

OPHTHALMOLOGIC ABNORMALITIES IN CHILDREN WITH IMPAIRED HEARINGInderjit Kaur¹, Jagdeepak Singh², Prempal Kaur³, Anup Narayanrao Thakare⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIM: To determine the nature of ophthalmologic abnormalities in severe and profound grades of hearing impaired children and to treat visual impairment if any at the earliest. **MATERIAL AND METHODS:** Study was conducted on 100 children in the age group of 5-14 years with severe and profound hearing loss visiting outpatient department of Ram Lal Eye and ENT hospital Govt. Medical College Amritsar and subjected to detailed ophthalmological examination. **RESULTS:** 100 children in the age group 5-14 years with hearing impairment were enrolled for the study, 68 had profound and 32 had severe hearing loss. Visual disorders were found to be as high as 71%. Highest percentage was seen in children aged 7 years. Majority of them (50%) had refractive error. Out of these 50 children, 28(56%) had myopia, 10 (20%) hypermetropia and 12(24%) had astigmatism. The other ophthalmic abnormalities in our study were conjunctivitis 14(19.71%), fundus abnormalities and squint 11(15.49%), blepharitis 5 (7.04%), vitamin A deficiency 6 (8.04%), amblyopia 8 (11.26%), pupil disorder 3 (4.22%), cataract 3 (4.22%) and heterochromia iridis 7 (9.85%). **CONCLUSION:** The high prevalence of ophthalmic abnormalities in deaf children mandate screening them for possible ophthalmic abnormalities. Early diagnosis and correction of visual disturbances would go a long way in social and professional performance of these children.

KEYWORDS: Ophthalmologic abnormalities, children, impaired hearing.

INTRODUCTION: Deaf children are heavily reliant on the sense of vision in order to develop efficient communication skills and explore the world around them. Any ophthalmic disorder may thus negatively impact on this process, especially if it is unrecognized in the early years of life. These disorders may be correctable (such as myopia) or treatable (such as cataract), and their early identification is of the utmost importance to optimize language development (spoken or sign, or both) and develop social cognition.¹

Vast majority of knowledge is obtained through the sense of sight and hearing, when one of these is seriously impaired the other is used to compensate. As the degree of impairment increases the role of the remaining senses becomes progressively more significant.² Thus, the deaf population may compensate by making greater use of visual perceptual clues than their hearing peers and thus even a mild refractive error may reduce the visual clues available to the child.³

The control of blindness in children is a VISION 2020 priority because the number of 'blind person years' resulting from blindness starting in childhood is second only to cataract. If VISION 2020 targets for children can be met, the global prevalence of blindness will have fallen from 7.5/10, 000 children (in 1997) to 4/10, 000 children by the year 2020.⁴

MATERIAL & METHODS: 100 children, visiting outpatient department of Ram Lal Eye and ENT hospital Govt. Medical College Amritsar between 5 to 14 years with severe and profound hearing loss

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determined by pure tone audiometric/BERA testing, after due consent from the parents and obtaining clearance from the ethical committee were enrolled. History of the risk factors such as history of prematurity or perinatal complications, exposure to ototoxic medications, rubella and cytomegalovirus, neurodevelopmental handicaps and syndromes with known hearing and ophthalmic complications for hearing loss were noted and detailed ophthalmological examination which included, acuity tests, ocular motility tests, a comprehensive ophthalmologic assessment by slit lamp biomicroscopy, streak retinoscopy, direct and indirect ophthalmoscopy, intraocular pressure measurement was done. Children with mild to moderate hearing loss, chronic otitis media and h/o trauma were excluded from the study.

OBSERVATIONS: Out of the 100 children, 32 had severe and 68 had profound hearing loss. 56 were males and 44 were females, with maximum number of children of 7 years age.

