Section: Obstetrics and Gynaecology

Original Research Article

PREDICTORS, PREVENTIVE MEASURES, AND MANAGEMENT STRATEGIES IN PREECLAMPSIA: A PROSPECTIVE HOSPITAL-BASED OBSERVATIONAL STUDY

***P. Kavitha*[1]**

[1]*Consultant, Department of Obstetrics and Gynaecology, Kumaran Medical Center, 499/500, Near Saravanampatti, Kurumbapalayam, SS Kulam, Coimbatore, Tamilnadu – 641107, India.*

Received *: 17/03/2026*
Received in revised form *: 02/05/2026*
Accepted *: 19/05/2026*

Corresponding Author:
Dr. Ramya Ponnuswamy,
Consultant, Department of Obstetrics and Gynaecology, Kumaran Medical Center, 499/500, Near Saravanampatti, Kurumbapalayam, SS Kulam, Coimbatore, Tamilnadu – 641107, India.
Email: kavitha.hariprasad@gmail.com

DOI: 10.70034/ijmedph.2026.2.392

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2026; 16 (2); 2344-2352

ABSTRACT

Background: Preeclampsia is a pregnancy-specific hypertensive disorder characterized by hypertension occurring after 20 weeks of gestation with proteinuria and/or end-organ dysfunction. It remains one of the leading causes of maternal and perinatal morbidity and mortality worldwide. Early identification of predictors and timely implementation of preventive and management strategies are essential to improve maternal and fetal outcomes.
Aim: To study the predictors, prevention, and management strategies for preeclampsia among pregnant women attending Kumaran Hospital, Coimbatore.
Materials and Methods: This prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Kumaran Hospital, Coimbatore, during the period 2024–2025. A total of 60 pregnant women diagnosed with preeclampsia after 20 weeks of gestation were included in the study. Detailed demographic, obstetric, clinical, laboratory, treatment, and outcome data were collected using a structured proforma. Risk factors, preventive measures, management strategies, maternal complications, and fetal outcomes were analyzed statistically.
Results: Among the 60 study participants, the majority belonged to the age group of 21–30 years (63.3%). Primigravida women constituted 58.3% of cases. Obesity (33.3%), family history of hypertension (20%), diabetes mellitus (16.7%), and chronic hypertension (13.3%) were identified as major predictors. Preventive measures included calcium supplementation in 50% and low-dose aspirin therapy in 41.7% of high-risk women. Mild preeclampsia was observed in 65% of cases, while severe preeclampsia occurred in 35%. Maternal complications included HELLP syndrome (6.7%), placental abruption (5%), and eclampsia (3.3%). Fetal complications included preterm birth (30%), low birth weight (33.3%), intrauterine growth restriction (16.7%), and NICU admission (25%).
Conclusion: Early identification of predictors and appropriate preventive interventions such as low-dose aspirin and calcium supplementation can reduce the severity and complications of preeclampsia. Timely management and close maternal-fetal monitoring significantly improve pregnancy outcomes.
Keywords: Preeclampsia, predictors, prevention, management, maternal outcome, fetal outcome.

INTRODUCTION

Preeclampsia is a pregnancy-specific multisystem disorder characterized by the development of hypertension after 20 weeks of gestation associated with proteinuria and/or evidence of maternal organ dysfunction.[1,2] It is one of the most significant causes of maternal and perinatal morbidity and mortality worldwide, particularly in developing countries.[3] Preeclampsia complicates approximately 5–8% of pregnancies worldwide and contributes substantially to maternal deaths, preterm deliveries, fetal growth restriction, and neonatal complications.[4,5]

The exact etiology of preeclampsia remains incompletely understood. However, abnormal placentation, endothelial dysfunction, vasospasm, immunological maladaptation, oxidative stress, and genetic predisposition are believed to play important roles in its pathogenesis.[8,9] Inadequate trophoblastic invasion of spiral arteries results in reduced placental perfusion, leading to placental ischemia and release of antiangiogenic factors into the maternal circulation, ultimately causing systemic endothelial damage.[10]

Several maternal and obstetric risk factors have been associated with the development of preeclampsia. These include primigravidity, advanced maternal age, obesity, multiple pregnancy, family history of hypertension, chronic hypertension, diabetes mellitus, renal disease, and previous history of preeclampsia.[6,11] Early identification of women at risk is essential to reduce adverse maternal and fetal outcomes.

