



Lecture 8

Non-immune mediated hemolysis

Red cells undergo hemolysis due to:

1. Temperature related damage due to Improper storage or shipping temperatures
Malfunctioning or improper use of blood warmers (use of microwave ovens or hot water baths).

2. Mechanical hemolysis due to Roller pump like used in cardiac surgery Infusion under pressure through small-bore needles.

3. Addition of drugs or hypotonic solutions to blood component or IV solutions

Bacterial Contamination

Bacterial Sources

- Donor skin flora – Donor bacteremia
- Contamination from – Collection
- Processing – during refrigeration (psychrophilic organisms).
- Storage: Bacteria can grow during storage at room temperature.
- Gram-positive and Gram-negative organisms have been implicated – Onset is shortly after transfusion or during the transfusion, but can be delayed.

Platelet products carry the greatest risk (1 in 3000 units may have bacteria) because they are stored at room temperature.

- The decreased risk with apheresis platelets



Transfusing a contaminated unit may uncommonly result in

- severe sepsis (1 in 100,000),
- septic shock and High fever/rigors ($>2^{\circ}$ C increase).
- Renal failure, death, Abdominal cramping/nausea/vomiting.

Blood product may be discolored

Lab. work up TM

- Culture and Gram Stain of Patient Blood
TM
- Possibly DNA and endotoxin testing
TM
- Culture and Gram Stain of Unit

Treatment - Bacterial Contamination

1. Immediately stop the transfusion
2. Notify the hospital blood bank (Prevent other units from the same donor being transfused culture of the blood pack).
3. Blood cultures should be taken before antibiotic given IV antibiotics

Transfusion Associated Circulatory Overload (TACO)

- High volume or rate of transfusion exceeds the ability of the patient's cardiovascular system to handle the additional workload
- Underlying cardiovascular or pulmonary pathology
- Elderly



Symptoms:

- a. Dyspnea, Orthopnea
- b. Hypoxemia
- c. Pulmonary edema
- d. Hypertension (>50 mmHg increase in SBP)
- e. Increased central venous pressure.

Transfusion-Associated Lung Injury (TRALI)

- ❖ TRALI is a syndrome characterized by the development of acute respiratory distress with hypoxemia during or up to 6 hours after completion of a blood transfusion.
- ❖ TRALI is a clinical diagnosis based on patient symptoms that has been associated with all types of blood products

Other complications of transfusion

- Iron overload (repeated transfusion as Sickle cell anemia)
- Metabolic abnormalities
- Hypocalcemia (In large amounts, citrate, a blood preservative that prevents clotting, can lower the level of calcium in the plasma (hypocalcemia), leading to muscle tremors and heart arrhythmias.
- Hyperkalemia (older or damaged RBCs release potassium, and transfusing such blood may cause hyperkalemia (an increased level of potassium) in the patient, putting them at risk of heart arrhythmias
- Hypothermia (blood that is not sufficiently warmed before transfusion)