Abstract

Due to advances in prenatal and neonatal medicine, there has been an improved survival rate of premature children over the past decades. Unfortunately, the most premature children have poor neurological and cognitive prognoses. The aetiology for the high proportion of learning disabilities in very premature children, is however often unknown (Grunau R, 2002; Litt, Taylor, Klein, & Hack, 2005). There has been increased awareness of visual problems in premature children, and of visual problems related to learning and reading. The studies reported in this thesis address the development of visual function as well as reading ability in premature children.

A series of visual functions, cognitive- and reading ability were evaluated in a group of typical Norwegian children (n= 87) in order to provide developmental trajectories for these functions. This group acted as the control group for a group of premature children (n= 37), of whom the majority (n= 25) came from an established cohort of extremely premature children from the National Hospital in Oslo. Finally, an intervention study for treatment of binocular visual problems for a subgroup of premature and typical children (n= 27) was executed.

Even when controlling for age, gender and cognitive ability, visual functions were generally weaker in the premature group. Deficiencies found in this group showed patterns that can be related to close work in one plane; a Planar component, and to focusing and binocular abilities; a Depth component. We have shown that convergence and fusion at close distances, which might interfere with near work, can be trained. There is also a possible improvement in ability to detect coherent motion as a result of this training. This ability might relate to learning and reading (Sigmundsson, Anholt, & Talcott, 2010; Stein, 2001). Thus more comprehensive visual examinations and treatment of deficiencies could lead to improved learning abilities in premature children.