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Karl Landsteiner - Father of Discovery of the Major Blood Groups

Blood Grouping for Clinical Practice

Dr. Rajib De*

Blood group antigens are molecules present on the surface of red blood cells.

There are 30 types of blood groups, each group consisting of several antigens.

ABO group is most immunogenic and most important from transfusion point of view.

ABO blood group consists of A & B Antigen on RBC surface and corresponding opposite naturally occurring antibody(Anti-B, Anti-A respectively) in plasma.

To confirm ABO grouping both forward (for Ag on RBC) and reverse (for corresponding opposite Ab in plasma) grouping as well as detection of H Ag must be done.

For RBC Transfusion, group must be same or compatible and should be properly crossmatched.

Crossmatch involves testing donor RBC with patient's plasma (Major crossmatch: Most important for transfusion) and patient's RBC with donor plasma (Minor crossmatch: not important for transfusion).

Bombay blood group means absence of H antigen with presence of corresponding anti H Ab in the plasma.

Bombay blood group patients can be given only Bombay group RBC as anti H in plasma can destroy all other group RBC including group O.

After A & B Ag, Rh D Ag is most immunogenic and should be matched before transfusion as Rh+(D Ag present), Rh- (D Ag absent).

RBC transfusion should be ABO & Rh(D) compatible.

ABO blood group is not necessary for Random Donor Platelet(RDP) and Cryoprecipitate transfusion.

Rh(D) grouping is not applicable for FFP, RDP, Cryoprecipitate transfusion.

Blood group O are sometimes known as universal donors due to absence of A or B Ags. However, their plasma does contain anti-A and anti-B that, if present in high titre, has the potential to haemolyse the RBCs of non-group O recipients.

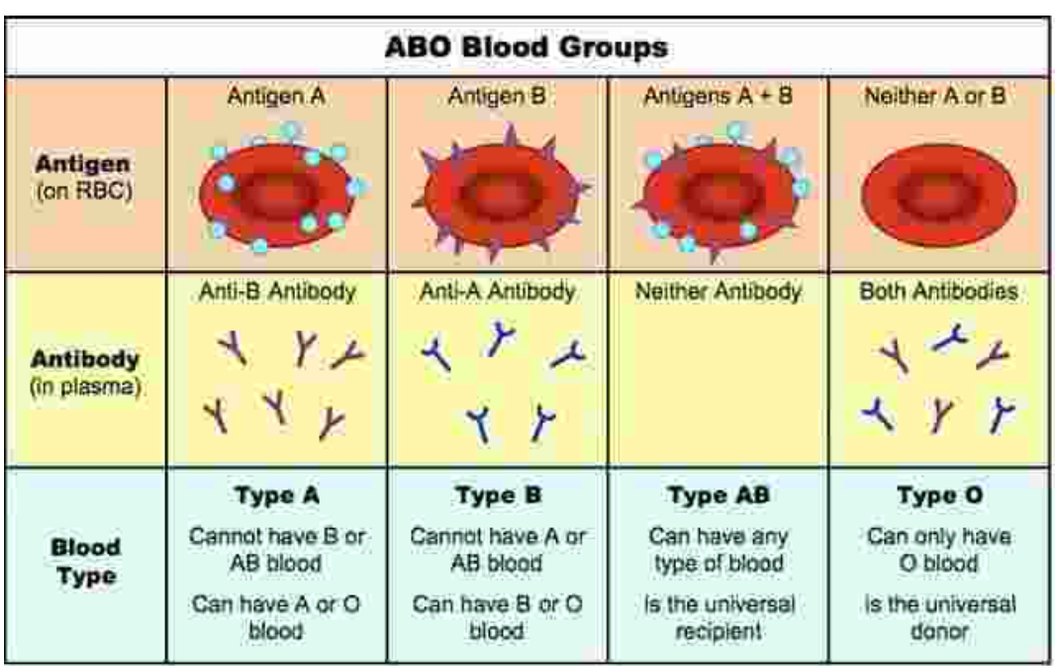
Blood group antigen expression is suboptimal upto 6 month of age, reach adult level at 5-10 years of age and again decline in older age > 65 years .

ABO and Rh(D) grouping is sufficient for occasional transfusion.

For multi-transfused patients extended grouping like Rh(C,c,E,e) and Kell are necessary to prevent alloantibody formation.

Grouping is best done by Tube method, Gel card or automated platforms. Slide method is not recommended for grouping.

Certain diseases like Leukemia, Multiple Myeloma, Autoimmune Haemolytic Anaemia etc can cause group discrepancy (discrepancy in forward & reverse grouping).



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