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BLOOD GROUP SYSTEMS AND BLOOD TRANSFUSION	عنوان المحاضرة باللغة الانجليزية
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محتوى المحاضرة



BLOOD GROUP SYSTEMS and blood transfusion

More than 20 genetically determined blood group systems are known today. But, Landsteiner discovered two blood group systems called the ABO system and the Rh system. These two blood group systems are the most important ones that are determined before blood transfusions.

ABO SYSTEM

- Blood having antigen A belongs to 'A' group. This blood has β -antibody in the serum.
- Blood with antigen B and α -antibody belongs to 'B' group.
- If both the antigens are present, blood group is called 'AB' group and serum of this group does not contain any antibody.
- If both antigens are absent, the blood group is called 'O' group and both α and β antibodies are present in the serum.

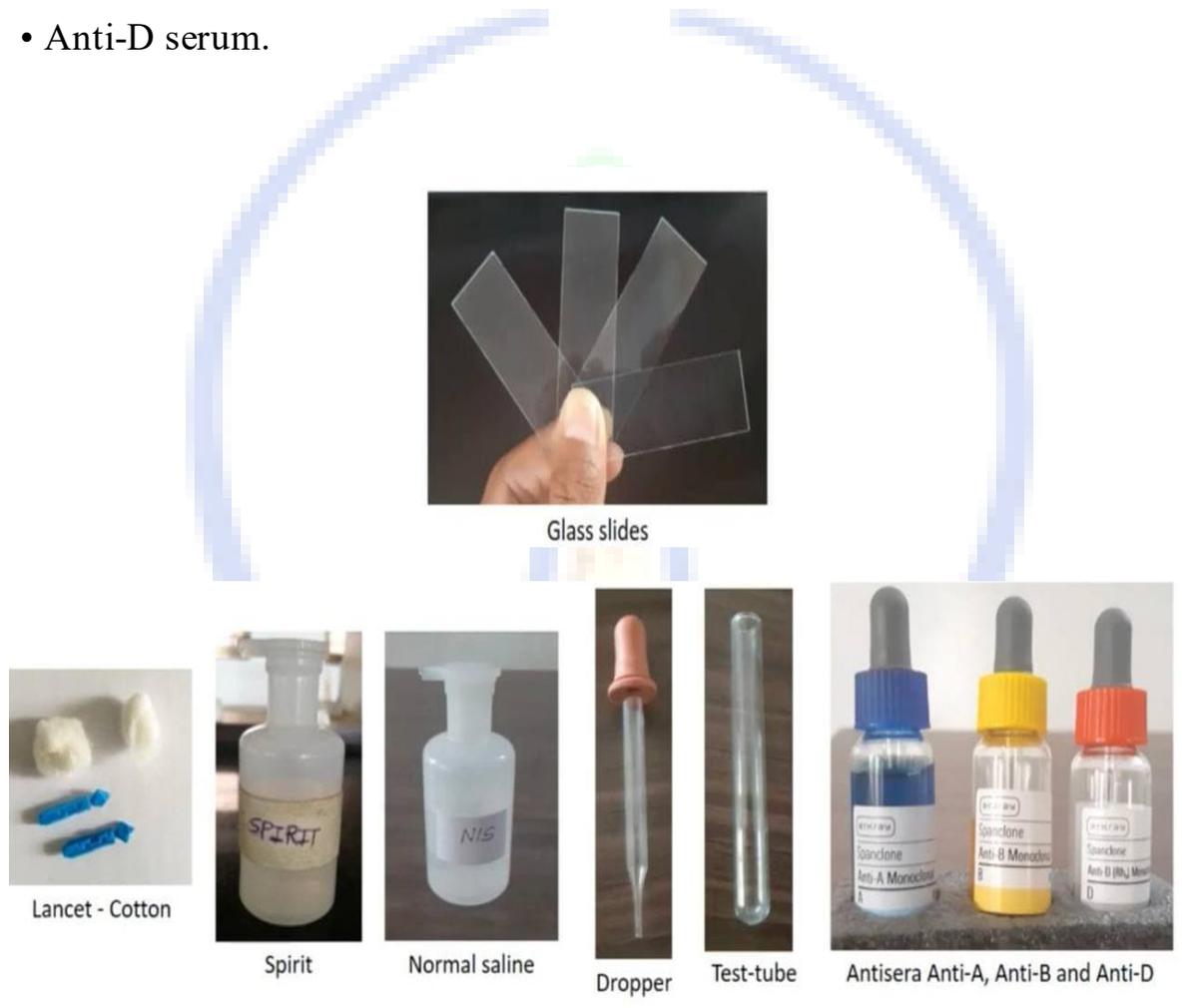
PRINCIPLE

- The RBCs contain a series of antigens known as agglutinogens on their cell membrane while
- the plasma contains antibodies known as agglutinins. To find out a person's blood group the
- RBCs are made to react with sera containing known agglutinins. The slide is then observed
- for the presence or absence of agglutination and hemolysis of RBC. This can be done with the
- naked eyes but is ideally done by viewing the slide under the microscope.

