

Blood Product Utilization Among Adolescent and Young Adult Patients with Acute Lymphoblastic Leukemia: A Single Center Experience

Jacquelyn Knobelsdorf¹, Sandra K. Althouse², Sandeep Batra³

¹Indiana University School of Medicine, ²Indiana Clinical and Translational Sciences Institute, ³Riley Hospital for Children

Background: Adolescent and young adult (AYA, 15-39 years old) patients with acute lymphoblastic leukemia (ALL) often experience pancytopenia and severe immunosuppression. Particularly during intensive phases of chemotherapy, allogeneic blood transfusion support is essential in their care. The utilization of both red blood cell (RBC) and platelet transfusions, as well as the thresholds used to determine when transfusions are needed, are poorly described in this population. The objective of this study is to describe blood product utilization in AYA patients with ALL treated at our institution.

Methods: A cohort of 20 AYA patients with ALL treated at Riley Hospital for Children from October 2020 to July 2023 were identified for data collection. Pre- and post-transfusion laboratory values, transfusion totals, comorbid events or complications, transfusion reactions, and minimal residual disease (MRD) values were collected and analyzed. All values reported are mean \pm standard deviation for continuous variables and n (%) for categorical variables. Values were calculated individually for each patient for each phase of therapy and averaged across all patients.

Results: Patients studied had varying needs for transfusions throughout their therapy (50.75 ± 48.06), with an average of 22.95 ± 15.65 RBC transfusions and 25.60 ± 29.65 platelet transfusions. Patients being treated with standard chemotherapy protocols required more transfusions during induction (14.13 ± 21.56) and delayed intensification (14.07 ± 24.29) phases compared to other phases. Patients with MRD positive status required more transfusions (69.14 ± 58.14) than patients with MRD negative status (40.92 ± 40.84).

Conclusions and Potential Impacts: This study helped to elucidate the need for transfusions among the AYA ALL patient population, throughout the different phases of treatment. These findings hold implications for establishing guidelines that could clarify when transfusions should be given in this population, helping physicians provide the best care to future patients.