Age (years)	Male	Female	Total
5	7	5	12
6	11	2	13
7	8	7	15
8	2	5	7
9	4	3	7
10	5	8	13
11	4	1	5
12	4	3	7
13	5	6	11
14	6	4	10
Total	56	44	100

SHOWING AGE AND SEX DISTRIBUTION OF CHILDREN IN THE STUDY

Age (years)	Male	Female	Total
5	6 (8.45%)	4(5.63%)	10(14.08%)
6	5(7.04%)	2(2.81%)	7 (9.85%)
7	2(2.81%)	7(9.85%)	9 (12.67%)
8	2(2.81%)	4(5.63%)	6(8.45%)
9	2(2.81%)	2(2.81%)	4(5.63%)
10	3(4.22%)	6(8.45%)	9(12.67%)
11	4(5.63%)	0(0.00%)	4(5.63%)
12	3(4.22%)	2(2.81%)	5(7.04%)
13	3(4.22%)	6(8.45%)	9(12.67%)
14	5(7.04%)	3(4.22%)	8(11.26%)
Total	35	36	71

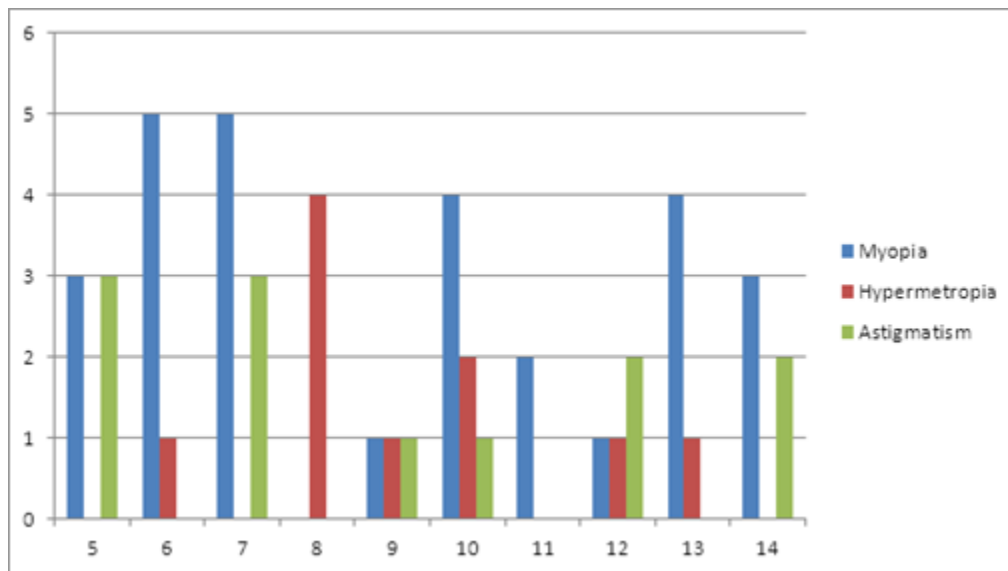
AGE AND SEX WISE DISTRIBUTION OF CHILDREN WITH VISUAL DISORDERS WITH REGARD TO SEX

Overall prevalence of visual disorder was found to be 71%.

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Age	Myopia	Hypermetropia	Astigmatism	Total
5	3	0	3	6
6	5	1	0	6
7	5	0	3	8
8	0	4	0	4
9	1	1	1	3
10	4	2	1	7
11	2	0	0	2
12	1	1	2	4
13	4	1	0	5
14	3	0	2	5
Total	28	10	12	50