Recent advances in obstetric care have focused on the prediction and prevention of preeclampsia through first-trimester screening methods, uterine artery Doppler studies, and biochemical markers such as Placental Growth Factor (PlGF) and soluble fms-like tyrosine kinase-1 (sFlt-1).[5,14] Preventive interventions including low-dose aspirin and calcium supplementation have shown promising results in reducing the incidence and severity of preeclampsia among high-risk women.[4,13]

Management of preeclampsia depends on the severity of disease, gestational age, and maternal-fetal condition. It includes regular maternal monitoring, blood pressure control, seizure prophylaxis with magnesium sulphate, fetal surveillance, and timely delivery.[2,7] Despite improvements in antenatal care and intensive obstetric management, preeclampsia continues to pose a major challenge in clinical practice.[15]

Considering the increasing incidence and complications associated with preeclampsia, this study was undertaken to evaluate the predictors, prevention, and management strategies of preeclampsia among pregnant women attending Kumaran Hospital, Coimbatore. The study aims to improve understanding regarding risk factors, preventive measures, and treatment outcomes, thereby contributing to better maternal and neonatal healthcare.

Aim of the Study

To study the predictors, prevention, and management strategies for preeclampsia among pregnant women attending the Department of Obstetrics and Gynaecology, Kumaran Hospital, Coimbatore, during the study period October 2024 to October 2025.

Objectives

Primary Objective

- To identify the predictors associated with preeclampsia among pregnant women.

Secondary Objectives

- To evaluate the preventive measures used in high-risk pregnancies for reducing the incidence and severity of preeclampsia.
- To study the clinical presentation and severity of preeclampsia.
- To assess the management strategies adopted for preeclampsia.
- To evaluate maternal outcomes in pregnancies complicated by preeclampsia.
- To assess Fetal and neonatal outcomes associated with preeclampsia.

MATERIALS AND METHODS

Study Design

Prospective observational study.

Study Setting

The study was conducted in the Department of Obstetrics and Gynaecology, Kumaran Hospital, Coimbatore.

Study Period

The study was conducted for a period of one year from October 2024 to October 2025.

Study Population

Pregnant women diagnosed with preeclampsia attending the antenatal outpatient department or admitted to the obstetric ward of Kumaran Hospital, Coimbatore.

Sample Size

A total of 60 pregnant women diagnosed with preeclampsia were included in the study.

Inclusion Criteria

- Pregnant women with gestational age greater than 20 weeks.
- Pregnant women diagnosed with preeclampsia based on standard diagnostic criteria.
- Women aged between 18 and 40 years.
- Both primigravida and multigravida women.
- Patients willing to participate in the study and provide informed written consent.

Exclusion Criteria

- Pregnant women with chronic hypertension diagnosed before pregnancy or before 20 weeks of gestation.
- Patients with chronic renal disease.

- Women with pre-existing seizure disorders or epilepsy unrelated to pregnancy.
- Pregnant women with known cardiovascular disease.
- Patients with autoimmune disorders such as systemic lupus erythematosus or antiphospholipid syndrome.

Diagnostic Criteria for Preeclampsia

Preeclampsia was diagnosed according to the American College of Obstetricians and Gynecologists (ACOG) guidelines. Pregnant women with gestational age greater than 20 weeks were considered to have preeclampsia if they developed new-onset hypertension, defined as systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg recorded on two occasions at least four hours apart in a previously normotensive woman, along with proteinuria. Proteinuria was defined as urinary protein excretion of ≥300 mg in a 24-hour urine sample, protein/creatinine ratio ≥0.3, or urine dipstick reading of ≥1+ when quantitative estimation was not available.

In the absence of proteinuria, preeclampsia was diagnosed when hypertension was associated with evidence of maternal organ dysfunction such as thrombocytopenia (platelet count <100,000/µL), impaired liver function with elevated liver enzymes, renal insufficiency with serum creatinine >1.1 mg/dL, pulmonary edema, or new-onset cerebral or visual disturbances including severe headache and blurring of vision.

Severe preeclampsia was diagnosed in patients presenting with severe hypertension (blood pressure ≥160/110 mmHg), severe persistent headache, visual disturbances, epigastric pain, oliguria, pulmonary edema, HELLP syndrome, eclampsia, or evidence of severe fetal growth restriction.

