Several reports of acute hemolytic transfusion reactions (AHTRs) have been reported following out-of-group transfusion of group O single donor apheresis platelets (SDP) to group A, B or AB patients. In nearly all reports, the implicated donor possessed unusually high titers of anti-A and/or anti-B. It is believed that the risk of AHTR due to a group O "high-titer" donor is significantly higher with SDPs, in which a patient may receive 200-400 ml plasma from a single donor, than pooled platelets, in which donor plasma (50 ml) is diluted 4-6 fold in the final infused product.

To reduce the risk of AHTR following out-of-group SDP transfusion, several blood centers have instituted policies to screen all group O SDP to identify “high-titer” units. Units identified as “high-titer” are reserved for group O patients only. Recently, Josephson et al reported their experience using gel method to screen group O SDPs. In their study, the authors reported that 28% of group O SDPs were “high-titer”, with anti-A and anti-A,B titers of ≥ 1:64.

Although pooled group O platelets are considered low-risk for AHTRs, there are no published studies of ABO titers in pooled platelet concentrates. To investigate the latter, we determined ABO titers in 185 pooled platelet concentrates by both tube and gel methods.

### Methods

**Platelet Samples**

Whole blood-derived platelet concentrates were obtained from the American Red Cross (Detroit, MI). For transfusion, 4 or 5 units of type-specific platelets were pooled immediately prior to transfusion. Samples for testing were obtained from tubing that had been stripped twice to assure that the contents were representative of the final pooled product. Altogether, 185 pooled platelet concentrates were tested including 125 group O (115, 5-unit pools; 10, 4-unit pools), 25 group A (5-unit), 26 group B (5-unit) and 9 mixed pools, containing group O and either group A or B platelet concentrates.

**ABO Titer in Pooled Group O Platelets**

Anti-A titers were also determined in 26 pooled group B platelets. As shown in Fig. 2, anti-A titers were significantly lower in group B than group O platelets, particularly by gel method (MT=8 vs MT=64). No group B platelet had a titer ≥ 1:64.

**A-B in Pooled Group A Platelets**

Anti-B titers were determined in 25 pooled group A platelets. As shown in Fig. 3, anti-B titers were roughly equivalent in group A and group O platelets, regardless of method. No pooled group A platelet had a titer ≥ 1:64.

**Statistics**

Results were plotted as the number and relative percentage (%) units for each end titer. Histograms and T-tests were performed with commercial software (Kaleidograph™, Synergy Software, Reading, PA).

### Results

ABO Titters in Pooled Group O Platelets

Fig. 1 shows the distribution of anti-A and anti-B in 125 pooled group O platelets. Overall, titers by gel were higher than tube method by approximately 2 dilutions (P=0.0001, paired t-test).

The median titer (MT) for anti-A by gel (1:64) is higher than that reported for SDP (1:32). Using a critical titer of ≥ 1:64, 60% of pooled group O platelets would be considered “high-titer”.

### Conclusions

Neutralization of ABO Antibodies in Mixed Platelet Pools

Although it is general policy to pool platelets according to a single ABO type, on occasion it is necessary to pool platelets of more than one ABO type due to product shortages. Mixed platelet concentrates containing at least one group O platelet concentrate are labeled and dispensed as group O for transfusion purposes.

Nine platelet pools containing a mix of group O and either group A or group B platelets were available for testing. As shown in Table 1, the presence of even one non-O platelet significantly decreases the corresponding isoagglutinin titer.

### References