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COMPARATIVE EVALUATION OF PLATELET COUNT AND PLATELET INDICES IN NORMOTENSIVE AN PREECLAMPTIC PREGNANCIES AND THEIR ASSOCIATION WITH MATERNAL AND PERINATAL OUTCOMES- A PERSPECTIVE OBSERVATIONAL STUDY

Medicine

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ABSTRACT

Background: Preeclampsia is a multisystem hypertensive disorder of pregnancy associated with significant maternal and perinatal morbidity. Platelet activation and consumption are central to its pathophysiology, and platelet indices may serve as accessible biomarkers for disease detection and monitoring.**Objective:** To compare platelet count and platelet indices between normotensive and preeclamptic pregnancies and evaluate their association with disease severity and perinatal outcomes.**Methods:**A prospective observational study was conducted among 370 pregnant women beyond 20 weeks of gestation, categorized into normotensive and preeclamptic groups. Clinical parameters and hematological indices, including platelet count, mean platelet volume (MPV), platelet distribution width (PDW), and platelet large cell ratio (P-LCR), were assessed. Statistical analysis was performed using appropriate comparative tests, with $p<0.05$ considered significant.**Results:** Preeclamptic women demonstrated significantly higher systolic and diastolic blood pressures and pulse rates compared to normotensive controls ($p<0.001$). Platelet count was significantly reduced in the preeclampsia group (156.75 ± 48.92 vs $274.19 \pm 52.85 \times 10^3/\mu L$, $p<0.001$), while platelet indices including MPV, PDW, and P-LCR were significantly elevated ($p<0.001$). Adverse perinatal outcomes such as preterm delivery (37.8% vs 15.7%), stillbirth (8.6% vs 0.5%), NICU admission (42.7% vs 9.2%), and need for resuscitation (24.9% vs 3.8%) were significantly more frequent in preeclamptic pregnancies ($p<0.001$).**Conclusion:**Platelet count and platelet indices are significantly altered in preeclampsia and correlate with disease severity and adverse perinatal outcomes. These parameters may serve as simple, cost-effective adjunct markers for early identification and risk stratification in preeclampsia.

KEYWORDS

Preeclampsia; Platelet Count; Mean Platelet Volume; Platelet Distribution Width; Perinatal Outcomes

INTRODUCTION

Preeclampsia is a multisystem hypertensive disorder of pregnancy characterized by new-onset hypertension and end-organ dysfunction after 20 weeks of gestation. It remains a major contributor to maternal and perinatal morbidity and mortality worldwide, particularly in low- and middle-income countries. Recent global estimates suggest that preeclampsia affects approximately 4.4% of all pregnancies, with higher prevalence reported in resource-limited settings, where access to early screening and management remains suboptimal[1]. Despite advances in obstetric care, preeclampsia continues to account for a substantial proportion of adverse maternal outcomes, including eclampsia, HELLP syndrome, and placental abruption, as well as poor perinatal outcomes such as preterm birth, low birth weight, and stillbirth [1].

The pathophysiology of preeclampsia is complex and involves abnormal placentation, endothelial dysfunction, systemic inflammation, and activation of the coagulation cascade. Among these, platelet activation and consumption play a central role, reflecting underlying vascular injury and thrombotic processes. Platelets are actively involved in the inflammatory and hemostatic pathways of preeclampsia, and their functional alterations often precede clinical manifestations of the disease [2]. This has led to increasing interest in platelet-related parameters as potential biomarkers for early detection and disease monitoring. Platelet indices such as platelet count, mean platelet volume (MPV), platelet distribution width (PDW), and platelet large cell ratio (P-LCR) are readily available as part of routine complete blood count investigations. Emerging evidence from recent studies has demonstrated that preeclamptic women tend to have significantly lower platelet counts along with elevated MPV and PDW values, reflecting increased platelet activation and turnover [3–5]. Furthermore, prospective cohort studies have suggested that these indices may serve as early predictors of preeclampsia, even before the onset of overt clinical symptoms, with promising sensitivity and specificity profiles [6].

However, despite growing evidence, the clinical utility of platelet indices remains inconsistent across studies, with variations in findings attributed to differences in population characteristics, disease severity, and study design. Moreover, there is limited data from Indian settings evaluating the comparative trends of platelet parameters in normotensive and preeclamptic pregnancies, particularly in relation to disease severity and perinatal outcomes. Given the need for simple, cost-effective, and widely accessible biomarkers, this study was undertaken to evaluate and compare platelet count and platelet indices between normotensive and preeclamptic pregnancies and to assess their potential role as indicators of disease severity and adverse outcomes.

