e-ISSN: 0975-9506, p-ISSN: 2961-6093

Available online on www.ijpqa.com

International Journal of Pharmaceutical Quality Assurance 2026; 17(2); 203-208

Original Research Article

Preeclampsia Severity and Its Impact on Neonatal and Parturient Outcomes: A Retrospective Study

Vineeta Singh[1], Amit Kumar[2], Rajluxmi Tubid[3], Vijay Pratap Sinha[4]

[1]Senior Resident, Department of Obstetrics and Gynaecology, SNMMCH, Dhanbad, Jharkhand, India
[2]Senior Resident, Department of Orthopedics, SNMMCH, Dhanbad, Jharkhand, India.
[3]Professor and HOD, Department of Obstetrics and Gynaecology, SNMMCH, Dhanbad, Jharkhand, India
[4]Professor and HOD, Department of Orthopaedics, SNMMCH, Dhanbad, Jharkhand, India

Received: 10-12-2025 / Revised: 19-01-2026 / Accepted: 24-02-2026
Corresponding Author: Dr. Amit Kumar
Conflict of interest: Nil

Abstract:

Background: Preeclampsia (PE) is a multisystem pregnancy disorder associated with significant maternal and neonatal morbidity and mortality. Disease severity influences peripartum outcomes, yet data from tertiary care centers remain limited.

Aim: To evaluate the impact of preeclampsia severity on maternal and neonatal outcomes in a tertiary care setting.

Methodology: A retrospective observational study was conducted at Department of obstetrics and gynecology, SNMMCH, Dhanbad, analyzing records of 82 women diagnosed with PE over one year. Patients were categorized as severe (n=34) or non-severe (n=48) based on clinical and laboratory criteria. Maternal outcomes included mode of delivery, ICU admission, postpartum blood pressure management, and hospital stay. Neonatal outcomes included gestational age, birth weight, Apgar scores, NICU admission, and complications. Statistical analysis used t-tests, Chi-square, and Fisher's exact tests, with $p<0.05$ considered significant.

Results: Severe PE was associated with higher cesarean rates (79.4% vs. 58.3%, p=0.041), maternal ICU admission (14.7% vs. 2.1%, p=0.032), prolonged hospitalization, and HELLP syndrome (17.6% vs. 0, p=0.001). Neonates had increased preterm birth (70.6% vs. 37.5%, p=0.004), low birth weight (64.7% vs. 33.3%, p=0.006), NICU admission (52.9% vs. 22.9%, p=0.007), and lower Apgar scores.

Conclusion: Severity of preeclampsia significantly worsens maternal and neonatal outcomes. Early recognition and close monitoring are essential to reduce complications.

Keywords: Preeclampsia, Maternal Outcomes, Neonatal Outcomes, Severity, Retrospective Study.

DOI: 10.25258/ijpqa.17.2.32

Introduction

Preeclampsia (PE) is a pregnancy-specific condition, which is indicated by the development of hypertension after the 20 th week of pregnancy [1]. It is a multistage disease that is complicated and may involve various organs that include kidneys, liver, and cardiovascular system and is linked with a huge morbidity and mortality to both the mother and the neonate. PE is still the primary cause of maternal and fetal issues affecting mothers and fetuses in most parts of the world, which lead to poor maternal hypertension, placenta abruption, fetal growth retardation, and preterm birth [2]. PE is not limited to the low- and middle-income countries and is a global health complication due to the high burden of the hypertensive disorders of pregnancy (HDP). The maternal mortality is one of the complications of PE, and it is very important to recognize and stratify risks and address them accordingly in a timely manner [3].

The treatment of PE is a difficult task, as it is heterogeneous and presents differently in different patients. Although the ultimate cure in PE is delivering the placenta and fetus, the delivery time should be done cautiously in order to strike a balance between the mother and the baby. Serious maternal and neonatal complications can still be encountered after delivery, and the maternal mortality can happen even after childbirth [4]. Besides mortality, the ICU admission is also a serious complication especially in cases of long-term hospitalization resulting in long-term sequelae [5]. PE is multisystemic, which implies that maternal organ dysfunction may appear both in the prepartum period, peripartum, and in the postpartum period, and close monitoring and early intervention are vital in this case [6]. On this note, it is important to note that references to tertiary care centers with multidisciplinary missions and

specialized maternal and neonatal ICUs would enhance optimality [7].

