

Abstract

Background

A challenge faced by many hospitals is to match the need for blood with product availability. Because platelets have a short shelf life, they are often in short supply. Platelet shortages may lead to the postponement of treatments, the rescheduling of surgeries, and in extreme cases, to complications that may put patients' lives at risk. It would be in the transfusion service's best interest to direct the available platelets to the recipients who would receive the most benefit from them. Platelet activation status has recently been shown to be important for platelet efficacy in different patient populations. A method to screen platelets and assess the effect of activated platelet transfusions was evaluated. The goal was to reduce platelet consumption and the burden of platelet shortages by providing targeted platelet transfusions to hematology/oncology patients.

Study Design/Methods

A clinical study was conducted at a large academic hospital to evaluate the clinical response of hematology/oncology patients receiving activated platelets. Upon receipt of platelets from the regional blood center, each unit was tested for platelet activation status (ThromboLUX, LightIntegra Technology Inc.). Platelets were screened, and nonactivated platelets were allocated to hematology/oncology patients. The sporadic occurrence of these patients receiving activated platelets allowed for analysis of the effects of an activated platelet transfusion on the average count increment and transfusion interval of subsequent transfusions. Data were analyzed using a likelihood ratio test, 95% confidence interval, and Waldtype intervals.

Results/Findings

A total of 1296 tested platelet components were transfused to 122 patients. There was a statistically significant decrease of $5.4 \times 10^9/\text{L}$ (21.5% reduction) in the count increment after receipt of an activated transfusion, with a mean posttransfusion count increment (1-4 hours) of $25.11 \times 10^9/\text{L}$ (22.06-28.16) before and $19.71 \times 10^9/\text{L}$ (15.87-23.55; $p = 0.003$) after an activated transfusion. The mean times between transfusions were 37.7 hours (30.2-47.1) before and 28.8 hours (22.0-37.6; $p = 0.04$) after receipt of an activated transfusion. There was a statistically significant decrease of 8.9 hours (30.9% reduction) in the time between transfusions after receipt of an activated transfusion.

Conclusions

A statistically significant reduction in count increments and time between transfusion was found after a patient received an activated transfusion. The limited shelf life for platelets necessitates careful inventory management. Being able to direct specific platelets to the patients who would benefit most from them could be helpful.