FREQUENCY OF ADVERSE FETOMATERNAL OUTCOMES IN PATIENTS WITH PREECLAMPSIA

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Abstract

Background: Preeclampsia is characterised by a systolic blood pressure above 140mmHg and/or diastolic blood pressure exceeding 90 mm Hg, together with proteinuria of 0.3 g or more per 24 hours after 20 weeks of gestation. Despite significant global efforts, there is a lack of sufficient data from Pakistan, particularly in this region.

Methodology: This cross-sectional study was carried out in the Department of Obstetrics and Gynaecology at QHAMC Nowshera, spanning from September 20, 2021, to March 20, 2022. The study involved a cohort of 139 pregnant women diagnosed with preeclampsia. Every patient was monitored until birth, and any negative outcomes for both the foetus and the mother were recorded according to specific definitions.

Results: The age range of participants in this study was between 18 and 40 years, with a mean age of 27.712±2.77 years. The average gestational age was 28.841±3.12 weeks, and the average parity was 1.021±1.35. The proportion of male patients was 50.5%, while the proportion of females was 49.5%. The occurrence of placental abruption was reported in 30.9% of patients, while disseminated intravascular coagulation was observed in 35.3% of patients. Postpartum haemorrhage occurred in 19.4% of patients, acute renal failure in 23% of patients, intrauterine growth restriction in 5.8% of patients, preterm birth in 8.6% of patients, intrauterine mortality in 7.2% of patients, low birth weight in 10.1% of patients, and NICU care was required for 51.8% of patients.

Conclusion: Pregnancy-related hypertension problems are prevalent and have a negative effect on both the mother and the foetus.

Keywords: Preeclampsia, Fetomaternal outcomes, Placental Abruption.

Introduction

Preeclampsia (PE) is defined as a systolic blood pressure more than 140mmHg and/or a diastolic blood pressure greater than 90mmHg, as well as proteinuria equivalent to or more than 0.3 g per 24 hours after 20 weeks of amenorrhea.[1] It occurs in 3-8% of all pregnancies and is linked with a high prevalence of morbidity and death in both mothers and fetuses.[2]

PE, or preeclampsia, is the third greatest cause of maternal mortality globally, accounting for nearly 60,000 deaths each year. Following hemorrhage and embolism, it is the leading cause of maternal mortality.2 When combined with additional disorders such as HELLP syndrome (hemolysis, elevated liver enzymes, low platelets), liver hemorrhage or rupture, acute renal damage, oliguria, disseminated intravascular coagulation, as well as pulmonary edoema, the death rate may increase.[3] Globally, pulmonary embolism (PE) is a significant challenge in underdeveloped nations, with a fatality rate of over 15%, in contrast to the 0-2% mortality rate observed in industrialised countries.[4] In addition to inadequate medical care and a greater incidence of severe cases of PE and eclampsia, these nations also face challenges related to insufficient screening and preventative measures.[4]

The likelihood of negative outcomes in infants is contingent upon the intensity of hypertensive disorders experienced during pregnancy. Specifically, the risk of delivering prematurely was lowest among moms without hypertension, higher among mothers with pregnancy-induced

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hypertension (PIH), and highest among women with preeclampsia.[5]

A study conducted by Un-Nisa S, et al. revealed that the occurrence rates of various complications in patients with preeclampsia were as follows: placental abruption (31.6%), disseminated intravascular coagulation (40%), postpartum haemorrhage (29%), and acute renal failure (28.5%). Additionally, the study found that the occurrence rates of intrauterine growth restriction, preterm birth, intrauterine death, and low birth weight in patients with preeclampsia were 10%, 25%, 18.2%, and 50% respectively.[6]

A study conducted by Belay Tolu L, et al. revealed that the incidence of intrauterine growth restriction was 12%, preterm delivery was 18.8%, and NICU hospitalisation was 36.6% among patients diagnosed with preeclampsia.[7]

Despite the considerable amount of research that has been conducted on this subject on a global scale, there is a dearth of data from Pakistan, particularly in this region. Pakistan has one of the most unfavourable rates of pregnancy complications globally, which is considerably worse than the majority of low-resource nations.[8] As a result, obtaining local evidence concerning adverse fetal-maternal outcomes in preeclamptic patients is of the utmost importance. The findings of this research will assist in emphasising the necessity for an effective awareness campaign concerning hypertensive disorder during pregnancy.

