



**Karolinska
Institutet**

**Institutionen för Klinisk Neurovetenskap
Sektionen för Ögon och Syn**

**VISUO-MOTOR PERFORMANCE IN CHILDREN VISUALLY IMPAIRED DUE
TO FETAL ALCOHOL SYNDROME (FAS)**

AKADEMISK AVHANDLING

som för avläggande av medicine licentiatexamen vid Karolinska
Institutet offentligen försvaras i Bibliotek (plan 3).

S:t Eriks Ögonsjukhus, Polhemsgatan 50, 112 82 Stockholm

Tisdagen den 7 maj 2013, kl 10.00

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Stockholm 2013

ABSTRACT

Purpose: To investigate the ophthalmological characteristics and to evaluate the magnocellular function in Russian orphanage children with fetal alcohol syndrome (FAS).

Methods: In the study 100 children aged 10-16 from Russian (St Petersburg) orphanages were examined: 50 with FAS and 50 control children. In the first study all 100 children were tested with distant visual acuity with subjective optimal correction (VA; Sivtsev chart), skiascopy, visual inspection for FAS external ocular features, biomicroscopy, eye alignment using cover test and indirect ophthalmoscopy. In the second study 89 children from above groups (49 with FAS and 40 controls) were included in the study. A coherent motion perception test was used. The test consisted of 150 white moving dots on a black background presented in different signal-to-noise ratio conditions. The task was direction detection of the coherently moving dots whose percentage decreased at each step of the test.

Results: All analyzed parameters were worse in children with FAS compared with controls. FAS children showed a higher incidence of amblyopia, hyperopia, astigmatism and anisometropia. In FAS children the incidence of blepharophimosis was 34% (8% in controls), epicanthus 14% (2% in controls), telecanthus 32% (compared to 4% in controls), eye-lid ptosis 9% (none in controls) and strabismus 26% (10% in controls).

Ophthalmoscopy revealed a tilted optic disc in five FAS-children (7%) compared with none in controls. In the Motion perception test a significant difference between the two groups was found ($p = 0.018$). Children with FAS had lower coherent motion perception ability in all the signal-to-noise ratio conditions. A significant difference between difficulty levels ($p < 0.001$) was found for all subjects in both groups – decreasing the stimulus signal-to-noise level decreased the motion perception score. In both groups, the motion perception score differed for vertical and horizontal stimuli ($p = 0.003$) with better performance for vertical stimuli.

Conclusion: Russian FAS children show a higher incidence of structural and functional visual problems that needs to be taken into account and demands participation of the ophthalmologist in monitoring of those patients. Impaired motion perception in FAS children could be indicative of a magnocellular pathway developmental dysfunction resulting from alcohol brain damage.

ISBN 978-91-7549-143-1