Less is more (LIM) reducing the amount of blood taken for tests from extremely preterm infants

Ongoing study 2020-2023

Less is more (LIM) is a prospective multicentre clinical trial involving extremely premature babies born before week 27 in a group of 210 babies. Is a randomized study running in three university hospital units (Lund, Gothenburg, Stockholm), in a group of 210 children. Half of the group in the study will have a limitation of blood volumes during sampling with the aim of preserving factors in circulating blood essential for normal development.

Primary endpoint is to reduce the amount of blood currently required to be taken for various test to investigate whether reduced blood sampling and thus loss of blood volume in extremely premature babies leads to a lower incidence of Chronic lung disease, BPD.

Secondary endpoint is to investigate whether reduced blood sampling and thus loss of blood volume increased levels of circulating growth factors, stem cells and level of fetal / adult haemoglobin and reduce number and volume of blood transfusion with adult donor blood. Reduced incidence of neonatal morbidity such as cerebral intraventricular Haemorrhage (IVH), Necrotizing Enterocolitis (NEC) and Retinopathy of Premature infants (ROP). Improved brain development assessed with NIRS at 14 days of age and Magnetic Camera Examination (MRI) at 40 weeks postnatal age and neurocognitive development at 2 and 5.5 years of age and improved health economy sickness and preserving factors essential for the child's normal development.

The study

Once your child is born and admitted to the neonatal ward, they will be chosen at random (randomised) either for blood sampling using the apparatus for analysis of blood gases and CRP normally used (control group) or for blood sampling with analysis of blood gases and CRP using reduced blood volumes (treatment group). We will obtain written consent from parents within 24 hours of the birth, and if you have not agreed to your child participating at this point, the child will be taken out of the study. The clinical information obtained through the respective blood gas and CRP analysis methods is the same. Analysis of blood gases and CRP is conducted according to randomisation during the period of neonatal intensive care for a maximal period of six weeks. Following this period, the standard clinical apparatus is used for all future clinical testing. In order to find out whether different sampling volumes can

impact on the presence of important factors in the blood, blood samples are taken from the umbilical cord on day 1, 7 14 and 28 following birth. The sample from the umbilical cord is taken after the umbilical cord is cut and has no impact at all on the child. The placenta is sent away for a biopsy, which is the common clinical procedure for very preterm deliveries. The other blood samples are taken in conjunction with clinical testing, and there are no additional needlesticks. The sample amounts are very small compared to the routine testing. On days 3, 7, 10 and 14, a sample is taken from the mother's pumped-out breast milk, and a sample of the child's faeces is taken on the same days. These samples are taken to investigate whether reduced sampling volumes have an impact on bacterial growth in the bowel. Reduced blood sample volumes, and the subsequently reduced need for blood transfusions, may hypothetically alter the infant's own stores of iron in the body. This is currently checked with a blood sample included in the clinical procedure on day 28 of life, but will be followed up by a blood sample when the infant is full-term (40 gestational weeks) as well as when you come in for the child's 3-month, 2-year, and 5.5-year check-ups. On each occasion, the child will be given a topical numbing cream at the site where the blood is drawn, which effectively prevents any discomfort from the needle. Your child will undergo an ultrasound examination of the brain as well as regular eye examinations according to the normal clinical procedure. Once the infant has reached full term (40 gestational weeks) a brain examination is conducted using magnetic resonance imaging (MRI). This examination is already conducted on many preterm infants; it is harmless to the child and entails no pain or discomfort. The child is awake during the examination, but may need a mild sedative. At full term, the infant's body composition (proportion of fat and muscle) is also examined in a chamber where the infant can move freely (the examination takes 2 minutes). This examination is then repeated at the age of 3 months. At 3 months of age, we will also examine the infant's spontaneous movements, which is done by filming them for about 5 minutes. At 2 and 5.5 years old, the child will be examined by a paediatrician and psychologist looking at their mental and motor development according to clinical procedure. Other information required for the study is obtained from the medical records of the mother and child, as well as from national and regional registers regarding medicine use, resource consumption in the healthcare sector and guardians' absence from work due to their child's illness.