1. Abstract #4706

Activation Status of Pathogen Reduced Platelet Components in Plasma in Comparison with Conventional Plasma Platelet Components

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Abstract Text:

Background/Case Studies: Circulating blood microparticles (MPs) play complex and dynamic physiological roles as mediators of inflammation and hypercoagulation. Seventy to ninety percent of MPs in blood are released from platelets or megakaryocytes. Some studies suggest that high MP content in platelet components, indicating a high level of platelet activation, may limit the effectiveness of platelet transfusions. Activated platelets may be beneficial to stop active bleeding suggested by work on cryopreserved and cold-stored platelets. Conversely, platelet components with a low MP content (non-activated) may be beneficial for prophylactic platelet transfusion in bone marrow transplant patient population. This study investigated whether pathogen reduction changes the activation status of single donor platelets.

Study Design/Method: We received conventional (non-PRT) and PRT (pathogen reduction technology) INTERCEPT™apheresis platelets in plasma from the regional blood donor center. Each platelet component was tested in our institution using ThromboLUX System (LightIntegra Technology Inc., Vancouver, Canada) in order to establish the MP profile of PRT platelets in plasma. ThromboLUX is a non-invasive, in vitro optical test utilizing dynamic light scattering to characterize a platelet components by quantitation of platelet MP present in the sample. Data were analyzed with Minitab® 17.3.1 Statistical Software.

Results/Finding: We tested a total of 139 platelet components including 95 (68.4 %) PRT and 44 (31.7 %) conventional platelets**.** A 15% threshold for MPs to separate non-activated from activated platelets was established for both conventional and PRT platelet components in plasma. 34.7 % of PRT (33 out of 95) and 34.1% of conventional (15 out of 44) platelet components revealed activated platelet status based on MP content (MP %). Statistical analysis for MP content (MP %) in PRT and conventional platelet components showed no significant difference using a 3-parameter Weibull distribution. Mean MP content in PRT and conventional platelets were the same: 0.12 ± 0.12 (alpha=0.01, P=0.8). Alpha=0.05 level of significance P values greater than 0.05 were considered significant.

Conclusion: In our study PRT and conventional platelet components in plasma showed similar platelet activation distribution based on MP content (MP %). About 35% of our PRT and conventional platelet inventory tested as activated. Pre-screening platelet components for low (non-activated) and high (activated) MP content (MP %) may be helpful to manage the platelet inventory for targeted use for prophylactic or therapeutic applications.