APPARATUS AND REAGENTS REQUIRED

- Sterile lancet
- Cotton swab
- Alcohol
- Glass dropper

- porcelain tile
- Toothpicks
- Anti-A serum
- Anti-B serum
- Anti-D serum.



PROCEDURE

With a glass marking pencil, the porcelain tile is divided into 3 portions. Under aseptic conditions the subject whose blood group is to be determined is asked to stick out his finger which porcelain tile is pricked and 3–4 drops of blood is then obtained.

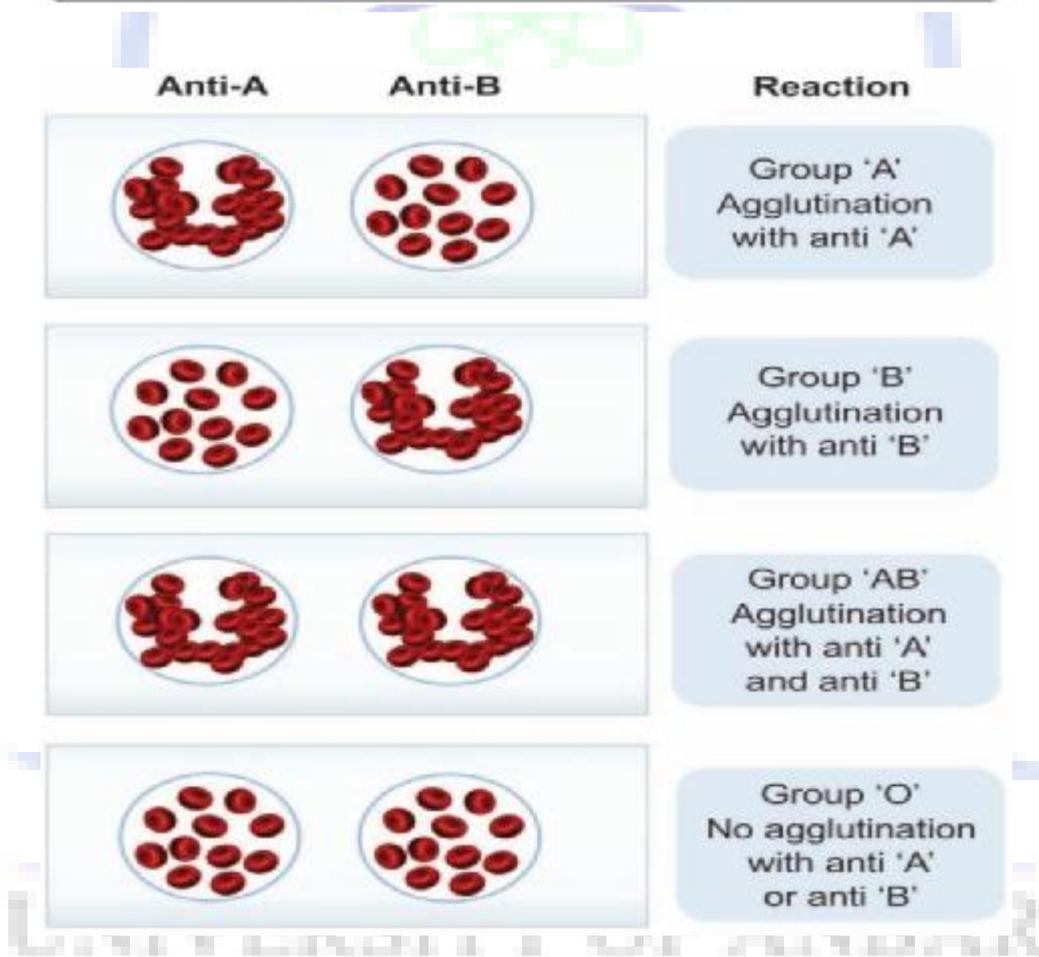
A drop of anti-A, anti-B and anti-D sera is placed on each of the 3 portions on the tile. Now, 1 drop of the diluted blood is put on each of the 3 portions containing the sera. This is mixed with 3 separate toothpicks. After 10–15 minutes each portion is examined for clumping and agglutination first with the naked eyes and then under the microscope

