Adverse Reactions to Blood Products


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Transfusion Reactions

Hemolytic Reactions

Hemolytic reactions occur when the recipient's serum contains antibodies directed against the corresponding antigen found on donor red blood cells. This can be an ABO incompatibility or an incompatibility related to a different blood group antigen.

Disseminated intravascular coagulation (DIC), renal failure, and death are not uncommon following this type of reaction.

The most common cause for a major hemolytic transfusion reaction is a clerical error, such as a mislabelled specimen sent to the blood bank, or not properly identifying the patient to whom you are giving the blood. DO NOT ASSUME IT IS SOMEONE ELSE'S RESPONSIBILITY TO CHECK!

Allergic Reactions

Allergic reactions to plasma proteins can range from complaints of hives and itching to anaphylaxis.

Febrile Reactions

White blood cell reactions (febrile reactions) are caused by patient antibodies directed against antigens present on transfused lymphocytes or granulocytes.

Symptoms usually consist of chills and a temperature rise > 1 degree C.

Transfusion related acute lung injury (TRALI)

TRALI is caused when plasma contains HLA or granulocyte specific antibodies which correspond to antigens found on donor WBC's.

Granulocyte enzymes are released, increasing capillary permeability and resulting in sudden pulmonary edema.

Most often occurs with administration of blood products with plasma, such as FFP.

Bacterial Contamination

Bacterial contamination of blood can occur during collection. Bacteria can grow during storage at room temperature and during refrigeration (psychrophilic organisms). Transfusing a contaminated unit can result in septic shock and death.

Circulatory Overload

Circulatory overload can occur with administration of blood or any intravenous fluid, particularly in patients with diminished cardiac function.

Incidence of Transfusion Reactions (U.S.)

Type of Reaction	Relative risk
Allergic	1:500
Febrile	1:1000 to 1:10,000
TRALI	1:5000 to 1:100,000
Hemolytic, fatal	1:250,000 to 1:600,000

Alloimmunization

RBC's

RBC transfusions can expose the patient to RBC antigens not recognized as self. If an antibody is produced, future transfusions can be delayed because extended donor blood typing will be required to identify compatible units.

O negative blood released uncrossmatched in emergencies could result in a hemolytic transfusion reaction if the patient has an alloantibody produced after a previous transfusion.

Alloantibody production in a female can result in hemolytic disease of the newborn.

Platelets

Platelets contain HLA and A & B antigens. Prior exposure to non-self HLA antigens (from WBC contamination of red cell products) can result in antibodies that will render future platelet transfusions useless.

Graft Versus Host Disease (GVHD)

GVHD is a situation where transfused lymphocytes engraft and multiply in immunocompromised patients (e.g., bone marrow transplant patients). The newly engrafted lymphocytes attack the host. This is the opposite of a host rejecting a transplanted organ (e.g., a heart).

Transfusion-associated graft versus host disease (TAGVHD) is a different disease from GVHD in allogeneic bone marrow transplant recipients. TAGVHD is uniformly fatal and untreatable. It occurs when the blood products contain T-lymphocytes and attack many host tissues. It occurs when the recipient is immunocompromised

TAGHVD is prevented by gamma-irradiating the blood products to be transfused.

 Go to the section on Apheresis.

 Return to the Blood Bank tutorial menu.