Peer Reviewed

Fellows Column: Conservative Approach to Platelet Transfusion in a Preterm Infant

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Abstract:

We describe a case of a preterm infant managed conservatively using a lower threshold of 25 K/uL (25 x 10^3/μL) for platelet transfusion. We saved three extra platelet transfusions by not using the 50 K/uL (50 x 10^3/μL) threshold. No complications of thrombocytopenia, including petechiae, purpura, intraventricular bleeding, ecchymosis, hemorrhage, were noted by following the conservative approach.

Keywords:

Preterm infant, platelet count, platelet transfusion, thrombocytopenia.

Introduction:

Shortage of platelet remains an ongoing problem. Some approaches to dealing with the shortage include relaxing the clinical guidelines, reducing prophylactic transfusions, and using split apheresis platelets. (1,2) Recent data support a lower platelet transfusion threshold of 25 × 10^9 /L in non-bleeding premature neonates. (3) Curley et al. (4) reported higher mortality among preterm infants who received platelet transfusions at a platelet-count threshold of 50 x 103/μL than those who received platelet transfusions at a platelet-count threshold of 25 x 10^3/μL. We changed our platelet transfusion algorithm for preterm infants based on the evolving evidence. Here we present a case of a preterm infant, where we used 25 x10^3/μL as a cutoff instead of 50 x10^3/μL and prevented the infant from three extra platelets transfusions and risk of donor exposure.

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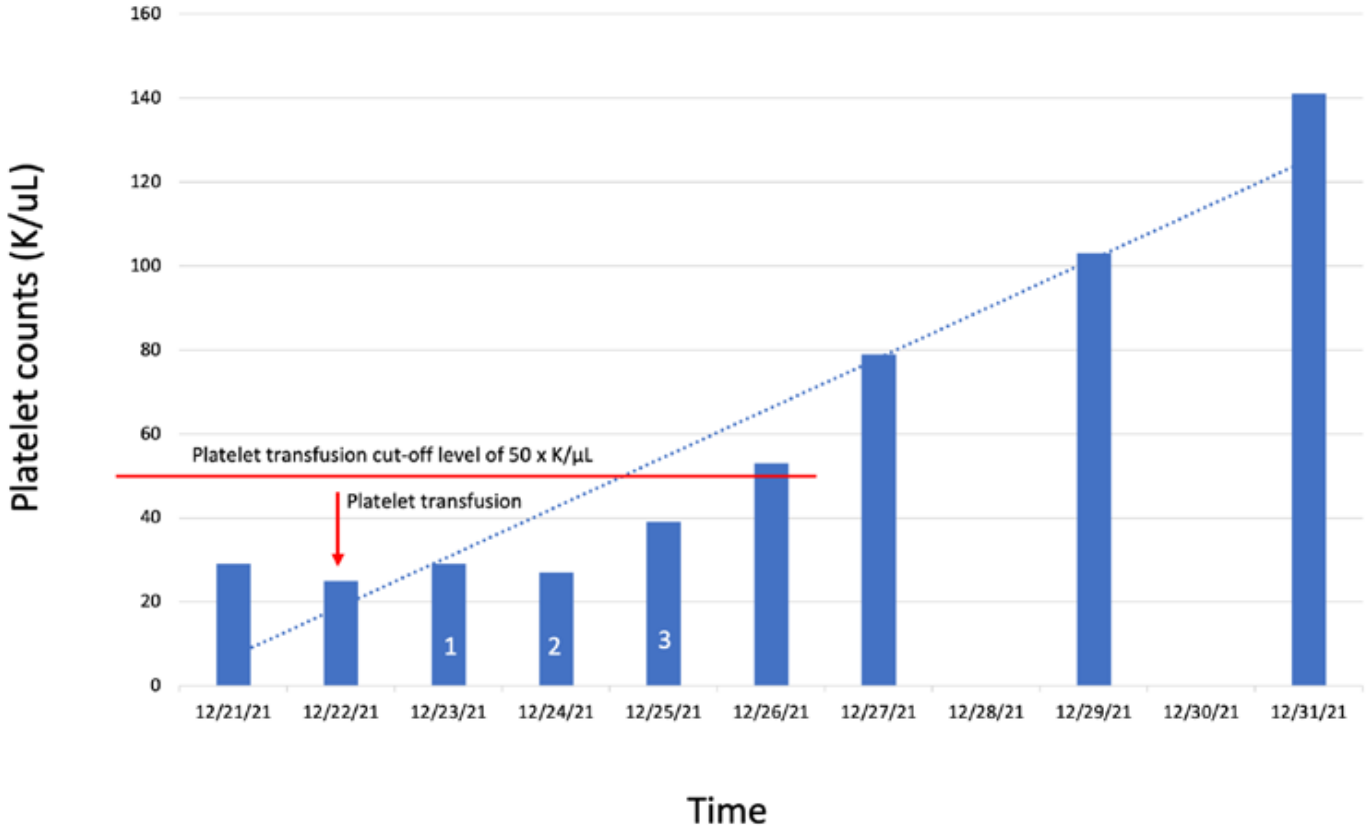

