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RESEARCH ARTICLE

KNOWLEDGE AND AWARENESS OF AMBLYOPIA AMONG THE CHILDREN OF REWA (M.P)

*Dr. Shivani Awasthi

Department of Bio-Chemistry T.R.S Collage Rewa (M.P)

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ABSTRACT

Amblyopia, usually known as "lazy eye," is a childhood vision disorder resulting from impaired coordination between the brain and the eye during early visual development, leading to reduced vision in one eye. It is a universal public health concern, affecting 1-5% of the population, with higher prevalence in developing countries due to limited access to early diagnosis and treatment. Untreated amblyopia can cause permanent vision loss, impacting education and career prospects. In India studies highlight the prevalence of amblyopia, emphasizing the necessity for awareness, early detection, and improved access to treatment. The All India Ophthalmological Society (AIOS) underscores the importance of timely intervention in its guidelines for amblyopia management, addressing challenges like limited awareness and access to eye care services. The primary course of management once there is a suspected refractive amblyopia is to first fully correct for the refractive error, followed by intermittent periods of patching or pharmacological blurring to promote use of the amblyopic eye once improvements in visual acuity have stabilized.

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INTRODUCTION

Amblyopia is a developmental disorder that affects vision. Characterized by neurodevelopmental alterations, amblyopia leads to physiological abnormalities in visual pathway development during early childhood, resulting in impaired vision occurring unilaterally or, less commonly, in both eyes. This condition occurs when cortical visual development fails in one or both eyes early in life. Amblyopia is normally known as a "lazy eye" among the general public. If left untreated, amblyopia can lead to permanent vision loss in the affected eye, even if the underlying ocular pathology is later resolved (1). Amblyopia is an important public health problem leading to visual impairment which is lifelong (2). Refractive error is one of the common causes of amblyopia (3). The prevalence of amblyopia is often underestimated due to lack of awareness and knowledge in parents about refractive errors in children and late ophthalmological referrals for visual screenings (4). The reasons of amblyopia include anisometropia, high refractive errors and opacities of the ocular media, strabismus or a combination of two or more aetiologies in the same case. But the basic mechanism of amblyopia is either abnormal binocular interaction, or form deprivation in one or both eyes. If timely corrective measures (upper limit of the critical time for development of the Amblyopia eight years) are not taken, lifelong visual impairment can occur (5). It is most normally caused by untreated eye misalignment (strabismus), uncorrected refractive error between the eyes (anisometropia), or both conditions (anisostabismus). Visual acuity loss, however, is only one of the many deficits caused by amblyopia, and it has the least real-world functional impact because visual acuity is usually normal in the non-amblyopic fellow eye.

Beyond visual acuity, monocular deficits in other aspects of spatial vision, such as contrast sensitivity and spatial integration, have been well established in amblyopia (6). A small study reported a prevalence of 5% for specific reading disability in amblyopia, which is within the 5–12% range reported for reading disabilities in the common population. Other studies found slower reading in strabismic in anisometropic or in both types of amblyopia (7). Amblyopia is typically treated with spectacles and/or surgery to correct the factors that caused it, followed by occlusion of the fellow eye either with an eye patch or less commonly with atropine penalization or Bangerter filters. Clinically, occlusion therapy is considered to be "successful" if visual acuity of the amblyopic eye increases to within normal limits or if equal visual acuity in the two eyes is achieved. In addition to visual acuity, patching has been shown to improve other aspects of spatial vision such as contrast sensitivity and spatial integration (8). However, stereopsis and motion perception deficits often persist in spite of improved visual acuity in response to patching in prospective studies (9). Aim of this study to find-out the amblyopia in children.

Signs, Symptoms, and Quality-of-Life Concerns: In addition to reduced best-corrected VA, there are a plethora of visual function deficits of the amblyopic eye, including abnormal contour interaction, reduced contrast sensitivity, positional uncertainty, spatial distortion, poor accommodation, abnormal eye movements and suppression (10). Because of good vision in their non-amblyopic (sound) eye, persons with unilateral amblyopia typically do not complain of blurred or poor vision under habitual binocular viewing conditions; however, latest studies have reported reduced reading speed and compromised fine-motor skills even with both eyes open (11).

Etiology: Amblyopia can be categorized based on its underlying causes, referred to as refractive, strabismic, visual deprivation, and occlusion (reverse)(12).