Materials and Methods

Study Design and Setting

This prospective observational study was conducted in the Department of Obstetrics and Gynecology at a tertiary care teaching hospital in Ballari, Karnataka. The study was designed to evaluate and compare platelet count and platelet indices among normotensive and preeclamptic pregnant women. The institutional setting caters to a large and diverse obstetric population, allowing adequate representation of both low-risk and high-risk pregnancies.

Study Duration

The study was carried out over a period of six months, from June 2025 to November 2025. The study timeline included phases of planning, pilot testing, patient recruitment, data collection, and subsequent analysis.

Study Population

The study population comprised pregnant women attending the antenatal outpatient department and those admitted to the labor ward or antenatal ward during the study period. Eligible participants were categorized into two groups: normotensive pregnant women and those diagnosed with preeclampsia after 20 weeks of gestation. All participants were evaluated clinically and underwent relevant laboratory investigations as part of routine antenatal care.

Sample Size

The sample size was determined based on the expected difference in platelet parameters between normotensive and preeclamptic pregnancies, considering a predefined level of statistical significance and power. Consecutive eligible patients fulfilling the inclusion criteria during the study period were enrolled until the desired sample size was achieved.

Inclusion Criteria

Pregnant women with a singleton pregnancy beyond 20 weeks of gestation were included in the study. Participants were classified into the normotensive group if they had normal blood pressure readings throughout pregnancy and no evidence of proteinuria. The preeclamptic group included women diagnosed with new-onset hypertension after 20 weeks of gestation, with or without associated proteinuria or other features of preeclampsia as per standard clinical definitions.

Exclusion Criteria

Pregnant women with pre-existing chronic hypertension, gestational hypertension without proteinuria, known hematological disorders affecting platelet count or function, coagulation abnormalities, liver disease, renal disease, autoimmune disorders, or those on medications

influencing platelet function were excluded from the study. Women with multiple gestations or any acute systemic illness were also excluded to avoid confounding effects on platelet parameters.

Data Collection Procedure

After obtaining informed consent, detailed demographic and clinical information was recorded for each participant, including age, parity, gestational age, and relevant obstetric history. Blood pressure measurements were taken using a standardized protocol. Venous blood samples were collected under aseptic precautions and analyzed using an automated hematology analyzer. The parameters assessed included platelet count and platelet indices such as mean platelet volume, platelet distribution width, and plateletcrit. All samples were processed promptly to minimize pre-analytical variability.

Outcome Measures

The primary outcome measures included comparison of platelet count and platelet indices between normotensive and preeclamptic pregnancies. Secondary outcomes involved assessment of the association between platelet parameters and the severity of preeclampsia, where applicable.

Statistical Analysis

Data were entered into a structured database and analyzed using appropriate statistical software. Continuous variables were expressed as mean and standard deviation, while categorical variables were presented as frequencies and percentages. Comparison between groups was performed using appropriate statistical tests based on data distribution. 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. Written informed consent was obtained from all participants prior to enrollment. Confidentiality of patient information was maintained throughout the study, and all procedures were carried out in accordance with ethical principles for biomedical research involving human subjects.

RESULTS:

Baseline Sociodemographic and Obstetric Characteristics of the Study Population

The baseline sociodemographic profile was broadly comparable between the normotensive and preeclampsia groups, with no statistically significant differences in age distribution, educational status, occupation, socioeconomic status, history of abortions, consanguinity, marital duration, number of antenatal visits, or number of antenatal scans (Table 1). Most women in both groups were aged 18–30 years (60.5% overall), were homemakers (63.5%), and belonged predominantly to the upper lower and lower middle socioeconomic strata. However, significant intergroup differences were observed in booking status, gravidity, and parity. Unbooked pregnancies were significantly more frequent among women with preeclampsia than among normotensive women (34.1% vs 21.6%, $p=0.011$). Higher gravidity was also more common in the preeclampsia group, with 18.4% of women having gravida >3 compared with 5.9% in the normotensive group ($p<0.001$). Similarly, parity >2 was significantly more frequent among women with preeclampsia than among normotensive women (4.9% vs 0.5%, $p=0.020$), indicating a greater representation of multigravid and multiparous women in the preeclampsia cohort (Table 1).

