



OHIO ASSOCIATION OF BLOOD BANKS



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Is Your Weak D Transfusion Policy Weak?

*Christopher L. Gonzalez, MD
Suneeti Sapatnekar, MD, Ph.D
American Red Cross—Northern Ohio Region*

A recent case of a 6 y.o. blood group O, Rh weak D female with ALL, raised the recurring question: Should weak D recipients receive D negative blood products? Ultimately this patient was given O neg blood, but her case additionally fostered this discussion of the management of blood products and recipients that have weak D. Literature review reveals that weak D remains an area of confusion and that there is no consistent approach how weak D patients are transfused. Much of this article is based on Dr. George Garratty's recent editorial (1) and readers are advised to review the reference list for a more in depth discussion.

In the words of the great immunohematologist Dr. Peter Issitt: "Though vastly complex, the Rh blood group system is used at its most basic level in almost every transfusion. The red cells of donors and patients are typed with anti-D" (2). Most D+ cells agglutinate at immediate spin (IS) with anti-D reagent and are unambiguously classified as Rh+. If RBC's negative at IS are further tested with antihuman globulin some are found to be D+. By most current definitions these

cells are said to be "weak D" positive (formerly called D^w). About 0.2 to 1.0% of the population type as weak D (1).

Over 90% of weak D RBC's have a D molecule with normal antigenic sites but a variant intramembranous region that interferes with membrane insertion (3). The weak D expression results from decreased numbers of D molecules inserted into and expressed on the RBC membrane. Because this type of weak D is immunologically identical to normal D it should not be associated with alloimmunization. A minority of weak D cases (less than 10%) are "partial D" variants manifesting as weak D. The partial D molecule is antigenically dissimilar to normal D because it lacks some normal D epitopes. This subtype usually results from mutations that replace the "missing" D epitopes with sequences coded by the RHCE gene (4, 5). Because this partial D subtype of weak D is antigenically different from normal D, some potential for alloimmunization exists.

The risk of alloimmunization from a weak D recipient being transfused with D+ blood or a D negative

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From The OABB President

As everyone is trying to stay warm, the OABB Board has been working to develop an educational program for our Annual Meeting. The meeting this year is in Cleveland, Friday May 5th. Save the date! Speakers from across the country will be sharing their expertise on topics such as Benchmarking, therapeutic apheresis, improving blood safety, new immunosuppressive drugs, and others. We are also hoping to provide a forum for students to present on topics related to Blood Banking.

It is also that time of year for our annual Membership Renewal. There are membership applications available on the website, www.OABB.org, if needed. I would also like to remind members that you are welcome to join a committee of the organization. Membership on a committee is a good way to have input regarding the activities of the organization without a huge time commitment. Committees that I would recommend: Membership, Nominations, Education, and the Newsletter. The Membership Committee addresses the issues of identifying and retaining members of the organization. The Nominations committee is responsible for identifying members interested in serving the organization by becoming a Board member. The Education Committee is involved primarily in planning for the Fall Workshop, and is welcome to provide suggestions on topics or speakers for the Annual Meeting. The Newsletter committee is involved in this publication.

I hope that you plan to attend the upcoming Annual Meeting in Cleveland. If you would like to explore other opportunities in OABB, please email me at nicolk@chi.osu.edu.

I look forward to hearing from you!

Kathleen Nicol, M.D.
OABB President

MS PROGRAM. University-based regional blood center and transfusion service through the College of Allied Health Sciences, University of Cincinnati is accepting applications for Fall quarter 2006 for a 2-year Master's program in Transfusion and Transplantation Sciences. Applicants apply for one of two tracks.

The **Blood Transfusion Medicine** track emphasizes all aspects of transfusion medicine including immunohematology, blood center and transfusion service operations, quality assurance, component therapy, cellular therapies, transplantation immunology and independent research. Students simultaneously fulfill the requirements for the Specialist in Blood Bank Technology (SBB) certification.

