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ORIGINAL ARTICLE

Assessment of Maternal and Fetal Outcomes in Preeclampsia: A Tertiary Care Experience

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ABSTRACT

Background: Preeclampsia is a disorder of pregnancy of hypertension and appears due to high blood pressure and proteinuria after 20 weeks of pregnancy. It is still a significant cause of maternal and perinatal morbidity and mortality especially in low- and middle-income countries. Proper management and early recognition can be of importance towards enhancing better maternal and fetal outcomes.

Goals: To examine the maternal and fetal outcomes of pregnant women with preeclampsia and to determine the severity and complications of the condition as provided in the setting of a tertiary care center.

Study design: A prospective observational study.

Place and Duration of Study: The study was conducted at Department of Gynae & Obs, Khyber Teaching Hospital (MTI) Peshawar from January 2022 to December 2022.

Methods: A prospective observational study that was carried out in the department of Obstetrics and Gynecology during 12 months and included 100 pregnant women who were diagnosed with preeclampsia at least 20 weeks of pregnancy. Maternal age, parity, gestational age, level of blood pressure, complications, and fetal outcomes were attached. The statistical package was done in SPSS version 25. The percentages were averaged, standard deviation and p-values determined to assess the significance.

Results: A hundred patients were recruited and the mean maternal age was 27.6 \178 w in age. Out of them, 60 percent were displaying mild preeclampsia, and 40 percent were in severe preeclampsia. There was preterm delivery in 36 percent of cases in addition to 28 percent with intrauterine growth restriction (IUGR). Maternal complications were eclampsia (6 percent), HELLP (4 percent) and abruptio placentae (3 percent). The neonatal outcomes demonstrated that 42 percent had low birth weight and 30 percent were admitted at the NICU. Significant relationship ($p < 0.05$) was found between severity of preeclampsia and adverse outcomes. Conclusion: Preeclampsia has drastic effects on the health of the mother and baby particularly, given it is severe. By correct diagnosis and management in a tertiary care hospital, it is possible to minimize complications and improve outcomes. The study claim the significance of regular antenatal care to detect it. The enhancement of referral mechanisms and maximization of delivery decision are important milestones in ensuring reduction of morbidity and mortality related to this condition.

Keywords: Preeclampsia, maternal outcome, fetal complications, tertiary care

INTRODUCTION

A multisystem hypertensive condition of pregnancy that has its onset usually after 20 weeks of gestation. It is embodied by fresh-onset hypertension and proteinuria or end-complexity of non-normotensive ladies[1]. It is continually one of the principal reasons of maternal and perinatal morbidity and mortality, particularly in low- and medium-earnings nations. It has been estimated that about 10 percent of all pregnancies in the world are complicated by hypertensive disorders where preeclampsia used to contribute to most of these disorders[2]. The pathophysiology of preeclampsia is still not fully understood but it is believed that dysfunction in the placental, immune maladaptation and endothelial injury and hereditary factors are significant factors[3]. Clinical manifestation may be asymptomatic hypertension to prominent manifestations namely visual disturbances, pulmonary signatures, thrombocytopenia, and end-organ failure. The effects of severely preeclampsia and its sequelae, eclampsia, HELLP syndrome (Hemolysis, Elevated Liver enzymes and Low Platelets), and abruptio placentae mainly impact the health of a pregnant woman and her growing offspring seriously[4]. Among the fetal complications there are intrauterine growth restriction (IUGR), preterm birth, low birth weight, still birth and higher admissions to neonatal intensive care unit (NICU)[5]. Possible bad outcomes are determined by the level of seriousness of the disease and the gestation age of the diagnosis and delivery. Preeclampsia diagnosed before 34 weeks of gestation is likely to have a poorer prognosis as compared to the preeclampsia diagnosed later[6]. The problem was compounded by late presentation, poor coverage of antenatal care, nonexistence of diagnostic facilities or inadequate referral systems in many resource-limited settings. Hence, it is imperative that preeclampsia should be diagnosed early and treated aggressively to decrease deaths of mother and fetus. Treatment is based on antihypertensive treatment, corticosteroids to mature lung (in the preterm gestation) and early delivery[7]. The tertiary care centers usually have multidisciplinary teams and intensive care facilities of mothers and newborns. The analysis of the outcomes of preeclampsia in such a setting can give an answer to the effectiveness of the clinical protocols and areas that may be improved. Although there are a number of studies on maternal and fetal complications of preeclampsia, geographic and health disparities result in geographic and healthcare difference in the data on local epidemiology and outcomes. This paper will evaluate the outcomes and assessment of maternal and fetal conditions in the case of preeclampsia in a tertiary care center and whether relationships exist between the severity of the disease and the complications. The results of the present study will assist in streamlining the management practices and enhancing the delivery of antenatal care in related clinical practices[8,9].

