

Prevalence of Ophthalmic Disorders in Hearing Impaired School Children

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Abstract

Introduction: Vision forms the major aspect in understanding the surroundings and to communicate with others in a hearing impaired child and so even a mild refractive error will lead to significant handicap in the quality of life for the child and retards the overall development.

Aim: To know the causes and to study the prevalence of ophthalmic disorders in hearing impaired school children.

Materials and Methods: A cross-sectional study of 350 children was conducted in a special school for deaf. Approval by the Institutional Ethical Committee and permission of appropriate authorities were obtained. All children from class 1 to 10 of both genders were screened. Those not willing to participate, not cooperative, who were not available at the time of examination were excluded in the study. Demographic data, history from every child was recorded with the help of teachers in the school. Complete ophthalmological examination with refraction and systemic examination was done.

Results: Of the 359 children examined, males were 211 and females comprised 148. Among these, 104 were found to have one or more ophthalmic abnormalities. Thus, the prevalence of ophthalmic disorders is 29% in this study. Refractive errors predominated in our study with the prevalence of 16.99% (61/359), followed by Vitamin A deficiency, heterochromia iridis, pigmentary retinopathy, and retinitis pigmentosa. More than 70% of ophthalmic abnormalities are either preventable or treatable in our study.

Conclusion: The prevalence of ophthalmic disorders in hearing impaired schools is more compared to normal schools. Visual impairment in these children can be prevented by regular eye screening by an ophthalmologist and early recognition and treatment of the disorder.

Key words: Heterochromia iridis, Ophthalmic disorders, Pigmentary retinopathy, Refractive errors, Retinitis pigmentosa

INTRODUCTION

Hearing impairment in children leads to significant appreciation of other senses such as vision, smell, and touch. Vision forms the major aspect in understanding the surroundings and to communicate with fellow beings. When one of these is seriously impaired, the others are used to compensate the disability, so the hearing impaired

population may compensate by making greater use of visual-perceptual cues than their normal hearing peers, and thus, even a mild refractive error may reduce the visual cues available to the hearing impaired person.¹ It also leads to severe impairment in the mental condition of the child and retards the overall development. Hence, it is essential to detect, diagnose, and treat the possible ophthalmic conditions for a better living of a hearing impaired child. If both hearing and speech are affected, these children also develop mental retardation the World Health Organization estimates the prevalence of mental retardation in the general population (across all ages) to be 2%, being 3% in individuals below the age of 18 years.² Despite the magnitude of the problem, affected individuals are underserved due to a lack of awareness about their problems, even among health-care providers.

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Aim

To know the causes and to study, the prevalence of ophthalmic disorders in hearing impaired school children.

MATERIALS AND METHODS

This cross-sectional study was conducted in a special school in Tirunelveli, Tamil Nadu. To have 95% confidence interval, we planned to enroll 359 hearing impaired children into this study. The Institutional Ethics Committee approval and authorities' permission to conduct the study in the special school were obtained. All children from class 1 to 12 of both genders were included in the study. Those not willing to participate, not cooperative, who were not available at the time of examination were excluded. Demographic data, history from every child, with the help of teacher was noted. The ophthalmologic workup included visual acuity assessment, pupillary evaluation, ocular motility examination, and alternate cover test and fundus examination. Snellen's chart was used for examining children. A cycloplegic refraction was done where indicated. Systemic examination was also carried out.



Figure 1: Heterochromia iridis - total, partial, and a child with bilateral congenital ptosis

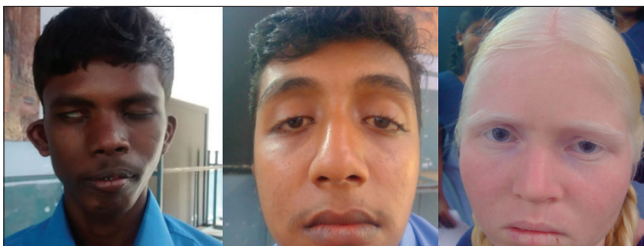


Figure 2: Right congenital facial palsy, congenital ptosis with antimongoloid slant, albinotic child with hypochromic iris

