ارتكاسات نقل الدم

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Transfusion Complications

- Acute Transfusion Reactions (ATR's)
- Chronic Transfusion Reactions
- Transfusion related infections

Acute Transfusion Reactions

- Hemolytic Reactions (AHTR)
- Febrile Reactions (FNHTR)
- Allergic Reactions
- TRALI
- Coagulopathy with Massive transfusions
- Bacteremia

Cause of Acute HTR

- ABO incompatibility:source of error
  - 10% at phlebotomy/labeling
  - 23% in Transfusion Lab
  - 67% transfusion administration (at the bedside)

Frequency of Transfusion Reactions

Adverse Effect	Frequency	Comments
Acute Hemolytic Rxn	1 in 25,000	Red cells only
Anaphylactic hypotensive	1 in 150,000	Including IgA
Febrile Nonhemolytic	1 in 200	Common
Allergic	1 in 1,000	Common
Delayed Hemolytic	1 in 2,500	Red cells only
RBC alloimmunization	1 in 100	Red cells only
WBC/Plt alloimmunization	1 in 10	WBC and Plt only

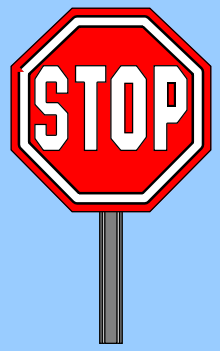
Acute Hemolytic Transfusion Reactions (AHTR)

- Occurs when incompatible RBC's are transfused into a recipient who has pre-formed antibodies (usually ABO or Rh)
- Antibodies activate the complement system, causing intravascular hemolysis
- Symptoms occur within minutes of starting the transfusion
- This hemolytic reaction can occur with as little as 1-2 cc of RBC's
- Labeling error is most common problem

Symptoms of AHTR

- High fever/chills
- Hypotension
- Back/abdominal pain
- Oliguria
- Dyspnea
- Dark urine
- Pallor

What to do?
If an AHTR occurs



- **STOP TRANSFUSION**
- **ABC's**
- Maintain IV access and run IVF (NS or LR)
- Monitor and maintain BP/pulse
- Give diuretic
- Obtain blood and urine for transfusion reaction workup
- Send remaining blood back to Blood Bank

Blood Bank Work-up of AHTR

- Check paperwork to assure no errors
- Check plasma for hemoglobin
- DAT
- Repeat cross-match
- Repeat Blood group typing
- Blood culture

Labs found with AHTR

- Hemoglobinemia
- Hemoglobinuria
- Positive DAT
- Hyperbilirubinemia
- Abnormal DIC panel

Monitoring in AHTR

- Monitor patient clinical status and vital signs
- Monitor renal status (BUN, creatinine)
- Monitor coagulation status (DIC panel– PT/PTT, fibrinogen, D-dimer/FDP, Plt, Antithrombin-III)
- Monitor for signs of hemolysis (LDH, bili, haptoglobin)

Febrile Non-hemolytic Transfusion Reactions (FNHTR)

- Definition--Rise in patient temperature >1°C (associated with transfusion without other fever precipitating factors)
- Occurs with approx 1% of PRBC transfusions and approx 20% of Plt transfusions
- FNHTR caused by alloantibodies directed against HLA antigens
- Need to evaluate for AHTR and infection

What to do?
If an FNHTR occurs

- STOP TRANSFUSION
- Use of Antipyretics—responds to Tylenol
- Use of Corticosteroids for severe reactions
- Use of Narcotics for shaking chills
- Future considerations
  - –May prevent reaction with leukocyte filter
  - –Use single donor platelets
  - – Use fresh platelets
  - – Washed RBC’s or platelets

Washed Blood Products

- PRBC's or platelets washed with saline
- Removes all but traces of plasma (>98%)
- Indicated to prevent recurrent or severe reactions
- Washed RBC's must be used within 24 hours
- RBC dose may be decreased by 10-20% by washing
- Does not prevent GVHD

Allergic Non-hemolytic Transfusion Reactions

- Etiology
  - May be due to plasma proteins or blood preservative/anticoagulant
  - Best characterized with IgA given to an IgA deficient patients with anti-IgA antibodies
- Presents with urticaria and wheezing
- Treatment
  - Mild reactions—Can be continued after Benadryl
  - Severe reactions—Must STOP transfusion and may require steroids or epinephrine

TRALI

Transfusion Related Acute Lung Injury

- Clinical syndrome similar to ARDS
- Occurs 1-6 hours after receiving plasma-containing blood products
- Caused by WBC antibodies present in donor blood that result in pulmonary leukostasis
- Treatment is supportive
- High mortality

Massive Transfusions

- Coagulopathy may occur after transfusion of massive amounts of blood (trauma/surgery)
- Coagulopathy is caused by failure to replace plasma
- See electrolyte abnormalities
  - Due to citrate binding of Calcium
  - Also due to breakdown of stored RBC's

Bacterial Contamination

- More common and more severe with platelet transfusion (platelets are stored at room temperature)
- Organisms
  - Platelets—Gram (+) organisms, ie Staph/Strep
  - RBC's—Yersinia, enterobacter
- Risk increases as blood products age (use fresh products for immunocompromised)

Nursing management

- **Recognise**
  - that signs and symptoms may be due to the transfusion
- **React**
  - immediately STOP transfusion
  - assess and manage patient, follow policy
  - review documentation (in particular check the pt's ID band against blood bag and compatibility report form)
- **Report**
  - to HMO and Blood Bank

Document: (local hospital policy)

- Transfusion Report Form and/or Incident report
- Progress notes
- Investigations – pathology slip

Chronic Transfusion Reactions

- Alloimmunization
- Transfusion Associated Graft Verses Host Disease (GVHD)
- Iron Overload
- Transfusion Transmitted Infection

Alloimmunization

- Can occur with erythrocytes or platelets
- Erythrocytes
  - Antigen disparity of minor antigens (Kell, Duffy, Kidd)
  - Minor antigens D, K, E seen in Sickle patients
- Platelets
  - Usually due to HLA antigens
  - May reduce alloimmunization by leukoreduction (since WBC's present the HLA antigens)

Transfusion Associated GVHD

- Mainly seen in infants, BMT patients, SCID
- Etiology—Results from engraftment of donor lymphocytes of an immunocompetent donor into an immunocompromised host
- Symptoms—Diarrhea, skin rash, pancytopenia
- Usually fatal—no treatment
- Prevention—Irradiation of donor cells

Transfusion Associated Infections

- Hepatitis C
- Hepatitis B
- HIV
- CMV
  - CMV can be diminished by leukoreduction, which is indicated for immunocompromised patients

Prevention

	Leukocyte Depletion Filter	Gamma Irradiation	CMV Negative	Single Donor Platelets (Apheresis)
Febrile Transfusion Reactions	X[1]			X
Alloimmunization	X			X
CMV	?[2]		X	
Transfusion Related GVHD		X		

1 In PRBC transfusion
2 Leukocyte Reduction by filtration may be an alternative to CMV-negative blood

Transfusion Reaction Summary

- AHTR can be fatal
- **Stop the Transfusion**
- Monitor for symptoms and complete evaluation
- FNHTR is a diagnosis of exclusion
- TRALI (ARDS-like reaction)
- Chronic Transfusion reactions
- Prevention methods – using filters, irradiation and premedication