

Summer 2005



Special Interest Articles:

Page 2

Transfusion of Adult Patients

Page 3 – 4

Neonatal and Paediatric Transfusion

Inserts

FALL Meeting 2005 Flyer

President's Message-Karla Smith_{MT(ASCP)SBB}

As summer turns into fall, its time for us to begin thinking about the fall meeting. This year it will be held on Saturday, September 24 at General Butler State Park in Carrollton, Kentucky.

Our Education Committee has worked diligently planning for the fall meeting. They have scheduled an array of topics for all to enjoy. The meeting program is attached to this issue of Channels.

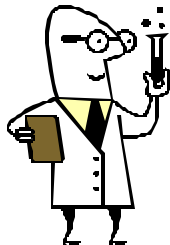
KABB is proud to introduce online registration for the fall meeting. For more details and to register, go to www.kabb.org or you can mail in the attached registration form.

If you have any suggestions, ideas for future educational topics, comments, or would like to become more active in KABB, please contact me at karla@disneydog.com.

2006 Meetings Information

KABB/ KSCLS Spring 2006 Meeting
Tuesday & Wednesday, March 7 & 8, 2006
Crowne Plaza Hotel - The Campbell House
Lexington, KY

KABB Fall 2006 Meeting
Saturday, September 16, 2006
Cumberland Falls State Park
Corbin, KY



JOB OPPORTUNITIES

The American Red Cross Reference Laboratory (Louisville, KY) has a 2nd shift Reference Technologist position open. The hours are from 3pm – 11:30 pm, M-F including weekend on-call rotation. Bachelor's degree in Science or equivalent with MT (ASCP) certification or equivalent certification required. Minimum of two years recent blood bank experience preferred. BB or SBB preferred. For more information or if you have any questions please contact us at 1-888-820-1327 / 540-7044 or come by our downtown location to pickup an application.

CKBC(Lexington, KY), a non-profit, community-based blood center seeks medical technologist to perform and interpret serological procedures on specimens submitted for compatibility testing or problem resolution. Will resolve typing problems, antibody problems, and crossmatch problems; and communicate with hospitals as needed. 2nd shift, 3-11:30 p.m., M-F, including on-call rotation. MT(ASCP) with minimum two years recent blood bank experience, MT(ASCP)SBB preferred. Strong written and oral communication skills, a do-what-it-takes work ethic, and a team player attitude required. Competitive salary, comprehensive benefits including health/dental/life, LTD, paid vacations/holidays, EAP, 403(b) retirement savings plan, and pension plan. **Please send cover letter and resume to:** CKBC, Attn: HR 330 Waller Avenue Lexington, KY 40504 jobs@ckbc.org
CKBC is a drug-free and EOE. www.ckbc.org

If anyone would like to advertise a job opening in the state please e-mail the request to thackerd@usa.redcross.org. Before I put them in Channels I will call to verify the position is still available. Listings will depend on available space.



TRANSFUSION OF ADULT PATIENTS by Dr. Elpidio Pena:

Medical Directors for Central Kentucky Blood Center. For questions or comments pertaining to this article, please email Dr. Pena at: epena2@email.uky.edu

DURING THE YEAR 2001 ABOUT 29 MILLION UNITS OF BLOOD COMPONENTS WERE TRANSFUSED. THE MAJORITY OF THESE TRANSFUSIONS WENT TO ADULT PATIENTS. IN THIS BRIEF REVIEW WE WILL DISCUSS THE MAIN INDICATIONS FOR TRANSFUSIONS IN THE ADULT POPULATION AND THE MOST COMMON SIGNS AND SYMPTOMS OF TRANSFUSION REACTIONS.