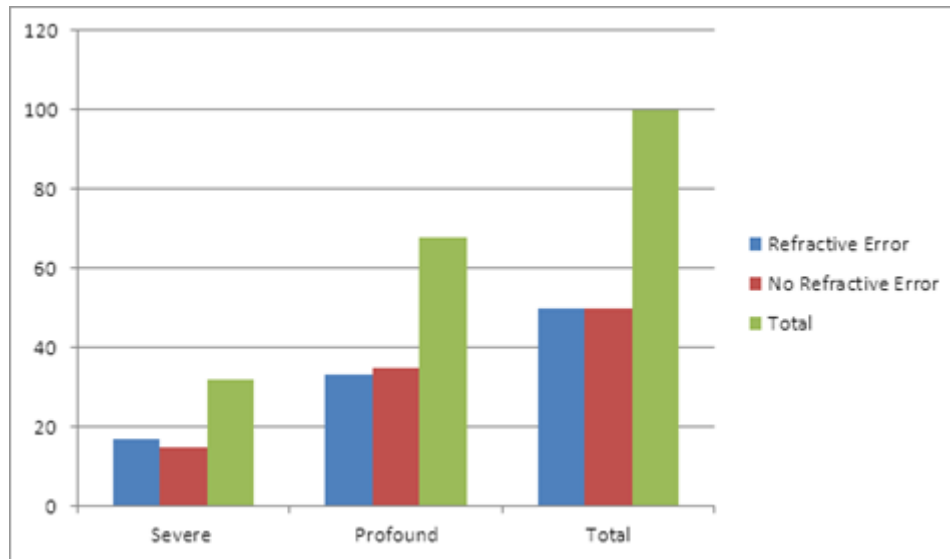
AGE-WISE DISTRIBUTION OF REFRACTIVE ERROR



Degree of hearing loss	Refractive error	No refractive error	Total
Severe	17(53.12%)	15(46.87%)	32
Profound	33(48.52%)	35(51.47%)	68
Total	50	50	100