Material and Methods

This cross-sectional study was done in the Department of Obstetrics & Gynaecology, QHAMC Nowshera, from September 20, 2021, to March 20, 2022, and included a total of 139 patients. The sample size was determined using the WHO sample size calculator, taking into consideration a 10% frequency of intrauterine growth retardation, a 95% confidence level, and a 5% margin of error.[6] patients were recruited for the study utilising a Non-probability consecutive sampling method. This group consisted of women between the ages of 18 and 40 who were capable of delivering children. These women had a single pregnancy confirmed by ultrasound, a gestational age of more than 20 weeks based on their last menstrual period, and could have any number of previous pregnancies. Additionally, they had preeclampsia. The study excluded women who had a medical history of diabetes, severe anaemia, renal failure, cardiac illness, antiphospholipid syndrome, and TORCH infection.

The study comprised patients who met the specific requirements from the Department of Obstetrics and Gynaecology at Qazi Hussain Ahmed Medical Complex in Nowshera. Approval was obtained from the ethics committee. The patient/attendant received a thorough explanation regarding their involvement in the trial, and an informed permission was acquired that clearly outlined the risks and benefits. Essential demographic information including as age, gestational age, and parity were recorded.

The study tracked all patients until delivery and recorded any negative outcomes for both the mother and foetus, including placental abruption, disseminated intravascular coagulation, postpartum haemorrhage, acute renal failure, intrauterine growth restriction, preterm birth, intrauterine death, low birth weight, and admission to the neonatal intensive care unit (NICU). These outcomes were defined according to specific criteria. The data was meticulously documented and entered into custom-designed proforma. The data was analysed using the statistical analysis programme SPSS Ver. 23. Analysed were the frequencies and percentages of categorical variables such as placental abruption, disseminated intravascular coagulation, postpartum haemorrhage, acute renal failure, intrauterine growth restriction, preterm birth, intrauterine death, low birth weight, and NICU hospitalisation. Mean ± standard deviation (SD) was reported for quantitative factors including as age, gestational age, and parity. The study categorised negative outcomes for both the foetus and mother based on factors such as age, length of pregnancy, and number of previous pregnancies. A post-stratification chi-square test was conducted, with a significance level of $p < 0.05$ indicating statistical significance.

Results

The age range of participants in this study ranged from 18 to 40 years, with a mean age of 27.712±2.77 years. The mean gestational age was 28.841±3.12 weeks, and the mean parity was 1.021±1.35.

The incidence of placental abruption was 30.9% in the patients, while disseminated intravascular coagulation was observed in 35.3% of them. Postpartum haemorrhage occurred in 19.4% of the patients, acute renal failure in 23%, intrauterine growth restriction in 5.8%, preterm birth in 8.6%, intrauterine death in 7.2%, low birth weight in 10.1%, and NICU admission in 51.8% as indicated in Table-I.

The tables labelled as Tables-2 display the categorization of negative outcomes for both the foetus and mother based on age, gestational age, and parity.

Table 1: Frequency of adverse outcome. (N=139)

Adverse outcome	Yes	No	Percentage
Placental abruption	43	96	30.9 %
DIC	49	90	35.3 %
Postpartum hemorrhage	27	112	19.4 %
Acute renal failure	32	107	23 %
IUGR	8	131	5.8 %
Preterm birth	12	127	8.6 %
IUD	10	129	7.2 %
Low birth weight	14	125	10.1 %
NICU admission	72	67	51.8 %

Table 2: stratification of adverse outcome with respect to age, gestational age and parity. (N-139)

