

Prevalence of Amblyopia among School Children in Faridabad, Haryana

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ABSTRACT

Purpose: To determine the prevalence of amblyopia among 6 to 16 year old school going children in Faridabad, Haryana.

Methods: This population based cross sectional study included 2,370 randomly selected students. Visual acuity was tested using a Snellens chart. Refractive errors were measured by Retinoscopy and Autorefractometer, Strabismus was checked using cover test. Direct ophthalmoscopy was used to assess the anterior segment, lens opacities, red reflex and fundus. Functional amblyopia was defined as best corrected visual acuity $\leq 6/12$ or $20/40$ in one or both eyes with no anatomical problems.

Results: The mean age of the study group was 11 (± 3.16) years. Amblyopia was present in (n=33)1.39% of participants with difference between the genders. Male (n=22) 66.66% was more amblyopic than female (n=11)33.33%. Amblyopic subjects were significantly younger than non-amblyopic children. Due to refractive error, 28 (84.84%) students were amblyopic in which hyperopic (17) myopic (7) astigmatism (4) visual deprivation 1 (3.03%) and cases had amblyopia. Strabismus was found in 4 (12.12%) of cases. Refractive errors, especially anisometropia (24)72.72% and hyperopia (17)51.51%, were important amblyogenic risk factors. Unilateral Amblyopia (29/33) was more than bilateral amblyopia (4/33) ($P < 0.0001$) and Moderate amblyopia (25/33) was more than severe amblyopia (8/33) ($P < 0.004$)

Conclusion: By this study it is mandatory to screen the children for refractive errors and correction of refractive error and improve the facility for check-up and frequent eye screening for refractive errors. Most of the children in our study were found to have developed amblyopia due to uncorrected refractive error, which could be avoided simply by detecting and correcting error on time. Lack of knowledge and awareness about amblyopia and its appropriate timely management has been the cause for late presentation and significant visual impairment associated with amblyopia.

Keywords: Amblyopia; Refractive Error; Anisometropia; School; vision;

INTRODUCTION

Amblyopia ^[1](Lazy eye) has been defined as a unilateral or bilateral decrease of visual acuity caused by deprivation of pattern vision or abnormal binocular interaction. Even though no cause can be detected by physical examination of the eye, some cases will improve with the treatment clinically.

The prevalence of amblyopia in the literature ranges from 0.7% to 5%, depending on the characteristics of study population, visual acuity criteria and measurement methods ^[2-5]

‘Stager suggested that Amblyopia is one of the most common eye problem in children. Early treatment can eliminate Amblyopia’ ^[8]. Amblyopia results from abnormal development of the visual system in early childhood. The visual cortex needs continuous, clear and focused visual impulses to develop normally ^[9-15]. Children with amblyogenic risk factors, if not treated, are vulnerable to functional reduction of visual acuity causing amblyopia ^[9-11]. The causes of amblyopia are strabismus, high refractive error, anisometropia and opacities of the ocular media, or a combination of two or more etiologist in the same patient. In spite of different causes, the basic mechanisms in all cases are either abnormal binocular interaction between eyes or from deprivation in

one or both eyes. Visual loss due to amblyopia can be permanent if corrective measures are not taken in time. The burden of disability due to this problem can become massive when one takes into account the duration of life with visual disability^[5-6]. Early detection of refractive error defect and strabismus and ocular causes will prevent from amblyopia. Simon observed that screening for strabismus, refractive and ocular diseases conditions directly associated with Amblyopia is clearly proven. A prevalence of 4.4% has been reported in New Delhi and 1.9% in south china among 5 to 15 year old children^[6-7].

Purpose

Determine the prevalence of amblyopia and associated risk factors through screening of 6-16 year old school children in Faridabad.

MATERIALS AND METHODS

This population based cross sectional study was performed on 2370 children to determine the prevalence of amblyopia and refractive errors among school going children in Faridabad, Haryana. Among 6 to 16 year old Schoolgoing students, the students were divided in three age groups: 6-10years, 11-14years, 15 to 16 years, and this study from July 2017 to august 2018. The study was approved by the Ethics Committee of the Fortis hospital Faridabad

Definition of amblyopia considered

“Two line intraocular acuitydifference Snellensacuity between eyes even after optical correction.

One day before the examination, a written informed consent form explaining the details of project was sent to the principals, teachers and parents for agreement and signing the students present on the day of visit were included in the study. No follow up visits were done.

Some schools were randomly selected in each selected school students were randomly chosen.

Inclusion criteria:

- A. School going Children up 6 to 16year
- B. Children Vision $\leq 6/12$
- C. Children whose parents give informed consent
- D. Children who were present on the day of examination