It is imperative to understand the association between maternal traits and the severity of the diseases as well as the pregnancy outcomes in order to enhance the management of preeclamptic women [8]. Obesity, already-presented diabetes, gestational diabetes mellitus (GDM), and abnormal maternal laboratory results are some of the risk factors that can affect the development of PE and predisposition to adverse outcomes. The list of these predictors may help clinicians to prioritize patients on the risk and apply specific interventions to minimize complications. The interaction of the maternal blood pressure levels, laboratory parameters, and other comorbid conditions can shed light on the risk of adverse mother and neonatal outcomes, allowing to plan the care on a more accurate and individualized basis.

The proposed retrospective study will help to investigate the connection between the maternal characteristics during PE diagnosis, such as obesity, diabetes, GDM, maternal laboratory tests, and blood pressure, and the further development of a pregnancy, perinatal outcomes, and the mother. This study aims to improve clinical decision-making and early risk identification to decrease the severe maternal and neonatal complications by determining the possible risk factors. In addition, knowledge about the laboratory findings that can be used to forecast unfavorable outcomes can be used to make timely interventions and enhance maternal and neonatal prognoses.

This study is relevant not only to the short-term clinical outcomes. Defining the peculiarities of high-risk pregnancy with PE, the medical staff will be able to design specific control plans, to plan time and method of childbirth, and to take precautions to reduce the morbidity of the mother and child. Early detection and proper care of the high-risk women can play a large part in minimizing the complications that come with PE such as preterm delivery, fetal growth retardation and the mother in the ICU. In the end, the findings of this research can be used to shape up evidence-based practices, inform resource allocation in the healthcare sector, and help in order to decrease the burden of maternal and neonatal morbidity and mortality caused by preeclampsia across the world.

Methodology

Study Design: This retrospective observational study was conducted to assess the severity of preeclampsia and its impact on neonatal and parturient outcomes. Medical records of patients diagnosed with preeclampsia were reviewed and analyzed. The study population was categorized into preeclampsia with severe features and without severe features based on established clinical and laboratory diagnostic criteria.

Study Area: The study was carried out in the Department of Obstetrics and Gynecology, SNMMCH, Dhanbad, Jharkhand, India.

Study Duration: The study was conducted over a period of one year.

Sample Size: A total of 82 patients diagnosed with hypertensive disorders of pregnancy were included in the study. Among them, 76 patients were diagnosed with preeclampsia and 6 patients were diagnosed with eclampsia. All patients delivered at the study center during the study period and were included in the final analysis.

Sample Population: The sample population comprised pregnant women diagnosed with preeclampsia who were admitted to the Department of Obstetrics and Gynecology at SNMMCH and subsequently delivered in the same hospital. Patients were grouped according to the severity of preeclampsia based on blood pressure measurements and evidence of end-organ involvement.

Data Collection: Data were collected retrospectively from hospital medical records, including inpatient case sheets, labor room registers, laboratory reports, and neonatal records. Maternal variables included age, gravidity, parity, gestational age at diagnosis and delivery, history of preeclampsia, associated comorbidities, baseline and diagnostic blood pressure, mode of delivery, indications for cesarean section, laboratory parameters such as platelet count, serum creatinine, liver enzymes (AST and ALT), urine protein by dipstick method, length of hospital stay, and ICU admission. Neonatal variables included birth weight, Apgar scores at 1 and 5 minutes, head circumference, preterm status, need for hospitalization, and NICU admission.

Inclusion Criteria

- Pregnant women diagnosed with preeclampsia during the study period.
- Patients who delivered at SNMMCH, Dhanbad.
- Availability of complete maternal and neonatal records.

Exclusion Criteria

- Patients with incomplete or missing clinical/laboratory data.
- Patients who were referred out before delivery.
- Patients who delivered outside the study institution.
- Pregnancies complicated by chronic hypertension diagnosed before pregnancy (unless superimposed preeclampsia was clearly documented).

Procedure: Eligible patient records were identified and categorized based on the severity of preeclampsia according to standard diagnostic criteria. Maternal outcomes were assessed during antenatal,

intrapartum, and postpartum periods. Primary maternal outcomes included mode of delivery, preterm delivery, length of hospital stay, postpartum complications, and ICU admission. Neonatal outcomes assessed included birth weight, Apgar scores, need for NICU admission, and neonatal complications.

