Brief Communication

Visual Screening in Agosh Special School, Karachi

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ABSTRACT

We present the results of visual screening in Aghosh special school in Karachi. Complete ocular examination was done with special attention to visual acuity, refractive errors, and frequency of associated syndromes in 103 individuals, from July 2022 to December 2022. Age ranged between 5 and 25 years. There were 50.5% females and 49.5% males. Majority of the subjects (62%) had visual acuities of 6/6 – 6/12 in both eyes, followed by 27% of subjects with visual acuities of 6/18 – 6/60, 7.7% had visual acuities of 6/60-3/60, and 2.9% had less than 3/60. Down syndrome was seen in 34%, mental retardation in 55.3% and ADHD in 10.7%. Hypermetropia was the commonest refractive error and exotropia was the commonest ocular deviation.

Key Words: Down syndrome, ADHD, Mental Retardation, Myopia, Hypermetropia, Refractive error, Visual Acuity.

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INTRODUCTION

Uncorrected Refractive errors are the second leading cause of preventable blindness and the most common cause of visual impairment.[1] Prevalence of visually disabled children in Pakistan is estimated to be 0.9%, which comes to about 1.25 million persons under the age of 20 years.[2] Down Syndrome (DS) is the most commonly diagnosed chromosomal abnormality in infants and the most recognized congenital aneuploidy (presence of an erroneous number of chromosomes, e.g. 45 or 47) associated with delayed physical and mental development. Children with DS show have refractive errors (esotropia being more common), cataract, Keratoconus and squint.[3]

ADHD (Attention Deficit Hyperactivity Disorder) is a neuro developmental disorder. Children with ADHD have trouble paying attention and are hyperactive with impulsive behavior.[4] There is high prevalence of amblyopia and abnormal near point of convergence.[5]

Mental retardation or MR (current term, intellectual disability [ID]) is used for constellation of symptoms that includes severe deficits or limitations in an individual's developmental skills in several areas or domains of function: cognitive, language, motor, auditory, psychosocial, moral judgment and activities of daily life. Increasing severity of intellectual disability is related to higher prevalence of nystagmus, strabismus, astigmatism, hypermetropia, and anisometropia.[6]

There is scarcity of data from Pakistan regarding special children. We planned this study to find out gravity of situation. This will help in further expanding screening process in other parts of the country.

METHODS

It was a school-based, cross-sectional study conducted at Agosh Special Children School, Karachi, Pakistan. The non-probability, purposive sampling technique was conducted from July 2022 to December 2022. Ethical approval was taken by the Research Ethical Committee (REC) of the Isra School of Optometry and the Agosh Special Children School. The inclusion criteria were subjects between 5 – 25 years of age who had a positive history of Down Syndrome ADHD or

Table 1 *Association of syndrome with Refractive Errors.*

Syndrome	Associated Refractive Error				Total
	Myopia	Hypermetropia	Astigmatism	Emmetropia	
Down syndrome	3	24	2	6	35 (33.98)
ADHD	2	8	1	0	11 (10.7)
Mentally retarded MR	22	28	4	3	57 (55.3)
Total	27 (28.7%)	60 (63.8%)	7 (7.4%)	9 (9.5%)	103 (100)

Table 2: *Association of syndromes with muscle imbalance.*

Cause	Esotropia N (%)	Exotropia N (%)	Orthophoria N (%)	Total N (%)
Down syndrome	6	5	24	35 (33.98)
ADHD	1	1	9	11 (10.7)
Mentally Retarted (MR)	3	8	46	57 (55.3)
Total	10 (10.6%)	14 (13.5%)	79 (76.6%)	103 (100)

Mental Retardation. The protocol for examination for all patients who are evaluated at Agosh Special School included demographic data and history of onset. All the subjects were examined after obtaining fully informed consent. Visual acuity of all subjects was checked and recorded separately for both distances, with and without glasses. Objective refraction was performed through retinoscopy. Anterior segment was examined with an ophthalmoscope to exclude any ocular disease. The data were analyzed by using SPSS Statistical Package for Social Sciences 20.0 version. All qualitative variables were shown as frequency and percentages.

RESULTS

A total of 103 subjects fulfilled the inclusion criteria for the study. Out of 103 subjects, 52 (50.5%) were females and 51 (49.5%) were males. Details of different syndrome and associated refractive errors and muscle imbalance are shown in tables 1 and 2. Mean age was 13.05, ranging between 5 – 25 years. Majority of (n = 64, 62%) subjects had good visual acuities of 6/6 – 6/12 in both eyes, followed by 28 (27%) subjects who had moderate vision between 6/18 – 6/60, 8 (7.7%) with 6/60 – 3/60, and 3 (2.9%) with less than 3/60. On examination, 94 subjects had a refractive error. The most prevalent refractive error was hypermetropia. Exotropia was the most common ocular deviation.

Out of 103 subjects, 27 (26.2%) had insufficient normal point of convergence (NPC), 31 (30.5%) had dilated pupils, 18 (17.4%) had latent nystagmus, and 10 (9.7%) exhibited epicanthus folds.

DISCUSSION

The present study was conducted as the initial screening examination of visual acuity, refractive error, and additional ocular disorders associated with Down syndrome, Mental retardation and ADHD in special school children. This study found that (62%) of subjects had visual acuity of 6/6 – 6/12. Literature shows that visual acuity with Down syndrome is between (6/9-6/60).[7]

Refractive error was present in 91%, with 63.8% subjects with hypermetropia, followed by 28.7% with myopia, and 7.4% subjects with astigmatism. Another study found (55%) were hyperopic, 34% were myopic and 11% were astigmatic.[8] The frequency of refractive error in ADHD subjects was 11, out of them, 8 subjects had hyperopia, followed by 2 subjects had myopia where 1 subject had astigmatism.[9]

In our study 13.5% had exotropia followed by 10.6% with Esotropia. Earlier studies have shown similar results.[10,11] Another study found that nystagmus was seen in 17.4% of the subjects but it was not seen in our findings.[12]

Occurrence of undiagnosed ocular disorders among the subjects was identified in the study, demonstrating the significance of regular and more often organized eye examinations for these children. The estimated occurrence of ocular disorders in this study may have been undercounted due to the fact that eye investigations in the school were performed with a direct ophthalmoscope, which may have limitations in the diagnosis of some subtle ocular presentations that could have been uncovered with a more advanced screening test.[13]

CONCLUSION

Majority of special school children had uncorrected refractive error and exotropia. A substantial fraction of children suffering from different syndromes has undetected or undertreated ocular disorders that, if left untreated, can have a negative impact on their quality of life.

Conflict of Interest

Authors declared no conflict of interest.

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Author's Designation and Contribution

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