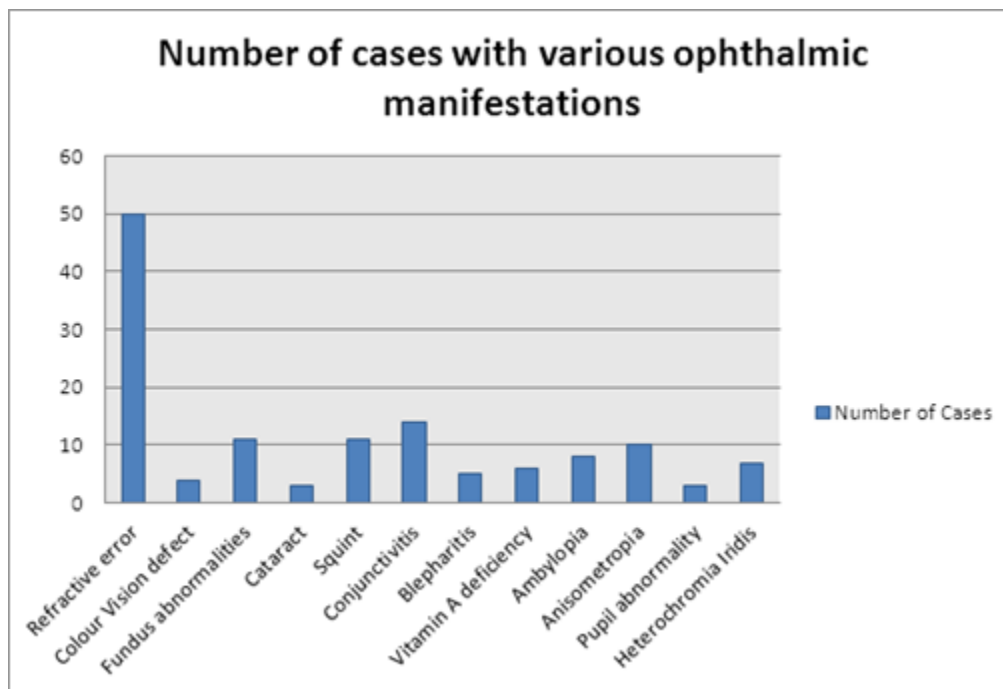
DISTRIBUTION OF REFRACTIVE ERROR WITH RESPECT TO DEGREE OF HEARING LOSS

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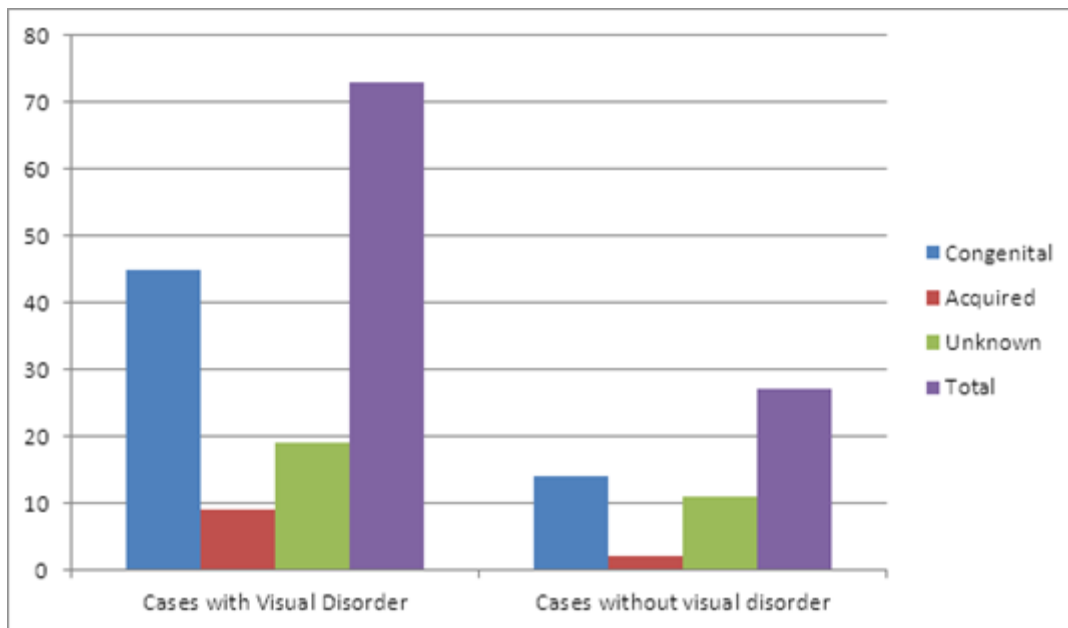


Out of 100 cases in the study majority (50%) had refractive error. The prevalence of other ophthalmic abnormalities in our study were color vision defect 4(5.63%), fundus abnormalities 11(15.49%), cataract 3(4.22%), squint 11(15.49%), conjunctivitis 14(19.71%), blepharitis 5 (7.04%), vitamin A deficiency 6 (8.04%), amblyopia 8(11.26%), anisometropia 10(14.08%), pupil disorder 3(4.22%), and heterochromia iridis 7(9.85%).

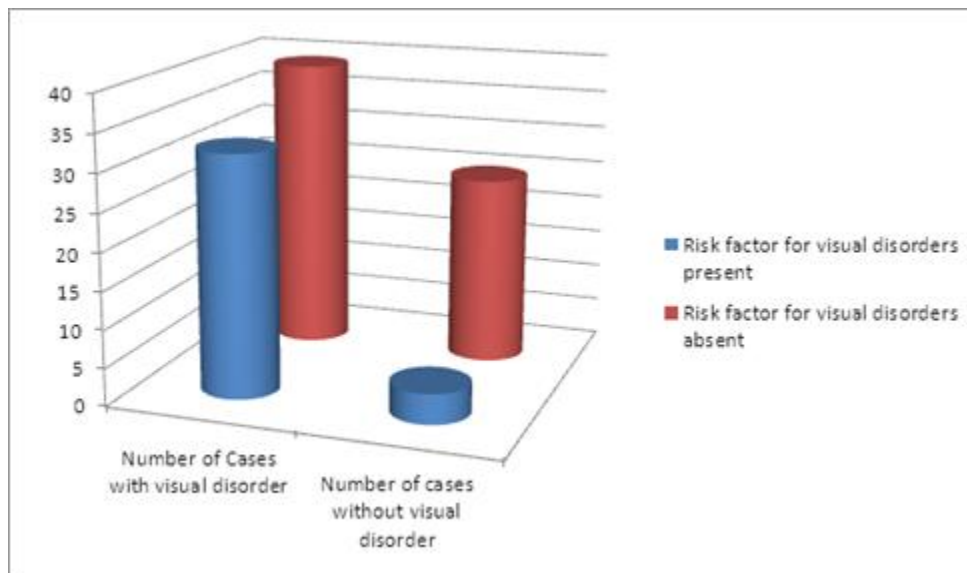
Some patients had more than one ophthalmic abnormality.



