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Original Research Article

ROLE OF PLATELET INDICES IN THE EVALUATION OF QUANTITATIVE PLATELET DISORDERS: A CROSS SECTIONAL STUDY

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ABSTRACT

Background: Quantitative platelet disorders, including thrombocytopenia and thrombocytosis, are frequently encountered in routine haematology practice. Although platelet count is the primary parameter used for their detection, it may not adequately indicate the underlying mechanism. Platelet indices such as plateletcrit (PCT), mean platelet volume (MPV), platelet distribution width (PDW), and platelet large cell ratio (P-LCR) provide additional information regarding platelet mass, size, heterogeneity, and turnover. The aim and objective is to evaluate the role of platelet indices in quantitative platelet disorders by comparing their values in hypoproductive and hyperdestructive thrombocytopenia, primary and secondary thrombocytosis, and assessing their usefulness as adjunctive parameters in routine haematological evaluation. **Materials and Methods:** This cross-sectional study was conducted in the Clinical Pathology Laboratory, SVRRGGH, S.V. Medical College, Tirupati. A total of 180 cases were included, comprising 107 cases of thrombocytopenia and 73 cases of thrombocytosis. Blood samples were collected in EDTA vacutainers and analysed within three hours using an ERBA Mannheim five-part differential cell analyser. Platelet count, PCT, MPV, PDW, and P-LCR were recorded. Peripheral smears stained with Leishman stain were examined for platelet count confirmation and morphology. Data were analysed using R programming language. **Results:** Of the 107 thrombocytopenia cases, 36 were hypoproductive and 71 were hyperdestructive. PCT, MPV, and P-LCR were significantly higher in hyperdestructive thrombocytopenia, with p values of 0.001, 0.001, and <0.001, respectively. Of the 73 thrombocytosis cases, 14 were primary and 59 were secondary. PCT, MPV, and P-LCR were significantly higher in primary thrombocytosis, with p values of 0.014, 0.005, and 0.006, respectively. PDW was not statistically significant in either group. **Conclusion:** PCT, MPV, and P-LCR are useful adjunctive parameters for evaluating quantitative platelet disorders and differentiating their underlying mechanisms.

INTRODUCTION

Platelets are small, anucleate cytoplasmic fragments derived from bone marrow megakaryocytes and play a central role in primary haemostasis, maintenance of vascular integrity, inflammation, and thrombus formation. Quantitative platelet disorders, particularly thrombocytopenia and thrombocytosis, are frequently encountered in routine haematology practice. Although platelet count remains the primary laboratory parameter for detecting these abnormalities, it provides limited information regarding platelet morphology, production, destruction, and functional activity. In this context, platelet indices generated by automated haematology analysers have emerged as simple, rapid, inexpensive, and readily available parameters that may support the evaluation of platelet disorders.[1] Thrombocytopenia is commonly defined as a platelet count below 150×10^9 /L and may result from decreased bone marrow production,

increased peripheral destruction, splenic sequestration, or abnormal platelet distribution. Differentiating hypo-productive thrombocytopenia from hyper-destructive thrombocytopenia is clinically important, as management strategies and prognosis differ according to the underlying mechanism. Bone marrow examination remains an important diagnostic tool for assessing marrow production; however, it is invasive, costly, and may not be appropriate as an initial investigation in all patients. Therefore, non-invasive laboratory markers that can assist in identifying the possible mechanism of thrombocytopenia are of considerable clinical value.[2,3] Thrombocytosis, defined as a platelet count above 450 × 10^9 /L, may be primary or secondary in origin. Primary thrombocytosis is usually associated with myeloproliferative neoplasms such as essential thrombocythaemia, polycythaemia vera, and chronic myeloid leukaemia, whereas secondary or reactive thrombocytosis may occur in infections, inflammatory disorders, iron deficiency anaemia, malignancy, haemorrhage, tissue injury, and post-splenectomy states. Distinguishing reactive thrombocytosis from clonal thrombocytosis is clinically significant because clonal disorders carry a higher risk of thrombotic and haemorrhagic complications and often require further molecular, cytogenetic, and bone marrow evaluation.[4,5]

