Many things can be read in a newborn's gaze

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Experienced nannies and doctors have always known how much the visual contact with a newborn can convey. Credit: © University of Helsinki / Linda Tammisto

Experienced nannies and doctors have always known how much the visual contact with a newborn can convey. A recent Finnish study provides scientific evidence for this everyday belief. A study performed in the University of Helsinki and the Children's Hospital within Helsinki University Central Hospital shows that the visual abilities of the newborn predict childhood development of visual processing.

The study also showed that the newborn ability to fixate on objects is related to the level of maturation at the microscopic level studied by magnetic resonance imaging. An abnormal newborn fixation associates with widespread changes in the white matter tracts.

These findings support the idea that key cognitive abilities are already present in a newborn infant, and later neurocognitive development proceeds as a cascade that builds on these early cognitive building blocks.

Poor visual cognitive abilities are the most common lifelong compromise in children born very prematurely or with oxygen deprivation at birth, says Dr. Sampsa Vanhatalo, the leader of this study, and adjunct professor in clinical neurophysiology. Learning the early development of visual abilities will hopefully open new pathways to early recognition of cognitive problems, and, consequently, we will learn how to help the infant and prevent development of visual cognitive disabilities, says child neurologist Dr. Aulikki Lano, the head of neurological examinations in the project.

Vanhatalo points out another key conclusion of their study: A well done clinical examination may be as informative of a child's future as many of the technologically advanced research methods currently popular.

Most adults with experience in babysitting or other child care have always paid attention to the eye contact of the child. It is somewhere deep in the back of our minds to note when a newborn has abnormal eye contact, yet its significance has not been shown in scientific studies. Our new study provides evidence as to the scientific relevance of this intuitive experience; however, it also opens new possibilities for developing research and care in pediatric neurology.

These results have convinced us of the necessity to develop objective

and quantitative measures of eye contact in the newborn. They could help us recognize children with developmental risks right after birth. Such a method would open unprecedented vistas in developing new therapeutic interventions that could start from the first months of life, which is even years before the problems become apparent using current approaches, says Dr. Marjo Metsäranta, Adjunct Professor in neonatology.

The study was done in the Children's hospital, Helsinki University Central Hospital, and it analyzed two different cohorts of neonates. The first cohort included 57 babies recruited in 2006 - 2007, and it included 42 extremely preterm infants. At term age, the children were tested for their visual abilities, and scanned with advanced magnetic resonance imaging, followed by neuropsychological assessment at two years of age. The second cohort consisted of 1,410 newborns recruited 1985 - 86 as a part of a very large, population-based follow-up study (called "Arvo Ylppö Longitudinal Study"). Altogether 948 of these infants had been hospitalized for various reasons, and about one-fifth of them were born preterm. These children were re-assessed for general reasoning and visual-motor abilities at five years of age.

The study is published in the *Journal of Neuroscience*.

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