Data Collection Procedure

After obtaining approval from the Institutional Ethics Committee and informed written consent from the participants, pregnant women fulfilling the inclusion criteria were enrolled in the study. A detailed history regarding maternal age, gravidity, parity, gestational age, socioeconomic status, previous obstetric history, family history of hypertension or preeclampsia, and associated medical disorders was obtained using a structured proforma. General physical examination and obstetric examination were performed for all patients. Blood pressure was recorded using a standardized sphygmomanometer, and urine samples were tested for proteinuria.

Relevant laboratory investigations including complete blood count, liver function tests, renal function tests, urine routine examination, coagulation profile, and obstetric ultrasonography were carried out. Information regarding preventive measures such as low-dose aspirin therapy and calcium supplementation was documented. Details regarding management strategies including antihypertensive therapy, magnesium sulfate administration, maternal monitoring, fetal surveillance, and timing of delivery were recorded.

All patients were followed up until delivery, and maternal as well as fetal outcomes were documented and analyzed systematically.

Investigations

All study participants underwent detailed clinical and laboratory evaluation to assess the severity of preeclampsia and associated maternal and fetal complications. The following investigations were performed:

Hematological Investigations

Hematological investigations were performed in all study participants to assess the severity of preeclampsia and detect associated complications. Complete blood count (CBC) including hemoglobin estimation, total leukocyte count, platelet count, and packed cell volume (PCV) was carried out. Special attention was given to platelet count for early detection of thrombocytopenia and HELLP syndrome. These investigations were repeated during the course of management whenever clinically indicated.

Urine Examination

Urine examination was performed in all study participants to assess proteinuria and renal involvement associated with preeclampsia. Urine routine analysis and urine albumin by dipstick method were carried out at admission. Proteinuria was confirmed by 24-hour urinary protein estimation or urine protein-creatinine ratio whenever indicated. Urine examination was repeated during follow-up and management based on the clinical condition of the patient.

Renal Function Tests

Renal function tests were performed in all study participants to evaluate renal involvement and assess the severity of preeclampsia. Investigations included blood urea, serum creatinine, and serum electrolyte estimation. These parameters were monitored regularly during the course of treatment to identify renal insufficiency and guide further management.

Liver Function Tests

Liver function tests were performed in all study participants to assess hepatic involvement associated with preeclampsia. Investigations included serum bilirubin, serum glutamic oxaloacetic transaminase (SGOT/AST), serum glutamic pyruvic transaminase (SGPT/ALT), and lactate dehydrogenase (LDH) levels. These investigations were useful in detecting liver dysfunction, severe preeclampsia, and complications such as HELLP syndrome. The tests were repeated whenever clinically indicated during the course of management.

Coagulation Profile

Coagulation profile was assessed in study participants whenever clinically indicated to evaluate coagulation abnormalities associated with severe preeclampsia. Investigations included prothrombin time (PT), activated partial thromboplastin time (aPTT), and international normalized ratio (INR). These tests were performed to detect coagulation

defects, disseminated intravascular coagulation, and other hematological complications that may occur in severe cases of preeclampsia.

Obstetric and Fetal Evaluation

Obstetric and fetal evaluation was carried out in all study participants to assess fetal growth, fetal well-being, and complications associated with preeclampsia. Obstetric ultrasonography was performed to evaluate fetal biometry, gestational age, placental location, and amniotic fluid index. Fetal growth restriction and oligohydramnios were assessed whenever suspected. Doppler velocimetry studies were performed in selected cases to evaluate uteroplacental and fetoplacental circulation. Non-stress test (NST) was used for fetal surveillance and monitoring of fetal well-being. These assessments were repeated during follow-up according to the maternal and fetal condition.

Preventive Measures Evaluated

Preventive measures were evaluated among high-risk pregnant women to assess their role in reducing the incidence and severity of preeclampsia. The preventive strategies included low-dose aspirin therapy, calcium supplementation, regular antenatal checkups, blood pressure monitoring, dietary counseling, and lifestyle modifications. Low-dose aspirin was administered to selected high-risk women as per standard obstetric guidelines, while calcium supplementation was advised particularly for women with inadequate dietary calcium intake. Compliance with antenatal visits and preventive medications was also assessed during the study period.