Platelet indices, including mean platelet volume (MPV), platelet distribution width (PDW), plateletcrit (PCT), and platelet large cell ratio (P-LCR), provide additional information about platelet size, volume heterogeneity, total platelet mass, and the proportion of large platelets in circulation. MPV reflects the average platelet size and may indicate platelet turnover. PDW represents variation in platelet volume and is considered a marker of platelet anisocytosis. PCT reflects the total circulating platelet mass, while P-LCR indicates the percentage of larger platelets. In hyper-destructive thrombocytopenia, compensatory marrow response often leads to the release of younger and larger platelets, resulting in increased MPV, PDW, and P-LCR. In contrast, hypo-productive thrombocytopenia is generally associated with relatively lower platelet indices due to impaired megakaryopoiesis.[6-10] In cases of thrombocytosis, platelet indices may also provide useful supportive information. Reactive thrombocytosis often shows relatively normal or mildly altered platelet indices, whereas clonal thrombocytosis may be associated with abnormal platelet size variation, increased PDW, and the presence of large or giant platelets due to dysregulated megakaryocytic proliferation. PCT may be increased in thrombocytosis as it reflects total platelet burden and may assist in assessing the magnitude of circulating platelet mass.[11] Previous studies have reported the usefulness of platelet indices in various clinical conditions associated with platelet abnormalities, including immune thrombocytopenia, dengue fever, malaria, sepsis, megaloblastic anaemia, aplastic anaemia, acute leukaemia, paediatric thrombocytopenia, reactive thrombocytosis, and myeloproliferative neoplasms. These indices may aid in early categorisation of quantitative platelet disorders, assessment of disease severity, and reduction of unnecessary invasive investigations.[12,13] However, interpretation of platelet indices may be influenced by analyser type, anticoagulant used, sample storage duration, processing time, and the underlying clinical condition. Hence, platelet indices should not be interpreted in isolation but should be correlated with clinical findings, peripheral blood smear examination, and other relevant laboratory investigations.[14,15] The present cross-sectional study, titled Role of Platelet Indices in the Evaluation of Quantitative Platelet Disorders, was undertaken to evaluate the significance of platelet indices in patients with thrombocytopenia and thrombocytosis. The study aims to assess the utility of MPV, PDW, PCT, and P-LCR as adjunctive parameters in the routine haematological evaluation of quantitative platelet disorders.

MATERIALS AND METHODS

Study Design and Duration: This was a cross-sectional study conducted to evaluate the role of platelet indices in patients with quantitative platelet disorders. The study was carried out over a period of six months, from March 2025 to August 2025, after obtaining approval from the Institutional Scientific Committee and Institutional Ethics Committee.

Study Setting and Source of Data: The study was carried out in the Clinical Pathology Laboratory, Sri Venkateswara Ramnarain Ruia Government General Hospital (SVRRGGH), S.V. Medical College, Tirupati. The source of data included blood samples received for complete hemogram evaluation in the haematology laboratory during the study period.

Study Population and Sample Size: All cases showing quantitative platelet abnormalities, including thrombocytopenia and thrombocytosis, on complete blood count analysis were considered for inclusion. The study included all eligible thrombocytopenia and thrombocytosis cases received in the pathology laboratory over a period of six months. The average sample size was approximately 180 cases.

Inclusion Criteria

All blood samples received for hemogram evaluation showing thrombocytopenia or thrombocytosis were included in the study.

Exclusion Criteria

Inadequate blood samples and clotted samples were excluded from the study to avoid erroneous platelet counts and unreliable platelet index values.

Sample Collection and Processing: Blood samples were collected in ethylene diamine tetra-acetic acid (EDTA) anticoagulant vacutainers under standard

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aseptic precautions. All samples were processed within three hours of venipuncture to minimise EDTA-induced platelet swelling, which can falsely alter platelet indices, particularly mean platelet volume.

Haematological Analysis: Complete blood count analysis was performed using an ERBA Mannheim five-part differential cell analyser. The analyser measures platelet count by the impedance method. In this method, platelets pass through a small aperture in a streamlined flow and generate electronic impulses due to changes in electrical resistance between electrodes. These impulses are interpreted by the analyser to provide platelet count and platelet indices. For each case, platelet count and platelet indices were recorded. The platelet indices assessed included plateletcrit (PCT), mean platelet volume (MPV), platelet distribution width (PDW), and platelet large cell ratio (P-LCR).