Statistical Analysis: Data were entered into Microsoft Excel and analyzed using IBM SPSS Statistics version 25.0. The normality of continuous variables was assessed using the Shapiro–Wilk test. Continuous variables were presented as mean ± standard deviation for normally distributed data and as median (minimum–maximum) for non-normally distributed data. Categorical variables were expressed as frequencies and percentages. Comparisons between two groups were performed using Student's t-test or Mann–Whitney U test as appropriate. The Chi-square test or Fisher's exact test was used for categorical variables. A p-value of less than 0.05 was considered statistically significant.

Result

Table 1 summarizes the demographic and obstetric characteristics of 82 patients. The mean maternal age was 28.96 ± 5.84 years, with 63 women (76.8%) under 35 years and 19 (23.2%) aged ≥35 years. Median gravida was 2 (range 1–6) and parity 1 (0–4). Mean initial maternal weight was 74.8 ± 14.6 kg, increasing to a median third-trimester weight of 88 kg (range 62–138). Median gestational age at delivery was 35 weeks, with 28 (34.1%) delivering <34 weeks, 24 (29.3%) at 34–36⁶ weeks, and 30 (36.6%) at ≥37 weeks. Mean neonatal birth weight was 2465 ± 910 g, with median Apgar scores of 8 at 1 min and 9 at 5 min. Cesarean section was performed in 55 women (67.1%), including 14 primary and 16 repeat cesareans, while 27 (32.9%) had vaginal deliveries. NICU admission was required in 29 neonates (35.4%), and maternal ICU admission occurred in 6 women (7.3%). Postpartum blood pressure medication was needed in 46 women (56.1%), with 36 (43.9%) showing spontaneous BP regulation. Median hospital stay was 5 days (range 3–16). Overall, the cohort included predominantly younger women with high cesarean rates and notable NICU and postpartum BP management needs.

Table 1: Demographic and Obstetric Characteristics of Patients (N = 82)

Characteristics	n	Value
Age (years)	82	28.96 ± 5.84
<35 years	63	63 (76.8%)
≥35 years	19	19 (23.2%)
Gravida	82	2 (1–6)
Parity	82	1 (0–4)
Initial maternal weight (kg)	82	74.8 ± 14.6
Third trimester weight (kg)	82	88 (62–138)
Gestational age at delivery (weeks)	82	35 (28–40)
<34 weeks	28	28 (34.1%)
34–36⁶ weeks	24	24 (29.3%)
≥37 weeks	30	30 (36.6%)
Neonatal birth weight (g)	82	2465 ± 910
Apgar score (1 min)	82	8 (4–9)
Apgar score (5 min)	82	9 (6–10)
Mode of delivery – Cesarean section	55	55 (67.1%)
Mode of delivery – Vaginal delivery	27	27 (32.9%)
Primary cesarean section	14	14 (17.1%)
History of previous cesarean	16	16 (19.5%)
Need for NICU admission	29	29 (35.4%)
No NICU required	53	53 (64.6%)
Maternal ICU admission	6	6 (7.3%)
Postpartum BP medication required	46	46 (56.1%)
Spontaneous BP regulation	36	36 (43.9%)
Maternal hospital stays (days)	82	5 (3–16)

Table 2 summarizes maternal laboratory parameters at diagnosis in 82 women with preeclampsia. The median systolic blood pressure was 154 mmHg (range 130–210), and diastolic blood pressure was 96 mmHg (range 80–120). Mean platelet count was 228 ± 68 ×10³/μL, serum creatinine 0.64 ± 0.18 mg/dL, and urea ranged from 8–48 mg/dL (median 22). Liver enzymes showed AST 20 U/L (range 9–180) and ALT 14 U/L (range 6–165). Proteinuria on dipstick testing revealed 14 women (17.1%) negative, 18 (22.0%) 1+, 12 (14.6%) 2+, 13 (15.9%) 3+, and 25 (30.5%) 4+, indicating a wide variation in renal involvement. Overall, most women had

elevated blood pressure with variable proteinuria and generally preserved renal and hepatic function.

Table 2: Maternal Laboratory Parameters at Diagnosis (N = 82)		
Parameter	**n**	**Value**
Systolic BP (mmHg)	82	154 (130–210)
Diastolic BP (mmHg)	82	96 (80–120)
Platelet count (×10³/μL)	82	228 ± 68
Serum creatinine (mg/dL)	82	0.64 ± 0.18
Urea (mg/dL)	82	22 (8–48)
AST (U/L)	82	20 (9–180)
ALT (U/L)	82	14 (6–165)
Proteinuria (Dipstick)	82	
Negative	14	14 (17.1%)
1+	18	18 (22.0%)
2+	12	12 (14.6%)
3+	13	13 (15.9%)
4+	25	25 (30.5%)

