



e-Network Forum

CALIFORNIA BLOOD BANK SOCIETY

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The practice of transfusing out-of-type platelets

A blood banker from a University Hospital in the Midwest wants to know the practice of transfusing out of type platelets, for instance giving a group O Plateletspheresis unit to a group B patient. At the Midwesterner's institution they transfuse approximately 20% of their platelets as plasma incompatible Plateletpheresis and they are wondering about the practice in the rest of the country. In addition, the inquiring blood banker would also like to know how many hemolytic or adverse reactions have been noted due to these transfusions, because acute intravascular hemolysis secondary to out-of-group platelet transfusion has been reported by others, including Larsson LG, Welsh VJ and Ladd VJ in *Transfusion* Aug., 2000. For example, the aforementioned authors reported on a 44-year-old woman, blood group A, who was recently diagnosed with acute myeloid leukemia and was receiving chemotherapy. After the transfusion of apheresis platelets from a group O donor, back pain, hemoglobinuria, and hemoglobinemia developed, and her Hb dropped by 2.3 g per dL, despite the transfusion of 2 units of RBCs. Investigation revealed acute intravascular hemolysis with a positive DAT due to anti-A1 on her RBCs. **The donor's titer of anti-A1 was greater than 16,000.** Review of published cases raises the possibility that hemolytic reactions to out-of-group platelets may be more frequent since the use of apheresis platelets has increased. Other links of interest include:

- [Reducing supernatant plasma of pooled platelets before administration to ABO-incompatible adult recipients](#)
- [Washed and volume-reduced Plateletpheresis units](#)

The following replies were submitted in response to the above.

1. **A blood banker from Virginia** reported on his hospital's policy to only transfuse plasma-incompatible plateletpheresis products that have an anti-A and/or anti-B titer less than 200. (See technique in May 11 **Addendum** below.) Using their approach, he reports that they have not had any cases of intravascular hemolysis from plateletspheresis products while following this protocol.
2. **A blood bank physician from New York** reported that at his hospital the consequences ABO out-of-group transfusions may be much more serious immunologically and clinically than mild hemolytic transfusion reactions. The consequences of repeated ABO-mismatched transfusions clearly include reduced platelet count increments and an increased incidence of platelet transfusion refractoriness (data from randomized clinical trials). The responding blood banker has summarized this finding and other possible changes in clinical outcomes in an editorial in *Transfusion* (39: 1155-1159, 1999) and in a recent paper in *Transfusion* (41: 790-793, 2001). Their own practice is to **almost never give ABO antigen or antibody incompatible platelets to patients receiving repeated platelet transfusions** and they are now trying hard to avoid giving them to anyone. That's obviously a lot easier in a large university hospital using 15-20 transfusions a day than in smaller hospitals with inventory issues.

3. **A medical director of a large transfusion service on the East coast** who wishes to remain nameless on this item has the following comment:

"The problem of out-of-group platelets represents another example of the **disadvantage of single donor apheresis platelets** over pooled whole blood platelets. Recipients of single donor platelets from donors with high-titre isohemagglutins receive **a large volume of plasma exclusively from one donor**. It is reasonable to assume that pooling whole-blood-derived platelets decreases the risk from a variety of adverse consequences including out-of-group plasma, allergic reactions to donor factors, TRALI, etc. It is time to reconsider the prevailing opinion that apheresis platelets are a safer product." (**Editor's note:** e-Workers may be interested in the following link - [Usage of Pooled Platelets vs. Pheresis Platelets](#))

ADDENDA May 11, 2002

4. In reference to the **titer technique** used by the **Virginia transfusion service** (in reply #1 above): "It is a straight immediate spin read at a 1 to 200 dilution. There is no antihuman globulin enhancement, and the test is interpreted as positive or negative. If the test result is positive, those

platelets cannot be transfused to a patient whose red cells will react with the transfused ABO antibody." The Virginian reports that this approach has worked very well for them, with no reported hemolysis ever with this procedure in place.

5. **A retired blood bank physician in Northern California** offers this question and suggestion: "Aside from the transfusion service in Virginia and those in the U.K., I wonder how many others screen the plasma of their group O platelet donors for high-titer anti-A/B? Identifying such products seems like an easy and inexpensive approach to averting potentially troublesome hemolytic complications when out-of-type platelets need to be transfused. Knowing that the plasma of these platelets did **not** have high-titer anti-A/B might also comfort those physicians who feel uneasy about accepting "incompatible" platelets when the plasma-compatible ones are unavailable. Has the AABB Standards Committee considered this?"

