Association of Platelet Kinetics During G-CSF Mobilization with Peripheral Blood CD34⁺ Counts in Healthy HPC Donors

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BACKGROUND

Mobilization efficiency varies among healthy hematopoietic progenitor cell (HPC) donors. While prior study showed the baseline platelet counts are associated with CD34⁺ mobilization, platelet kinetics have not been systematically evaluated as indicators of CD34⁺ mobilization efficiency.

OBJECTIVE

To evaluate the association between platelet kinetics during G-CSF mobilization and peripheral blood CD34⁺ cell counts in healthy hematopoietic progenitor cell (HPC) donors undergoing stem cell collection.

METHODS

- Retrospective review of 60 healthy HPC donors.
- Donors underwent G-CSF mobilization followed by PBSC collection.
- Baseline and post-mobilization platelet counts were recorded.
- Percent platelet decline during mobilization was calculated.
- Pre-apheresis peripheral blood CD34⁺ counts were assessed.
- Relationships between platelet measures and CD34⁺ counts were analyzed using statistical correlation and subgroup comparisons.

RESULTS

- Sixty healthy HPC donors were included in the analysis.
- Higher baseline platelet counts were associated with higher peripheral blood CD34⁺ concentrations.
- Greater platelet decline during G-CSF mobilization was associated with enhanced CD34⁺ mobilization.
- Donors with a platelet decline >20% had significantly higher CD34⁺ counts than those with a decline ≤20% (107.6 vs. 78.9 cells/μL; $p = 0.024$).
- Both baseline platelet count and platelet kinetics during mobilization were associated with mobilization efficiency.

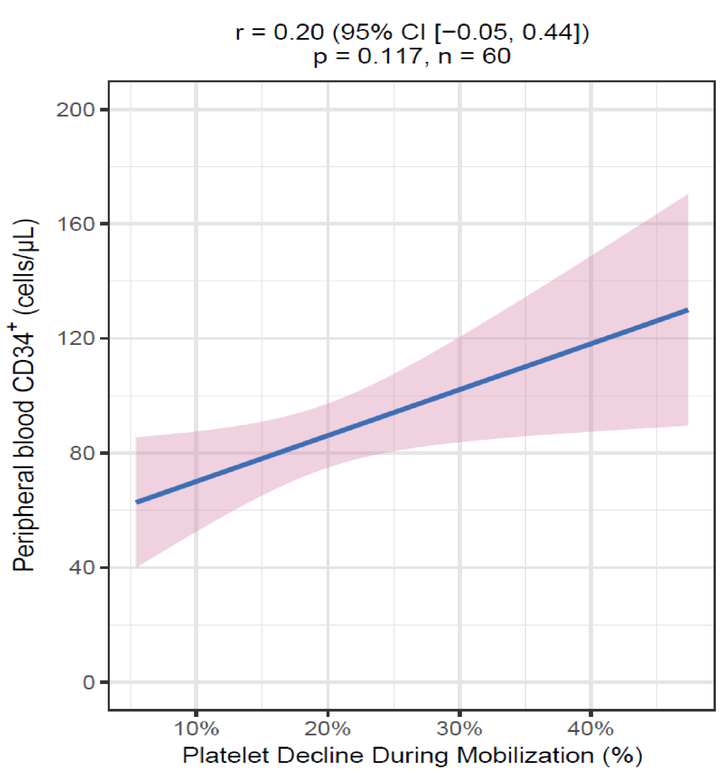


Figure 1: Baseline Platelet Count vs. CD34⁺ Count

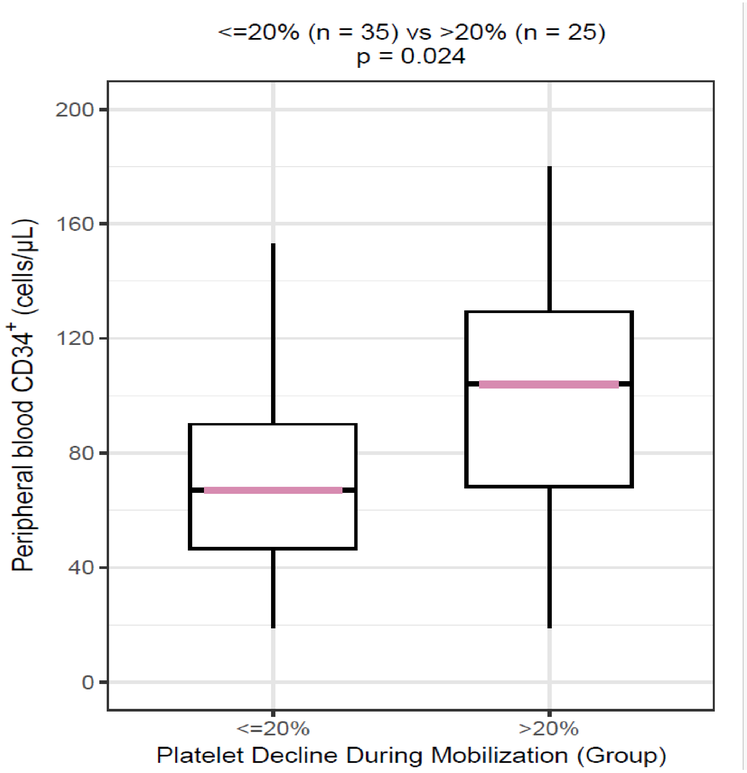


Figure 2: CD34⁺ Count by Platelet Decline Group

CONCLUSIONS

In this preliminary analysis of healthy HPC donors, both baseline platelet count and platelet kinetics during early mobilization were associated with peripheral blood CD34⁺ concentrations. These findings suggest that platelet dynamics during mobilization may reflect variability in donor mobilization efficiency and warrant further investigation in larger cohorts.

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