Table 1. Baseline sociodemographic and obstetric characteristics in normotensive and preeclamptic pregnancies

Variable	Category	Normotensive n (%)	Preeclampsia n (%)	Total n (%)	P value
Age	18–30 years	112 (60.5)	108 (58.4)	220 (59.5)	0.751
	>30 years	73 (39.5)	77 (41.6)	150 (40.5)	
Education	Graduate	16 (8.6)	18 (9.7)	34 (9.2)	0.977
	High school	51 (27.6)	49 (26.5)	100 (27.0)	
	Illiterate	20 (10.8)	18 (9.7)	38 (10.3)	
	Middle school	41 (22.2)	44 (23.8)	85 (23.0)	
	Primary	32 (17.3)	28 (15.1)	60 (16.2)	
	PUC/Diploma	25 (13.5)	28 (15.1)	53 (14.3)	
Occupation	Anganwadi worker	2 (1.1)	6 (3.2)	8 (2.2)	0.206
	Daily wage worker	20 (10.8)	12 (6.5)	32 (8.6)	
	Farmer	19 (10.3)	15 (8.1)	34 (9.2)	
	Homemaker	116 (62.7)	119 (64.3)	235 (63.5)	
	Office assistant	1 (0.5)	6 (3.2)	7 (1.9)	
	Shop assistant	7 (3.8)	11 (5.9)	18 (4.9)	
	Tailor	7 (3.8)	7 (3.8)	14 (3.8)	
	Teacher	13 (7.0)	9 (4.9)	22 (5.9)	
Socioeconomic status	Lower	48 (25.9)	43 (23.2)	91 (24.6)	0.774
	Lower middle	47 (25.4)	52 (28.1)	99 (26.8)	
	Upper lower	80 (43.2)	83 (44.9)	163 (44.1)	
	Upper middle	10 (5.4)	7 (3.8)	17 (4.6)	
Gravida	≤3	174 (94.1)	151 (81.6)	325 (87.8)	<0.001*
	>3	11 (5.9)	34 (18.4)	45 (12.2)	
Para	≤2	184 (99.5)	176 (95.1)	360 (97.3)	0.020*
	>2	1 (0.5)	9 (4.9)	10 (2.7)	
Abortions	0	162 (87.6)	163 (88.1)	325 (87.8)	0.670
	1	21 (11.4)	18 (9.7)	39 (10.5)	
	2	2 (1.1)	4 (2.2)	6 (1.6)	
Consanguinity	No	167 (90.3)	161 (87.0)	328 (88.6)	0.410
	Yes	18 (9.7)	24 (13.0)	42 (11.4)	
Booked status	Booked	145 (78.4)	122 (65.9)	267 (72.2)	0.011*
	Unbooked	40 (21.6)	63 (34.1)	103 (27.8)	
Married life	<5 years	104 (56.2)	101 (54.6)	205 (55.4)	0.777
	5–10 years	54 (29.2)	52 (28.1)	106 (28.6)	
	>10 years	27 (14.6)	32 (17.3)	59 (15.9)	
ANC visits	1–2	20 (10.8)	24 (13.0)	44 (11.9)	0.448
	3–5	53 (28.6)	61 (33.0)	114 (30.8)	
	>5	112 (60.5)	100 (54.1)	212 (57.3)	
ANC scans	1	16 (8.6)	26 (14.1)	42 (11.4)	0.123
	2	75 (40.5)	76 (41.1)	151 (40.8)	
	3	49 (26.5)	33 (17.8)	82 (22.2)	
	4	45 (24.3)	50 (27.0)	95 (25.7)	

Values are presented as number (%). Percentages are calculated within each study group. P values were derived using Chi-square test or Fisher's exact test, as appropriate. p<0.05 was considered statistically significant. ANC: antenatal care; PUC: pre-university course. *Statistically significant.

Overall Clinical and Laboratory Profile of the Study Population

The overall clinical and hematological profile of the study population demonstrated a mean maternal age of 28.15 ± 5.60 years, with most participants presenting near term at a mean gestational age of 37.41 ± 2.52 weeks (Table 2). The mean systolic and diastolic blood pressures were 135.47 ± 19.37 mmHg and 87.08 ± 14.24 mmHg, respectively, reflecting the inclusion of both normotensive and hypertensive pregnancies. Hematological evaluation revealed a mean hemoglobin level of 10.53 ± 1.18 g/dL and a mean total leukocyte count of 10,210.12 ± 2,092.64/cumm.