ADDENDUM May 13, 2002

6. **The blood banker from Virginia** (who already mentioned that they restrict ABO plasma-incompatible platelet transfusions to those units with low titer anti-A and anti-B) has **provided their procedures** (MS Word files) for platelet donor ABO antibody titers and for selection of platelet products. It is their understanding that blood centers could easily perform a direct agglutination test with diluted donor plasma/serum with an automated blood typing instrument, should this become an accepted practice. [Note: These two procedures have been reproduced almost exactly as they were provided, except for very minor edits that were necessary due to some minor font issues (in other words, they seem to have used a PC to write their procedures and I used a MAC to read them).]

ADDENDUM May 14, 2002

7. **A blood banker from Leeds, UK**, thought that the e-network forum might be interested in a paper recently published by the National Blood Service Clinical Policies Group (PDF) on the subject of hemolysis thought to be due to high-titre anti-A/B, and what measures are being taken to prevent this complication.

ADDENDA Sept. 2, 2005

8. A transfusion medicine physician at a blood center in the Midwest wants to know what is common practice at other blood centers and hospital blood banks when **managing group O blood donors who have high titer anti-A and anti-B**. In particular, their center has a donor who was implicated in a severe hemolytic transfusion reaction when a single apheresis platelet unit was transfused to a group A patient. The donor's **anti-A titer** testing was determined by a tube technique by **direct agglutination at room temperature (titer = 256)** and by indirect antiglobulin testing with **anti-IgG anti-human globulin (titer = 16,000)**. This donor has donated more than 200 times, with over 100 donations of apheresis platelets. No other hemolytic reactions were reported to be associated with previous transfusions from this donor's blood products. This colleague wants to know **if other blood centers would defer such a donor** temporarily, and test the titer again before reinstating him, or would they defer him indefinitely, or are there other blood centers who titer group O apheresis platelets at each donation. Are packed red cells acceptable for ABO non-identical recipients because of the minimal amount of plasma present? In this particular case the donor will be allowed to only donate platelets, and the collected platelet units will be tagged indicating that they are for transfusion of ABO identical recipients only.

ADDENDA Sept. 8, 2005

9. **A transfusion medicine physician in Sacramento** with many years experience in a donor center environment is of the opinion that the donor described in the **ADDENDA of Sept. 2, 2005** above **should be allowed to donate packed cells**, preferably into an additive solution to minimize the amount of plasma left on the packed cells. He would keep the donor as a platelet donor, too but **just use the platelets for Group O recipients**. If the donor were an HLA match for a Group A recipient, he would recommend that the platelets be volume reduced and/or resuspended in a suitable solution.

Please submit comments to the [e-Network Forum](#).

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Addenda: May 11, 13 & 14, 2002; Sept. 2, 8, 20 & 29, Oct. 3, Nov. 1 & 2, 2005

Link Corrections: July 22, 2002

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The practice of transfusing out-of-type platelets Page 2

ADDENDA Sept. 20, 2005

10. **A transfusion medicine physician in Buenos-Aires, Argentina** reports that his hospital tests for "dangerous donors" before using group O plasma containing products for non-group O recipients. They transfuse, if possible, blood from the same ABO group, but if ABO identical products are not available, they select a "non dangerous" component. They have chosen a final dilution **cut-off of 1:64 for anti-A and anti-B**, according to the International Forum from 16 experts ([Transfusion of apheresis platelets and ABO groups](#). Vox Sanguinis 2005; 88: 207-221). Their policy applies for all components, but especially to apheresis platelets. According to Lozano and Cid ([The Clinical Implications of Platelet Transfusion Associated With ABO or Rh \(D\) Incompatibility](#). Transfusion Medicine Reviews 2003; 17: 57-68) there have been 15 reports of hemolysis after a platelet transfusion (12 were from apheresis platelets and 3 from random donor pool). [The British Guidelines for the Use of Platelet Transfusions](#) (Br J Haematol 2003; 122: 10-23) establishes: "Group O platelets should only be used for group A, B and AB patients if they have been tested and labeled as negative for high-titer anti-A or anti-B (grade B recommendation, level III evidence)".

ADDENDA Sept. 20, 2005

11. **A Quality Manager at the Blood and Tissue Bank of Cantabria Santander, Spain** reports that they **test for anti-A titer on all group O platelet donations**. According to their protocol, **titers greater than 64** are recorded in a database and **printed on the product label**. They use an immediate spin test in tube and titration by the classical saline dilution technique. The titer does not affect the donor's management or status, since whole blood or apheresis platelets can be collected from individuals whose anti-A titers are greater than 64. However, the product labeling allows the hospital pathologist in charge of transfusion to decide on the use of such products. Usually plasma by apheresis from whole blood donations with high titer anti-A are not transfused to group A patients except in critical emergencies. As far as he knows, this has never happened. Platelets donated by apheresis with high titer anti-A are transfused to group A patients only if a dire emergency arises. Red cells collected from donors with high titer anti-A are used without concern for group A patients, since their plasma content has been reduced with processing. However, group O RBCs are not transfused to group A patients unless group A RBCs are unavailable.