The **Cellular Therapies** track emphasizes the biology and therapeutic use of hematopoietic stem cells and other somatic cell therapies. The program includes significant hands-on laboratory experience in selection and genetic manipulation of stem cells and in the development of novel cell therapy treatment protocols.

Application deadline: March 1, 2006.

Contact: Cathy Beiting, MS, MT(ASCP)SBB, Hoxworth Blood Center, University of Cincinnati Medical Center, 3130 Highland Avenue, PO Box 670055, Cincinnati, OH 45267-0055, (513) 558-1275, email: catherine.beiting@uc.edu

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recipient being transfused with weak D blood appears to be very low, although not zero (6). So let us pose the question again: Should weak D recipients receive D negative blood products? Not surprisingly blood bankers come down on both sides of the issue. Some believe that individuals with weak D can safely receive D+ blood because they rarely make anti-D (7), but it is also common practice to transfuse known weak D positive patients with D negative blood (8).

For pretransfusion testing, blood banking policies are very cautious and try to avoid untoward alloanti-D formation. For transfusion recipients AABB standards (9) state: "Rh type shall be determined with anti-D reagent. The test for weak D is unnecessary when testing a patient." With this approach, recipients that are truly weak D will be classified as Rh negative, receive D negative blood and not be exposed to the risk, albeit small, of being alloimmunized with D. Likewise AABB does not require weak D testing of obstetric patients for Rh immune globulin administration.

Should blood donors be tested for weak D? As dictated by the AABB (9): "The Rh type shall be determined for each collection with anti-D reagent. If the initial test with anti-D is negative, the blood shall be tested using a method designed to detect weak D. When either test is positive, the label shall read "Rh POSITIVE". With this approach weak D units of blood are classified as D + and will usually not be given to Rh negative recipients even though the likelihood of alloimmunization is small. Similarly when a D negative mother's baby is tested, weak D status should be assessed; a weak D baby is considered D+ for the purpose of Rh immune globulin prophylaxis (in fact our referral patient was identified as weak D because she had been tested as a neonate).

Even with these policies some unusual situations occur in which contradictions arise. Such a case can be seen with autologous donation. A weak D individual could potentially be typed Rh NEGATIVE as a recipient but their blood products would be typed Rh POSITIVE and this must be administratively reconciled.

References:

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Highlights of 2005 OABB Annual Meeting

The 2005 Annual Meeting of the Ohio Association of Blood Banks was held on Thursday and Friday, April 21 and 22, 2005 at The Holiday Inn French Quarter in Perrysburg, Ohio. The President's Reception was held on Thursday night. About 25 members and speakers attended this event. The time gave the attendees and some of the speakers an opportunity to meet informally and discuss all types of topics, relax and socialize.

On Friday, the meeting opened with the President's Welcome given by OABB President Dr. Kathleen Nicol, MD. OABB Board member Cathy Fincham moderated the morning session. The first topic was titled "Transfusion Medicine Today and Tomorrow" and was presented by past AABB President Kathleen Sazama, MD, JD. She discussed the factors that affect transfusion medicine today and in the future. These factors include the changing population demographics, transfusion medicine practices, cost and reimbursement, and the use of new therapeutics. Demographics are changing in donors, patients, and the workforce. Based on the US Bureau of Census, US citizens aged 65 and up will double by the year 2020. On the plus side, people aged 55 to 75 will be healthier and add bonus years to the workforce. Dr. Sazama explained that the leading causes of death have historically been infectious diseases and acute illness. Today they are primarily chronic disease and degenerative illness.

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This will change the way we will distribute resources. Transfusion needs have increased 10% since 1999 with the most dramatic increase in the transfusion of platelets. Dr. Sazama then presented the implications on the workforce that affects all of the health care fields. In the past 20 years, the supply of health care workers has not kept up with the demand. She presented several options to attract individuals to the transfusion medicine field, one of which is to utilize the professional's bonus years in the workforce. Human blood donations will continue to be important. Donor recruitment will have to continue in order to increase the number of donors in the US which is currently about 5% of the population. The new campaign, aimed at 17 to 24 year olds, is critical in keeping up with the loss of WWII donors. Future blood collections will be customized to collect only the components that are needed. Reimbursement issues that were discussed focused on why costs have increased since 1982 due to the explosion in testing. During the same time, transfusion services have not coded correctly for this service. Dr Sazama concluded her discussion reviewing the history of cellular therapeutics and how future use of these will offset some transfusion needs.