ONE OF THE MAIN COMPONENTS TRANSFUSED IS RED BLOOD CELLS (RBCS). THE GOAL OF TRANSFUSING RBCS IS TO INCREASE THE RBCS MASS, INCREASING THE OXYGEN-CARRYING CAPACITY AND DELIVERY OF OXYGEN TO TISSUES. THE INDICATIONS FOR TRANSFUSION ARE BASED IN THE CLINICAL SYMPTOMS OF THE PATIENT. AN ANEMIC PATIENT USUALLY WILL HAVE A PULSE RATE ABOVE 100/MIN, A RESPIRATORY RATE GREATER THAN 30/MIN AND OTHER SYMPTOMS THAT INCLUDE, BUT ARE NOT LIMITED TO WEAKNESS, DIZZINESS AND CHEST PAIN. A PATIENT WITH THESE SYMPTOMS MOST LIKELY WILL HAVE HEMOGLOBIN BELOW 7 G/DL, WHICH IS USUALLY THE TRANSFUSION TRIGGER VALUE.

RBCS TRANSFUSIONS SHOULD NOT BE GIVEN FOR REASON OTHER THAN ANEMIA. A UNIT OF RBCS HAS A HEMATOCRIT OF 55-70% AND IS EXPECTED TO INCREASE THE HEMOGLOBIN BY 1 G/DL OR 3% IN THE HEMATOCRIT. CURRENTLY, MOST RBCS UNITS ARE LEUKOCYTE-REDUCED. THE INDICATION FOR SPECIAL RBCS PRODUCTS (IRRADIATION, WASHING) WILL BE DISCUSSED IN A FUTURE ARTICLE.

PLATELETS ARE THE PRINCIPAL PLAYERS IN THE PRIMARY HEMOSTASIS PROCESS. THEIR MAIN INDICATION IS TO TREAT BLEEDING DUE TO THROMBOCYTOPENIA OR PLATELET DYSFUNCTION AND TO PREVENT BLEEDING IN THROMBOCYTOPENIC PATIENTS. OTHER INDICATIONS ARE DISSEMINATED INTRAVASCULAR COAGULATION (DIC), PATIENTS WHO HAVE RECEIVED MASSIVE TRANSFUSIONS (REPLACEMENT OF A PATIENT BLOOD VOLUME IN A 24 HOUR-PERIOD) AND THROMBOCYTOPENIC PATIENTS WHO WILL UNDERGO SURGERY. AS A PROPHYLACTIC TREATMENT THE TRIGGER VALUE IS A PLATELET COUNT OF LESS THAN 10,000/?L. PLATELETS CAN BE DERIVED FROM WHOLE BLOOD (PLATELET CONCENTRATE), USUALLY TRANSFUSED IN PACK OF SIX UNITS OR APHERESIS PLATELETS. A UNIT OF APHERESIS PLATELETS OR A SIX-PACK SHOULD INCREASE THE PLATELET COUNT BY 30,000 TO 50,000/?L. FAILURE TO REACH AN ADEQUATE INCREMENT CAN BE DUE TO MANY CAUSES INCLUDING BLEEDING, FEVER AND SPLENOMEGALY. IF ANY OF THESE ARE NOT PRESENT, THE PATIENT MIGHT BE REFRACTORY DUE TO HLA SENSITIZATION. IN THIS CASE A PLATELET COUNT TAKEN AN HOUR AFTER THE TRANSFUSION WILL SHOW A POOR INCREMENT OR NO INCREMENT AT ALL, WHEREAS WHEN THE POOR INCREMENT IS DUE TO NON-IMMUNE CAUSES THE ONE-HOUR PLATELET COUNT MOST LIKELY WILL SHOW AN ADEQUATE INCREMENT.

FRESH FROZEN PLASMA (FFP) IS ONE OF THE BLOOD COMPONENTS THAT IS FREQUENTLY TRANSFUSED WITHOUT PROPER INDICATION. FFP CONTAINS ALL COAGULATION FACTORS AND IT SHOULD BE USED TO TREAT BLEEDING (AND ON OCCASION AS PROPHYLAXIS), IN PATIENTS WITH MULTIPLE COAGULATION FACTOR DEFICIENCY, LIKE LIVER FAILURE, DIC AND MASSIVE TRANSFUSION. IT CAN BE USED TO REVERSE THE WARFARIN EFFECT. THE TRANSFUSION TRIGGER FOR FFP IS AN INR OF MORE THAN 1.5 OR A PTT OF MORE THAN 55. FFP SHOULD NOT BE USED FOR BLOOD VOLUME EXPANSION OR FOR REPLACEMENT OF PROTEINS.