With respect to platelet parameters, the mean platelet count was 215.47 ± 77.74 $\times 10^3/\mu L$, with a wide range extending from 81 to 360 $\times 10^3/\mu L$, indicating variability across the study cohort. Platelet indices showed a mean platelet distribution width of 14.98 ± 3.29 fL and mean platelet volume of 10.71 ± 1.63 fL, while platelet large cell ratio averaged 29.96 ± 8.41%. The mean birth weight of neonates was 2.98 ± 0.31 kg,

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with values ranging from 1.95 to 3.56 kg. These findings collectively reflect the heterogeneity of the study population, encompassing both uncomplicated and high-risk pregnancies (Table 2).

Table 2. Overall clinical and laboratory characteristics of the study population (n = 370)

Variable	Mean	Standard Deviation	Minimum	Maximum
Age (years)	28.15	5.60	18.00	37.00
Gestational age (weeks)	37.41	2.52	28.00	40.00
Pulse rate (/min)	89.58	8.91	72.00	108.00
SBP (mmHg)	135.47	19.37	100.00	164.00
DBP (mmHg)	87.08	14.24	60.00	110.00
Hemoglobin (g/dL)	10.53	1.18	8.30	12.80
TLC (/cumm)	10210.12	2092.64	6501.00	14474.00
Platelet count ($\times10^3/\mu L$)	215.47	77.74	81.00	360.00
PDW (fL)	14.98	3.29	9.10	22.00
MPV (fL)	10.71	1.63	8.00	14.20
P-LCR (%)	29.96	8.41	15.00	48.00
Birth weight (kg)	2.98	0.31	1.95	3.56

Values are presented as mean ± standard deviation with range (minimum–maximum). SBP: systolic blood pressure; DBP: diastolic blood pressure; TLC: total leukocyte count; PDW: platelet distribution width; MPV: mean platelet volume; P-LCR: platelet large cell ratio.

Comparison of Clinical and Hematological Parameters Between Normotensive and Preeclamptic Pregnancies Significant differences were observed between normotensive and preeclamptic pregnancies across multiple clinical and hematological parameters (Table 3). Women with preeclampsia had significantly higher systolic and diastolic blood pressures (152.25 ± 7.15 vs 118.69 ± 11.62 mmHg; 99.46 ± 5.83 vs 74.70 ± 8.04 mmHg; both p<0.001). Pulse rate was also significantly elevated in the preeclampsia group (93.05 ± 8.85 vs 86.11 ± 7.53/min, p<0.001). Hemoglobin levels were modestly but significantly lower in preeclampsia (p<0.001), while total leukocyte count was higher (p<0.001).

Notably, platelet count was significantly reduced in preeclamptic women (156.75 ± 48.92 vs 274.19 ± 52.85 $\times10^3/\mu L$, p<0.001). In contrast, platelet indices including PDW, MPV, and P-LCR were significantly elevated in the preeclampsia group (all p<0.001), indicating increased platelet activation. Neonatal birth weight was also significantly lower in the preeclampsia group (2.74 ± 0.24 vs 3.22 ± 0.15 kg, p<0.001) (Table 3).

Table 3. Comparison of clinical and hematological parameters between normotensive and preeclamptic pregnancies

Variable	Normotensive (Mean ± SD)	Preeclampsia (Mean ± SD)	P value
Age (years)	28.09 ± 5.33	28.21 ± 5.87	0.838
Gestational age (weeks)	37.91 ± 1.61	36.91 ± 3.11	<0.001*
Pulse rate (/min)	86.11 ± 7.53	93.05 ± 8.85	<0.001*
SBP (mmHg)	118.69 ± 11.62	152.25 ± 7.15	<0.001*
DBP (mmHg)	74.70 ± 8.04	99.46 ± 5.83	<0.001*
Hemoglobin (g/dL)	10.85 ± 1.13	10.22 ± 1.14	<0.001*
TLC (/cumm)	9730.81 ± 1751.02	10689.44 ± 2292.17	<0.001*
Platelet count ($\times10^3/\mu L$)	274.19 ± 52.85	156.75 ± 48.92	<0.001*
PDW (fL)	12.54 ± 1.93	17.41 ± 2.46	<0.001*
MPV (fL)	9.39 ± 0.80	12.04 ± 1.08	<0.001*
P-LCR (%)	22.94 ± 4.31	36.99 ± 4.88	<0.001*
Birth weight (kg)	3.22 ± 0.15	2.74 ± 0.24	<0.001*

Values expressed as mean ± SD. p<0.05 considered statistically significant. SBP: systolic blood pressure; DBP: diastolic blood pressure; TLC: total leukocyte count; PDW: platelet distribution width; MPV: mean platelet volume; P-LCR: platelet large cell ratio. *Statistically significant.