Peripheral Smear Examination: Peripheral blood smears were prepared from all samples and stained with Leishman stain. Smear examination was performed to confirm platelet count, assess platelet morphology, identify platelet clumping if present, and correlate automated analyser findings with peripheral smear features.

Classification of Cases: Cases were initially categorised into thrombocytopenia and thrombocytosis based on platelet count. Thrombocytopenia cases were further classified into hypoproductive and hyperdestructive groups based on clinical details, laboratory findings, and peripheral smear correlation. Thrombocytosis cases were categorised into primary thrombocytosis associated with bone marrow disorders and secondary or reactive thrombocytosis based on available clinical and laboratory data.

Statistical Analysis

Data were entered into Microsoft Excel spreadsheets and analysed using R programming language. Descriptive statistics were used to summarise the findings. Results were expressed as frequencies, percentages, and mean values where appropriate. Platelet indices were compared between hypoproductive and hyperdestructive thrombocytopenia, and between primary and secondary thrombocytosis, to assess their usefulness in differentiating various quantitative platelet disorders. The findings were presented in tabular form.

RESULTS

A total of 180 cases with quantitative platelet disorders were included in the study. Of these, 107 cases were thrombocytopenia and 73 cases were thrombocytosis, constituting 59.4% and 40.6% of the total study population, respectively. Among the total study population, 103 patients were males and 77 were females, accounting for 57.2% and 42.8%, respectively. In the thrombocytopenia group, 63 cases were males and 44 were females, while in the thrombocytosis group, 40 cases were males and 33 were females. Age-wise distribution showed that thrombocytopenia was most commonly observed in the 31–40 years age group, followed by the 21–30 years age group. Thrombocytosis was most frequently seen in the 1–10 years age group. [Table 1]

Table 1: Distribution of cases according to gender and age

Variable	Category	Thrombocytopenia cases (N=107)	Thrombocytosis cases (N=73)	Total (N= 180)
Gender	Male	63 (58.9%)	40 (54.8%)	103 (57.2%)
	Female	44 (41.1%)	33 (45.2%)	77 (42.8%)
Age group	1–10	9 (8.4%)	27 (37.0%)	36 (20.0%)
	11–20	10 (9.3%)	7 (9.6%)	17 (9.4%)
	21–30	20 (18.7%)	4 (5.5%)	24 (13.3%)
	31–40	21 (19.6%)	5 (6.8%)	26 (14.4%)
	41–50	18 (16.8%)	10 (13.7%)	28 (15.6%)
	51–60	14 (13.1%)	11 (15.1%)	25 (13.9%)
	61–70	9 (8.4%)	6 (8.2%)	15 (8.3%)
	71–80	4 (3.7%)	3 (4.1%)	7 (3.9%)
	81–90	2 (1.9%)	0 (0.0%)	2 (1.1%)
Total		107 (100.0%)	73 (100.0%)	180 (100.0%)

Among the 107 thrombocytopenia cases, 36 were classified as hypoproductive thrombocytopenia and 71 as hyperdestructive thrombocytopenia, representing 33.6% and 66.3%, respectively. In the hypoproductive group, 25 patients were males and 11 were females. In the hyperdestructive group, 38 patients were males and 33 were females. Alcohol-related causes were the most common diagnosis in the hypoproductive group, accounting for 11 cases, followed by acute leukaemia in 9 cases, infections in 6 cases, nutritional causes in 3 cases, and other causes in 7 cases. In the hyperdestructive group, immune thrombocytopenic purpura was the most frequent diagnosis, observed in 38 cases, while other causes accounted for 33 cases. [Figure 1 & Table 2]