Legends to Figure: Graph showing spontaneous recovery of platelet counts. The red arrow points to the only platelet transfusion given for a platelet count of 25 x 10^3/uL.The horizontal red line shows the platelet transfusion threshold of 50x 10^3/μL (if used). Vertical bars labeled 1,2,3 show the three potential platelet transfusions saved by not using the 50x 10^3/μL as the threshold.

Case:

A preterm male infant was born to a 28-year-old gravida 3, para 2 at 30 $^{6/7}$ weeks of gestation via cesarean section. The pregnancy was complicated by diabetes mellitus class A2, low-lying placenta, obesity, and herpes simplex virus. Mother was transferred from an outside facility for premature, prolonged rupture of membrane betamethasone, ampicillin, azithromycin, and magnesium sulfate. The mother did not have a history of thrombocytopenia or immune thrombocytopenic purpura.

"An admission laboratory investigation showed a platelet count of 29 x103/µL. Repeat platelet count 24 hours later, was found to be 25 x103/µL and thus received platelet transfusion of 15 ml/kg. Platelet count initially rose to 29 x103/µL the next day but dropped back down to 27 x 103/µL two days following the transfusion."

At delivery, the baby had a weak cry; he was dried and stimulated. After suctioning the airway, the infant was placed on nasal continuous positive airway pressure (CPAP). The baby was then transported to the NICU on CPAP. An admission laboratory investigation showed a platelet count of 29 x10^3/µL. Repeat platelet count 24 hours later, was found to be 25 x10^3/µL and thus received platelet transfusion of 15 ml/kg. Platelet count initially rose to 29 x10^3/µL the next day but dropped back down to 27 x 10^3/µL two days following the transfusion. Based on our new evidence-based guideline, we decided to observe clinically and not to transfuse platelet for count > 25 x 10^3/µL unless clinically indicated. The platelet counts were followed daily. Figure 1 depicts the serial platelet counts showing three consecutive daily platelet counts of < 50 x 10^3/µL, where no transfusion was given. The infant did not manifest any clinical signs of thrombocytopenia throughout the course, including mucosal bleeding, petechiae, or purpura. Head ultrasound was also normal, and no hemorrhage was seen. On further investigation, maternal platelet indirect antibodies were positive for HLA class 1.

Discussion:

Platelet transfusion is not cheap. (5,6) Increased mortality and co-morbidity have been associated with platelet transfusion. Recently, Elgendy et al. (7) found platelet transfusion associated with a significant increase in mortality (24.8 vs. 13.8%). They also reported increased co-morbidities as retinopathy of prematurity (22.3 vs. 19.2%), severe intraventricular hemorrhage (18.3 vs. 10.1%), the median length of hospital stays (51 vs. 47 days), and cost of hospitalization (USD 298,204 vs. USD 219,760) with platelet transfusion. The possible reasons for these findings are that platelets are key players in mediating a diverse range of immune and inflammatory processes. (8)

A common reason for platelet transfusion in preterm infants is the scare of intraventricular hemorrhage. Stanworth et al. (9) studied a large cohort of 3652 neonatal admissions and found 194 neonates with severe thrombocytopenia (60 x 10^3/µL), out of which one third developed thrombocytopenia of < 20 x 10^3/µL. They found 91% not developing major hemorrhage meaning only 9% of infants with a platelet count less than 20 x 10^3/µL had a major hemorrhage. They concluded that most platelet transfusions were given to neonates with thrombocytopenia with no bleeding or minor bleeding only. Similar findings have been reported by Sparger et al. (10)

Our case and literature review highlight the need to follow a conservative approach to platelet transfusion in neonates. This guidance will save donor exposure and cost and decrease the associated mortality and morbidity.

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