Management Protocol

All patients diagnosed with preeclampsia were managed according to the standard institutional protocol based on the severity of the disease and gestational age. Patients with mild preeclampsia were managed conservatively with regular blood pressure monitoring, antihypertensive therapy when required, adequate rest, dietary advice, and close maternal and fetal surveillance. Fetal monitoring included daily fetal movement count, non-stress test, and periodic ultrasonography for assessment of fetal growth and amniotic fluid volume.

Patients with severe preeclampsia were admitted for intensive monitoring and management. Antihypertensive drugs such as labetalol, nifedipine, or hydralazine were administered to control severe hypertension. Magnesium sulphate was given for seizure prophylaxis according to standard regimens. Maternal monitoring included blood pressure charting, urine output monitoring, neurological assessment, and periodic laboratory investigations. Fetal surveillance was performed using ultrasonography, Doppler studies, and cardiotocography whenever indicated.

Termination of pregnancy was considered based on maternal and fetal condition, gestational age, severity of preeclampsia, and response to treatment. Vaginal delivery was preferred whenever feasible, while cesarean section was performed for obstetric indications or fetal distress. All patients were monitored closely during the postpartum period for persistence or progression of complications.

Outcome Measures

The outcome measures of the study included both maternal and fetal outcomes associated with preeclampsia. Maternal outcomes assessed were progression to severe preeclampsia, development of eclampsia, HELLP syndrome, placental abruption, acute renal impairment, need for intensive care unit admission, mode of delivery, and maternal mortality. The effectiveness of antihypertensive therapy and seizure prophylaxis was also evaluated.

Fetal and neonatal outcomes assessed included preterm delivery, low birth weight, intrauterine growth restriction (IUGR), oligohydramnios, fetal distress, need for neonatal intensive care unit (NICU) admission, perinatal mortality, and Apgar score at birth. These outcomes were analyzed to determine the impact of preeclampsia and the effectiveness of the management strategies adopted during the study period.

Statistical Analysis

The collected data were entered into Microsoft Excel and analyzed using Statistical Package for Social Sciences (SPSS) software version 23.0. Descriptive statistics such as mean and standard deviation were used for continuous variables, while categorical variables were expressed as frequencies and percentages. Statistical significance between variables was assessed using Chi-square test and Student's t-test wherever appropriate. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

The study was conducted after obtaining approval from the Institutional Ethics Committee of Kumaran Hospital, Coimbatore. Informed written consent was obtained from all participants prior to inclusion in the study. Confidentiality and privacy of patient information were strictly maintained throughout the study period. Participation in the study was voluntary, and patients were assured that refusal to participate would not affect their treatment or quality of care. All procedures followed in the study were in accordance with standard ethical guidelines for biomedical research involving human subjects.

RESULTS

A total of 60 pregnant women diagnosed with preeclampsia were included in the study. The collected data were analyzed with respect to demographic profile, risk factors, severity of disease, preventive measures, maternal complications, and fetal outcomes.

Age Distribution

Among the 60 study participants, the majority belonged to the age group of 21–30 years accounting for 63.3% of cases, followed by the 31–40 years age group which constituted 23.3% of the study population. Women aged less than 20 years

accounted for 10% of cases, while only 3.3% of patients were above 40 years of age.

Table 1: Distribution of Study Participants According to Age Group

Age Group (Years)	Frequency	Percentage
<20	6	10%
21–30	38	63.3%
31–40	14	23.3%
>40	2	3.3%
Total	**60**	**100%**

Note: The majority of the study participants were in the age group of 21–30 years (63.3%), indicating that preeclampsia was more commonly observed among women in the reproductive age group.

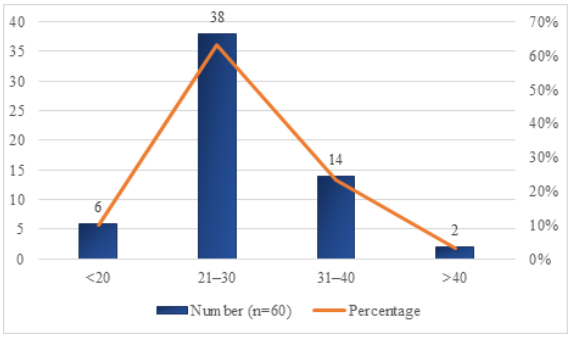

Figure 1: Distribution of Study Participants According to Age Group

Note: The majority of the study participants belonged to the age group of 21–30 years accounting for 63.3% of cases, followed by the 31–40 years age group. Women above 40 years constituted the least proportion of the study population.