ADDENDA Oct. 3, 2005

12. **A hospital Transfusion Safety Technologist in Montreal, Canada** reports that in order to maintain a continuous stock of platelets for trauma patients, her hospital network orders platelets from their blood supplier up to twice daily with the goal of maintaining a stock of platelets sufficient for 7 platelet transfusions/day at site A and 4/day at site B. She reports that their platelet inventory is comprised of mainly group A platelets, fewer group O platelets, and they try to keep at least 1 group B or 1 group AB platelet on hand. In addition they strive for at least half of their inventory to be 'CMV-negative' and irradiated. They try to stock apheresis platelets as a priority, but often must receive 'random donor' platelets, due to product availability. They try to **avoid issuing platelets for transfusions that contain ABO antibodies that are incompatible with the recipient's red cells**, but they will issue plasma incompatible platelets if the products in their inventory are at risk of expiration. In order to "feel safe doing this", they **perform titer testing using a 1/50 dilution of the product by an immediate spin test** before releasing platelets that contain ABO incompatible plasma, and **limit (when possible) the use of platelets that have a titer > 50 to group O patients**. However, if they do not have plasma compatible platelets or platelets with low titer incompatible ABO antibodies, they notify the patient's doctor and note in the patient's record so as to avoid the same patient getting a second dose of platelets containing incompatible ABO antibodies. They implemented this strategy because several years ago they had a hemolytic adverse event when a group A patient received a second transfusion of group O platelets. Since implementing the above strategy, they are unaware of any subsequent hemolytic reaction due to the transfusion of plasma incompatible platelets.

ADDENDA Nov. 1, 2005

13. **A South African physician** reports that in **ADDENDA #11** from September 20, 2005, a Quality Manager at the Blood and Tissue Bank of Cantabria Santander, Spain implied that transfusing a unit of RBC from a donor with high titer Anti-A should not be of concern because the plasma content of such an RBC unit would be reduced during routine processing. The South African physician wants to know if such a lack of concern would apply for a transfusion of a **group O RBC unit into a two week old Group A Rh positive premature neonate** whose parents have opted for directed donations rather than using "banked blood". In this case, the baby's father is Group O Rh positive and the mother is Group A Rh positive. The mother is unable to donate according to local guidelines, having delivered the baby just two weeks earlier by Caesarean section. The father's red cells are crossmatch compatible with the baby's serum using a low ionic reagent (LIR) technique which is similar to LISS; the crossmatch reportedly included both a LIR immediate spin test and a LIR indirect antiglobulin test. The mother's serum was tested against her baby's red cells and against the father's red cells; both tests failed to show the presence of maternal alloantibodies. The father's plasma was tested for **anti-A antibody titer**, which = **128** using a saline indirect antiglobulin test. The inquiring colleague wonders **if a directed donor unit of RBCs collected from the father can be safely transfused to the baby, or if it is necessary to wash the paternal RBC unit before transfusing it?** If the paternal unit is used as a directed donation, it would be irradiated, regardless if it is washed. The local policy for directed donations from blood relatives requires that such units be irradiated to prevent GVHD.

ADDENDA Nov. 2, 2005

14. In response to **ADDENDUM #13 of November 1, 2005** in which a South African physician asks if one should be concerned with the transfusion of group O packed red cells into a two week old Group A Rh positive premature neonate whose parents have opted for directed donations rather than using "banked blood", **a transfusion medicine physician in New York** comments that in his practice **unwashed Group O packed red cells are routinely used for neonates** who need red cell transfusions. In fact, he believes that the use of unwashed red cells for neonates to be the **customary practice in the US**, in that many blood centers routinely provide Pedipaks of group O red cells for neonatal transfusion therapy.

15. Also in response to **ADDENDUM #13**, **a transfusion medicine physician in Central California** is of the opinion that the **most important consideration regarding the directed donation of RBCs from a group O father to his group A child is that the RBC unit be irradiated**. The California physician hopes that the baby's father is truthful in his responses to the donor eligibility questions, since he believes that the mother is potentially a better donor for a variety of reasons, even if she does not qualify by local guidelines because of her recent C-section. Finally, the California physician comments that in his experience an **anti-A titer of 128** in the plasma of a donor RBC unit is **borderline in significance**, but to minimize any potential problems arising from transfusion of anti-A, he would **process the red cells in an additive solution or "wash" them one time**. This could be done just before transfusion and right after irradiation to minimize any problems from potassium leakage induced by the irradiation dose.

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