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METHODS

The study carried out was a prospective observational conducted in Khyber Teaching Hospital (MTI) Peshawar from January 2022 to December 2022 at the Department of Obstetrics and Gynecology. Pregnant women diagnosed with preeclampsia at more than 20 weeks pregnancies were recruited. The Diagnosis was according to the ACOG 2020 criteria: SBP 140 mmHg or more; DBP 90 mmHg or more in two measurements of at least four hours apart with or without proteinuria. Mild and severe cases of preeclampsia were stratified on clinical and laboratory parameters with respect to patients. Through demographic characteristic data on obstetric case, maternal, and fetal outcome were entered. Such outcomes included mode of delivery, preterm birth, intrauterine growth restriction, NICU admission, and stillbirth.

Inclusion Criteria: Pregnant women at or more than 20 weeks of gestation diagnosed with preeclampsia in accordance with the ACOG criteria and attending the antenatal care setting or patients who ended up in the obstetrics ward during the study period were included.

Exclusion Criteria: There are chronic hypertension, renal disease, autoimmune disorders, multiple pregnancies, or incomplete records, thus women of these conditions were not included in the study to mitigate confounding variables and guarantee reliability of data.

Statement of Ethical Approval: It was approved by Institutional Ethics Committee of Khyber Teaching Hospital, approval number (390/DME/KMC). All the participants signed the informed consent prior to the collection of data. During the study, confidentiality and anonymity were observed as in line with the ethical study requirement.

Data Collection: The identification of data was carried out through a pre-structured questionnaire and a patient medical record. These included maternal age, parity, blood pressure, gestational age at the time of diagnosis and delivery, complications and neonatal outcomes. The follow-ups were done regularly up through delivery and discharge in order to record the health conditions of the mother and fetus.

Statistical Analysis: The SPSS version 24.0 was used in data analysis. The demographic variables were done by using descriptive statistics. The expression of continuous variables was meanonly SD. Chi-square tests were used in analyzing categorical variables. All comparisons were made under the assumption that p- value < 0.05 was deemed as statistically significant.

RESULTS

The study sample consisted of 100 preeclampsia patients in their last trimester of pregnancy. The maternal age was 27.6 4.8 years on average. A majority (60%) of the patients were primigravida. The frequency of mild preeclampsia and severe preeclampsia was also 60 and 40 percent respectively. Preterm birth was presented in 36 percent of the patients with IUGR identified in 28 per cent. Complications in the mother were 6 percent on eclampsia, 4 percent on HELLP syndrome, and 3 percent on abruptio placentae. There was a need to conduct a Cesarean birth in 65 percent of cases, which mostly involved fetal distress or a deteriorated maternal condition. A total of 42 percent of the fetal outcomes involved low birth weight with 30 percent of fetuses ending up in NICU, and 5 percent with a stillbirth fetus. The birth weight was an average of 2.4 -0.6 kg. There was a statistically significant relationship between severe preeclampsia with negative outcomes as low birth weight, preterm birth and NICU admission ($p < 0.05$). Maternal complications as well as cesarean delivery were also observed to be higher with severity of disease. Early diagnosis and subsequent treatment were essential in the prevention of poor results.

Table 1: Maternal Demographic Profile (n = 100)

Variable	Mean ± SD / Frequency (%)
Age (years)	27.6 ± 4.8
Gravida	
- Primigravida	60 (60%)
- Multigravida	40 (40%)
Gestational Age at Admission (weeks)	33.2 ± 3.4
Booking Status	
- Booked	65 (65%)
- Uncooked	35 (35%)
Residence	
- Urban	55 (55%)
- Rural	45 (45%)

Table 2: Clinical Profile and Severity of Preeclampsia

Parameter	Frequency (%)
Type of Preeclampsia	
- Mild	60 (60%)
- Severe	40 (40%)
Mean Systolic BP (mmHg)	152 ± 10
Mean Diastolic BP (mmHg)	98 ± 7
Proteinuria (Dipstick)	
- 1+	35 (35%)
- 2+	45 (45%)
- 3+	20 (20%)
Associated Symptoms	
- Headache	40 (40%)
- Blurred Vision	20 (20%)
- Epigastric Pain	10 (10%)

Table 3: Maternal Outcomes and Complications

Complication	Frequency (%)
Mode of Delivery	
- Vaginal	35 (35%)
- Cesarean Section	65 (65%)
Maternal Complications	
- Eclampsia	6 (6%)
- HELLP Syndrome	4 (4%)
- Abruptio Placentae	3 (3%)
- Postpartum Hemorrhage	5 (5%)
ICU Admission	8 (8%)
Maternal Mortality	0 (0%)

Table 4: Fetal Outcomes

Outcome	Frequency (%)
Preterm Birth (<37 weeks)	36 (36%)
Birth Weight	
- Normal (>2.5 kg)	58 (58%)
- Low (<2.5 kg)	42 (42%)
IUGR	28 (28%)
Apgar Score <7 at 5 minutes	12 (12%)
NICU Admission	30 (30%)
Stillbirth	5 (5%)

