Exchange Transfusion for Newborn Infant

Introduction

Exchange transfusion is an effective procedure to counteract the potential harm of severe jaundice or changes in blood. The procedure involves the incremental removal of the patient's blood and simultaneous replacement with fresh donor blood, saline or plasma.

Description

- Babies usually need to be fasted before and during the procedure. In order to perform an exchange transfusion, we first have to establish ways to remove and replace blood. This involves the insertion of one or two catheters into a vein or an artery. The exchange transfusion proceeds in cycles, each of a few minutes' duration. The patient's blood is slowly drawn out (usually in small volumes of 5 to 20 ml depending on the patient's size), and an equal amount of fresh, prewarmed blood, plasma or physiologic saline is transfused. The cycle is repeated until a predetermined volume of blood has been replaced, and the whole process may take up to 120 minutes.
- After the exchange transfusion, catheters may be left in place for a while in case the procedure needs to be repeated.
- In a condition called polycythaemia (newborn plethora -- when there are too many red blood cells in the body making the blood viscous and difficult to circulate), a target portion of the baby's blood is removed and replaced with normal saline or albumin solution. This decreases the total amount of red blood cells in the body and makes circulation smoother.

Indications

Conditions in which an exchange transfusion may be needed include:

- Severe neonatal jaundice that does not respond to phototherapy (light treatment)
- Haemolytic disease of the newborn
- Neonatal polycythaemia
- Severe chronic anaemia in utero

- Others e.g. severe sepsis, metabolic derangements, intoxications

Risk and Complication

General risks can be divided into transfusion-related and catheter-related. These include:

- Cardiac and respiratory disturbances, arrhythmia
- Low body temperature
- Shock due to bleeding or inadequate replacement of blood
- Procedure related or blood related infection (stringent precaution and infection screening program have greatly reduced this risk)
- Clot formation(causing occlusion of catheters, impairment of blood flow to the organs)
- Alterations in blood chemistry (high or low potassium, low calcium, low glucose, change in pH)
- Rare but severe complications include: air embolism, portal hypertension and necrotising enterocolitis, intraventricular haemorrhage in preterm infants, blood transfusion related complications including allergy, haemolysis from blood group incompatibility, death
- With careful screening and monitoring systems, the risk associated with the procedure will be kept to a minimum

Convalescence

The infant may need to be monitored for several days in the hospital after the exchange transfusion, and the length of stay will depend on the underlying condition for which the exchange transfusion was performed.

Remarks

The list of complications is not exhaustive and other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For any queries or further information, please consult our medical staff.