OBSERVATION AND RESULTS

If any agglutination occurs, it is usually visible to the naked eye as dark red clumps of different sizes. The presence or absence of agglutination indicates the blood group of the subject as shown in the following table:

AGGLUTINATION OF SUBJECT'S BLOOD GROUP

With anti-A serum	With anti-B serum	Blood group
Present	Absent	A
Absent	Present	B
Present	Absent	AB
Absent	Present	O

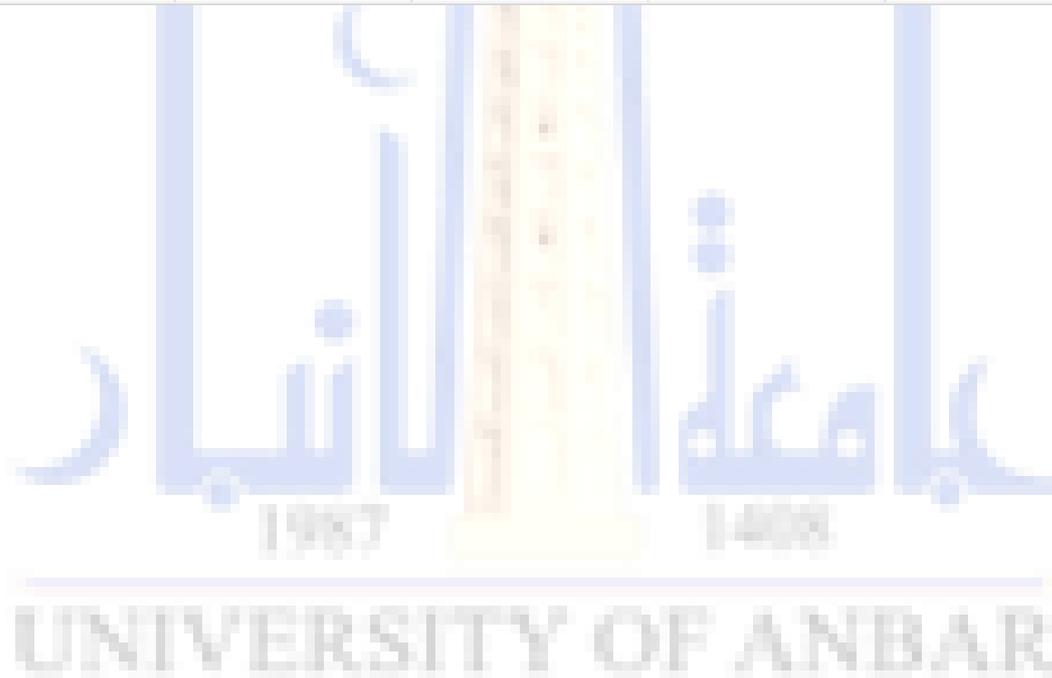


The importance of knowing blood group is:

1. Medically, it is important during blood transfusions and in tissue transplants.
2. Socially, one should know his or her own blood group and become a member of the Blood Donor's Club so that he or she can be approached for blood donation during emergency conditions.

3. It general among the couples helps to prevent the complications due to Rh incompatibility and save the child from the disorders like erythroblastosis fetalis.
4. helpful in medico-legal cases to sort out parental disputes.

Blood Group	Antigens	Antibodies	Can give blood to	Can receive blood from
AB	A and B	None	AB	AB, A, B, O
A	A	anti-B	A and AB	A and O
B	B	anti-A	B and AB	B and O
O	None	anti-A and anti-B	AB, A, B, O	O



Blood transfusion;

- is the process of transferring blood or blood components from one person (the donor) into the bloodstream of another person (the recipient).

- Transfusion is done as a life-saving procedure to replace blood cells or blood products lost through bleeding.



Blood transfusion is essential in the following conditions:

1. Anemia
2. Hemorrhage
3. Trauma
4. Burns
5. Surgery

Hazards of blood transfusion are of four types:

1. Reactions due to mismatched (incompatible) blood transfusion – transfusion reactions

- Fever
- Allergy

2. Reactions due to massive blood transfusion ; It leads to

- Circulatory shock
- Hyperkalemia
- Hypocalcemia
- i v. Hemosiderosis

3. Reactions due to faulty techniques during blood transfusion leads to:

- Thrombophlebitis
- Air embolism

4. Transmission of infections;

- HIV
- Hepatitis B,C and A
- Bacterial infections.

EXCHANGE TRANSFUSION

Exchange transfusion is the procedure which involves removal of patient's blood completely and replacement with fresh blood or plasma of the donor. It is otherwise known as replacement transfusion. It is an important life-saving procedure carried out in conditions such as severe jaundice, sickle cell anemia, erythroblastosis fetalis, toxicity of certain drugs. etc.

