Feasibility of pulse oximetry screening for critical congenital heart defects after home births and early discharge in the Netherlands: a prospective study

Leiden University Medical Center, Leiden, the Netherlands (1); Cooperation of community midwives in the Leiden region, LEO, Leiden, The Netherlands (2); Department of Pediatrics, Diaconessenhuis Leiden, Leiden, the Netherlands (3); Department of Pediatrics, Rijnland Ziekenhuis, Leiderdorp, the Netherlands (4)

Introduction: Studies have shown evidence for universal neonatal screening for critical congenital heart defects (CCHD) with pulse oximetry (PO). However, the feasibility of CCHD screening after homebirth is unknown. We assess the feasibility of PO screening in the Netherlands, where there is a high percentage of homebirths and early discharge after delivery in hospital.

Methods: From October 2013 a feasibility study was performed in the Leiden region. At home or in hospital pre and post ductal SpO2 are measured ≥1 hour after birth in term low-risk infants using Nellcor PO [figure 1]. The measurement is repeated at day 2 or 3. Infants with positive screenings are assessed at the pediatric department and echocardiography is performed in case of persistent abnormal SpO2. An acceptability questionnaire was sent to the mothers and screeners were asked if the screening should be implemented universally.

Results: 3059 infants have been screened (99% of infants of whom parents consented). In 33 infants screening was positive, of which 6 were not recognized and not referred. In 16 positive referred screenings, we detected 5 non-critical CHD, 5 infants with persistent pulmonary hypertension or wet lung, 1 meconium aspiration, 2 polycythaemias, 3 infants received sepsis therapy. In 9 infants measurements were normal in the hospital. No CCHD was detected and there were no false negative screenings. Median(IQR) pre and post ductal SpO2 in the first hour of life was 99%(98-100) and 99%(97-100) respectively (n=382). Of the responding mothers 69% would absolutely recommend the test to others (25% probably, 6% neutral, 1% probably not, 0% absolutely not). 82% of the screeners think that the screening should be universally implemented in the Netherlands (13% neutral, 5% disagree).

Conclusions: This is the first European pilot study assessing CCHD screening in a country with home birth and early discharge from hospital. In this setting CCHD screening is feasible and detects potential life-threatening pathology in newborns. Median pre and post ductal SpO2 in the first hour of life is already 99%. Most mothers would recommend the test to others and the majority of screeners want the screening to be universally implemented in the Netherlands.