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SHOWING DISTRIBUTION OF CASES WITH RESPECT TO ETIOLOGY OF HEARING LOSS



DISTRIBUTION OF CASES WITH RESPECT TO PRESENCE OR ABSENCE OF RISK FACTORS FOR VISUAL DISORDERS

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DISCUSSION: It has been reported that 10 percent of the Indian children below 14 years of age have some kind of an impairment or physical disability which 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 stage⁵. An estimated one to three per 1,000 children have some degree of sensorineural hearing loss, which occurs as a result of damage to the nerves of the inner ear⁶. 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.⁷ The WHO prevention of blindness program with the international center for eye health has developed a standard methodology and reporting form to record the causes of visual loss in children with emphasis on the identification of treatable or preventable causes of blindness.⁸ Controlling blindness in children is a priority of VISION 2020.⁹ The present study was conducted on 100 children with severe and profound hearing loss in age group of 5 to 14 years. Prevalence of ocular manifestations, their relation to the etiology and degree (severe/profound) of hearing loss with respect to presence or absence of risk factors for visual abnormalities were studied. 71% of children were affected with some kind of ophthalmologic abnormality. The results of our study correlate well with the following previous studies as shown below in the table.

Name	Country	Year	Cases	Ocular problems	Refractive errors
Nicol et al ¹⁰	Australia	1988	78	33%	-
Ma et al ¹¹	China	1989	279	35.8%	17.9%
Elango et al ¹²	Malaysia	1994	165	57.6%	13.9%
Siatkowski et al ¹³	USA	1994	54	61.1%	44.4%
Guy et al ¹⁴	UK	2003	122	90.1%	31.1%
Hanioglu-Kargi ¹⁵	Turkey	2003	104	40.4%	29.3%
Gogate et al ¹⁶	India	2008	901	24%	18.5%
Present study	India	2011	100	71%	50%

PREVALANCE OF OPHTHALMIC ABNORMALITIES IN SIMILAR STUDIES IN DEAF CHILDREN IN DIFFERENT COUNTRIES

STUDY	PREVALENCE OF OCULAR MORBIDITY
Deshpande Jayant D and Malathi K ¹⁷	27.65%
Dandona, Gilbert CE ¹⁸	38%
Madhu Gupta, Bhupinder Gupta ¹⁹	31.6%
Khurana AK, Sikka KL ²⁰	58.8%
Desai S, Desai R ²¹	71.7%
Kalikiyavi V, Naduvilath TJ ²²	43.5%

PREVALANCE OF OPHTHALMIC ABNORMALITIES IN SIMILAR STUDIES IN NORMAL CHILDREN

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Our present study showed a much higher number of ophthalmologic abnormalities i.e. 71%.as compared to their peers with normal hearing. It was also seen that the prevalence of refractive error was much more in deaf population as compared with normal children of same age group. Refractive error was corrected and suitable glasses were prescribed. Those whose refractive errors could not be corrected had some forms of ocular abnormality such as anisometropia, amblyopia, strabismus, pigmentary retinopathy or cataract. An ophthalmologic evaluation is thus of utmost importance in children with hearing loss for the early diagnosis and correction of visual disturbances which would help them in their overall development and performance. Moreover, early notification to the parents about the abnormalities, hereditary syndromes and concomitant co-morbidities would go a long way in the management and rehabilitation of these children. The high prevalence of ophthalmic abnormalities in deaf children, mandate routine ophthalmologic screening for any possible ophthalmologic abnormality.

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