

Exchange transfusion

Indication

- severe form of morbus hemolyticus neonatorum,
- severe hyperbilirubinemia,
- septic shock
- DIC,
- polycythemia,
- Hereditary metabolic disorders.

Performance technique

- **Simple one-way exchange transfusion**
 - Blood is exchanged through one central venous catheter.
 - In neonatology, access through the umbilical vein is most commonly used.
 - A one-time special kit is used for replacement, the essence of which is a 4-way tap, which enables replacement in a closed manner.
 - The exchange begins with taking the first dose of blood from the patient, followed by the withdrawal of donor blood from the can and its intravenous administration to the patient.
 - The volume of exchanged portions depends on the patient's weight (for patients < 3 kg it is 10 ml, for patients > 3 kg it is 20 ml).
 - With a tendency to bradycardia, we slow down the rate of exchange.
- **Isovolumetric double-way exchange transfusion**
 - 2 vascular approaches are used – the patient's blood is taken from a central venous catheter or through a cannulated artery, while the donor's blood is simultaneously administered into another central or peripheral vein.
 - This method is especially advantageous for patients in intensive care, in whom sudden volume and pressure changes in the vascular bed are not suitable for their serious general condition, and at the same time we take advantage of the fact that these patients often have a cannulated artery or 2 or more venous accesses available.

Choice of blood for exchange transfusion

- When immunized in the Rh system with the mother's blood group A, B, AB we choose Rh negative blood and the same groups as the child.
- during isoimmunization in the ABO system, we choose group 0 erythrocytes suspended in AB plasma;
- during isoimmunization in both systems, we simultaneously choose a mixture of group 0 Rh negative erythrocytes in AB plasma.

Requirements for characteristics of donor blood

- Blood must be tested for HIV, CMV, HBV, HCV, Syphilis;
- in premature infants, the blood should be irradiated because of the risk of graft versus host reaction;
- compatibility test at the bed + biological test is always required.

Volume of blood used

- An adequate amount of blood to be exchanged is equal to 2 to 3 times the volume of the newborn's blood;
- as a rule, 160-180 ml/kg is exchanged, in Anglo-Saxon literature it is referred to as "two volume";
- the blood volume of a full-term baby is estimated at 80 ml/kg, in a premature baby 95 ml/kg;
- after exchange of 100 ml of blood, 1 ml of 10% Ca-gluconicum is always given, because citrated blood binds ionized calcium.

Complications

- Thromboembolism;
- Thrombocytopenia;
- hyperkalemia, hypoglycemia;
- NEC;
- Cardiac failure

Indications for administration of fresh frozen plasma

- No cross-examination is required, but a filter is required;

- replacement of coagulation factors: 10 ml/kg;
- volume expansion: 15-20 ml/kg.

Links

Source

- HAVRÁNEK, Jiří: *Hematologie*. (corrected)