The discussion changed gears focusing on "First Order Change Management: A Foundational System for Success!" that was presented by Lisa Walters, PhD, MBA, MT(ASCP)SBB,QSA(IRCA). Dr. Walters began by differentiating second order change from first order. The second order change is a macro change that results in a brand new set of actions for all members. First order changes, on the other hand, are considered a micro change with incremental adjustments and day-to-day fine-tuning. First order changes may affect only one unit of an organization. Either type of successful change progresses through a predictable pattern. The "Thaw" phase prepares members for change. The "Change" phase moves members to the new arrangement, and the "Refreeze" phase addresses unanticipated problems. First order change control ensures that systems or process changes are designed, validated, and implemented so that unexpected results of the changes are minimized, thereby ensuring that changes provide the expected outcome. Dr. Walters shared that change will happen, and it is best to look for it yourself rather than having to react to it.

When selecting changes, choose those with an easy implementation first because it is motivating when success comes from the visible progress. Additionally, this will prepare you for dealing with tougher changes. According to Dr. Walters there are five critical control points when implementing change. These are: Analyze, Plan, Do, Check, and Act. Elements in the first order change management give framework for the management of the larger second order change. Dr. Walters concluded that change management is the backbone of any organization. If it is not done adequately, processes suffer either apparently or silently.

The morning session concluded with the Annual Meeting of the Membership. President Kathy Nicol commented on how well attended the meeting was. She encouraged the membership to become more involved in their organization by contributing whatever capacity they can. President-Elect Gregg Witham asked for nominations from the floor for a chairman of the Regulatory Committee. There being none, anyone interested in the position was asked to see Gregg. He also announced that there will be two vacancies on the Board of Directors next year and asked for nominees in these regions. Committee reports were presented and election of officers followed. Continuing on the Board of Directors are: Suneeti Sapatnekar, MD, Cathy Fincham, and Kathleen Nagy serving for their second term. Those serving for their third term are: Kirby Reinhart, MD, William Cornell, MD, Mary Schumacher as Secretary, and Michelle Bartkowiak as Treasurer. Cindy Condrey was appointed to chair the Membership Committee.

The afternoon session was moderated by OABB Board member Cathy Shaffner. The first speaker was Nancy Gurney MT(ASCP)SBB, MBA whose topic was the "ISBT Update". She first gave the history of ISBT 128 and explained that it was developed as an International Standard for blood and blood component labeling. ISBT 128 is not in the public domain. Hospitals that have computer systems managing blood, tissue or HPC products, along with those who apply the labels will have to be registered. There have been many timelines set for the implementation of ISBT 128; the FDA is currently expecting completion in 2006. The

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differences between the existing Codabar and ISBT 128 were compared and the benefits of ISBT 128 explained. The standard layout of a blood product label using ISBT 128 was described with there being four quadrants of equal size and standard placement of bar codes on the label. Changing to ISBT 128 is more than just bar-coding. It also provides data identifiers, efficient data transfer, and standardization of data elements. The advantages of this standardization will be realized in better process control, reduced software development time, and improved resource sharing. The session concluded by discussing the need for each institution to develop implementation and contingency plans to facilitate the conversion. AABB members can access the ISBT 128 implantation plan at <http://www.aabb.org/>.

Dr. Robertson Davenport, MD next discussed "Informed Consent for Blood Transfusion". Dr. Davenport began by reviewing several legal cases that have made informed consent both an ethical and legal process. The elements of Informed Consent were reviewed. These elements consist of 1) threshold or the precondition, 2) information, which includes the recommendation and 3) consent that includes the decision and authorization of the plan.