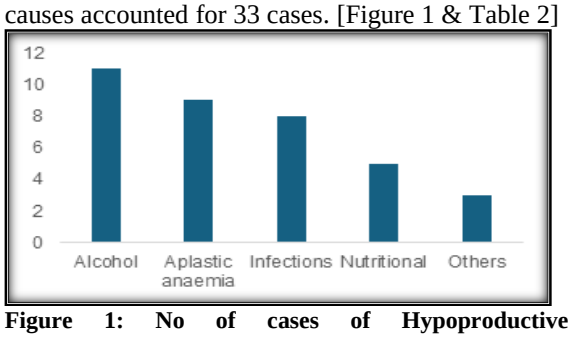

Figure 1: No of cases of Hypoproductive thrombocytopenia

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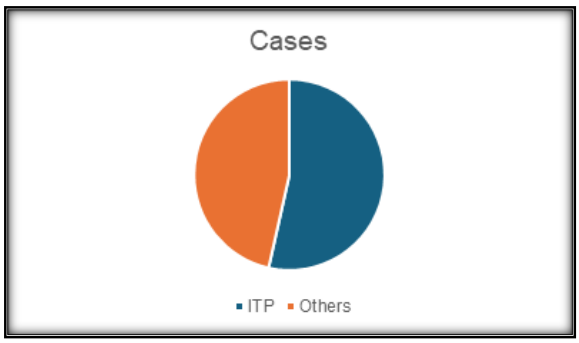

Figure 2: No of cases of Hyperdestructive thrombocytopenia.

Comparison of platelet indices in thrombocytopenia showed that the mean platelet count was 55,194.4/cumm in hypoproductive thrombocytopenia and 74,197.1/cumm in hyperdestructive thrombocytopenia. [Table 2] Mean plateletcrit was significantly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 0.075 and 0.054, respectively (p = 0.001).

Mean platelet volume was also significantly higher in the hyperdestructive group than in the hypoproductive group, with values of 11.53 fL and 10.72 fL, respectively (p = 0.001). Mean platelet distribution width was 16.91% in hyperdestructive thrombocytopenia and 16.43% in hypoproductive thrombocytopenia, but the difference was not statistically significant (p = 0.448). Mean platelet large cell ratio was significantly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 39.84% and 33.27%, respectively (p < 0.001). [Table 2, Figure 1]

Table 2: Comparison of thrombocytopenia cases according to type and platelet indices

Parameter	Hypoproductive thrombocytopenia	Hyperdestructive thrombocytopenia	Total / p-value
No. of cases	36 (33.6%)	71 (66.3%)	107 (100%)
Male	25	38	63
Female	11	33	44
Mean platelet count	55,194.4/cumm	74,197.1/cumm	Decreased
Mean PCT	0.054	0.075	p = 0.001
Mean MPV	10.72 fL	11.53 fL	p = 0.001
Mean PDW	16.43%	16.91%	p = 0.448
Mean P-LCR	33.27%	39.84%	p < 0.001

Of the 73 thrombocytosis cases, 59 cases were secondary or reactive thrombocytosis and 14 cases were primary thrombocytosis due to bone marrow disease, accounting for 80.8% and 19.2%, respectively. Among reactive thrombocytosis cases, 32 patients were males and 27 were females. Among primary thrombocytosis cases, 8 patients were males and 6 were females.

In the reactive thrombocytosis group, infections were the most common cause, observed in 24 cases, followed by iron deficiency anaemia in 11 cases, post-splenectomy state in 2 cases, underlying malignancy in 3 cases, inflammatory bowel disease in 3 cases, and other causes in 16 cases. Among primary thrombocytosis cases, chronic myeloid leukaemia was the predominant diagnosis, seen in 11 cases, while other bone marrow disorders accounted for 3 cases. No cases of essential thrombocythaemia or polycythaemia vera were recorded in the present study. [Figure 3 and 4]

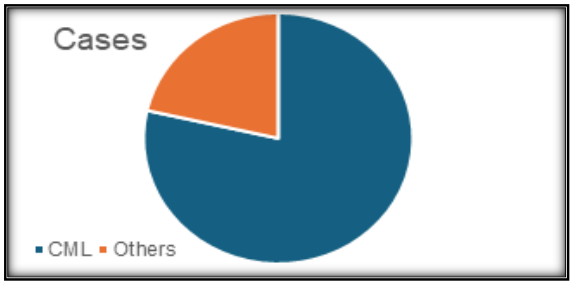

Figure 3: No of cases of Primary thrombocytosis / bone marrow disease

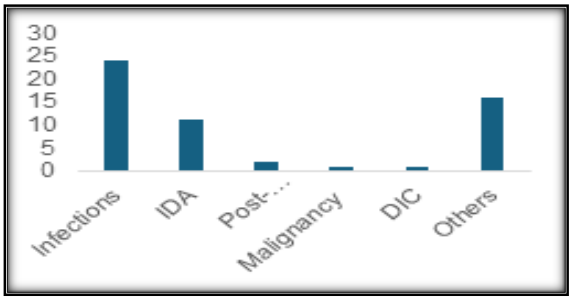

Figure 4: No of cases of Secondary / Reactive thrombocytosis.