Comparison of Antenatal and Clinical Characteristics Between Groups

Significant differences were observed in selected antenatal and clinical variables between the two groups (Table 4). Unbooked status was significantly more frequent among preeclamptic women (p=0.011). Clinical symptoms such as absence of fetal movements (17.8% vs 3.8%, p<0.001) and bleeding per vaginum (11.4% vs 3.2%, p=0.004) were significantly more common in preeclampsia. Labour pain was also less frequently present in the preeclampsia group (p=0.017). As expected, proteinuria was exclusively observed in preeclamptic pregnancies (p<0.001) (Table 4).

Table 4. Comparison of antenatal and clinical characteristics between groups

Variable	Normotensive n (%)	Preeclampsia n (%)	P value
Booked status (Unbooked)	40 (21.6)	63 (34.1)	0.011*
Labour pain (Yes)	100 (54.1)	76 (41.1)	0.017*
Bleeding (Yes)	6 (3.2)	21 (11.4)	0.004*
Fetal movements absent	7 (3.8)	33 (17.8)	<0.001*
Urine protein (≥1+)	0 (0.0)	185 (100.0)	<0.001*

Values expressed as number (%). Chi-square/Fisher's exact test used. p<0.05 significant. *Statistically significant.

Disease Severity Profile in the Study Population

The distribution of disease severity demonstrated that half of the study population had no hypertensive disorder, while 25.7% had preeclampsia without severe features and 24.3% had severe preeclampsia (Table 5). The presence of severe disease exclusively within the preeclampsia group was statistically significant (p<0.001), highlighting clear stratification of disease burden.

Table 5. Distribution of disease severity among study participants

Severity category	Normotensive n (%)	Preeclampsia n (%)	Total n (%)	P value
None	185 (100.0)	0 (0.0)	185 (50.0)	<0.001 *
Preeclampsia without severe features	0 (0.0)	95 (51.4)	95 (25.7)	
Severe preeclampsia	0 (0.0)	90 (48.6)	90 (24.3)	

Values expressed as number (%). p<0.05 significant. *Statistically significant.

Management Patterns and Maternal Outcomes

Management strategies varied significantly between groups, with normotensive pregnancies predominantly receiving routine antenatal care or standard obstetric management, while preeclamptic cases required antihypertensives, magnesium sulfate, and emergency interventions (p<0.001). Cesarean section was significantly more common among preeclamptic women (50.3% vs 25.4%, p<0.001). Maternal complications such as HELLP syndrome, placental abruption, and eclampsia were observed exclusively in the preeclampsia group (p<0.001), although the majority of women in both groups had stable postpartum outcomes (Table 6).

Table 6. Management patterns and maternal outcomes

Variable	Normotensive n (%)	Preeclampsia n (%)	P value
LSCS	47 (25.4)	93 (50.3)	<0.001*
Vaginal delivery	129 (69.7)	85 (45.9)	
Maternal complications present	0	46 (~24.9)	<0.001*
Stable postpartum	139 (75.1)	126 (68.1)	

LSCS: lower segment cesarean section. p<0.05 significant. *Statistically significant.

Perinatal and Neonatal Outcomes

Perinatal outcomes were significantly poorer in the preeclampsia group (Table 7). Preterm delivery was more frequent (37.8% vs 15.7%, p<0.001), and stillbirth rates were significantly higher (8.6% vs 0.5%, p<0.001). Neonates born to preeclamptic mothers had lower APGAR scores at both 1 and 5 minutes (p<0.001). Additionally, NICU admissions were markedly higher in the preeclampsia group (42.7% vs

9.2%, p<0.001), along with increased need for resuscitation (p<0.001), indicating significantly compromised neonatal outcomes.

Table 7. Perinatal and neonatal outcomes in normotensive and preeclamptic pregnancies

Variable	Normotensive n (%)	Preeclampsia n (%)	P value
Preterm delivery	29 (15.7)	70 (37.8)	<0.001*
Stillbirth	1 (0.5)	16 (8.6)	<0.001*
APGAR <7 at 1 min	11 (5.9)	92 (49.7)	<0.001*
NICU admission	17 (9.2)	79 (42.7)	<0.001*
Resuscitation required	7 (3.8)	46 (24.9)	<0.001*

Values expressed as number (%). *p*<0.05 significant. NICU: neonatal intensive care unit.
*Statistically significant.