Gravidity Distribution

Among the 60 study participants, primigravida women constituted the majority accounting for 58.3% of cases, while multigravida women accounted for 41.7% of the study population. The findings indicate that preeclampsia was more commonly observed among primigravida women.

Table 2: Distribution of Study Participants According to Gravidity

Gravidity	Frequency	Percentage
Primigravida	35	58.3%
Multigravida	25	41.7%
Total	60	100%

Note: Primigravida women constituted the majority of the study population (58.3%), suggesting that preeclampsia was more common among first-time pregnant women.

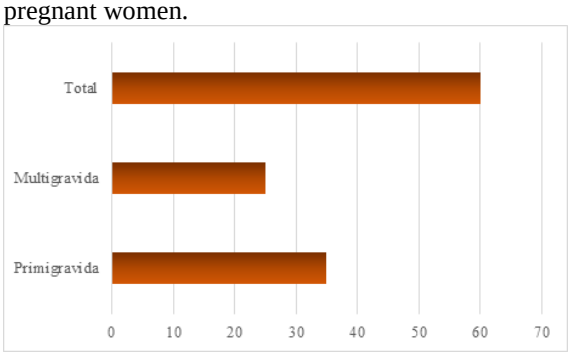

Figure 2: Distribution of Study Participants According to Gravidity

Note: Primigravida women constituted the majority of the study population accounting for 58.3% of cases, indicating that preeclampsia was more commonly observed among first-time mothers. Multigravida women accounted for 41.7% of the study participants.

Distribution of Risk Factors

Among the various risk factors identified in the study population, obesity was the most common risk factor observed in 33.3% of cases, followed by family history of hypertension or preeclampsia in 20% and diabetes mellitus in 16.7% of patients. Chronic hypertension was present in 13.3% of women, while multiple pregnancy and previous history of preeclampsia were each noted in 8.3% of cases.

Table 3: Distribution of Risk Factors among Study Participants

Risk Factors	Frequency	Percentage
Obesity	20	33.3%
Family history of hypertension/preeclampsia	12	20%
Diabetes mellitus	10	16.7%
Chronic hypertension	8	13.3%
Multiple pregnancy	5	8.3%
Previous history of preeclampsia	5	8.3%
Total	60	100%

Note: Obesity was identified as the most common risk factor (33.3%) among the study participants, followed by family history of hypertension or preeclampsia (20%) and diabetes mellitus (16.7%).

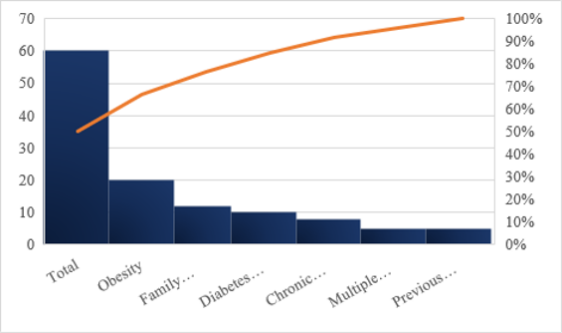

Figure 3: Distribution of Risk Factors among Study Participants

Note: Obesity was the most common risk factor identified among the study participants accounting for 33.3% of cases, followed by family history of hypertension or preeclampsia and diabetes mellitus. Multiple pregnancy and previous history of preeclampsia were the least common risk factors observed in the study population

Severity of Preeclampsia

Among the 60 study participants, mild preeclampsia was observed in the majority of cases accounting for 65%, while severe preeclampsia was noted in 35% of patients. The findings indicate that although most women presented with mild disease, a significant proportion developed severe preeclampsia requiring intensive monitoring and management.

Table 4: Distribution of Study Participants According to Severity of Preeclampsia

Severity of Preeclampsia	Frequency	Percentage
Mild preeclampsia	39	65%
Severe preeclampsia	21	35%
Total	60	100%

Note: Mild preeclampsia was observed in the majority of the study participants accounting for 65% of cases. Severe preeclampsia was noted in 35% of patients, indicating a significant proportion requiring intensive monitoring and management. Early diagnosis and timely intervention may help reduce progression to severe disease and associated complications.