Comparison of platelet indices in thrombocytosis showed that the mean platelet count was 847,500/cumm in primary thrombocytosis and 631,423/cumm in secondary thrombocytosis. [Table 3] Mean plateletcrit was significantly higher in primary thrombocytosis than in secondary thrombocytosis, with values of 0.813 and 0.543, respectively (p = 0.014). Mean platelet volume was 9.84 fL in primary thrombocytosis and 8.69 fL in secondary thrombocytosis, showing a statistically significant difference (p = 0.005). Mean platelet distribution width was 15.10% in primary thrombocytosis and 14.10% in secondary thrombocytosis; however, this difference was not statistically significant (p = 0.129). Mean platelet large cell ratio was significantly higher in primary thrombocytosis than in secondary thrombocytosis, with values of 25.74% and 18.83%, respectively (p = 0.006). [Table 3]

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Table 3: Comparison of thrombocytosis cases according to type and platelet indices

Parameter	Primary thrombocytosis / Bone marrow disease	Secondary / Reactive thrombocytosis	Total / p-value
No. of cases	14 (19.2%)	59 (80.8%)	73 (100%)
Male	8	32	40
Female	6	27	33
Mean platelet count	847,500/cumm	631,423/cumm	Increased
Mean PCT	0.813	0.543	p = 0.014
Mean MPV	9.84 fL	8.69 fL	p = 0.005
Mean PDW	15.10%	14.10%	p = 0.129
Mean P-LCR	25.74%	18.83%	p = 0.006

Overall, hyperdestructive thrombocytopenia was more common than hypoproductive thrombocytopenia, while reactive thrombocytosis was more frequent than primary thrombocytosis. Plateletcrit, mean platelet volume, and platelet large cell ratio showed statistically significant differences between hypoproductive and hyperdestructive thrombocytopenia, as well as between primary and secondary thrombocytosis. Platelet distribution width did not show a statistically significant difference in either comparison.

Clinical analysis dashboard demonstrating the distribution of thrombocytopenia and thrombocytosis cases, demographic pattern, diagnostic categorisation, and comparison of platelet indices. Significant differences were observed in plateletcrit, mean platelet volume, and platelet large cell ratio between hypoproductive and hyperdestructive thrombocytopenia, and between primary and secondary thrombocytosis. Platelet distribution width did not show a statistically significant difference in either group comparison.

DISCUSSION

The present cross-sectional study evaluated the role of platelet indices in the assessment of quantitative platelet disorders, including thrombocytopenia and thrombocytosis. A total of 180 cases were included, of which 107 cases were thrombocytopenia and 73 cases were thrombocytosis. Thrombocytopenia constituted the major proportion of cases, accounting for 59.4% of the study population, whereas thrombocytosis accounted for 40.5%. This indicates that thrombocytopenia was the more frequently encountered quantitative platelet abnormality in the present study. Similar observations have been reported in earlier studies, where thrombocytopenia was identified as a common haematological finding requiring etiological evaluation and clinical correlation.

In the present study, cases were further categorised into hypoproductive and hyperdestructive thrombocytopenia, and primary and secondary thrombocytosis, to evaluate the usefulness of platelet indices in differentiating the underlying mechanisms of platelet count abnormalities. The higher proportion of thrombocytopenia in the present study was comparable with the findings of Saran et al. and Mittal et al., who also reported thrombocytopenia as a frequent laboratory abnormality in routine haematology practice.