Refractive Amblyopia: Refractive amblyopia is caused by untreated refractive errors unilaterally or in both eyes. This condition consequences from blurred visual input caused by hyperopia, astigmatism, or myopia, typically with a difference of refractive error exceeding 1 diopter (D) between the Anisometric amblyopia is a type of vision impairment occurring in 1 eye due to uncorrected and unequal refractive errors between the eyes, which consequences in a poorly focused image primarily affecting the weaker eye and can manifest with or without strabismus (13). While bilateral refractive amblyopia is less common, it can occur when both eyes consistently receive blurred images on their retinas due to severe uncorrected refractive errors during development.

Strabismic Amblyopia: This disorder can develop when both eyes fail to align correctly. In pediatric cases, the brain employs a mechanism to prevent diplopia by suppressing the visual input from one eye, leading to impaired visual development in that eye(14).

Visual Deprivation Amblyopia: Deprivation amblyopia occurs due to any pathology that obstructs the visual pathway, leading to partial or complete blockage and consequently causing blurred or degraded images to be projected onto the retina (15).

Occlusion or Reverse Amblyopia: Occlusion amblyopia is rare, resulting from prolonged visual deprivation in the healthy eye, often induced by pharmaceutical cycloplegia or therapeutic patching (16).

Treatment / Management: Treatment is usually more effective and sometimes complete when the diagnosis and therapeutic measures start as early as possible during childhood. Timely treatment can have numerous benefits during early development and adulthood, including improvements in BCVA, binocular vision, oculomotor deficits, stereopsis, fixation, contrast sensitivity, and quality of life(17). In treating various forms of amblyopia, visual penalization of the eye without amblyopia is often necessary to stimulate visual development in the amblyopic eye. The most common visual penalization method is patching the nonamblyopic eye. The duration of patching can vary depending on the severity of the amblyopia, with practitioners recommending patching for 2 hours, 6 hours, or even full-time in some cases (18). In cases where patients cannot reliably adhere to patching therapy, pharmacologic treatment for amblyopia is an option. A cycloplegic drug, typically atropine, can inhibit accommodation in the eye without amblyopia. The treatment offers the advantage of being administered as a single daily drop, which can be more convenient than an eye patch's extended use. Research has indicated that pharmacologic therapy can be similarly effective to patching in suitable patients (19).

MATERIALS AND METHODS

In this retrospective, hospital and private clinics based studies, 1200 children from 5 years till 15 years of age who attended the OPD and private clinic during the period from September 2022 to February 2023, were included. All the children had undergone detailed history related to the age of onset, as noticed by the patient or his guardian. Ophthalmic examination included visual acuity by Snellen vision chart, cycloplegic refraction by streak retinoscope, auto-refractometer (Righton Speed 01), thorough anterior and posterior segment and examination by lamp biomicroscopy, ophthalmoscopy and assessment of the ocular alignment by cover-uncover test and ocular motility. Assessment of the binocular status of the eye was performed with the help of Worth's four -dot test and synaptophore. An inclusion criterion was best corrected visual acuity in one or both eye 6/12 or less than 6/12 in absence of any organic lesion according to ATS (20). Cases of strabismus, previous history of ocular surgery, trauma and diseases affecting the vision were excluded from the study.

Observation: The present study Knowledge and Awareness of Amblyopia Among the Children of Rewa (M.p), was under taken in department of Biochemistry T.R.S College Rewa. 1200 children were diagnosed for ophthalmic examination with age limit of 5-15 were including in this study. 375 case of Amblyopia was observed.

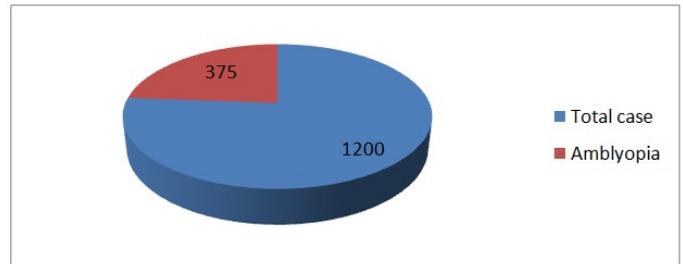


Figure 1. Prevalence of amblyopia in school going children

Table 1. Distribution according to sociodemographic variables of children screened