Table 3 presents the association between the severity of preeclampsia (PE) and maternal outcomes among 82 women. Women with severe PE (n = 34) had higher rates of adverse maternal outcomes compared to those with non-severe PE (n = 48). Cesarean section was performed in 27 (79.4%) versus 28 (58.3%) (p = 0.041). Maternal ICU admission occurred in 5 (14.7%) versus 1 (2.1%) (p = 0.032). Postpartum blood pressure medication was required in 26 (76.5%) versus 20 (41.7%) (p = 0.003). Hospital stay >5 days was noted in 21 (61.8%) versus 17 (35.4%) (p = 0.021), and HELLP syndrome developed in 6 (17.6%) of severe PE cases compared to none in the non-severe group (p = 0.001). Overall, severe preeclampsia was significantly associated with increased maternal morbidity.

Table 3: Association Between Severity of Preeclampsia and Maternal Outcomes (N = 82)			
Outcome	**Severe PE (n=34)**	**Non-Severe PE (n=48)**	**p-value**
Cesarean section	27 (79.4%)	28 (58.3%)	0.041
Maternal ICU admission	5 (14.7%)	1 (2.1%)	0.032
Postpartum BP medication required	26 (76.5%)	20 (41.7%)	0.003
Hospital stay >5 days	21 (61.8%)	17 (35.4%)	0.021
HELLP syndrome	6 (17.6%)	0	0.001

Table 4 shows the association between the severity of preeclampsia (PE) and neonatal outcomes among 82 pregnancies. Adverse outcomes were more frequent in the severe PE group (n = 34) compared to the non-severe PE group (n = 48). Preterm birth (<37 weeks) occurred in 24 cases (70.6%) versus 18 cases (37.5%) (p = 0.004). Low birth weight (<2500 g) was seen in 22 (64.7%) versus 16 (33.3%) (p = 0.006). NICU admission was required in 18 (52.9%) versus 11 (22.9%) (p = 0.007). Apgar score <7 at 1 minute occurred in 8 (23.5%) versus 4 (8.3%) (p = 0.048), and neonatal complications were observed in 10 (29.4%) versus 6 (12.5%) (p = 0.045). Overall, severe preeclampsia was significantly associated with worse neonatal outcomes.

Table 4: Association Between Severity of Preeclampsia and Neonatal Outcomes (N = 82)			
Outcome	**Severe PE (n=34)**	**Non-Severe PE (n=48)**	**p-value**
Preterm birth (<37 weeks)	24 (70.6%)	18 (37.5%)	0.004
Birth weight <2500 g	22 (64.7%)	16 (33.3%)	0.006
NICU admission	18 (52.9%)	11 (22.9%)	0.007
Apgar score <7 (1 min)	8 (23.5%)	4 (8.3%)	0.048
Neonatal complications	10 (29.4%)	6 (12.5%)	0.045

Discussion

Our research demonstrates that preeclampsia (PE) severity directly affects both maternal and neonatal health results. The study population had an average age of 28.96 years with a standard deviation of 5.84 years and 76.8% of participants who were under 35 years of age which matches the findings of Khan et al. (2022) [9] who found that younger women made up the majority of women with preeclampsia. The population of our study showed a median gravidity of 2 and a median parity of 1 which supports

previous research showing that multiple births do not protect against preeclampsia while first-time pregnancy creates a higher risk. The study results show that high maternal weight (mean 74.8 ± 14.6 kg) increases risk which confirms previous research that identified obesity as a major factor that causes PE development (Lambert et al., 2014) [10].

The study monitored delivery gestational ages from 28-week gestation until 40-week gestation and recorded 34.1% of deliveries before 34-week gestation which demonstrated high preterm delivery rates among study participants especially those with severe preeclampsia whose preterm delivery rate reached 70.6% The finding established that severe PE leads to preterm birth in more than 60% of affected cases according to Yıldız and Yılmaz (2022) [11] study results The study recorded an average neonatal birth weight of 2465 ± 910 g while 64.7% of infants in the severe PE group weighed below 2500 g which established a strong relationship between disease severity and low birth weight that Dong et al. (2017) [12] studied through their research on adverse fetal outcomes that occurred with prematurity and proteinuria.

