

# Accepted Manuscript

Visual Function and Fundus Morphology in Relation to Growth and Cardiovascular Status in 10-Year-Old Moderate-to-Late Preterm Children

Alexandra Lind, Jovanna Dahlgren, Lina Raffa, Kerstin Allvin, Deala Ghazi Mroué, Marita Andersson Grönlund



PII: S0002-9394(18)30430-6

DOI: [10.1016/j.ajo.2018.07.037](https://doi.org/10.1016/j.ajo.2018.07.037)

Reference: AJOPHT 10608

To appear in: *American Journal of Ophthalmology*

Received Date: 21 April 2018

Revised Date: 19 July 2018

Accepted Date: 25 July 2018

Please cite this article as: Lind A, Dahlgren J, Raffa L, Allvin K, Ghazi Mroué D, Andersson Grönlund M, Visual Function and Fundus Morphology in Relation to Growth and Cardiovascular Status in 10-Year-Old Moderate-to-Late Preterm Children, *American Journal of Ophthalmology* (2018), doi: 10.1016/j.ajo.2018.07.037.

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## Abstract

### Purpose

To study visual function and ocular fundus morphology in relation to growth, metabolic status and blood pressure in moderate-to-late preterm (MLP) children at 10 years of age.

### Design

Prospective cohort study.

### Methods

In this population-based observational study, non-syndromic MLP children born in Gothenburg, Sweden, were examined neonatally year 2002–2003 concerning length, weight, head circumference and insulin-like growth factor I (IGF-I). At 10 years of age, 33 children (10 girls) were examined regarding previously mentioned variables, and regarding visual acuity, refraction, fundus morphology, IGF binding protein 3 (IGFBP-3), leptin, adiponectin and blood pressure. An age- and sex-matched control group consisted of 28 children (9 girls).

### Results

Myopia was more commonly found in MLP children than in controls ( $p=0.004$ , 95% CI 1.8–49.8). The MLP group had smaller optic disc area ( $p=0.01$ , 95% CI -0.5–(-0.1)), smaller rim area ( $p=0.001$ , 95% CI -0.5–(-0.2)), less branching points ( $p=0.0001$ , 95% CI -5.7–(-2.1)), higher index of tortuosity of arteries ( $p=0.03$ , 95% CI 0.002–0.03) and veins ( $p=0.02$ , 95% CI 0.003–0.02). Refraction correlated with IGF-I ( $p=0.0005$ ,  $r_s=0.60$  in right eye, and  $p=0.002$ ,  $r_s=0.55$  in left eye) at 10 years of age. Tortuosity of arteries at assessment correlated with neonatal IGF-I levels ( $p=0.03$ ,  $r_s=-0.39$ ). Tortuosity of veins correlated with a leptin/adiponectin ratio at assessment ( $p=0.04$ ,  $r_s=0.37$ ).

### Conclusion

The findings suggest that being born MLP is associated with myopia, smaller optic disc and rim areas, and abnormal retinal vascularization. Furthermore, metabolic status and growth factors seem to have an impact on ocular development.

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