Sociodemographic variables	Number of Children	%	
Age group (years)	5-8 years	285	23.75
	9-12 years	500	41.66
	13-16 years	415	34.58
Gender	Male	660	55
	Female	540	45

Table 2. Distribution of children with amblyopia according to sociodemographic variables

		Number of cases (n=375)	Percentage (%)
Age group (years)	5-7	138	36.8
	8-10	72	19.2
	11-13	137	36.5
	14-16	28	7.5
Gender	Male	220	59
	Female	155	41
Socioeconomic status	Upper class	50	13.3
	Upper middle	50	13.3
	Lower middle	68	18.13
	Upper lower	87	23.2
	Lower	120	32

Table 3. Distribution according to Risk factors and Characteristics of amblyopia

Characteristics of amblyopia		Number of cases (375)	Percentage (%)	
Risk factors	Anisometropia	142	37.8	
	Myopia	10	2.6	
	Hypermetropia	15	4	
	Astigmatism	6	1.6	
	Strabismus	19	5	
	Ptosis	5	1.3	
	Congenital cataract (blue dot)	8	2.13	
	Anisometropic	163	43.4	
Type of amblyopia	Ametropic	7	1.8	
	Meridional	59	15.7	
	Strabismic	160	42.6	
Grading	Sensory deprivation	156	41.6	
	Mild	6/24-6/12	80	21.3
	Moderate	6/60-6/36	250	66.6
Refractive error	Severe	< 6/60	45	12
	Myopia		75	20
	Hypermetropia		180	48
Squint	Astigmatism		120	32
	Esotropia		145	38.6
	Exotropia		230	61.3
Laterality	Bilateral		90	24
	Unilateral		285	76

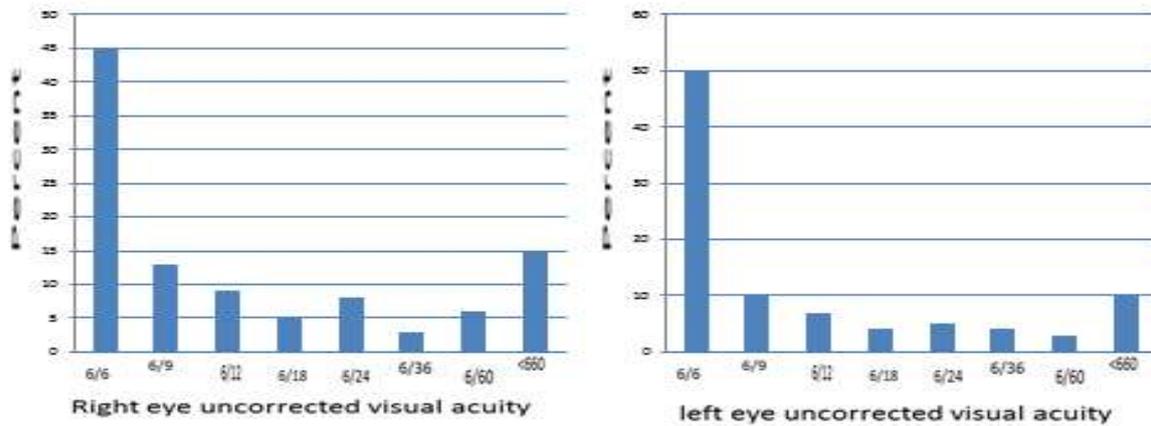


Figure 2. Unaided visual acuity of children aged from 5 to 15 years at pediatric eye OPD, Rewa M.P from September to February, 2022/23 (n = 375)