Our cohort study found that 67.1% of participants underwent cesarean delivery which increased to 79.4% in severe cases while only 58.3% of non-severe cases needed the procedure according to the study results which showed a statistically significant difference at p value 0.041. Guida et al. (2018) reported that severe PE necessitated cesarean delivery in approximately 72% of cases, often due to fetal compromise or maternal indications. Maternal ICU admission occurred in 7.3% overall, with severe PE patients demonstrating significantly higher rates (14.7% vs. 2.1%; p = 0.032). The study results confirm findings from Cantwell et al. (2011) [13] and Khan et al. (2006) [14] which showed that postpartum severe hypertension combined with organ dysfunction requires patients to undergo intensive monitoring during their first three days.

The laboratory tests showed that the participants had median systolic blood pressure of 154 mmHg and median diastolic blood pressure of 96 mmHg while their kidney function remained intact with a mean creatinine level of 0.64 ± 0.18 mg/dL. The observed values match the reported values because medical literature shows that early hypertension detection together with proper hypertension treatment prevents women from developing eclampsia and HELLP syndrome (Lambert et al., 2014; Brown et al., 2018) [10,15]. The results showed that patients who needed postpartum intensive care unit treatment had increased ALT and AST levels while higher ALT levels occurred in patients who had cesarean sections because of abnormal fetal development, which supported the findings from Mei-Dan et al. (2013) [16] that early pregnancy liver enzyme increases predict severe PE. The presence of maternal liver dysfunction leads to negative effects on both the mother and the developing fetus.

Our cohort showed different levels of proteinuria because 30.5% of participants reached 4+ protein levels and 17.1% tested negative. The study found that severe PE patients who experienced high proteinuria developed postpartum antihypertensive treatment requirements at a rate of 76.5% which exceeded the 41.7% rate of the control group. The findings of the study match the results of Guida et al. (2018) [17] and Yıldız and Yılmaz (2022) [11] who demonstrated that massive proteinuria predicts higher rates of maternal complications which require special postpartum medical treatment. The researchers from Dong et al. (2017) [12] found that early-onset PE develops through proteinuria but the degree of proteinuria does not determine maternal health results instead prematurity creates more severe neonatal health issues. The research establishes that maternal and neonatal health risks increase with high proteinuria levels which lead to NICU admissions at a rate of 52.9% versus 22.9% (p = 0.007) and Apgar scores below 7 at one minute which occurred at a rate of 23.5% versus 8.3% (p = 0.048).

The study found that 35.4 percent of all newborns needed NICU admission which demonstrated that preeclamptic pregnancies caused severe neonatal complications. The research conducted by Newman et al. (2003) [18] discovered that mothers with massive proteinuria had higher NICU admission rates for their infants because of two main factors: their infants' prematurity and low birth weight. The evidence supports this connection which shows that severe PE with elevated proteinuria leads to greater dangers for newborns.

Our research shows that severe PE leads to negative impacts on both mother and newborn health which include preterm birth and low birth weight and higher rates of cesarean sections and ICU stays and extended hospital treatment. The results demonstrate that early detection combined with blood pressure and proteinuria monitoring and scheduled delivery should be used as methods to reduce negative outcomes which Brown et al. (2018) [15] and the ISSHP and ASOG international guidelines recommended.

Conclusion

The study highlights that the severity of preeclampsia significantly influences both maternal and neonatal outcomes. Women with severe preeclampsia experienced higher rates of cesarean delivery, ICU admission, prolonged hospitalization, and the need for postpartum blood pressure management, with a notable occurrence of HELLP syndrome. Neonates born to mothers with severe preeclampsia were more likely to be preterm, have low birth weight, require NICU admission, and experience lower Apgar scores and other complications. These findings

underscore the critical impact of preeclampsia severity on peripartum health, emphasizing the importance of early recognition, close monitoring, and timely intervention to mitigate adverse outcomes for both mothers and their newborns.

