

Fetal Alcohol Spectrum Disorders in Children and Young Adults with an emphasis on ophthalmology

Akademisk avhandling

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Avhandlingen baseras på följande delarbeten

- I. Landgren V, Svensson L, Gyllencreutz E, Aring E, Andersson Grönlund M, Landgren M. Fetal alcohol spectrum disorders from childhood to adulthood: a Swedish population-based naturalistic cohort study of adoptees from eastern Europe. *BMJ Open*. 2019;9(10):e 032407.
- II. Gyllencreutz E, Aring E, Landgren V, Svensson L, Landgren M, Andersson Grönlund M. Ophthalmologic Findings in Fetal Alcohol Spectrum Disorders - A Cohort Study from Childhood to Adulthood. *Am J Ophthalmol*. 2020;214:14–20.
- III. Gyllencreutz E, Aring E, Landgren V, Landgren M, Andersson Grönlund M. Thinner retinal nerve fibre layer in young adults with foetal alcohol spectrum disorders. *Br J Ophthalmol*. 2020;bjophthalmol-2020-316506.
- IV. Gyllencreutz E, Aring E, Landgren V, Svensson L, Landgren M, Andersson Grönlund M. Visual Perception Problems and Quality of Life in Young Adults with Foetal Alcohol Spectrum Disorders. *Submitted manuscript 2020*.

**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR NEUROVETENSKAP
OCH FYSIOLOGI**



Fetal Alcohol Spectrum Disorders in Children and Young Adults with an emphasis on ophthalmology

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Abstract

Introduction: Fetal alcohol spectrum disorders (FASD) are a group of disorders caused by prenatal alcohol exposure (PAE). The most severe and most studied FASD condition is fetal alcohol syndrome. Other conditions include partial fetal alcohol syndrome and alcohol-related neurodevelopmental disorder. Longitudinal reports based on individuals with FASD are few, especially ophthalmological studies.

Aims and Methods: The overall aim of this thesis was to describe the long-term consequences of FASD; both in general (*Paper I*) and with an emphasis on ophthalmological findings (*Paper II–IV*). A total of 71 children adopted from eastern Europe to Sweden were examined by a multidisciplinary team in 2000–2001; 37 of them (13 female [f], median age 8 years [y]) were diagnosed with FASD. Of these 37, 36 were reassessed in 2014–2019 (13 f, median age 22y). A social, medical, psychiatric, psychological, and an ophthalmological evaluation, which included visual acuity, refraction, binocular function, motility, slit lamp examination, optical coherence tomography, structured history-taking of visual perception, and questionnaires regarding quality of life (QoL) were performed. A group of 29 healthy young adults (20 f, median age 25 y) were recruited as controls in *Paper III* and *IV*.

Results: *Paper I:* 14/36 had attended special education, 20/36 were dependent on social welfare or disability pension, 22/32 showed gross motor coordination abnormalities, 29/32 had psychiatric co-morbidity, and 7/32 had attempted suicide. Mean intelligence quotient was low in both childhood (86) and young adulthood (68) (n=29). *Paper II:* Ophthalmological findings such as astigmatism (14/30), strabismus (13/30), and optic nerve abnormalities (11/30) were common. Findings from childhood persisted into young adulthood. *Paper III:* The peripapillary and macular nerve fiber layers were thinner in the FASD group than in the controls. *Paper IV:* Visual perception problems were more common in the FASD group, and self-reported health-related and vision-related QoL scores were lower than in the controls.

Conclusion: These long-term follow-up studies show that the young adults with FASD in our cohort have general health problems including psychiatric disorders, impaired cognitive function, poor QoL, and ophthalmological conditions such as astigmatism, strabismus, structural abnormalities, and VPPs. The long-lasting effects of PAE must be considered when evaluating young adults with complex health issues. Given the high frequency of ophthalmological aberrations, an ophthalmological evaluation of individuals with FASD is important in both childhood and early adulthood.

Keywords: Fetal Alcohol Syndrome, Optic nerve, Optical Coherence Tomography, Strabismus, Vision, Visual Perception, Quality of Life