

June 2011

Patient Case: Mini Child, a 4 year old female, presented in pediatric emergency department with a history of recurring nose bleeds.

Lab Results: Leukocytes $16.1 \times 10^9/L$, Hemoglobin 61g/L, Platelets $15 \times 10^9/L$. Mini's admission diagnosis is Acute Lymphocytic Leukemia and chemotherapy treatment will be initiated.

Despite the pediatric hematologist's detailed information and discussion about blood transfusions, Mini's parents remain concerned. They question Mini's nurse Flo, asking if she would be worried if she or her child ever needed blood transfusions.

QUESTION 1: What issue is likely causing Mini's parents concern (that is, what is the general public's concern regarding blood transfusion)?

- Risk of Human Immunodeficiency Virus (HIV)
- Risk of Hepatitis C Virus (HCV)
- Risk of Hepatitis B Virus (HBV)
- Risk of allergic or febrile transfusion reactions
- Risk of hemolytic transfusion reaction

QUESTION 2 What are the risks (per unit of blood transfused) of HIV, HCV, and HBV (as per Bloody Easy2: Blood Transfusions, Blood Alternatives and Transfusion Reactions Callum JL, Pinkerton PH. 2005)?

- HIV is 1 in 1,000,000; HCV is 1 in 100,000; HBV is 1 in 10,000,000
- HIV is 1 in 100,000; HCV is 1 in 10,000,000; HBV is 1 in 1,000,000
- HIV is 1 in 1 million; HCV is 1 in 1 million; HBV is 1 in 1million
- HIV is 1 in 4.7 million; HCV is 1 in 3.1 million; HBV is 1 in 82 thousand
- HIV, HCV, HBV are no longer risks of transfusion because the blood is treated to eradicate all viruses.

QUESTION 3 What is the #1 serious risk of transfusion (excluding minor allergic and febrile reactions)?

- Infectious disease transmission
- Severe allergic reactions / Anaphylactic reaction
- Transfusion Related Acute Lung Injury (TRALI)
- Transfusion Associated Graft versus Host Disease (TA-GVHD)
- Incorrect Blood Component Transfused (IBCT) related to human error

ANSWERS:

- Usually a. Might also be b or c.
- d
- e

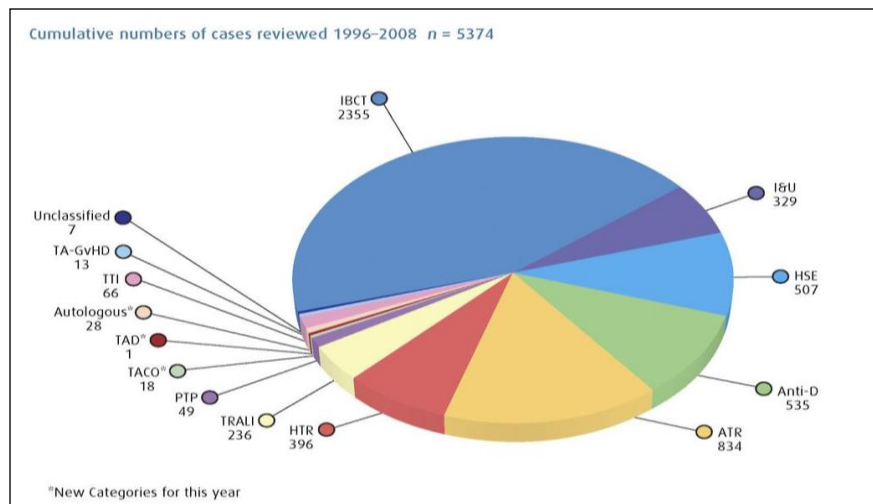
DISCUSSION:

Many people continue to assume the #1 risk of blood transfusion is HIV or HCV or HBV. Blood will never be 100% risk free from viral transmission. However with the extensive screening of blood donors and testing of the donated blood, in Canada the risk (per unit of blood transfused) of transmission of HIV is 1 in 4.7 million, HCV is 1 in 3.1 million and HBV is 1 in 82 thousand (based on Bloody Easy2, 2005 edition). With current increased sensitivity of the testing performed by Canadian Blood Services (CBS), today's risk is even lower than that reported in 2005.

At this time CBS carries out the following tests on all donated blood:

- Hepatitis B Surface Antigen (HBsAg)
- Syphilis
- Antibodies to Hepatitis B core antigen (HBcore), Hepatitis C Virus (HCV), Human T-cell Lymphotropic Virus (HTLV-1 and 2), Human Immune Deficiency Virus (HIV-1 and 2)
- Presence of viral RNA: HIV-1, HCV and West Nile Virus (WNV)
- Presence of viral DNA: Hepatitis B virus (HBV)

The #1 risk of blood transfusion is Incorrect Blood Component Transfused (IBCT). In the pie graph from the Serious Hazards of Transfusion Report (<http://www.shotuk.org/home.htm>) IBCT is represented in the large blue section. IBCT risk is approximately 1 in 27,000 transfusions.



IBCT is the result of human error, often related to inadequate patient identification at specimen collection or at blood administration. The patient's name and PIN number on their armband must always be checked against specimen labels or the label on the unit of blood to ensure unequivocal patient identification. When possible, the patient or family member should participate in confirming patient identification (spelling their name, stating their date of birth). Errors in the laboratory could also lead to IBCT; strict adherence to Standard Operating Procedures is required.

The blood transfusion order needs to be reviewed before a blood product is administered to confirm the correct product and correct dose will be transfused at the correct rate to the correct patient.

For an online review of blood administration (2 module e-learning program), use this link:

<http://www.lhsc.on.ca/lab/bldbank/nurses.htm>

For an e-learning program developed specifically for patients, refer to:

<http://www.transfusionontario.org/patients/index2.html>