



اسم المادة و الكورس

PRE_MEDICATION BEFORE TRANSFUSION & BLOOD GROUP

Sawa University

جامعة ساوة الاهلية

College of health and medical techniques

كلية التقنيات الصحية والطبية

Department of Medical Laboratories

قسم تقنيات المختبرات الطبية

..... Stage

المرحلة 4...

محاضرة رقم ..2.....

الجانب النظري

Lecture No.

Theoretical

تدريسي المادة :الدكتور علي عواد

Overview

Pre medication before transfusion.

Blood types.(ABO system and RH System)



PRE-MEDICATION BEFORE TRANSFUSION

Allergic reaction, anaphylaxis, hemolytic, non hemolytic reactions are the most common adverse reactions.

Dangerous side effects from transfusion such as sepsis due to contaminated blood products and intravascular red cell haemolysis.

In an effort to prevent these reactions, patients are given drugs prior to transfusion.

Here some drugs are used before transfusion :-

- Antihistamine {diphenhydramine hydrochloride [benadryl, diphen]}
- Analgesics and antipyretics{ Acetaminophen [Tylenol, Panadol]}
- Osmotic diuretics {mannitol injection 20 percent USP [osmitrol]}
- Vasopressors {Epinephrine [Epi-Pen, Adrenaline], Dopamine [Inotropin]}
- Loop diuretics{Furosemide [Lasix]}

BLOOD TYPES

- *A blood group is an inherited feature.*

Because blood types are responsible for the interactions between cells such as red blood cells and the immune system, it is important that the blood cells match.

➤ *THERE ARE FOUR BLOOD TYPES:*

- A
- B
- AB
- O

Introduction

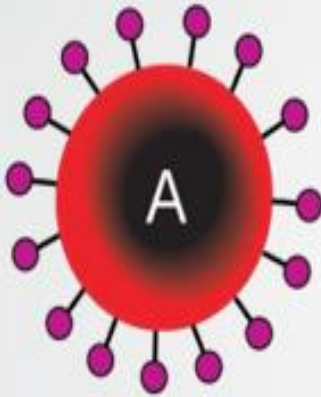
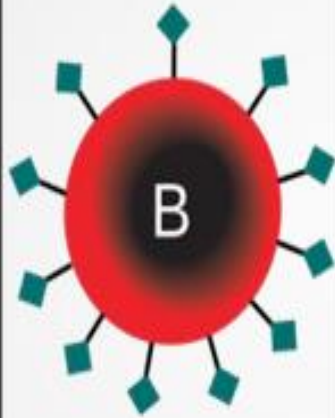
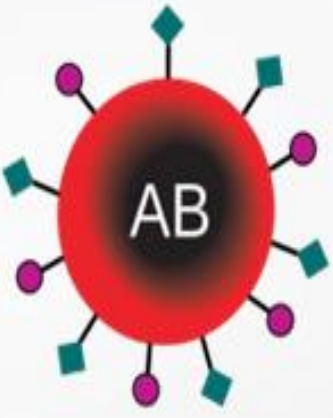
□ The surfaces of the RBCs contain numerous glycoprotein markers known as antigens (Ag). There are many different types of antigens , but the most common are the **A,B, & D antigens** (D is also known as the Rh factor).

According to the presence of these antigens , human blood can be classified into many groups.

□ About 6 months after birth , lymphocytes begin to produce certain antibodies (Ab) which are proteins that circulate in the blood plasma . These Ab are isolated from the plasma & used as anti-sera in the laboratory to determine blood types .

□ **Blood grouping** : also called blood typing, is a test performed to define the individual blood group and it is performed by mixing anti-ABO and anti-Rh agglutinins (antibodies, anti-sera) with the RBCs .