Adverse outcome	Age 18-30	Age > 30	P value	Gestational age 20-30 weeks	Gestational age >30 weeks	P value	Parity 0-2	Parity >2	P value
Placental abruption	36(30.8%)	7(31.8%)	0.922	24(28.6%)	19(34.5%)	0.456	34(30.4%)	9(33.3%)	0.764
DIC	43(36.8%)	6(27.3%)	0.393	29(34.5%)	20(36.4%)	0.824	42(37.5%)	7(25.9%)	0.258
Postpartum hemorrhage	22(18.8%)	5(22.7%)	0.670	19(22.6%)	8(14.5%)	0.239	22(19.6%)	5(18.5%)	0.895
Acute renal failure	27(23.1%)	5(22.7%)	0.971	19(22.6%)	13(23.6%)	0.889	24(21.4%)	8(29.6%)	0.364
IUGR	8(6.8%)	0(0%)	0.206	4(4.8%)	4(7.3%	0.534	8(7.1%)	0(0%)	0.153
Preterm birth	11(9.4%)	1(4.5%)	0.457	8(9.5%)	4(7.3%)	0.644	11(9.8%)	1(3.7%)	0.310
IUD	9(7.7%)	1(4.5%)	0.600	4(4.8%)	6(10.9%)	0.170	9(8%)	1(3.7%)	0.434
Low birth weight	11(9.4%)	3(13.6%)	0.545	10(11.9%)	4(7.3%)	0.375	10(8.9%)	4(14.8%)	0.362
NICU admission	62(53%)	10(45.5%)	0.516	43(51.2%)	29(52.7%)	0.859	59(52.7%)	13(48.1%)	0.672

Discussion

Preeclampsia is a multifaceted disorder that is linked to a range of negative effects on both the mother and the foetus. Preeclampsia is a frequently observed result of several negative maternal circumstances. Identifying different forms of preeclampsia could provide a better knowledge of how it affects the health of newborns in the short and long term (Boutin et al., 2021).[9] The World Health Organisation has provided an estimation of the significant annual maternal mortality globally that are connected to preeclampsia, highlighting the seriousness of this condition (Geldenhuys et al., 2018).[10] Research has indicated that the primary consequences of preeclampsia on both the foetus and the mother are premature birth, newborns with low birth weight, partial HELLP syndrome, perinatal death, eclampsia, and maternal death (Iqbal et al., 2020).[11] Furthermore, research has discovered that negative consequences for newborns are not solely restricted to premature birth in cases of

preeclampsia (Bozdağ et al., 2015). In addition, preeclampsia has been specifically linked to negative outcomes for newborns that go beyond the health problems caused by premature birth (Mendola et al., 2015).[12]

In this study, the most prevalent maternal complications among pregnant women with preeclampsia were placental abruption and PPH. In our analysis, placental abruption occurred in 30.9% of individuals, disseminated intravascular coagulation in 35.3%, postpartum hemorrhage in 19.4%, acute renal failure in 23, intrauterine growth restriction in 5.8%, preterm delivery in 8.6%, intrauterine mortality in 7.2%, low birth weight in 10.1%, and NICU hospitalization in 51.8%. This outcome was analogous to the results of studies undertaken in India, which likewise indicated placental abruption as a significant issue.[13]

In a study by Un-Nisa S, et al. has shown that frequency of placental abruption was 31.6%, disseminated intravascular coagulation 40%, postpartum hemorrhage 29% and acute renal failure was 28.5%, while frequency of Intrauterine growth restriction was 10%, preterm birth 25%, intrauterine death 18.2% and low birth weight was 50% in patients with preeclampsia.[6] In another study by Belay Tolu L, et al. has shown that frequency of intrauterine growth restriction was 12%, preterm birth 18.8% and NICU admission was 36.6% in patients with preeclampsia.[7]

Hypertensive diseases associated with pregnancy pose a threat to the health of both the mother and the fetus. In this study, LBW was the most frequent newborn morbidity associated with preeclampsia. In his research, Jiang W et al. discovered a favorable correlation between preeclampsia and gestational age as well as between LBW and preeclampsia[14]. Preterm delivery and IUGR were the most frequent fetal problems among pregnant women with eclampsia in this research. Additionally, eclampsia was found to be a risk factor for premature delivery in a Tehran investigation[15]. Four stillbirths in this research occurred in eclamptic mothers.

There are a few limitations to this study: first, it was a single-center study with a small sample, so the results cannot be generalized; second, selection bias may have been introduced because of the convenient consecutive sampling technique used in this study. Ultimately, preeclampsia is a significant risk factor for adverse fetomaternal outcomes, such as low birth weight, preterm, maternal death, and various complications; third, it is important to understand the different subtypes of preeclampsia and how they affect neonatal outcomes to improve management strategies and lower adverse outcomes.