Preventive Measures Used

Among the preventive measures used in the study population, calcium supplementation was administered in 50% of women, while low-dose aspirin therapy was given to 41.7% of high-risk pregnant women. Combined use of both low-dose aspirin and calcium supplementation was observed in 25% of cases. These preventive interventions were implemented to reduce the incidence and severity of preeclampsia among high-risk patients.

Table 5: Preventive Measures Used among Study Participants

Preventive Measures	Frequency	Percentage
Calcium supplementation	30	50%
Low-dose aspirin therapy	25	41.7%
Both aspirin and calcium supplementation	15	25%
Total	60	100%

Note: Calcium supplementation was the most commonly used preventive measure among the study participants accounting for 50% of cases. Low-dose aspirin therapy was administered in 41.7% of high-risk pregnant women. Combined use of aspirin and calcium supplementation was observed in 25% of patients to reduce the incidence and severity of preeclampsia.

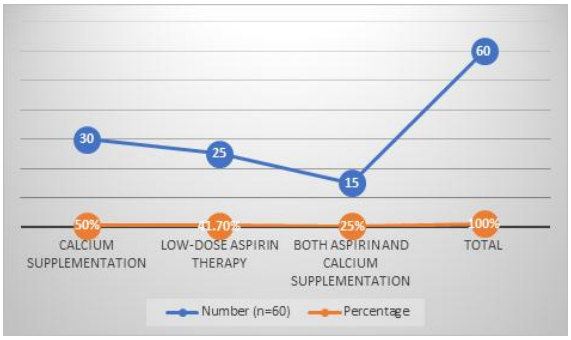

Figure 4: Preventive Measures Used among Study Participants

Note: Calcium supplementation was the most commonly used preventive measure among the study participants accounting for 50% of cases, followed by low-dose aspirin therapy in 41.7% of high-risk women. Combined use of aspirin and calcium supplementation was observed in 25% of patients to reduce the incidence and severity of preeclampsia.

Maternal Complications

Among the maternal complications observed in the study population, ICU admission was required in 8.3% of patients. HELLP syndrome was identified in 6.7% of cases, while placental abruption occurred in 5% of women. Eclampsia was observed in 3.3% of cases. Early diagnosis and timely management helped in reducing severe maternal morbidity and preventing maternal mortality.

Table 6: Maternal Complications among Study Participants

Maternal Complications	Frequency	Percentage
HELLP syndrome	4	6.7%
Placental abruption	3	5%
Eclampsia	2	3.3%
ICU admission	5	8.3%
Total	14	23.3%

Note: ICU admission was required in 8.3% of patients, making it the most common maternal complication observed in the study. HELLP syndrome and placental abruption were noted in 6.7% and 5% of cases respectively. Early diagnosis and prompt management helped in reducing severe maternal morbidity and preventing maternal mortality.

Fetal Outcomes

Among the fetal outcomes observed in the study population, low birth weight was the most common complication accounting for 33.3% of neonates, followed by preterm birth in 30% of cases. NICU admission was required in 25% of newborns, while intrauterine growth restriction (IUGR) was observed in 16.7% of cases. Perinatal mortality occurred in 3.3% of pregnancies complicated by preeclampsia.

Table 7: Fetal Outcomes among Study Participants

Fetal Outcomes	Frequency	Percentage
Preterm birth	18	30%
Low birth weight	20	33.3%
NICU admission	15	25%
Intrauterine growth restriction (IUGR)	10	16.7%
Perinatal mortality	2	3.3%

Note: Low birth weight was the most common fetal complication observed in 33.3% of neonates, followed by preterm birth in 30% of cases. NICU admission and intrauterine growth restriction were also commonly associated with pregnancies complicated by preeclampsia.

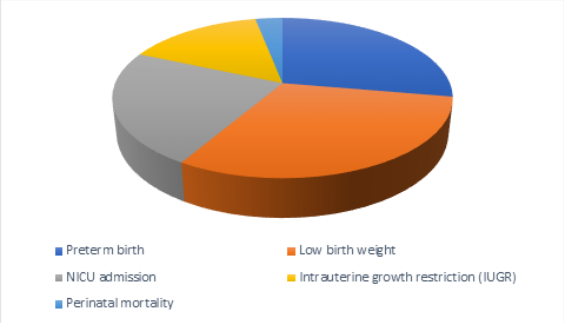

Figure 5: Fetal Outcomes among Study Participants

Note: Low birth weight was the most common fetal complication observed among the neonates, followed by preterm birth and NICU admission. Intrauterine growth restriction and perinatal mortality were observed in a smaller proportion of pregnancies complicated by preeclampsia.

