Activated Platelet Transfusions Decrease Count Increment and Time to Next Transfusion for Hematology-Oncology Patients

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Introduction

- Patients who receive multiple platelet transfusions are at risk of infection, hemolytic and non-hemolytic reactions, and refractoriness
- Platelets have a short shelf life and are often in limited supply
- Patients should receive the fewest number of transfusions necessary to increase their platelets, benefitting patient outcomes and hospital costs
- Microparticles are formed during platelet activation and associated in malignancy, inflammation, infection, and coagulation
- ThromboLUX uses dynamic light scattering to determine microparticle content as a measure of platelet activation status
- The goal of this study was to investigate the effect of activated transfusions on count increment and time between transfusions for hematology/oncology patients following dynamic light scattering testing of platelet concentrates.

Methods

- Platelet units were screened for activation status using ThromboLUX and transfused within 30 hours
- Treating physicians were unaware of the study and activation status of each bag
- Chart review identified eligible hematology-oncology patients based on diagnosis and availability of transfusion data

Results

- 1296 tested platelet components transfused to 122 patients within 90-day study period
- 59 patients and 410 transfusions analyzed for count increment
- **Statistically significant decrease** of 5.4 × 109/L (21.5% reduction) **in count increment** after receipt of an activated transfusion
- 54 patients and 416 transfusions analyzed for time between transfusions
- **Statistically significant decrease** of 8.9 hours (30.9% reduction) **in time between transfusions** after receipt of an activated transfusion

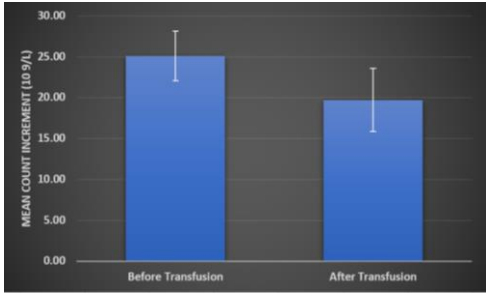

Figure 1: Mean count increment before and after transfusion of activated platelets

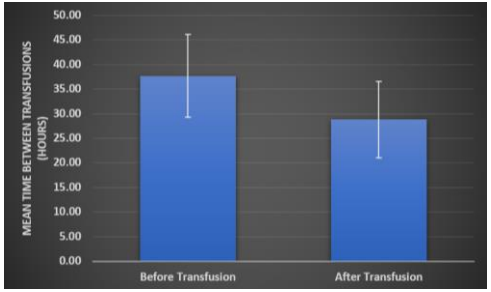

Figure 1: Mean count increment before and after transfusion of activated platelets

Limitations

- Inconsistent/insufficient documentation excluded portion of eligible patients
- Microparticle content only measure of platelet activation status
- No direct comparison to resting platelet transfusions

Conclusion

- Activated platelet transfusions in hematology/oncology patients reduced count increments and time between transfusions
- Hematology/oncology patients should receive resting platelet concentrates
- Directing platelet concentrates according to resting and activated status may allow for better patient outcomes and improved management of hospital resources.

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