Pre-, peri- and postnatal influences on ophthalmologic outcome

a study on children born after intracytoplasmic sperm injection (ICSI) and children born preterm

Akademisk avhandling

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av

Margareta Hök Wikstrand, Leg. läk

Fakultetsopponent: Docent Peter Jakobsson
Ögonkliniken, Universitetssjukhuset i Linköping

Huvudhandledare: Professor Ann Hellström
Bihandledare: Docent Aimon Niklasson

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I. **Hök Wikstrand M**, Strömland K, Flodin S, Bergh C, Wennerholm UB, Hellström A. Ophthalmologic findings in children born after intracytoplasmic sperm injection. *Acta Ophthalmologica Scandinavica 2006;84:177-181.*

II. **Hök Wikstrand M**, Niklasson A, Strömland K and Hellström A. Abnormal vessel morphology in boys born after intracytoplasmic sperm injection. *Acta Paediatrica 2008;97:1512-1517.*

III. **Hök Wikstrand M**, Hård A-L, Niklasson A and Hellström A. Postnatal growth variables are related to ophthalmologic outcome at school age in very preterm children. *Submitted*

IV. **Hök Wikstrand M**, Hård A-L, Niklasson A and Hellström A. Birth weight deviation and early postnatal growth are related to optic nerve morphology at school age in very preterm children. *Submitted*

UNIVERSITY OF GOTHENBURG

Pre-, peri- and postnatal influences on ophthalmologic outcome - a study on children born after intracytoplasmic sperm injection (ICSI) and children born preterm

Margareta Hök Wikstrand, 2009, Department of Ophthalmology, Institute of Neuroscience and Physiology, The Sahlgrenska Academy at University of Gothenburg.

Abstract

The aims of the present study were to investigate the effects of prenatal factors in children born after intracytoplasmic sperm injection (ICSI) and peri- and postnatal factors in children born preterm on visual function and ocular fundus morphology at school age. In the children born preterm the ophthalmologic outcomes, including optic nerve morphology were analysed in relation to gestational age (GA), birth weight (BW) standard deviation score (SDS), serum levels of insulin-like growth factor I (IGF-I), weight at week 32 (SDS), and weight, length and head circumference (SDS) at school age. We found that there was no significant difference in visual function between children born after ICSI (n=137) and matched control children (n=159). Furthermore, we found that boys born after ICSI (n=35) had slightly abnormal retinal vascularisation with significantly fewer central retinal vessel branching points in comparison with the control group (n=203). Among the preterm children (n=66), with a mean GA at birth of 27.5 weeks, 74 % had some kind of ophthalmologic abnormality, and 17 % had visual impairment. Early as well as later growth was closely related to visual acuity and perception at school age. In addition low IGF-I levels and poor growth during the first weeks/months of life were correlated with small head circumference and refraction anomalies at school age. We also found an association between a small neuronal rim area in the optic disc and low BW and poor early growth, indicating the importance of early weight gain for neural development in children born preterm.

A gender specific effect of the ICSI procedure on vascular development in the eyes of the boys cannot be excluded. In the preterm child the early postnatal growth and the growth factor IGF-I seem of importance for optimal development of visual functions, refraction and for head circumference at school age.

Keywords: Visual function, intracytoplasmic sperm injection, preterm birth, growth, insulin-like growth factor I, postnatal development, ocular fundus morphology.

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