Conclusion

PPH and placental abruption were shown to be the most often occurring related maternal problems, according to our study. The most prevalent related fetal problems were preterm delivery, IUGR, and low birth weight. Efforts should be made to reduce the risk factors that contribute to the high incidence of preeclampsia at the grassroots level. All levels of society should be made aware of the risks associated with hypertensive disorders of pregnancy in order to minimize complications for both mothers and fetuses. Health institutions should be well-equipped to recognize preeclampsia and other hypertension illnesses early and to appropriately manage them. Community awareness programs should also be implemented.

REFERENCES

1. Braunthal S, Brateanu A. Hypertension in pregnancy: pathophysiology and treatment. SAGE Open Med. 2019; 7:2050312119843700.

2. Rafii Tabrizi A, Ayoubi JM, Ahmed B. Practical approach to the prevention of preeclampsia: from screening to pharmaceutical intervention. J Matern Fetal Neonatal Med. 2021;34(1):152-8.

3. Shah FA, Guez G, Patel N. Complicated post-partum HELLP syndrome causing acute renal failure and a spontaneous acute subdural hematoma. Cureus. 2021;13(2):e13233.

4. von Dadelszen P, Magee LA. Preventing deaths due to the hypertensive disorders of pregnancy. Best Pract Res Clin Obstet Gynaecol. 2016;36:83-102.

5. Shen M, Smith GN, Rodger M, White RR, Walker MC, Wen SW. Comparison of risk factors and outcomes of gestational hypertension and pre-eclampsia. PLoS One. 2017;12:175914.

6. Un-Nisa S, Shaikh AA, Kumar R. Maternal and fetal outcomes of pregnancy-related hypertensive disorders in a tertiary care hospital in Sukkur, Pakistan. Cureus. 2019;11(8):e5507.

7. Belay Tolu L, Yigezu E, Urgie T, Feyissa GT. Maternal and perinatal outcome of preeclampsia without severe feature among pregnant women managed at a tertiary referral hospital in urban Ethiopia. PLoS One. 2020;15(4):e0230638.

8. Aziz A, Saleem S, Nolen TL, Pradhan NA, McClure EM, Jessani S, et al. Why are the Pakistani maternal, fetal and newborn outcomes so poor compared to other low and middle-income countries? Reprod Health. 2020;17(Suppl 3):190.

9. Boutin A, Guerby P, Gasse C, Tapp S, Bujold E. Pregnancy outcomes in nulliparous women with positive first-trimester preterm preeclampsia screening test: the Great Obstetrical Syndromes cohort study. American Journal of Obstetrics and Gynecology. 2021 Feb;224(2):204.e1–7.

10. Geldenhuys, J., Rossouw, T., Lombaard, H., Ehlers, M., & Kock, M. (2018). Disruption in the regulation of immune responses in the placental subtype of preeclampsia. Frontiers in Immunology, 9.

11. Iqbal, Q., Javed, A., Marri, Z., & Sabeen, N. (2020). Feto-maternal outcome of pregnancy complicated with preeclampsia. Journal of Pharmaceutical Research International, 44-48.

12. Mendola, P., Mumford, S., Männistö, T., Holston, A., Reddy, U., & Laughon, S. (2015). Controlled direct effects of preeclampsia on neonatal health after accounting for mediation by preterm birth. Epidemiology, 26(1), 17-26.

13. Panda S, Das R, Sharma N, Das A, Deb P, Singh K. Maternal and Perinatal Outcomes in Hypertensive Disorders of Pregnancy and Factors Influencing It: A Prospective Hospital-Based Study in Northeast India. Cureus. 2021 Mar 18;

14. Jiang W, Mo M, Si S, Wu J, Pu L, Huang M, et al. Association of hypertensive disorders of pregnancy with infant growth in the first 36 months of life. European Journal of Pediatrics. 2021 Jul 5;181(1):133–41.

15. Epidemiology and related risk factors of preterm labor as an obstetrics emergency. Halimi Asl AA, Safari S, Parvareshi Hamrah M. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5325899/ Emerg (Tehran) 2017;5:0