Who should obtain the consent and when it should be obtained were discussed. Several scenarios for both surgical and non-surgical cases were explained taking into account the course of treatment.

The indications for red cell, platelet and plasma transfusion were discussed. The risks of transfusion were broken down to common having little consequences, rare but serious, and very rare but potentially life threatening. Following the risks, the potential benefits, the consequences of refusal, and explaining alternatives to transfusion should be explained to the patient. The Informed Consent process is completed by allowing time for the patient to ask questions and assessing the level of understanding. Documentation of Consent can be accomplished by the use of a form or a note in the Medical chart.

"Cellular Therapies" was presented next by Thomas Gross, MD, PhD. Dr. Gross' discussion focused on the curative type of cellular therapies. These include

the use of stem cells, hematopoietic stem cells for bone marrow transplants (BMT) and non-BMT, and the use of non-hematopoietic cellular therapies. The history of human BMT using marrow and using blood was explained. The use of autologous stem cell transplants can provide advantages over conventional therapy and is an option when the tumor is responsive to chemotherapy and the marrow not involved. The rationale for allogeneic BMT is to eradicate the bone marrow and immune system and rescue them with a source of hematopoietic stem cells. The advantages and disadvantages of using hematopoietic stem cells from peripheral blood versus bone marrow were then presented. Allogeneic BMT has applications in the treatment of malignancies such as leukemia, treatment of bone marrow failure diseases, treatment of immune deficiencies, and treatment of inherited metabolic disorders. The use of hematopoietic stem cells in non-BMT situations is in clinical trials for the repair of cardiac muscle damage. Dr. Gross concluded his discussion with the non-hematopoietic cellular therapy being used in liver and pancreatic islet transplantation.

The last topic of the 2005 OABB Annual Meeting was "Blood Substitutes" presented by George Allen Hides from Northfield Laboratories. Whenever there is acute blood loss, the restoration of total blood volume and the maintenance of sufficient oxygen-carrying capacity are needed.

Blood substitutes could be an option in situations when red cells are temporarily unavailable such as at an accident site, when there is an inadequate supply, or cannot be used because of incompatibility or religious objections. Mr. Hides reviewed the development of several types of blood substitutes. He then presented the data from the clinical trials of PolyHeme, human polymerized hemoglobin, developed by Northfield Laboratories. PolyHeme can be used to replace both lost volume and lost oxygen carrying capacity.

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With a half life of one day, the oxygen carrying capacity is temporary. It was noted that the product is red and could create concern in the transfusion service when interpreting compatibility testing and evaluating immediate adverse reactions of transfused cells after it has been given.

This year's meeting was well attended with over 100 participants. The meeting topics were diverse, providing informative, educational and thought provoking materials that were well received by all in attendance. The 2006 OABB annual meeting will be held in the Cleveland area. Watch for announcements in the OABB Newsletter and make plans to attend.

Submitted by: Gregg W. Witham
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WELCOME NEW MEMBERS!

Andria Kuhlman
American Red Cross

Beverly Robinson
OSU Medical Center

Shari Lovelace
Middletown Regional Hospital

Education Committee Results **December 2004 through 2005**

December 2004

52 of 62 (84%) Institutions responded
100% correct results
AB Positive
Antibody screen Negative

January 2005, paper problem

41 of 65 (63%) Institutions responded
35 of 41 (85%) correct results
6 of 41 (15%) incorrect results
Antibody ID: Anti-Fya and Anti-Jka

July 2005

48 of 65 (74%) Institutions responded
38 of 48 (79%) correct results
10 of 48 (21%) incorrect results
B Negative, Positive screen
Antibody ID: Anti-D and Anti- Fya

September 2005

52 of 57 (91%) Responded
100% correct responses
AB Positive, Negative Antibody Screen

November 2005

45 of 56 (80%) responded
100% correct responses
A Positive, positive screen
Antibody ID: Anti- Fya

OABB Newsletter Submissions

Letters, articles, and announcements of upcoming events may be submitted at any time.

Classified advertisements will be accepted from any member institution and printed at no charge.



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