References

1. Pridjian G, Puschett JB. Preeclampsia. Part 1: clinical and pathophysiologic considerations. Obstet Gynecol Surv 2002; 57(9): 598-618. https://doi.org/10.1097/00006254-200209000-00023.
2. Petersen EE, Davis NL, Goodman D, Cox S, Mayes N, Johnston E, et al. Vital signs: Pregnancy-related deaths, United States, 2011-2015, and strategies for prevention, 13 states, 2013-2017. MMWR Morb Mortal Wkly Rep 2019; 68(18): 423-429. https://doi.org/10.15585/mmwr.mm6818e1.
3. Brown HL, Small MJ. Overview of maternal mortality. 2023. https://medilib.ir/uptodate/show/6713.
4. Khan S, Siddique AB, Jabeen S, Hossain AT, Haider MM, Zohora FT, et al. Preeclampsia and eclampsia-specific maternal mortality in Bangladesh: Levels, trends, timing, and care-seeking practices. J Glob Health 2023; 13: 07003. https://doi.org/10.7189/jogh.13.07003.
5. Simpson NB, Shankar-Hari M, Rowan KM, Cecconi M, Von Dadelszen P, Huning EY, et al. Maternal Risk Modeling in critical care – Development of a multivariable risk prediction model for death and prolonged intensive care. Crit Care Med 2020; 48(5): 663-672. https://doi.org/10.1097/ccm.0000000000004223.
6. Bakrania BA, Spradley FT, Drummond HA, LaMarca B, Ryan MJ, Granger JP. Preeclampsia: Linking placental ischemia with maternal endothelial and vascular dysfunction. Compr Physiol 2020; 11(1): 1315- 1349. https://doi.org/10.1002/cphy.c200008.
7. Jakhar R, Choudhary A. Study of maternal outcome in referral obstetric cases in a tertiary care centre. J Family Med Prim Care 2019; 8(9): 2814-2819. https://doi.org/10.4103/jfmpc.jfmpc_402_19.
8. Poon LC, Shennan A, Hyett JA, Kapur A, Hadar E, Divakar H, et al. The International Federation of Gynecology and Obstetrics (FIGO) initiative on pre-eclampsia: A pragmatic guide for first-trimester screening and prevention. Int J Gynaecol Obstet 2019; 145 (Suppl 1): 1. https://doi.org/10.1002/ijgo.12802.
9. Khan B, Allah Yar R, Khakwani AK, Karim S, Arslan Ali H. Preeclampsia ıncidence and ıts maternal and neonatal outcomes with associated risk factors. Cureus 2022; 14(11): e31143. https://doi.org/10.7759/cureus.31143.
10. Lambert G, Brichant JF, Hartstein G, Bonhomme V, Dewandre PY. Preeclampsia: an update. Acta Anaesthesiol Belg 2014; 65(4): 137-149. https://pubmed.ncbi.nlm.nih.gov/25622379.
11. Yıldız GA, Yılmaz EPT. The association between protein levels in 24- hour urine samples and maternal and neonatal outcomes of pregnant women with preeclampsia. J Turk Ger Gynecol Assoc 2022; 23(3): 190- 198. https://doi.org/10.4274/jtgga.galenos.2022.2022-4-3.
12. Dong X, Gou W, Li C, Wu M, Han Z, Li X, Chen Q. Proteinuria in preeclampsia: Not essential to diagnosis but related to disease severity and fetal outcomes. Pregnancy Hypertens 2017; 8: 60-64. https://doi.org/10.1016/j.preghy.2017.03.005.
13. Cantwell R, Clutton-Brock T, Cooper G, Dawson A, Drife J, Garrod D, et al. Saving Mothers' Lives: Reviewing maternal deaths to make motherhood safer: 2006-2008. The Eighth Report of the Confidential Enquiries into Maternal Deaths in the United Kingdom. BJOG 2011; 118 Suppl 1: 1-203. https://doi.org/10.1111/j.1471-0528.2010.02847.x.
14. Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: A systematic review. Lancet 2006; 367(9516): 1066-1074. https://doi.org/10.1016/S0140-6736(06)68397-9.
15. Brown MA, Magee LA, Kenny LC, Karumanchi SA, McCarthy FP, Saito S, et al. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis, and management recommendations for international practice. Hypertension 2018; 72(1): 24-43. https://doi.org/10.1161/hypertensionaha.117.10803.
16. Mei-Dan E, Wiznitzer A, Sergienko R, Hallak M, Sheiner E. Prediction of preeclampsia: Liver function tests during the first 20 gestational weeks. J Matern Fetal Neonatal Med 2013; 26(3): 250-253. https://doi.org/10.3109/14767058.2012.733771.
17. Guida JP, Parpinelli MA, Surita FG, Costa ML. The impact of proteinuria on maternal and perinatal outcomes among women with pre-eclampsia. Int J Gynaecol Obstet 2018; 143(1): 101-107. https://doi.org/10.1002/ijgo.12487.
18. Newman MG, Robichaux AG, Stedman CM, Jaekle RK, Fontenot MT, Dotson T, et al. Perinatal outcomes in preeclampsia that is complicated by massive proteinuria. Am J Obstet Gynecol 2003; 188(1): 264-268. https://doi.org/10.1067/mob.2003.84.