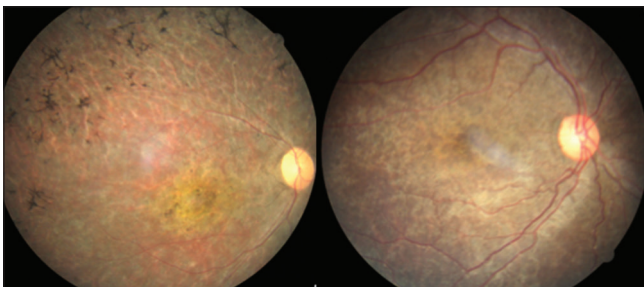


Figure 3: Fundus picture showing retinitis pigmentosa and pigmentary retinopathy

RESULTS

A total of 359 hearing impaired students were examined; males comprised 211/359 (58.8%). Females were 148/359 (41.2%). In this study, 255/359 (71%) had a normal ophthalmologic examination, while 104/359 (29%) had one or more ocular problems. Thus, the prevalence of ophthalmic disorders is 29% in this study. Out of those affected, males were 57/104 (54.8%) and females were 47/104 (45.2%). Refractive errors predominated with the prevalence of 16.99% (61/359). Myopia was found in 49/61 (80.4%) children including myopic astigmatism. Hypermetropia was found in 12/61 (19.6%). With appropriate spectacle correction, 45 had best corrected visual acuity equal to 6/6, 12 had 6/9 and 4 had <6/36 with correction. Pigmentary retinopathy was the most common finding 18/104 (17.3%). Retinitis pigmentosa was diagnosed in 6 (5.76%) children. Heterochromia iridis was present in 8/104 (7.69%) children (Table 1 and Figures 1,3).

Others included conjunctival nevi, microcornea, vernal keratoconjunctivitis (VKC), occlusio pupillae, and optic atrophy. There was a child with right congenital facial

Table 1: Gender distribution of ocular findings in our study

Condition	Children (n)	Percentage	Males (n)	Females (n)
Refractive errors	61	58.6	36	25
Pigmentary retinopathy	18	17.3	7	11
Retinitis Pigmentosa	6	5.76	2	4
Heterochromia irides	8	7.69	5	3
Vitamin A deficiency	11	10.57	8	3
DRS+strabismus	3	2.88	3	0
Ptosis	4	3.84	2	2
Hypertelorism	3	2.88	3	0
Nystagmus	3	2.88	2	1
Hordeolum	2	1.92	2	0
Others	12	11.53	6	6

Table 2: Distribution of ophthalmic manifestations

Ophthalmic disorder	Number % (n=104)
Preventable	
Vitamin A deficiency (Bitot's spots)	11 (10.57)
Treatable	
Refractive errors	61 (58.6)
Lid problems	7 (6.73)
Strabismus related	3 (2.88)
Unavoidable	
Retinal problems	
Retinitis pigmentosa	6 (5.76)
Pigmentary retinopathy	18 (17.3)
Heterochromia irides	8 (7.69)
Nystagmus	3 (2.88)
Hypertelorism	3 (2.88)
Microcornea	1 (0.96)
Others	10 (9.61)

Table 3: Comparison of ophthalmic abnormalities with similar studies

Author	Country	Year	Cases	Ocular problems (%)	Refractive errors (%)
Nicol and House ⁵	Australia	1988	78	33	-
Ma et al. ⁶	China	1989	279	35.8	17.9
Elango et al. ⁷	Malaysia	1994	165	57.6	13.9
Siatkowski et al. ⁸	USA	1994	54	61.1	44.4
Guy et al. ⁹	UK	2003	122	90.1	31.1
Hanioglu-Kargi et al. ¹⁰	Turkey	2003	104	40.4	29.3
Gogate et al. ³	India	2008	901	24	18.5
Our study	India	2016	359	29	16.99

palsy with lagophthalmos and another with an artificial eye (Figure 2). Findings do not equal the total number of children as one or more findings are found in a single child. Among the ophthalmic abnormalities, congenital causes are found in 49 children with ptosis and strabismus being the treatable conditions. Acquired causes are found in 75 children with 64 being treatable (refractive errors, hordeolum, and VKC) and 11 being preventable (Vitamin A deficiency). More than 70% of ophthalmic abnormalities are either preventable or treatable in our study (Table 2).

DISCUSSION

It has been reported that 10% of the Indian children below 14 years of age have some kind of an impairment or physical disability. This mandates a responsible and effective role of the government and its society. It has been estimated that more than half of the total disabilities are preventable by timely intervention at an early stage. An estimated 1-3/1000 children have some degree of sensorineural hearing loss, which occurs as a result of damage to the nerves of the inner ear. Especially early in life, sensorineural hearing loss is associated with delays in language, speech, cognitive, and social development. Given the effects of hearing impairment, children with sensorineural hearing loss are particularly dependent on other means of information acquisition. If these children were to have unrecognized ophthalmologic abnormalities that limited visual acuity, there could be further detrimental effects on development. The results of our study correlate well with other studies as shown in the table. Males comprised 58.8% in our study in comparison to 61.5% in Gogate et al. study.³ The prevalence of ophthalmic disorders was 29% in this study, in comparison to 24% in Gogate et al. study.³ Refractive errors predominated with the prevalence of 16.99%. The prevalence of refractive errors in normal schools is 6.3%.⁴ Comparison of ophthalmic abnormalities

in similar studies in hearing impaired children is as shown in Table 3.

Usher's syndrome was seen in 5.76% children in our study in comparison to 4.9% in Guy et al. study. Motility disorders were 3.7% in Siatkowski et al. study and 1.3% in Gogate et al. study in comparison to 2.88% in our study.^{3,8}

CONCLUSION

The prevalence of ophthalmic disorders in hearing impaired schools is more compared to normal schools. Visual impairment in these children can be prevented by regular eye screening by an ophthalmologist and early recognition and treatment of the disorder.

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