Summary of Results

The present study included 60 pregnant women diagnosed with preeclampsia. The majority of study participants belonged to the age group of 21–30 years (63.3%), and preeclampsia was more commonly observed among primigravida women (58.3%). Obesity was identified as the most common risk factor accounting for 33.3% of cases, followed by family history of hypertension or preeclampsia (20%) and diabetes mellitus (16.7%).

Mild preeclampsia was observed in 65% of patients, while severe preeclampsia occurred in 35% of cases. Preventive measures such as calcium supplementation and low-dose aspirin therapy were commonly used among high-risk pregnant women. Calcium supplementation was administered in 50% of patients, and low-dose aspirin therapy was used in 41.7% of cases.

Among maternal complications, ICU admission was required in 8.3% of patients, HELLP syndrome was observed in 6.7%, placental abruption in 5%, and eclampsia in 3.3% of cases. Regarding fetal outcomes, low birth weight was the most common complication observed in 33.3% of neonates, followed by preterm birth in 30% of cases. NICU admission was required in 25% of newborns, while intrauterine growth restriction was noted in 16.7% of cases. Perinatal mortality occurred in 3.3% of pregnancies complicated by preeclampsia.

The findings of the study highlight the importance of early identification of risk factors, implementation of preventive measures, and timely management in improving maternal and fetal outcomes in preeclampsia.

DISCUSSION

Preeclampsia is one of the leading causes of maternal and perinatal morbidity and mortality worldwide and continues to pose a major challenge in obstetric practice.[1,2] The present study was conducted to evaluate the predictors, preventive measures, and management strategies associated with preeclampsia among pregnant women attending Kumaran Hospital, Coimbatore.

In the present study, the majority of patients belonged to the age group of 21–30 years (63.3%). Similar findings were reported in studies conducted by Sibai et al. and Duley et al., where preeclampsia was more

commonly observed among women in the reproductive age group.[3,6] The increased incidence in this age group may be attributed to the higher number of pregnancies occurring during this period.

Primigravida women constituted 58.3% of the study population, indicating that preeclampsia was more common among first-time mothers. This finding is consistent with several previous studies which suggest that immunological maladaptation during the first pregnancy may contribute to the development of preeclampsia.[8,9]

Among the identified risk factors, obesity was the most common predictor accounting for 33.3% of cases, followed by family history of hypertension or preeclampsia and diabetes mellitus. Obesity is known to increase endothelial dysfunction, inflammatory response, and insulin resistance, thereby contributing to the development of hypertensive disorders during pregnancy.[10,11] Similar observations have been reported in various national and international studies.

Regarding preventive measures, calcium supplementation was used in 50% of study participants, while low-dose aspirin therapy was administered in 41.7% of high-risk women. Several studies have demonstrated the beneficial role of low-dose aspirin and calcium supplementation in reducing the incidence and severity of preeclampsia, particularly when initiated early in pregnancy among high-risk women.[4,5]

In the present study, mild preeclampsia was observed in 65% of cases, whereas severe preeclampsia accounted for 35% of patients. Early antenatal screening and timely diagnosis may have contributed to the higher proportion of mild disease detected before progression to severe complications.[12,13]

Maternal complications observed in the study included HELLP syndrome, placental abruption, eclampsia, and ICU admission. ICU admission was required in 8.3% of patients, while eclampsia occurred in only 3.3% of cases. These findings suggest that appropriate management protocols and close monitoring helped in reducing severe maternal morbidity.[6,10]

Among fetal outcomes, low birth weight and preterm birth were the most common complications observed. Low birth weight was noted in 33.3% of neonates, while preterm delivery occurred in 30% of cases. These findings are comparable with previous studies which have shown that uteroplacental insufficiency associated with preeclampsia adversely affects fetal growth and pregnancy duration.[14,15]

NICU admission was required in 25% of neonates, mainly due to prematurity and low birth weight. Perinatal mortality was observed in 3.3% of cases. Early fetal surveillance and timely obstetric intervention may have contributed to improved neonatal outcomes in the present study.[2,5]

