Amblyopia - Prevalence among School-Age Children in Etawah, Uttar Pradesh

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ABSTRACT

Purpose: To find out how common amblyopia is in school-age children in Etawah, Uttar Pradesh, aged 6 to 16.
Methods: 2370 randomly chosen students participated in this population-based cross-sectional study. A Snellen's chart was used to measure visual acuity. Strabismus was assessed using the cover test, and refractive errors were determined using an autorefractometer and retinoscopy. The fundus, red reflex, anterior segment, and lens opacities were evaluated with direct ophthalmoscopy. Best corrected visual acuity ≤ 6/12 or 20/40 in one or both eyes without anatomical issues was the definition of functional amblyopia.
Result: The study group's mean age was 11 (±3.16) years. There was a gender difference in (n=33)1.39% of participants who had amblyopia. Compared to females (n=11) 33.33%, males (n=22) 66.66% were more amblyopic. The participants with amblyopia were considerably younger than the non-amblyopian kids. (84.84%) pupils had refractive error-related amblyopia, including 17 hyperopic, 7 myopic, 4 astigmatic, 1 (3.03%) and cases of amblyopia. Of the cases, 4 (or 12.12%) had strabismus. Amblyogenic risk factors included refractive defects, particularly anisometropia (24)72.72% and hyperopia (17)51.51%.Both unilateral amblyopia (29/33) and moderate amblyopia (25/33) were greater than severe amblyopia (8/33) and bilateral amblyopia (4/33).
Conclusion: This study has made it necessary to screen kids for refractive defects, correct them, and upgrade the facilities for routine eye exams and frequent refractive error screening. Uncorrected refractive error caused amblyopia in the majority of the children in our study, a condition that might be prevented by promptly identifying and treating the mistake. The reason for delayed presentations and notable visual impairment linked to amblyopia has been attributed to a lack of understanding and awareness of amblyopia and its prompt care.

Keywords: school, eyesight, amblyopia, reflexive error, anisometropia,
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INTRODUCTION

A unilateral or bilateral loss in visual acuity brought on by improper binocular interaction or pattern vision deficiency is known as amblyopia [1] (lazy eye). Certain cases will improve with therapeutic treatment even when no explanation can be found by ocular examination.

The literature reports a prevalence of amblyopia ranging from 0.7% to 5%, depending on the research population's characteristics, visual acuity standards, and techniques of measurement[2–5].

Stagger proposed that amblyopia is one of the most prevalent eye conditions in kids. Amblyopia can be eradicated with early therapy. [8]. Early childhood abnormalities in the development of the visual system lead to amblyopia. For appropriate development, the visual cortex needs consistent, focused, and clear visual signals [9–15]. Untreated

amblyogenic risk factor children are susceptible to functional decrease of visual acuity, which can lead to amblyopia [9–11]. Amblyopia may result from a combination of two or more etiologies in a single patient, strabismus, excessive refractive error, ansometropia, and opacities of the ocular media. Although there are a variety of reasons for each case, the fundamental mechanisms are always either aberrant binocular contact between the eyes or deficiency in one or both of the eyes. Amblyopia can cause permanent vision loss if corrective action is not taken in a timely manner. The length of life with a visual impairment can significantly increase the burden of disability resulting from this issue[5–6]. Amblyopia can be avoided by early identification of strabismus, refractive error defects, and ocular causes. Simon noted that there is ample evidence to support the screening for strabismus, refractive errors, and ocular illnesses that are directly linked to amblyopia. For children aged 5 to 15, the prevalence has been reported to be 4.4% in New Delhi and 1.9% in South China [6-7].

PURPOSE

Using screening, ascertain the prevalence of amblyopia and related risk factors in school-age children in Etawah (6–16 years old).