CRYOPRECIPITATE (CRYO) WAS USED IN THE PAST TO TREAT HEMOPHILIA, BECAUSE IT CONTAINS FACTOR VIII. IT IS ALSO RICH IN VWF, FACTOR XIII AND FIBRINOGEN. CURRENTLY ITS MAIN USE IS AS FIBRINOGEN REPLACEMENT IN PATIENTS BLEEDING BECAUSE OF LOW FIBRINOGEN. CRYO IS TRANSFUSED WHEN FIBRINOGEN VALUES ARE LESS THAN 100 MG/DL. CRYO IS ALSO USED DURING SURGERY AS FIBRIN SEALANT.

THE TRANSFUSION OF ANY OF THESE BLOOD COMPONENTS COULD CAUSE AN ADVERSE EVENT RANGING FROM AN ACUTE HEMOLYTIC TRANSFUSION REACTION TO THE TRANSMISSION OF AN INFECTIOUS DISEASE. PART OF OUR DAILY ROUTINE AS BLOOD BANKERS IS THE EDUCATION OF THE HOSPITAL STAFF IN RECOGNIZING THE SIGNS AND SYMPTOMS OF A TRANSFUSION REACTION, SPECIALLY THE ACUTE ONES. A TRANSFUSION REACTION IS CONSIDERED ACUTE IF IT OCCURS WITHIN 24 HOURS OF THE ADMINISTRATION OF THE BLOOD/BLOOD COMPONENT.

VERY OFTEN THE BLOOD BANK STAFF IS CONSULTED WHEN A TRANSFUSION REACTION IS SUSPECTED, THAT IS WHY THE BLOOD BANKER SHOULD RECOGNIZE THE SIGNS AND SYMPTOMS OF TRANSFUSION REACTIONS AND SHOULD BE ABLE TO SUGGEST A POSSIBLE ETIOLOGY.

MOST ACUTE TRANSFUSION REACTIONS PRESENT WITH ONE OR MORE OF THESE SIGNS AND SYMPTOMS:

- FEVER: A VERY COMMON PRESENTATION WITH SEVERAL POSSIBLE CAUSES RANGING FROM A BENIGN FEBRILE NON-HEMOLYTIC TRANSFUSION REACTION TO A SEVERE HEMOLYTIC REACTION OR A POSSIBLE FATAL BACTERIAL CONTAMINATION CASE. FEVER DURING OR AFTER TRANSFUSION SHOULD BE INVESTIGATED CAREFULLY.
- HIVES OR ITCHING: ANOTHER COMMON PRESENTATION. IF IT IS NOT ASSOCIATED WITH OTHER SYMPTOMS AND IT COVERS LESS THAN 25% OF THE BODY SURFACE IS USUALLY A BENIGN ALLERGIC REACTION.
- DYSPNEA: IT IS ALMOST ALWAYS AN OMINOUS SIGN. THREE POSSIBLE ETIOLOGIES ARE: ANAPHYLAXIS, TRANSFUSION ASSOCIATED CIRCULATORY OVERLOAD OR TRANSFUSION RELATED ACUTE LUNG INJURY (TRALI).
- HYPOTENSION: IS A SERIOUS SIGN WHEN PRESENT. IT COULD BE DUE TO SEVERAL CAUSES INCLUDING TRALI, SEPSIS DUE TO BACTERIAL CONTAMINATION, ANAPHYLAXIS OR ACUTE HEMOLYTIC TRANSFUSION REACTION.

