido et al., in their study showed a low incidence of eclampsia. The author reported that the eclampsia was noted 1.2% of deliveries. Mortality rate was 11.7%, use of diazepam showed insignificant relation with maternal mortality (RR: 8.64, 95%CI; 0.53-140.29, p-value = 0.13). Birth asphyxia was noted in 39.1% cases and low birth weight in 25.8% cases.[13] Maternal complications due to preeclampsia can lead to maternal, fetal, and neonatal complications and mortality, including HELLP syndrome, DIC and renal failure.[14,15] Severe preeclampsia can increase the risk of composite maternal complications about 8.7-fold [16].

Singh A, et al. reported various maternal and fetal outcomes in pre-eclampsia patients like partial HELLP syndrome in 37.5% patients, DIC 3.6%, eclampsia, pulmonary edema 4%, prematurity (67.9%), 21.4% developed birth asphyxia and perinatal mortality in 12.5% cases.[7] Kumar et al., presented in their study that the most common morbidity in females having eclampsia were aspiration pneumonia, pleural effusion and pulmonary edema, which were noted in 25.58% cases, followed by fever in 23.3% cases and hematuria in 23.3%. It has been observed that the newborns delivered to females diagnosed with eclampsia, 46.5% were small for gestational age while 25.6% had intrauterine death and 34.88% had neonatal mortality. The overall perinatal mortality was 60.5%[17].

Ajah., et al. reported frequency of caesarean section (51.7%), maternal mortality (12.1%) and perinatal mortality (22.7%).[18] In another study, caesarean section (64%), eclampsia (11.8%), abruptio placentae (7.3%), partial HELLP (19.09%), post-partum haemorrhage (23.6%), renal failure (73%), intrauterine growth restriction (21.81%), prematurity (64.6%), respirator, distress syndrome (22.7%). Intrauterine death (64%), low birth weight babies (33.6%), and even neonatal death (21%) as the complications of pre-eclampsia [2].

Ngwenya et al., reported lower segment cesarean section (78.5%), HELLP syndrome (9.1%). Intrauterine fetal death (24%) and prematurity (30%) as significant complications.[9]

Minire et al reported liver failure in 5% and renal failure in 12.3%, and pulmonary edema (5.6%) in mothers [8].

## 5. CONCLUSION

This study concluded that the most common fetomaternal outcome was prematurity, low birth weight babies, partial HELLP syndrome, perinatal mortality, Eclampsia and maternal mortality in patients with pre-eclampsia. Now in the future, we can counsel the females to book themselves soon after conception to avoid the development of preeclampsia or complications of preeclampsia to improve the outcome of pregnancy.

## 6. LIMITATION

The study was conducted on 200 females only however the prevalence of preeclampsia is growing. So further studies can be done on large sample size and multi-centric studies can be done to determine the pattern of management of such cases and more outcomes can be assessed in further studies.

## CONSENT AND ETHICAL APPROVAL

Approval from the institutional ethical committee was taken before starting the study. Females were first informed about the research protocol and then written informed consent was taken. It was an observational study, so no hazard was involved.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

## REFERENCES

1. Lagana AS, et al., Early serum markers of pre-eclampsia: are we stepping forward? *J Mat Fetal Neonat Med.* 2016;29(18):3019-3023.
2. Pillai SS. Feto-maternal outcome in severe preeclampsia and eclampsia: a retrospective study in 1 tertiary care

- centre. *Int J Reprod Contracept Obstet Gynecol.* 2017;6:3937-3941.
3. Cunningham FG, et al. *Williams Obstetrics.* 24th ed. New York, NY: McGraw Hill Companies; 2014.
  4. Arulkumaran N, Lightstone L. Severe pre-eclampsia and hypertensive crises. *Best Pract Res Clin Obstet Gynaecol.* 2013;27(6):877-884.
  5. Kumasawa K, et al. Abdominal compartment syndrome complicated by preeclampsia and partial HELLP syndrome in a 45-year-old woman: A case report. *Clinical Case Reports.* 2020;8(7):1251-1254.
  6. McDonald SD, et al. Cardiovascular sequelae of preeclampsia/eclampsia: a systematic review and meta-analyses. *Am Heart J.* 2008;156(5):918-930.
  7. Singh A, et al. Fetomaternal outcome in cases of pre-eclampsia in a Tertiary Care Referral Hospital in Delhi, India: a retrospective analysis. *Int J Sci Stud.* 2016;4(2):100-3.
  8. Minire A, et al. Maternal complications of preeclampsia. *Med Arh.* 2013;67(5):339-341.
  9. Ngwenya S. Severe preeclampsia and eclampsia: incidence, complications, and perinatal outcomes at a low-resource setting, Mpilo Central Hospital, Bulawayo, Zimbabwe. *International journal of women's health.* 2017;9:353.
  10. Kawano S, et al. Emergency cesarean section. *Masui Japan J Anesthesiol.* 2012;61(9):917-23;923-4.
  11. Rimaitis K, et al. Diagnosis of HELLP Syndrome: A 10-year survey in a perinatology centre. *Int J Env Res Pub Health.* 2019;16(1):109.
  12. Carty DM, Delles C, Dominiczak AF. Preeclampsia and future maternal health. *J Hypertens.* 2010;28(7):1349-1355.
  13. Jido TA. Eclampsia: maternal and fetal outcome. *Afr Health Sci.* 2012;12(2):148-152.
  14. Ananth C, et al. Serious maternal complications in relation to severe pre-eclampsia: a retrospective cohort study of the impact of hospital volume. *BJOG.* 2017;124(8):1246-1253.
  15. Who U. UNFPA, World bank. Trends in maternal mortality. 1990;2008(2010):1.
  16. Ghimire S. Eclampsia: Feto-Maternal Outcomes in A Tertiary Care Centre in Eastern Nepal. *J Nepal Med Assoc.* 2016;54:(201).
  17. Praveenkumar AM, Patil R, Pachpande V. Maternal and Fetal Outcome in Eclampsia. *Ann Int Med Dent Res.* 2017;3(2):1.
  18. Ajah LO et al. The feto-maternal outcome of preeclampsia with severe features and eclampsia in Abakaliki, South-East Nigeria. *J Clin Diag Res.* 2016;10(9):QC18.

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