KHARKIV NATIONAL MEDICAL UNIVERSITY

ISIC-2020

KHARKIV NATIONAL MEDICAL UNIVERSITY

BIOMEDICAL SCIENCES

Akansha Singh

PECULIARITIES OF SOME BLOOD GROUP SYSTEMS IN BLOOD

Kharkiv National Medical University
Department of Physiology
Kharkiv, Ukraine
Scientific advisor: prof. Alina Goncharova

“A single pint can save three lives, a single gesture can create a million smiles.” This beautiful quote is about the life saving process, Blood transfusion. It is the process of transferring blood or blood components from one person called as the donor to another person called as the recipient. It is important to have knowledge about the physiological basis of blood transfusion because the blood flowing through our veins though of the same colour differs significantly. The main points which are to be kept in mind during blood transfusion are:- Blood type, compatibility, presence of drugs and STD’S. There are 29 different blood group systems including the major ABO type and Rh type. As each blood group systemhas specific antigens on the surface of erythrocytes they become important parameters to be checked before blood transfusion. The other major blood group systems are- MNS, P, Kell, Kidd, Bombay and Lewis. They generally are not considered clinically important but still we shouldn’t ignore them as it may cost the patient’s life.

Kell blood group system consists a group of 28 antigens, found on the surface of erythrocytes which are coded by gene KEL. The major antigens are K and k. They are highly immunogenic and are the third most potent antigens after ABO and Rh groups in triggering an immune reaction. There are reports which show that Kell antigens are expressed very early in erythropoiesis and it’s antibodies can suppress erythropoiesis. It is similar to Rh system and just like RhD antibodies it can cross placental barrier. About 90% of the population is Kell negative. As most of the countries do not test the blood for Kell antigen in case of mismatch of blood during transfusion in pregnant women leads to haemolytic disease of foetus and new-born (HDFN). In comparison to HDFN caused due to rhesus conflict which is mild and can be greatly prevented, this HDFN due to Kell incompatibility leads to severe anaemia in the foetus. This is because the Kell antibodies from the mother target the precursors of erythrocytes of foetus

suppressing erythrocyte production in foetus. As erythrocyte precursors do not contain haemoglobin, bilirubin released is very less and so it rarely causes jaundice but anaemia is vey severe. For this reason according to the NHS it is recommended to screen the blood for Kell and cytomegalovirus incase of blood transfusion intended for pregnant women.

In 1952, another rare blood group system was discovered in Bombay, India known as the Bombay type. This blood group is a case point mutation of H gene and is a case of recessive epistasis. From genetic point presence of hh results in Bombay type. The erythrocytes have an antigen H which is the precursor of ABO group antigens, A antigen and B antigen. If a person has a gene for A antigen or B antigen or both, it will be synthesized from H antigen. In case of O type there are no genes for synthesis of antigens so they only have H antigen in their erythrocytes. In Bombay type this H antigen is absent so the erythrocytes do not have A antigen, B antigen and H antigen. During blood typing, the Bombay type appears to be an O type. The plasma of a Bombay type has anti-A, anti-B and anti-H. This anti-H causes agglutination with the erythrocytes of all types (A type, B type, AB type and also O type) except for the Bombay type. The Bombay type is a universal donor to ABO type. Though the incidence of Bombay type is about 0.0004% (4 per million) of human population, it is still a possibility and for this reason we have to do cross-matching of the blood of the donor and the recipient.

MNS blood group system consists 46 antigens on the surface of erythrocytes. The main antigens are M, N, S, s and U. It has two sets of allele which form a single blood group system. They are MN type and Ss type. The anti-M and anti-N rarely cause transfusion reactions whereas anti-S, anti-s and anti-U cause moderate to severe case of haemolytic disease of foetus and newborn, which can even be fatal. For this reason we have to always do cross-matching before any transfusion.

Blood transfusion in today’s time is very important. It finds application in almost every important situations like in anaemia, accidents, blood disorders, surgery and many more. It saves lives of patients and can save many more. In the late 20th century there

was increase in cases of AIDS because of blood transfusion. Back then the blood wasn't tested for STD'S as a result which thousands of young children suffering from thalassemia were infected. By learning from our mistakes we started testing the blood for infectious diseases before transfusion as a result of which there has been a decline in transmission of disease through blood transfusion over the past few years. Let us hope to save many more lives, learning things on the way and proceeding to a brighter future.

Ananya Dwivedi

PREDICTIONS FOR DEVELOPMENT OF RHINOSINUSITIS

Kharkiv National Medical University
Department of Histology, Cytology and Embryology
Kharkiv, Ukraine
Scientific advisor: Dr. Victoria Alekseeva

OMC is the common channel that connects anterior part of PNS to the middle meatus. It is located on the lateral wall of nasal cavity and allows mucosal drainage and air flow. Anatomical variants in the OMC including haller cells, agger nasi cells, concha bulla or enlarged bulla ethmoidalis can obstruct the mucociliary drainage for clearance through OMC and are the most common causes of chronic rhinosinusitis.

The anatomical variations are evaluated by the help of CT scans as it visualises the anatomical structures and also tells us about the presence or absence of pathological tissues in the paranasal sinuses and also shows the parts that remain inconspicuous during endoscopy. It is important for the surgeon to know these structures to avoid surgical complications that may lead to reoccurrence of the disease in future.

Aim of study

To detect the anatomical variations of the Ostiomeatal complex that predicts the development of inflammatory processes inside the paranasal sinuses and their complications.

Materials and methods

CONTESTS