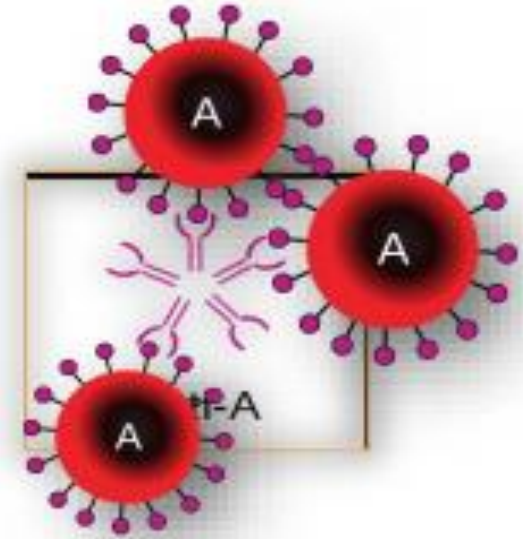
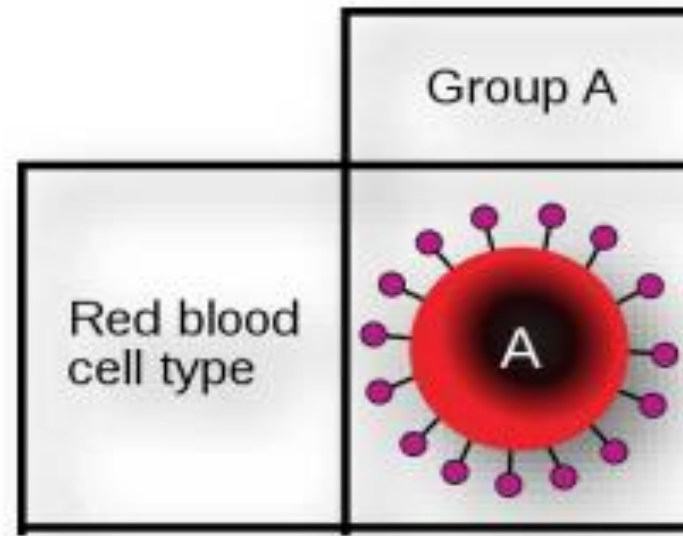
□ **The erythrocytes** of a person contain blood group antigens on the surface of the membrane. When these antigens are allowed to treat with corresponding antibodies (**agglutinins**), antigen-antibody reaction occurs and form agglutination.

	Group A	Group B	Group AB	Group O
Red blood cell type				
Antibodies in Plasma	 Anti-B	 Anti-A	None	 Anti-A and Anti-B
Antigens in Red Blood Cell	 A antigen	 B antigen	 A and B antigens	None

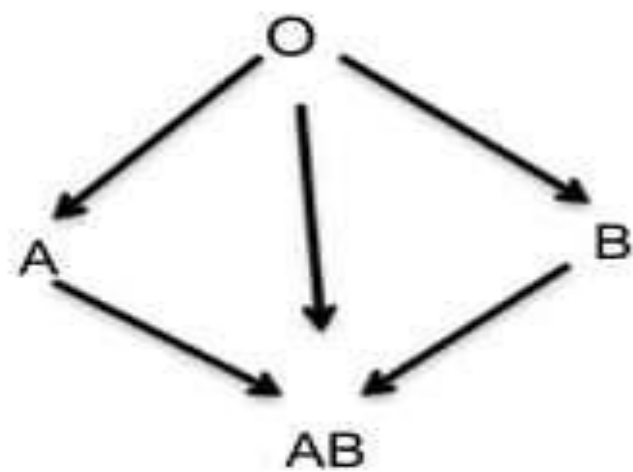
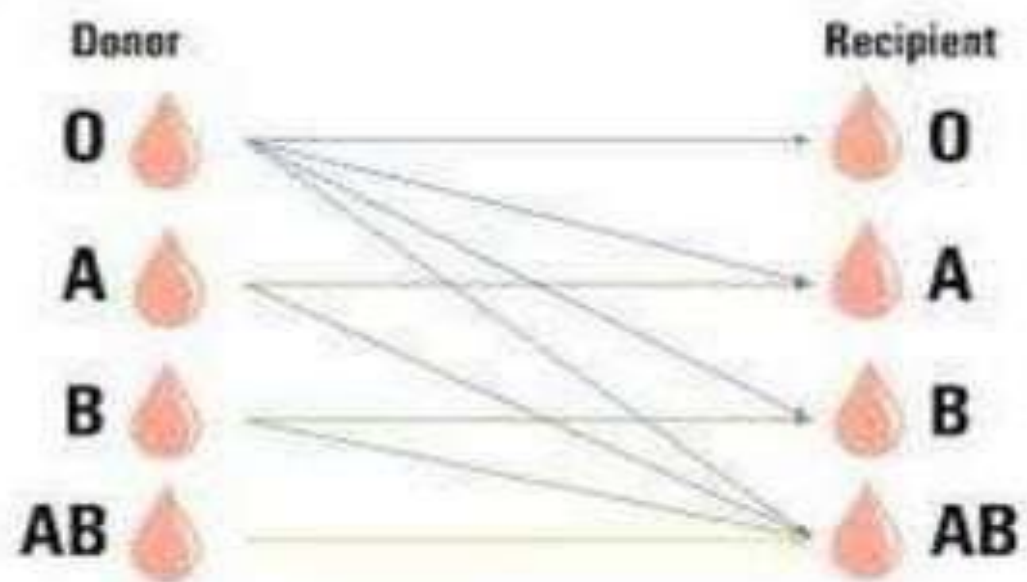
Blood Groups

Blood Group	Antigens	Antibodies	Can give blood (RBC) to	Can receive blood (RBC) from
AB	A and B	None	AB	AB, A, B, O
A	A	B	A and AB	A and O
B	B	A	B and AB	B and O
O	None	A and B	AB, A, B, O	O

Agglutination



Anti-B



Blood types and
their
compatibility

- Group O can donate blood to anybody. Its universal donor. But can only receive O.
- Group A can donate blood to A's and AB's.
- Group B can donate blood to B's and AB's.
- Group AB can donate to other AB's. But can receive from any type. Its universal recipient.
- People with Rh- positive blood can get Rh- positive or Rh- negative.
- But people with Rh- negative blood should get only Rh- negative blood.