Overall, the findings of this study emphasize the importance of early identification of high-risk pregnancies, implementation of preventive measures, regular antenatal monitoring, and timely management in reducing maternal and fetal complications associated with preeclampsia.[1,7]

CONCLUSION

Preeclampsia remains one of the major causes of maternal and fetal morbidity and mortality in obstetric practice. The present study showed that preeclampsia was more common among women aged 21–30 years and primigravida mothers. Obesity, family history of hypertension or preeclampsia, diabetes mellitus, and chronic hypertension were identified as important risk factors associated with the development of preeclampsia. Early identification of these predictors through regular antenatal screening can help in timely diagnosis and prevention of disease progression.

Preventive measures such as low-dose aspirin therapy and calcium supplementation were found to play an important role in reducing the severity of preeclampsia among high-risk women. Timely management with antihypertensive therapy, magnesium sulfate prophylaxis, close maternal and fetal monitoring, and appropriate timing of delivery contributed to improved maternal and neonatal outcomes. The study emphasizes the importance of comprehensive antenatal care and standardized management protocols in reducing complications associated with preeclampsia.

Limitations of the Study

The present study was conducted in a single tertiary care hospital with a relatively small sample size of 60 patients, which may limit the generalizability of the findings to the wider population. The study duration was limited, and long-term maternal and neonatal follow-up could not be assessed. Advanced biochemical markers and specialized predictive investigations for preeclampsia were not evaluated in all patients due to resource constraints. In addition, as this was an observational study, definitive causal relationships between risk factors, preventive measures, and outcomes could not be established.

REFERENCES

1. Cunningham FG, Leveno KJ, Bloom SL, Dashe JS, Hoffman BL, Casey BM, et al. Williams Obstetrics. 26th ed. New York: McGraw Hill Education; 2022.
2. American College of Obstetricians and Gynecologists. Gestational Hypertension and Preeclampsia. ACOG Practice Bulletin No. 222. Obstet Gynecol. 2020;135(6):e237–e260.
3. Duley L. The global impact of pre-eclampsia and eclampsia. Semin Perinatol. 2009;33(3):130–137.
4. World Health Organization. WHO Recommendations for Prevention and Treatment of Pre-eclampsia and Eclampsia. Geneva: WHO; 2011.
5. 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. Int J Gynecol Obstet. 2019;145(S1):1–33.
6. Sibai BM. Diagnosis and management of gestational hypertension and preeclampsia. Obstet Gynecol. 2003;102(1):181–192.

7. Magee LA, von Dadelszen P, Stones W, Mathai M. The FIGO Textbook of Pregnancy Hypertension. London: Global Library of Women's Medicine; 2016.
8. Roberts JM, Cooper DW. Pathogenesis and genetics of pre-eclampsia. Lancet. 2001;357(9249):53–56.
9. Redman CW, Sargent IL. Latest advances in understanding preeclampsia. Science. 2005;308(5728):1592–1594.
10. Steegers EA, von Dadelszen P, Duvekot JJ, Pijnenborg R. Pre-eclampsia. Lancet. 2010;376(9741):631–644.
11. Brown MA, Magee LA, Kenny LC, Karumanchi SA, McCarthy FP, Saito S, et al. Hypertensive disorders of pregnancy: ISSHP classification, diagnosis, and management recommendations. Hypertension. 2018;72(1):24–43.
12. Lowe SA, Bowyer L, Lust K, McMahon LP, Morton MR, North RA, et al. SOMANZ guidelines for the management of hypertensive disorders of pregnancy. Aust N Z J Obstet Gynaecol. 2015;55(5):e1–e29.
13. Tranquilli AL, Dekker G, Magee L, Roberts J, Sibai BM, Steyn W, et al. The classification, diagnosis and management of hypertensive disorders of pregnancy. Pregnancy Hypertens. 2014;4(2):97–104.
14. Kenny LC, Black MA, Poston L, Taylor R, Myers JE, Baker PN, et al. Early pregnancy prediction of preeclampsia. BMJ. 2014;348:g1753.
15. Mol BWJ, Roberts CT, Thangaratinam S, Magee LA, de Groot CJM, Hofmeyr GJ. Pre-eclampsia. Lancet. 2016;387(10022):999–1011.