Fourth stage

Blood transfusion

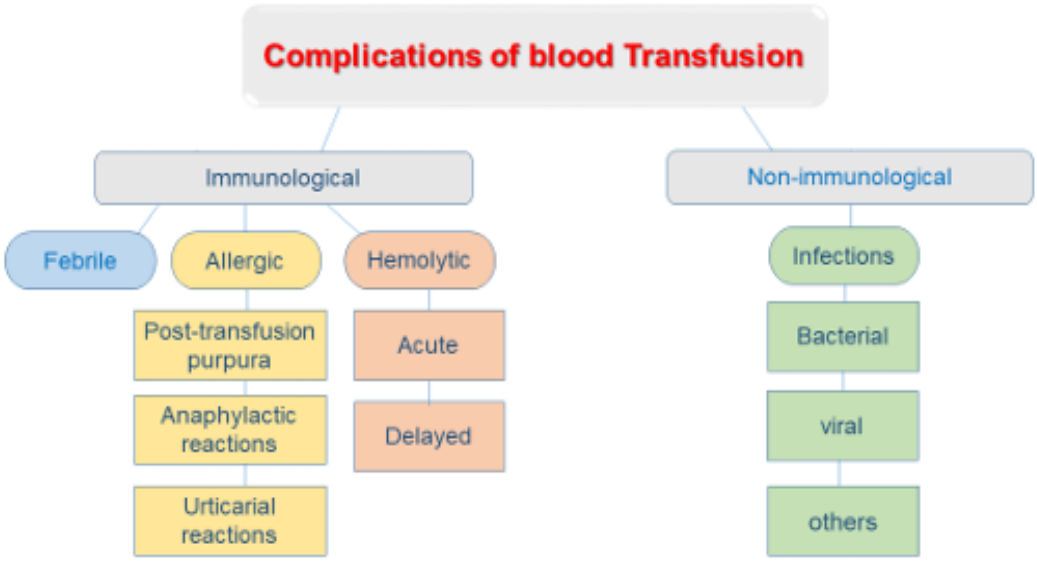
Complications of blood Transfusion

Assistant Lecturer

Mohammed Sami abdul Ameer

Introduction

- Blood transfusion complications are disorders whose symptoms appear during the transfusion of blood units or some blood components to the patient Or within 24 hours of a blood transfusion
- A blood transfusion is a very safe procedure but complications can occur and the patient should recognize it in case it happens.
- Sometimes the patient may have an allergic reaction to the blood transfused to him, and this may happen even when he is given the correct blood group. These allergic reactions range from mild to serious.
- Signs of allergic reactions include anxiety, back or chest pain, increased heart rate, low blood pressure, breathing disorder, fever, shivering, and nausea.



Febrile (non-hemolytic) reaction

Reason: Antibodies in the donor's blood attack the white blood cell antigens (HLA), triggering inflammatory chemical signals that contribute to raising the temperature.

Signs and symptoms: Fever, chills, mild dyspnea.

Management: includes slowing the transfusion rate, antipyretics, (no need to terminate the transfusion).

Allergic reactions

Reactions to platelets antigens (Post-transfusion Purpura - PTP)

Reason: They occur after transfusion of blood products and are associated with the presence in the patient's blood of antibodies directed against the platelets of both the donor and recipient HPA (human platelet antigen).

Signs and symptoms: purpura, petechiae, accompanied by bleeding (due to severe thrombocytopenia).

Management: It is usually self-limiting and platelet count is normal within 2 weeks.

Allergic reactions

Antibodies to plasma proteins (anaphylactic reactions)

Reason: caused by hypersensitivity to donor plasma proteins and, if severe, can result in anaphylactic shock, the reaction is triggered by IgG antibodies that recognize IgA in the infused blood product (in patients with IgA deficiency).

Signs and symptoms: angioedema (→ facial edema, dyspnoea), and hypotension (pruritus, urticaria, fever, rigors).

Management: stopping transfusion, O_2 and fluid support.

Allergic reactions

Antibodies to plasma proteins (urticarial reactions)

Reason: These are caused by IgE anti-allergen antibodies. When antibodies are bound to its antigens, histamine is released from mast cells and basophils. Either IgE antibodies from the donor's or recipient's side can cause the allergic reaction.

Signs and symptoms: present with urticaria, which can occur during, in the end, or shortly after a transfusion, flushing, dyspnea, and vomiting. No other allergic findings are present (there is no angioedema or hypotension,).

Management: This can be controlled by stopping the transfusion and giving antihistamines.

Hemolytic reactions

Acute hemolytic transfusion reactions

Reason: is caused by ABO incompatibility (performed IgM antibodies against donor red cells), "natural" IgM antibodies, usually against blood group antigens A or B, bind to red cells and rapidly induce complement-mediated lysis intravascular hemolysis + production of the anaphylatoxins (the C3a & C5a).

Signs and symptoms:

- shortness of breath
- Throbbing headache
- Flushing of the face

Management:

- Stop the transfusion immediately.
- Check vital signs (temperature, pulse rate, respiratory rate, BP, O2 saturation).
- Check the identity of the recipient and details on the blood unit.
- Check the urine for hemoglobinuria.

Hemolytic reactions

Delayed hemolytic transfusion reactions

Reason: These are typically caused by antibodies (IgG) which are present in low titer and are not detected at the time of cross-matching (so this reaction is neither predictable nor preventable!).

Signs and symptoms: fever, jaundice, low hemoglobin level.

Management: associated with a positive direct Coombs test, and laboratory features of hemolysis (e.g., elevated LDH).

Infectious complications

Reactions due to bacterial pyrogens or bacteria

Blood may be contaminated by microorganisms that utilize citrate as the primary source of carbon, which leads to citrate depletion and hence clotting of blood.

- Yersinia
- Serratia
- Escherichia coli
- Pseudomonas

Infectious complications

Transmission of viral Infection

- Hepatitis viruses
- Human immunodeficiency virus
- Human T-cell leukaemia virus
- Herpes viruses

Other Infectious

- Malaria
- Leishmania

Also Happens

- Increased blood volume: It occurs when an anemic patient is given a whole blood bag without separating its components, as he should be given only RBC.
- Hyperkalemia: The storage of blood results in a small increase in extra-cellular potassium concentration, which will increase the longer it is stored. Is rare, but is most likely to occur during the course of a large-volume transfusion of whole blood.
- Hemosiderosis: With repeated blood transfusions permanently, there is an excess of iron in the patient's body, and this condition occurs largely in thalassemia patients.