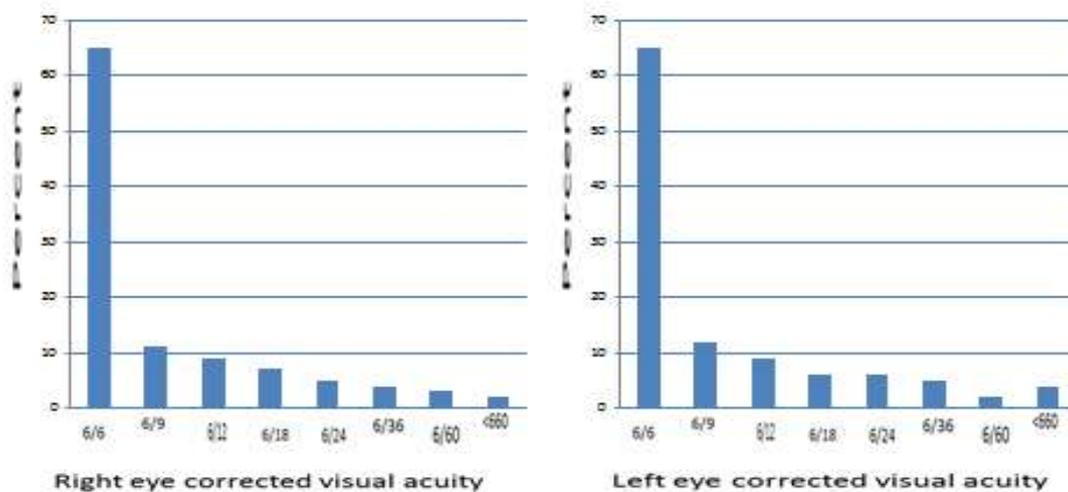


Figure 3. Best corrected visual acuity of children aged from 5 to 15 years at pediatric eye OPD, Rewa M.P from September to February, 2022/23 (n = 375)

RESULTS

A total of 1200 children were screened between the age range of 5 and 15 years. In present study, 375 children had amblyopia (32%) (Figure 1). 41.6% children were 9-12 years of age and among them 55 % were male and 45 % were female (Table- 1). Males comprises of 59% cases. About 32% cases belonged to lower socio- economic background (Table-2). Anisometropia was the most predominant risk factor associated with amblyopia (38.7%). Anisometropic amblyopia was most common (43.3%). Maximum patients had unilateral (76%) and moderate amblyopia (66.6%)(Table 3). Most children have unaided visual acuity of 6/6 in the Right eye (46%) and left eye (50.60 %) respectively (Figure -2). Most children have BCVA of 6/6 in the Right eye (64.85%) and left eye (65.4%) (Figure -3).



Picture Amblyopia in Child

DISCUSSION

Prevalence of amblyopia varies because of different age-group of studied populations and different factors prevailing in that region, like literacy rate, frequency of visual screening programmes and geographical factors. The population based regional studies in India related to the childhood blindness and prevalence of refractory errors showed. Vision screening in children is recommended for detection of potentially treatable disorders (21). In a large population country with moderate resources like India, lack of early eye care services for pre-schoolers makes the selected age group of our study (5–15 years old); ideal for screening because of their mandatory presence at schools at regular basis, reliable responses, and possible treatment of discovered amblyopia as proven by recent research (22). In our study, amblyopia was higher in males than females. This was similar to the study of Gupta et al (23). In which slight male predominance was observed for amblyopia. An explanation for this gender discrepancy may be due to the bias that fewer girls report to hospitals and schools especially in rural areas and higher male female ratio in general population. Amblyopia was more common in children with lower socioeconomic background in our study. These findings were supported by findings of Ikuomenisan et al (24). This could be probably due to illiteracy and lack of awareness of regular eye check-ups, the importance of using spectacles, less affordability for hospital reach, ignorance of minor complaints, less or no advertisement to aware the population through electronic and print media about the amblyopia. Severity and prevalence of amblyopia increases as the amount of anisometropia increases (25). Hypermetropic patients with anisometropia of one Diopter difference may have amblyopia, while myopic anisometropic usually do not have amblyopia until anisometropia is large (26).

Unilateral high hyperopia or myopia greater than 6 Diopter can cause severe amblyopia (27). Isometric amblyopia (severe symmetric refractory errors) may cause mild to moderate bilateral amblyopia, more common in hyperops (in excess of +6 Diopter) than in myopes (27). This is because sharply focused images of objects held closely support the normal visual development in myopia. In meridional amblyopia the mild degree of astigmatism greater than 1.5 Diopter can be amblyogenic (27).

CONCLUSION

Amblyopia is one of the major hidden visual problems in the society which can be prevented by early identification and proper management in appropriate time. Early diagnosis and treatment can prevent and minimize risk of permanent deficit of vision in amblyopia if detected earlier especially before 10 years of age. Screening programs in school going children can detect amblyogenic factors earlier to prevent major permanent deficit in vision by amblyopia so screening of children should be done through school surveys, awareness should be spread through various campaigns among the teachers and parents of the children about amblyopia and its adverse consequences not only on visual impairment part but also functional, psychological, social, economic impact (20).

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