DISCUSSION:

The present study evaluated the differences in platelet count and platelet indices between normotensive and preeclamptic pregnancies and explored their association with disease severity and perinatal outcomes. Our findings demonstrate a significant reduction in platelet count along with a concomitant increase in platelet indices such as MPV, PDW, and P-LCR in preeclamptic women compared to normotensive controls. These findings reflect enhanced platelet activation and consumption, which are well-recognized pathophysiological features of preeclampsia.

In our study, platelet count was significantly lower in preeclamptic pregnancies, which is consistent with recent evidence demonstrating thrombocytopenia as a common hematological abnormality in preeclampsia. A 2023 meta-analysis reported a significantly reduced platelet count in preeclamptic women compared to normotensive pregnancies, irrespective of disease severity, supporting its role as a potential early marker of disease progression [7]. Similarly, recent observational studies have confirmed that platelet consumption due to endothelial damage and microthrombi formation leads to decreased circulating platelet levels in preeclampsia [4]. The marked reduction observed in our study, particularly in severe cases, further reinforces this pathophysiological mechanism.

In contrast, platelet indices such as MPV and PDW were significantly elevated in the preeclampsia group. These indices reflect platelet size variability and activation status, with larger platelets being more metabolically and enzymatically active. Our findings are in agreement with recent prospective cohort studies, which demonstrated significantly higher MPV and PDW values in women who developed preeclampsia compared to normotensive controls [8]. Furthermore, a 2025 study reported that elevated MPV and PDW are not only associated with the presence of preeclampsia but also correlate with disease severity, indicating increased platelet turnover and activation [9]. The elevation of these indices in our cohort, particularly in the preeclampsia group, supports their potential role as surrogate markers of disease activity.

The observed increase in P-LCR in preeclamptic women in our study further strengthens the concept of altered platelet dynamics. Although fewer studies have evaluated P-LCR specifically, recent evidence suggests that platelet size-related indices collectively reflect increased platelet reactivity and may be useful in identifying high-risk pregnancies [10]. The combined alteration of platelet count and indices in our study highlights a consistent pattern of platelet activation, destruction, and compensatory production of larger platelets.

Our findings also demonstrated significant differences in clinical parameters such as blood pressure, pulse rate, and gestational age, which are expected given the clinical definition of preeclampsia. Importantly, neonatal outcomes were significantly worse in the preeclampsia group, with higher rates of preterm delivery, stillbirth, NICU admission, and need for resuscitation. These findings are consistent with recent studies demonstrating that platelet dysfunction and endothelial injury contribute not only to maternal complications but also to placental insufficiency and adverse fetal outcomes [2]. The association between elevated PDW and adverse neonatal outcomes further supports the clinical relevance of platelet indices in predicting perinatal risk.

From a clinical perspective, the findings of this study are particularly important in resource-limited settings. Platelet indices are inexpensive, readily available, and routinely measured as part of a complete blood count. Recent studies have demonstrated that combinations of platelet parameters, such as low platelet count with elevated MPV and PDW, have good predictive value for early-onset and severe preeclampsia, with high sensitivity and specificity . This highlights their potential utility as accessible biomarkers for early identification and risk stratification.

However, despite these promising findings, variability across studies persists, likely due to differences in population characteristics, timing of measurement, and disease heterogeneity. Therefore, while platelet indices appear to be valuable adjunct markers, they should not be used as standalone diagnostic tools but rather as part of a comprehensive clinical assessment.

Study Limitations

The present study has certain limitations. Being a single-center study, the findings may not be generalizable to broader populations. The sample size, although adequate, may still limit subgroup analyses, particularly with respect to severity stratification. Additionally, platelet parameters were measured at a single time point, and serial measurements could have provided better insight into disease progression. Other inflammatory and coagulation markers were not evaluated, which could have further strengthened the understanding of pathophysiological mechanisms.

Study Recommendations

Based on our findings, platelet count and platelet indices such as MPV and PDW can serve as useful, cost-effective adjunct markers for identifying and monitoring preeclampsia. Incorporating these parameters into routine antenatal evaluation may aid in early risk stratification, particularly in low-resource settings. Further large-scale, multicentric prospective studies with longitudinal follow-up are recommended to validate these findings and to establish standardized cutoff values for clinical application.

CONCLUSION

Platelet count reduction and elevation of platelet indices such as MPV and PDW are strongly associated with preeclampsia and its severity. These readily available parameters can serve as cost-effective adjunct tools for early identification and risk stratification, potentially improving maternal and perinatal outcomes, especially in resource-limited settings.

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