BLOOD GROUP	ANTIGENS	ANTIBODIES	CAN GIVE BLOOD TO...	CAN RECEIVE BLOOD FROM
AB	A and B	None	AB	AB, A, B, O
A	A	B	A and AB	A and O
B	B	A	B and AB	B and O
O	None	A and B	AB, A, B, O	O

□ There are two important blood group systems :

1. ABO system (the most important blood group system in blood transfusion)

2. Rh system (the most important blood group system after ABO) □

The difference between ABO and Rh system is that in ABO , the agglutinins are formed spontaneously and can cause immediate reaction .

While in Rh system ,a spontaneous formation of agglutinins does not occur which can cause only delayed reactions.

There are 6 common types of Rh antigens these are C,D,E,c,d,e .

- The most common is the D antigen . Any body that has D agglutinogens is Rh positive .
- The antibodies to Rh antigens do not occur naturally but can occur after blood transfusion and during pregnancy .
- The percentage of people who are Rh+ is 75– 85 % .

RH factor • In addition to antigens of ABO system, the red cells of humans also contain an additional antigen, called Rh antigen (or Rh factor).

- There are several varieties of Rh antigen—C, D, E, c, d, and e—but the D antigen is the most common, and antigenically, the most potent. Therefore, Rh +ve persons are also called D +ve and Rh –ve are called D –ve. (Rh –).
- Persons whose red cells contain this additional antigen are called “Rh positive” (Rh +) while those who lack this antigen are called “Rh negative”

- However, there are no naturally occurring antibodies against Rh (D) antigen.
- The Rh (D) antigen is not present in body fluids and tissues, but only on red 

Clinical Significance of Rh factor

- Although there are no natural anti-Rh antibodies, and they never develop spontaneously, they can be produced only in Rh –ve persons. This can happen in either of 2 ways: •

In transfusions. When an Rh –ve person receives Rh +ve blood, there is no immediate reaction since there are no antibodies. But during the next few weeks/months, he/she may produce anti-Rh antibodies that will remain in the blood. (Even 0.5 ml of Rh +ve blood is enough to produce immune response).

However, if within a few weeks, or even years later, a second Rh +ve blood is injected, the newly donated red cells will be agglutinated and hemolysed, thus resulting in a serious transfusion reaction.

In pregnancy. The most common problem due to Rh incompatibility may arise when an Rh –ve mother (phenotype dd) carries an Rh +ve fetus

- Normally, no direct contact occurs between maternal and fetal bloods. However, if a small amount of Rh +ve blood leaks (at the time of delivery) from the fetus through the placenta into the mother's blood, the mother's immune system will start to make anti- Rh antibodies.
- As a result, some mothers develop high concentration of anti-Rh antibodies during the period following delivery. Therefore, the first-born baby will not be affected.

- However, during the second and subsequent pregnancies, the mother's "erythroblastosis fetalis" anti-Rh antibodies cross the placental membrane into the fetus where they cause agglutination and hemolysis. The clinical condition that develops in the fetus is called "hemolytic disease of the newborn (HDN)" or erythroblastosis fetalis" Also called, Erythroblastosis Fetalis
- **Mother is Blood type Rh-, Father and fetus are Rh+**
- **First pregnancy = sensitization at delivery due to hemorrhage**
- **Second pregnancy = Mother produce anti-Rh IgG antibodies that cross placenta to attack fetal RBCs leading to hemolysis**

PROCEDURE

➔ PREPROCEDURE

- *Confirm that the transfusion has been prescribed.*
- *Check that patient's blood has been typed and cross-matched.*
- *Verify that patient has signed a written consent form per institution or agency policy.*
- *Explain the procedure to the patient.*
- *Take patient's temperature, pulse, respiration, and blood pressure.*
- *Use hand hygiene and wear gloves in accordance with standard precautions.*
- *Use a 20-gauge or large needle for insertion in a large vein. Use special tubing that contains a blood filter to screen out fibrin clots and other particulate matter. Do not vent the blood container.*

REFERENCE :

mollison's blood transfusion in clinical medicine,

Standards for Blood Banks & Blood Transfusion Services



Any questions?

*Thank
You*