Male predominance was observed in the present study, with 103 males and 77 females, contributing to 57.2% and 42.8%, respectively. Among thrombocytopenia cases, 63 were males and 44 were females. This finding is comparable with the observations of Saran et al,[2] Mittal et al,[3] Anand et al,[12] and Himaja et al,[13] who also reported a higher occurrence of thrombocytopenia among males. This male predominance may be related to greater exposure to infections, alcohol-related disorders, occupational hazards, and other acquired causes of platelet abnormalities.

Age-wise analysis showed that thrombocytopenia was most commonly observed in the 31–40 years age group, followed closely by the 21–30 years age group. This suggests that young and middle-aged adults were more commonly affected by thrombocytopenia in the present study. A comparable pattern was reported by Mittal et al,[3] who observed a higher frequency of thrombocytopenia among younger adults.

In contrast, thrombocytosis was most commonly seen in the 1–10 years age group in the present study. This may be explained by the higher frequency of reactive thrombocytosis in children, particularly in association with infections and inflammatory conditions.

Among thrombocytopenia cases, hyperdestructive thrombocytopenia was more common than hypoproductive thrombocytopenia. Hyperdestructive thrombocytopenia accounted for 71 cases, forming 66.3% of thrombocytopenia cases, whereas hypoproductive thrombocytopenia accounted for 36 cases, forming 33.6%. This predominance of hyperdestructive thrombocytopenia is in agreement with previous studies that reported peripheral destruction as an important mechanism of thrombocytopenia in hospital-based populations.[6,7]

In the hyperdestructive group, immune thrombocytopenic purpura was the most common diagnosis, observed in 38 cases. Hyperdestructive thrombocytopenia is usually associated with normal or increased bone marrow platelet production and accelerated peripheral platelet destruction, resulting in compensatory release of younger and larger platelets into circulation.[8,9]

In hypoproductive thrombocytopenia, alcohol-related causes were the most frequent, followed by acute leukaemia, infections, nutritional causes, and

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other causes. Hypoproductive thrombocytopenia occurs due to impaired megakaryopoiesis or bone marrow suppression and is commonly associated with conditions such as aplastic anaemia, acute leukaemia, megaloblastic anaemia, myelodysplastic syndrome, marrow infiltration, and post-chemotherapy states. Rajashekar et al. emphasized the importance of platelet indices in evaluating thrombocytopenia related to megaloblastic anaemia and compared these indices with bone marrow megakaryocytic response.[9]

In the present study, the mean platelet count was lower in hypoproductive thrombocytopenia than in hyperdestructive thrombocytopenia, with values of 55,194.4/cumm and 74,197.1/cumm, respectively. Mean plateletcrit was significantly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 0.075 and 0.054, respectively ($p = 0.001$). Plateletcrit reflects total circulating platelet mass and depends on both platelet count and platelet volume. Chandrasekhar et al. described plateletcrit as a useful screening parameter for quantitative platelet disorders, supporting the relevance of PCT in the present study.[18]

Mean platelet volume was also significantly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 11.53 fL and 10.72 fL, respectively ($p = 0.001$). This finding supports the biological concept that peripheral platelet destruction stimulates the bone marrow to release larger, younger platelets into the peripheral circulation. Similar findings were reported by Baig et al., Francis et al., Khaleel et al., and Parveen and Vimal, who observed higher MPV values in hyperdestructive thrombocytopenia compared with hypoproductive thrombo-cytopenia.[4,6,10,11]

Mean platelet large cell ratio was significantly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 39.84% and 33.27%, respectively ($p < 0.001$). P-LCR reflects the proportion of large platelets and is closely related to MPV. Baig et al. and Panda et al. reported that P-LCR is useful in differentiating hyperdestructive thrombocytopenia from hypoproductive thrombocytopenia.[4,14] The findings of the present study further support the diagnostic utility of P-LCR as an adjunctive platelet parameter.

Mean platelet distribution width was slightly higher in hyperdestructive thrombocytopenia than in hypoproductive thrombocytopenia, with values of 16.91% and 16.43%, respectively. However, the difference was not statistically significant ($p = 0.448$). Although PDW reflects variation in platelet size and has been reported to increase in hyperdestructive thrombocytopenia in some studies, its diagnostic usefulness may vary according to analyser type, sample processing time, anticoagulant effect, and disease heterogeneity.[16-18] Therefore, PDW alone may not be sufficient for differentiation and should be interpreted along with MPV, PCT, P-LCR, clinical findings, and peripheral smear examination.