Subjects with mental retardation, ptosis covering the pupil, media opacity, and other factors leading to deprivation amblyopia, congenital ocular anomalies, impaired fixation such as nystagmus, eccentric fixation, age >16year and any other organic eye disorder were **excluded**; on the day of examination, A detailed ocular history was taken about present and past ocular problems along with history of use of spectacles. Visual acuity unaided and aided (if spectacles were being used by the subject) was a recorded using Snellens LCD cyber chart standard technique for distance and near. The visual status of those children, who were already wearing glasses, was also assessed for further improvement. All the students with defective vision were examined by the Optometrist. Objective refraction was performed with Heine Retinoscopy (BETA 200) which was followed by subjective refraction till the best corrected visual acuity was achieved. For ocular alignment assessment, Alternate cover test was used for distance (6m) and near (33cm) with an accommodative fixation target. Ocular motility was checked in all gazes to detect any muscular dysfunction. Students, who were found to have a visual acuity equal to or less than 6/12 or 20/40 after correction, refer to the Department of Ophthalmology, Fortis hospital Faridabad for further evaluation.His/her visual acuity, objective Refraction with help of Retinoscopy and Autorefractometer was re-examined and a complete eye examination was done. A written consent was taken from the parents for cycloplegic Refraction, Children already wearing spectacles were also examined and change in power was noted.Functional amblyopia was defined as best corrected visual acuity (BCVA) was <20/40 (6/12) or less in the absence of anatomical problems^[21, 22].

Table: 1 Distribution of amblyopia according to gender

Amblyopia	Frequency (n=2370)	Percentage	Gender	No. of cases	P-value
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Yes	33	98.06%	Male	22	0.08
No	2337	1.39%	Female	11	

Table: 2 Age group wise distribution of amblyopia

Age Group	No. of Cases	Percentage	P- value
6-10	18	54.54%	0.059
11-14		33.33%	
15-16	4	12.12%	

Table: 3 Severity wise distribution of amblyopia

Vision	No. of Cases	Type	P –value	
20/40-20/100	25	MODERATE	0.004	Highly significant
20/100-20/400	8	SEVERE		Highly significant

	No. of Cases	%	P –value	
BINO	4	12.12%	<0.0001	Highly significant
MONO	29	87.88%		Highly significant

Table: 4 Amblyopia distribution by unilateral & Bilateral**Table no:-5 Amblyopia distribution by types and refractive error.**

Amblyopia	Frequ ency	%	P - value	Amblyopia due to Refractive error	Frequ ency	%	P - value
Anisometri a	24	72.72%	0.000 2	Myopia	7	21.21 %	0.0002
Isometropia	4	12.12%		Hypermetropia	17	51.51 %	
Visual Depre viation	1	3.03%		Astigmatism	4	12.12 %	
Squint	4	12.12%					

DISCUSSION

In our study, amblyopia was present in 1.39%. The population based regional studies in India related to the childhood blindness and prevalence of refractory errors showed prevalence rate of amblyopia to be 1.1% (V Kalikiyavi et al.,) [17]. In another study by Rahi et al., involving nine states in our country, cataract, uncorrected aphakia and amblyopia comprised of 12.3% severe visual impairment [16]. In the urban population, the study reported the prevalence rate of amblyopia to be about 4.4% (GV Murthy et al.,) [6]. In a study done in Andhra Pradesh in India, the prevalence of amblyopia was 6.6% (K Anjaneyulu et al.,) [18]. In a Nepalese hospital based study the prevalence was near equal to 1.0% [19]. Another hospital based study done in Bharatpur eye hospital in Nepal, the prevalence rate was 1.40% which is similar to our study (Gopal Bhandari et al.,) [20]. In our studies, the percentage of amblyopia was 1.39% which is similar to 1.1% (V Kalikiyavi et al.,) in 1997 and less than 4.4% (GV Murthy et al.) in 2002 in New Delhi

In our study Male amblyopia (n=22)66.66% was more amblyopic than female (n=11)33.33%. (p-value 0.08) that is similar to a hospital based study done in uttarakhand by (manisha gupta) the prevalence of amblyopia was 8.6% (31/360). In that study male amblyopia was 61.2% and female 38.7%. (P-value>0.05)

In our study unilateral amblyopia was higher (87.88%) than bilateral amblyopia 12.12% which is similar to the study done in Nepal (71% unilateral amblyopia)^[19], in Andhra Pradesh by K Anjaneyulu et al.,^[18] and by Menon et al., where 7% cases were bilateral^[23].

RESULT

Amblyopia was present in (n=33)1.39% of participants with difference between the genders. Male (n=22) 66.66% was more amblyopic than female (n=11)33.33%. Amblyopic subjects were significantly younger than non-amblyopic children. Due to refractive error, 28 (84.84%) in which 24/28 were anisometropic and 4 were isometropic students were amblyopic in which hyperopic (17) myopic (7) astigmatism (4) visual deprivation (1) (3.03%) and cases had amblyopia. Strabismus was found in 4 (12.12%) of cases. Refractive errors, especially anisometropia (24)72.72% and hyperopia (17)51.51%, were important amblyogenic risk factors. Unilateral Amblyopia (29/33) was more than bilateral amblyopia (4/33) (P<0.0001) and Moderate amblyopia (25/33) was more than severe amblyopia (8/33) (P<0.004)

CONCLUSION

School screening is the best way to detect amblyopia and refractive error. It is very useful in early detection of correctable causes of poor vision, especially refractive errors and in preventing long term complications.

In our study that, refractive error is the major cause of amblyopia and if it is not corrected timely, can cause not only the permanent visual morbidity but also cause economical and psychological problem in adult life by not pursuing certain occupation because of lack of binocular vision. The results of our study emphasize the need for more school screening and public awareness programmes for prescribing the correct spectacles and educating the parents to help their children to use them (if needed).

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