AS BLOOD BANKERS WE SHOULD BE MINDFUL OF THESE SYMPTOMS, TAKING IN CONSIDERATION THAT FOR THE LAST TWO YEARS, THE MOST COMMON CAUSE OF TRANSFUSION ASSOCIATED DEATHS REPORTED TO THE FDA WERE HEMOLYTIC TRANSFUSION REACTIONS, SEPSIS DUE TO BACTERIAL CONTAMINATION OF BLOOD PRODUCTS AND TRALI.

Neonatal and Paediatric Transfusion.

By Muhammad A Nadeem MD. Fellow Blood Bank / Transfusion Medicine.
University of Louisville, KY. Email: m0nade01@gwise.louisville.edu

The paediatric transfusion is divided into two periods: Neonate from birth through 4 months and older infants (>4 months) and children. Advances in medical care now permit the survival of extremely premature neonates. The ill neonates are more likely than hospitalized patient of any other age group to receive red cell transfusion. The full term newborns have a blood volume of 85 ml/kg and preterm low birth weight newborns have an average blood volume of 100ml/kg. The need for frequent lab tests has made replacement of iatrogenic blood loss the most common indication for transfusion of low birth weight preterm neonates.



When is Blood transfusion indicated?

- **PROBLEMS ASSOCIATED WITH PREGNANCY**
 - Anemia.
 - Respiratory distress syndrome (RDS)
 - Haemorrhage due to vasa praevia, abruptio placenta and cord accidents.
 - Sepsis.
 - Disseminated intravascular coagulation (DIC)
- **HAEMOLYTIC DISEASE OF THE NEWBORN (HDN).**
- **IMMATURITY OF THE HAEMATOLOGICAL SYSTEM**
 - Hemoglobin F.
 - Deficiency of vitamin-K dependant coagulation factors.
 - Poor marrow reserves.

In University of Louisville, KY, major indications for Neonatal transfusion are:

- Anticipated intraoperative blood loss.
- Hematocrit <40% or hemoglobin < 13gm/dl in neonates < 24 hours old.
- Hematocrit <25% or hemoglobin < 8gm/dl in newborn infant with clinical manifestation of anemia.
- Hematocrit <40% in infants with respiratory distress, cyanotic heart disease.
- Acute blood loss > 10% of total blood volume.

What type of Blood / RBCs should be used?

Because the neonates and young infants are immunologically immature, alloimmunization to red cell are rare during the neonatal period. Because of rarity of alloimmunization, AABB *Standards* for Blood Banks and Transfusion Services requires only limited pretransfusion serological testing for infants under 4 months old. Initial testing must includes ABO and D typing of red cells from infants and screen for red cell antibodies can be done on mother serum or plasma.

The Blood / RBCs should be:

- Blood Group O Positive and O Negative depending on infants' blood group.
- Kell blood group negative.
- CMV Negative.
- Leukocyte reduced.
- Irradiated at time of blood issue.
- For exchange transfusion RBCs should be less than 5 days old and Sickle cell screen negative.
- Administered via the special Neonatal Set.
- Transfused within 30 minutes of product receipt and complete transfusion within 4 hours of spiking pack.

Method used for Neonatal Transfusion

Because the small volume requirements of transfusion, we can prepare several aliquots from a single whole blood donor unit, thus limiting donor exposure and decreasing donor related risks. A multiple-pack system is a common technique for providing small red cell volumes. A Quad pack, where a single unit of whole blood is collected into a bag with four integrally attached containers, allows all four aliquots to have the expiration date of the original unit. Each aliquot must be fully labeled, as it is prepared.

Vascular access is difficult in the tiny newborn and within a short time after birth; the umbilical artery may be cannulated. Transfusion through a needle as small as 25-gauge or a vascular catheter of a 24-gauge has been shown to cause little hemolysis.

More commonly, a single donor platelepheresis component is used for multiple aliquots utilizing a sterile welding device for attaching syringes

What type of Blood/ RBCs should be used?