In thrombocytosis, secondary or reactive thrombocytosis was more common than primary thrombocytosis. Reactive thrombocytosis accounted for 59 cases, forming 80.8% of thrombocytosis cases, whereas primary thrombocytosis due to bone marrow disease accounted for 14 cases, forming 19.2%. Infections were the most common cause of reactive thrombocytosis, followed by iron deficiency anaemia, post-splenectomy state, malignancy, inflammatory bowel disease, and other causes. Among primary thrombocytosis cases, chronic myeloid leukaemia was the predominant diagnosis. This distribution is comparable with Vaishnavi et al., who evaluated the role of platelet indices in differentiating reactive thrombocytosis from clonal thrombocytosis.[19]

In the present study, mean platelet count was higher in primary thrombocytosis than in secondary thrombocytosis, with values of 847,500/cumm and 631,423/cumm, respectively. Mean PCT, MPV, and P-LCR were also significantly higher in primary thrombocytosis, with p values of 0.014, 0.005, and 0.006, respectively. These findings suggest that primary thrombocytosis is associated not only with increased platelet count but also with altered platelet morphology and increased platelet volume. This may be explained by abnormal megakaryocytic proliferation and dysregulated platelet production in bone marrow disorders. Vaishnavi et al. similarly reported that platelet indices may help distinguish clonal thrombocytosis from reactive thrombocytosis.[19]

Mean PDW was higher in primary thrombocytosis than in secondary thrombocytosis, with values of 15.10% and 14.10%, respectively. However, this difference was not statistically significant ($p = 0.129$), suggesting possible overlap between primary and reactive thrombocytosis. Al-Tameemi and Noori also highlighted the usefulness of platelet indices in evaluating different platelet count disorders but emphasized that these parameters should be interpreted in combination with clinical and laboratory findings.[17]

Overall, the present study demonstrates that platelet indices are useful, simple, rapid, and cost-effective adjunctive parameters in the evaluation of quantitative platelet disorders. Among the indices studied, PCT, MPV, and P-LCR showed significant differences between hypoproductive and hyperdestructive thrombocytopenia, as well as between primary and secondary thrombocytosis. These indices may therefore assist in preliminary categorisation of platelet disorders and help guide further diagnostic evaluation. However, PDW did not show statistically significant differences in either thrombocytopenia or thrombocytosis groups, indicating that it has limited independent diagnostic value in the present study.

The main limitation of the present study was that it was conducted at a single institution with a limited

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sample size of 180 cases. Therefore, the findings may not be generalisable to larger populations. The study duration was relatively short, and patient follow-up was not included.[19] Platelet indices may vary depending on analyser type, anticoagulant used, sample storage duration, and time interval between venipuncture and analysis. Bone marrow examination and advanced platelet parameters such as immature platelet fraction was not performed in all cases. Hence, platelet indices should be interpreted as adjunctive parameters and correlated with clinical details, peripheral smear findings, and other relevant laboratory investigations.

The present study supports the use of platelet indices, particularly PCT, MPV, and P-LCR, as supportive tools in the evaluation of quantitative platelet disorders. These parameters are readily available from automated haematology analysers and may help differentiate hyperdestructive from hypoproductive thrombocytopenia and primary from secondary thrombocytosis in routine laboratory practice.

CONCLUSION

Platelet indices are simple, rapid, cost-effective, and non-invasive parameters that are readily available as part of routine automated hemogram analysis. In the present study, plateletcrit, mean platelet volume, and platelet large cell ratio showed significant utility in differentiating hyperdestructive thrombocytopenia from hypoproductive thrombocytopenia, as well as primary thrombocytosis from secondary thrombocytosis. Platelet distribution width showed limited independent diagnostic value.

These findings suggest that platelet indices can serve as useful adjunctive parameters in the evaluation of quantitative platelet disorders. Their interpretation, however, should be made in correlation with clinical findings, peripheral smear examination, and other relevant laboratory investigations. Incorporation of platelet indices into routine haematological assessment may help in early categorisation of platelet abnormalities and guide further diagnostic workup.

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