Table 5: Correlation of Preeclampsia Severity with Outcomes

Outcome	Mild PE (n=60)	Severe PE (n=40)	p-value
Preterm Birth	15 (25%)	21 (52.5%)	0.003
Low Birth Weight	18 (30%)	24 (60%)	0.002
NICU Admission	12 (20%)	18 (45%)	0.004
Cesarean Section	33 (55%)	32 (80%)	0.01
Maternal Complications	5 (8.3%)	13 (32.5%)	0.001

DISCUSSION

Preeclampsia continues to be a major cause of poor maternal and perinatal morbidity and mortality all over the world and more so in low-resource settings. We assessed that 60 percent of the women were mild infected with preeclampsia and 40 percent were severely infected by the disease[10]. Most of the complications such as maternal and fetal complications were increased highly in the severe preeclampsia group. The results correspond with the international evidence that preeclampsia severity is linearly associated with possible complications[8,9]. In our study, the average maternal age was 27.6 4.8 years old compared to the study done by Sharma et al., who stated an average age of 26.9 5.2 years old in their study of North Indian women with preeclampsia[11]. A majority of our cases represented primigravida (60 per cent) as it has been reported that primigravity is a known risk factor to preeclampsia[12]. The rate of cesarean sections in our study was 65 percent, more so in women with severe preeclampsia. It agrees with the paper carried by Dolea and Abusah who recorded those hypertensive disorders greatly increase the chances of patients producing through cesarean delivery as a result of fetal distress or worsening conditions of the mother[13]. The prevalence of preterm delivery was 36% of the study population of which severe preeclampsia patients had a significantly higher rate ($p = 0.003$). Similarly, Adekunle of et al. reported a similar percentage of 34.8 of women with preeclampsia gave birth prematurely especially in cases where preeclampsia is severe[14]. The preterm birth risk is attributed to the requirement of early intervention to establish the compromise of the maternal or fetus. In 28% and 42%, intrauterine growth restriction (IUGR) and low birth weight were reported to be

present and in severe preeclampsia, the incidence is significantly more. One can explain them through placental insufficiency, which is one of the critical characteristics in the pathogenesis of preeclampsia[15]. This is further supported by findings by Xiong et al. who noted that preeclampsia had a 2-3-fold increased risk of low birth weight, and IUGR[16]. The presence of maternal complications was noted in 18 percent of the study group. There were 6 percent of cases of eclampsia, 4 percent of HELLP syndrome, and 3 percent of abruptio placentae. Such complications were also much more common among women who have severe preeclampsia. In a retrospective study done by Ananth and Keyes, the complications showed comparative rates among the patients with severe disease, once again pointing to the extremity of monitoring and early treatment[17]. The incidence of stillbirths stood at 5 percent with most of them being those who were grouped off as having severe preeclampsia. These results are similar to those of a tiny study carried out by Osun bade and Ige who reported that stillbirths were mainly linked to severe hypertension and retardation of intervention[18]. In our study, the NICU admission rate of 30% depicts the large burden of neonatal compromise in preeclampsia. This can be likened to the results of a study carried out by Moodley et al., in which the rates of NICU admission are over 25 percent in preeclamptic pregnancies[19]. The leading indications of NICU admission were low birth weight, prematurity and respiratory distress syndrome. All in all, our study findings emphasize the importance of having tertiary care institutions in handling high-risk pregnancies. Multidisciplinary management, aggressive monitoring, and early referral contribute a lot to the improvement of the outcomes. Our findings highlight the similarities in risk factors, complications, and the association between the severity of the disease and adverse events when compared to the global evidence[20].

CONCLUSION

The outcomes of preeclampsia are majorly seen on both maternal and fetal sides mainly when it is serious. These complications can be minimized in case of early detection, attention, and interventions. Improvement of antenatal care and accessibility to facilities offering care on tertiary level is an absolute strategy that can be implemented to alleviate the burden of this high-risk condition so as to have a good overall assessment of pregnancies.

Limitations: Only a small sample size in one tertiary care center was studied; hence, this factor could hamper its applicability to the entire study. Moreover, long term neonatal outcomes were not measured. The management choices and the differences in outcomes might also have been affected by resource limitations as compared to multicenter or high-income setting studies.

Future Findings: The next studies must be aimed at multicentric studies of a larger sample size to confirm results and determine the long-term outcomes in maternal and newborns. Examining biomarkers that will be used to detect the disease early and make personalized management plans may improve prevention. The assessment of the community-based screening approaches can also enhance a timely referral, and the delay in the start of treatment.

Abbreviations:

1.	BP	Blood Pressure
2.	IUGR	Intrauterine Growth Restriction
3.	NICU	Neonatal Intensive Care Unit
4.	HELLP	Hemolysis, Elevated Liver Enzymes, and Low Platelet Count
5.	ICU	Intensive Care Unit
6.	SD	Standard Deviation
7.	SPSS	Statistical Package for the Social Sciences
8.	ACOG	American College of Obstetricians and Gynecologists
9.	PE	Preeclampsia
10.	WHO	World Health Organization
11.	BMI	Body Mass Index (if mentioned elsewhere)
12.	RDS	Respiratory Distress Syndrome (if applicable from NICU findings)

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