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ABSTRACT

Background

Platelet count remains the main laboratory parameter used to assess disease severity in primary immune thrombocytopenia (ITP). However, automated platelet indices, particularly mean platelet volume (MPV) and platelet distribution width (PDW), may provide additional information about platelet dynamics.

Objective

To evaluate the association between platelet indices and platelet count severity in adults with primary ITP during routine post-treatment follow-up.

Methods

This retrospective observational study included adults with primary ITP followed at a single tertiary care centre between 2011 and 2025. Of 243 patients reviewed, 232 met the inclusion criteria. Patients were categorized according to platelet count as $<30 \times 10^9/L$, $30-100 \times 10^9/L$, or $>100 \times 10^9/L$. The most recent available complete blood count during routine follow-up was analyzed. Differences between groups were assessed using the Kruskal–Wallis test, associations using Spearman correlation, and multivariable linear regression was performed for PDW adjusting for age, sex, disease duration, and treatment status.

RESULTS

Study Population

232 patients met the inclusion criteria and were included in the analysis. The median age was 39 years (IQR 21), with a predominance of females (182, 78.4%). Median disease duration was 7 years (IQR 7). At the time of the analyzed CBC, 193 patients (83.2%) were receiving steroids $\pm$ IVIG, while 39 (16.8%) were not receiving active treatment.

Platelet Count Groups

Patients were categorized according to platelet count into three groups:

Platelet count	n (%)
$<30 \times 10^9/L$	27 (11.6%)
$30-100 \times 10^9/L$	75 (32.3%)
$>100 \times 10^9/L$	130 (56.0%)

Platelet Indices

PDW differed significantly across platelet count categories (Kruskal–Wallis $p < 0.001$). Median PDW was highest among patients with platelet counts $<30 \times 10^9/L$ and lowest among those with platelet counts $>100 \times 10^9/L$:

Platelet count	MPV, median (IQR)	PDW, median (IQR)
$<30 \times 10^9/L$	10.9 (2.8)	18.1 (3.8)
$30-100 \times 10^9/L$	11.1 (2.2)	17.4 (2.5)
$>100 \times 10^9/L$	10.1 (1.8)	14.3 (4.3)
p-value	0.007	<0.001

Post-hoc analysis showed that PDW was significantly higher in both the $<30 \times 10^9/L$ and $30-100 \times 10^9/L$ groups compared with the $>100 \times 10^9/L$ group (both $p < 0.001$).

Correlation Analysis

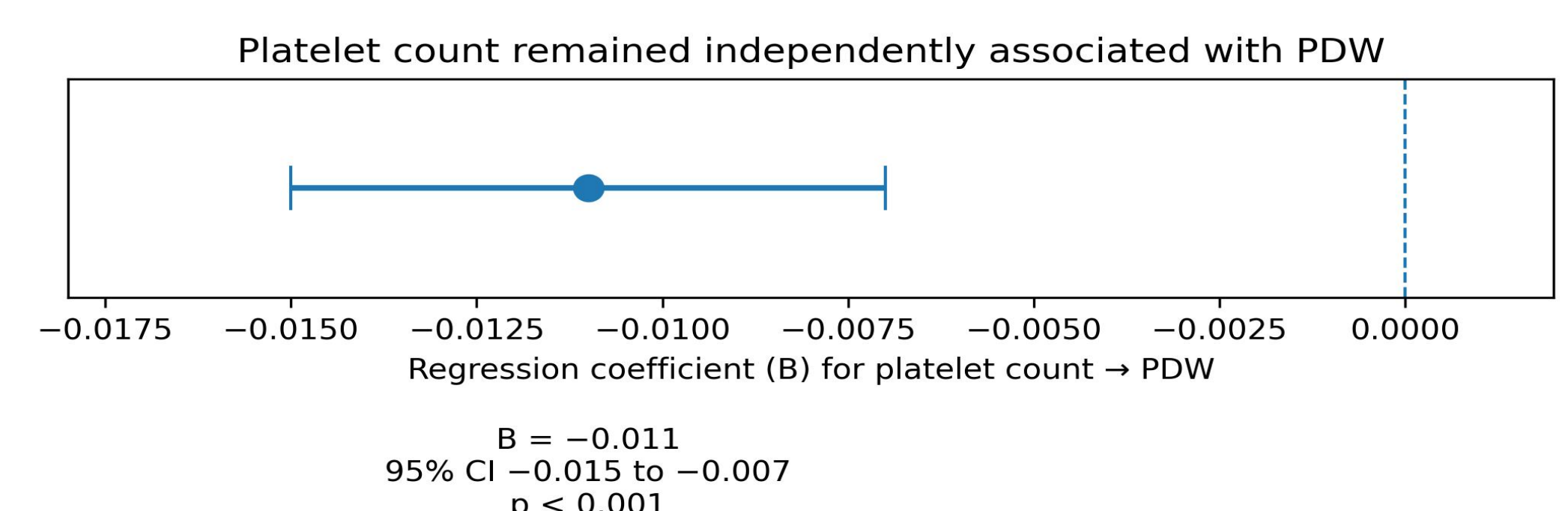
PDW demonstrated a **stronger inverse correlation with platelet count** than MPV:

•**PDW:** $r = -0.53$, $p < 0.001$

•**MPV:** $r = -0.25$, $p < 0.001$

Multivariable Analysis

As shown in the figure, platelet count remained independently associated with PDW after adjustment for age, sex, disease duration and treatment status (**$B = -0.011$, 95% CI -0.015 to -0.007 ; $p < 0.001$; $R^2 = 0.144$**).



CONCLUSION

PDW demonstrated a stronger and more consistent association with platelet count severity than MPV in patients with primary ITP during routine post-treatment follow-up. Although these findings should be interpreted cautiously, PDW may provide additional information when interpreted alongside platelet count and clinical context. Further prospective, multicenter studies with longitudinal assessment and clinical outcomes are warranted.

REFERENCES

- Walle M, Arkew M, Asmerom H, Tesfaye A, Getu F. The diagnostic accuracy of mean platelet volume in differentiating immune thrombocytopenic purpura from hypoproductive thrombocytopenia: a systematic review and meta-analysis. PLoS One. 2023;18(11):e0295011.
- Abdel Hi MZ, Khaled SA, Mahran DG, Aly MM. Platelet indices as a predictor in patients with aplastic anemia and immune thrombocytopenic purpura: a retrospective case–control study. Egypt J Intern Med. 2024;36(1):92.
- Khan MI, Ullah I. Diagnostic importance of mean platelet volume, platelet distribution width and platelet large cell ratio as screening tool in immune thrombocytopenia. Porto Biomed J. 2020;5(6):e094.

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