With duration of storage the extracellular potassium increases, PH fall and RBC 2,3-diphosphoglycerate declines so we prefer to give fresh blood >5 days old. The RBCs used for pediatric transfusion are traditionally stored in CPDA-1 but when the dose of transfused red cell is small (5-15ml/ kg) the recipient is exposed to small amount of preservative solution and RBCs stored in AS-1 and AS-3 solution has apparent no detrimental effect.

A transfusion of 10 ml/kg of red cells in additive solution, which has a hematocrit of approximately 65%, will result in a post transfusion hemoglobin increment of approximately 3 g/dl.

How to reduce the need for RBC / Blood transfusion in Neonates?

To prevent and reduce the severity of anemia and to reduce the donor exposure or risk associated with RBC transfusion, we can use following strategies:

- Delayed clamping of the umbilical cord.
- Restricting blood sampling.
- Using recombinant human erythropoietin to stimulate erythropoiesis
- Collecting and transfusing umbilical cord blood (autologous blood transfusion).
- Using iron and vitamins supplementations to minimize the severity of anemia.

REFERENCES

1. AABB Technical Manual Fifteenth edition.
2. Red cell transfusion in newborn infants (Canadian Pediatric Society).



TRANSFUSION MEDICINE QUESTIONS

- 1) The most common infectious adverse effects of blood transfusion is:
 - A) Urticaria
 - B) Hemolytic transfusion reaction
 - C) Hepatitis
 - D) Bacterial contamination

- 2) Which of the following is the least common presentation of a delayed hemolytic transfusion reaction?
 - A) Hemoglobinemia
 - B) Declining hemoglobin
 - C) Positive DAT
 - D) Positive antibody screen

- 3) Which of the following patients would benefit most from the transfusion of CMV-negative blood components?
 - A) Renal transplant patient
 - B) A patient receiving hematopoietic progenitor cells transplantation
 - C) A patient with sickle cell disease undergoing therapeutic plasma exchange
 - D) AIDS patient

- 4) Which of the following immediate procedures is NOT required by the AABB *Standards* in the investigation of a suspected hemolytic transfusion reaction?
 - A) Checking the labels on the blood containers and all records
 - B) Comparing the pretransfusion and posttransfusion serum or plasma
 - C) Repeating the ABO on the posttransfusion sample
 - D) Repeating the antibody screen on the pretransfusion sample
 - E) Performing a DAT on the posttransfusion sample

- 5) A 78-year-old female patient was transfused with 4 units of Red Blood Cells in the past 6 hours. She is now coughing, cyanotic, and is having difficulty catching her breath. Which of the following types of transfusion reactions is she likely experiencing?
 - A) Hemolytic
 - B) Circulatory overload
 - C) Allergic
 - D) Febrile

- 6) Therapeutic plasma exchange is least effective in treating patient with:
 - A) High titer IgG anti-D
 - B) Circulating immune complexes
 - C) Autoimmune disease
 - D) Waldenstrom's macroglobulinemia

Questions and answers from SBB "Last Chance" Review , Gulf Coast Regional Blood Center, Houston, Texas

See Page 6 for Answers to the above questions.

TRANSFUSION MEDICINE WORD SEARCH

BY SHARON NOBLE

T R A N S F E A R E V E F
P U R P U R A D E U S I O
F N R E F A C T E S I O N
A T S N L R A R E M U A C
I A O O U S A M P L A A I
N C C I S L A S T I F A N
T H V S H L O N H E E T H
I Y O N I I A T B H S N O
N C M E N H B R R H L O O
G A I T G C I R O D N B A
N R T O K L A C E I R W A
N D I P E I K T A S T O H
A I N Y D P P P E P O T S
N A G H D I Z Z I N E S S

FIND THE WORDS BELOW:

CHILLS
DIARRHEA
DIZZINESS
EDEMA
FAINTING
FEBRILE
FEVER
FLUSHING
HYPOTENSION

NAUSEA
PAIN
PURPURA
RASH
SHOCK
STOP
TACHYCARDIA
VOMITING

Answers: 1. D 2. A 3. B 4. D 5. B 6. A

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