MATERIAL AND METHODS

2370 children participated in this population-based cross-sectional study to find out how common amblyopia and refractive errors are among school-age children in Faridabad, Haryana. Three age groups of school-age students (6–16 years old) were identified: 6–10 years old, 11–14 years old, and 15–16 years old. The study was conducted from July 2021 to August 2022.

Definition of amblyopia considered “Two line intraocular acuity difference Snellens acuity 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 ≤ 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 disease.

On the day of the examination, a detailed ocular history about past and present ocular problems as well as the history of wearing spectacles was taken. 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 >16 years, and any other organic eye disorder were excluded. The Snellens LCD cyber chart standard technique was used to record the subject's visual acuity both unaided and aided (if they were wearing spectacles). For added enhancement, the children's visual status—who were already wearing glasses—was also evaluated. The optometrist assessed every pupil who had a visual impairment.

After employing Heine Retinoscopy (BETA 200) for objective refraction, subjective refraction was carried out until the highest level of corrected visual acuity was achieved. Alternate cover tests with an accommodating fixation target were employed to measure ocular alignment at near (33 cm) and far (6 m) intervals. To find any signs of muscle dysfunction, ocular motility was examined in each gaze. After correction, students whose visual acuity was determined to be at least 6/12 or 20/40 should be referred to the Department of Ophthalmology for additional assessment. A comprehensive eye examination was performed, including a reexamination of his or her visual acuity and objective refraction with the aid of retinoscopy and an auto-refractometer. In order to perform

cycloplegic refraction, parental consent was obtained in writing. Children who were already wearing spectacles underwent examination and adjustments.

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 6/12 or less in the absence of anatomical problems[21, 22] .

DISCUSSION

In our research, 1.39% of participants had amblyopia. Amblyopia was shown to be prevalent in 1.1% of Indian population-based regional studies on juvenile blindness and refractory error prevalence (V Kalikiyavi et al.,) [17]. In nine states across our nation, Rahi et al. conducted another study in which they found that amblyopia, cataract, and uncorrected aphakia accounted for 12.3% of cases of severe visual impairment [16]. According to the study (GV Murthy et al.,) [6], the prevalence rate of amblyopia in the urban population is approximately 4.4%. 6.6% of people in Andhra Pradesh, India, had amblyopia, according to a research (K Anjaneyulu et al.,) [18]]. In a study conducted in a hospital in Nepal, the prevalence was almost exactly 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.

Table: 1 Distribution of amblyopia according to gender					
Amblyopia	**Frequency (n=2370)**	**Percentage**	**Gender**	**No. of case**	**P-value**
Yes	23	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	13	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	0.0004	Highly significant
20/100-20/400	8	Severe		Highly significant

Table no:-4 Amblyopia distribution by types and refractive error							
Amblyopia	**Frequency**	**%**	**P - value**	**Amblyopia due to Refractive error**	**Frequency**	**%**	**P - value**
Anisometropia	24	72.72 %	0.0002	Myopia	7	21.21 %	0.0002
isometropia	4	12.12 %		Hypermetropia	17	51.51 %	
Visual deprivation	1	3.03 %		Astigmatism	4	12.12 %	
Squint	4	12.12 %					

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

In our research, 1.39% of participants had amblyopia. Amblyopia was shown to be prevalent in 1.1% of Indian population-based regional studies on juvenile blindness and refractory error prevalence (V Kalikiyavi et al.,) [17]. In nine states across our nation, Rahi et al. conducted another study in which they found that amblyopia, cataract, and uncorrected aphakia accounted for 12.3% of cases of severe visual impairment [16]. According to the study (GV Murthy et al.,) [6], the prevalence rate of amblyopia in the urban population is approximately 4.4%. 6.6% of people in Andhra Pradesh, India, had amblyopia, according to a research (K Anjaneyulu et al.,) [18]]. In a study conducted in a hospital in Nepal, the prevalence was almost exactly 1.0% (19).

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 perusing certain occupation because of lack of binocular vision. The results of our study emphasizes the need for more school screening and public awareness

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