



EVALUATION OF AMBLYOPIA IN CHILDREN OF 6- 16 YEARS AGE GROUP AT A TERTIARY CARE HOSPITAL: A PROSPECTIVE OBSERVATIONAL STUDY

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ABSTRACT Our study was carried out as a prospective observational study in the Department of ophthalmology at Gajraraja medical college and Jayarogya group of hospitals, Gwalior, M.P. for 1 year from May 2018 to April 2019. The study involved 100 no. of patients between 6-16 years of age with defective vision, subjected to visual tests, slit lamp examination, funduscopy, keratometry, A-scan biometry and retinoscopy.

KEYWORDS :

INTRODUCTION

The word "Amblyopia" (Greek: Amblyos = dull, ops= vision) "dullness of vision" was described by Hippocrates in 400 BC. One of the succinct definition has been attributed to Von Graefe, who defined amblyopia as the condition "in which the observer sees nothing and the patient very little". [1] Amblyopia is defined as a "decrease of visual acuity caused by pattern vision deprivation or abnormal binocular interaction for which no causes can be detected by the physical examination of the eye and which, in appropriate cases, is reversible by therapeutic measures." [2]

In the development of visual system critical period is between 1 week to 3 months of age. Clinically for practical purpose amblyopia is defined as vision of at least 2 Snellen lines difference in visual acuity between two eyes. Reduced vision in case of amblyopia may range from missing few letters on the 20/20 line to hand movement vision. Amblyopic patients Eyes also have deficits in accommodation, contrast sensitivity, and spatial orientation. It usually occurs in the first decade of life, but its effects can last for lifetime. Amblyopia is best diagnosed and treated as early as possible, but results from clinical study have challenged the notion of a significant age effect of treatment. [3]

In children amblyopia is the most common cause of visual impairment and it often persist into adulthood. The prevalence in childhood is estimated to be 1-4%. In the age between 20 and 70 years it is leading cause of monocular vision loss. In Adults prevalence of amblyopia was found to be 2.9% in one study, indicating need for early detection and treatment.

Amblyopia may be unilateral or, less often, bilateral. Most cases are usually esotropia in infancy or early childhood because of misalignment and others are because of anisometropic, or a combination of strabismus and anisometropia. Incidence of amblyopia 1.5 to 40 times greater when child has anisometropia and 2.7 to 18 times greater when child has strabismus. [4] Visual loss in amblyopia varies from mild to severe. About 25% of cases have visual acuity less than 6/30 and about 75% cases had 6/30 or better. The cause of amblyopia defines the extent of visual deficit. More severe physiological deficit is seen in strabismic amblyopia than isolated anisometropic amblyopia and in case of combined strabismic and anisometropic amblyopia will cause more serious deficit. [3,5]

Amblyopic children are usually unaware of there visual deficit. [6,8] Uncorrected visual deficit will cause immediate and long term problems on life such as poor educational performance, missed employment opportunities impaired quality of life. [7] Thus need for the screening of children to aid early detection and treatment of this condition to improve visual out come and to avoid visual disability which prevents the prevalence of life long visual morbidity.

Table 1 : Classification of Amblyopia

Classification:
1. Strabismic Amblyopia
Infantile strabismus (esotropia, exotropia)
Acquired strabismus in childhood
Accommodative strabismus
Intermittent strabismus
Syndromic strabismus (Duane, Brown, Mobius syndromes)
2. Refractive Amblyopia
Iso-ametropic
Anisometropic
3. Deprivation Amblyopia
Eyelid abnormalities
Corneal abnormalities
Lenticular/vitreous abnormalities
Occlusion or reverse amblyopia from excessive patching

AIMS AND OBJECTIVE

- To determine and evaluate amblyopia in children aged between 6-16 years.
- To study the types of amblyopia occurring in 6-16 years age group.
- To determine different types of refractive error occurring in 6-16 years age group.

MATERIAL AND METHODS

The study was carried out as a prospective observational study in the Department of ophthalmology at Gajraraja medical college and Jayaraogya group of hospitals, Gwalior(M.P) for one year from May 2018 to April 2019 . The study involved total no. of 100 patients of amblyopia visited to OPD. The study was approved by the ethical committee of the hospital.

The study subjects were children aged between 6-16 years visiting OPD with complaint of defective vision. All the patients were interviewed for detailed clinical history and examined. They were then subjected to visual tests for both Distant and Near vision, Clinical examination of Anterior and Posterior segments of the eye by slit lamp examination, funduscopy, keratometry and A-Scan biometry. Children are then taken up to assess refractive error under the cycloplegic effect of 1% homatropine bromide for 6-8 years and 1% cycloplentolate for 8-16 years of age, by streak retinoscopy.

OBSERVATION AND RESULTS

A total of 100 subjects were included in the final analysis.

Table 2: Descriptive analysis of age in study population (N=100)

Parameter	Mean ± SD	Median	Minimum	Maximum	95% C.I	
					Lower	Upper
Age	12.11 ± 2.93	12.00	6.00	16.00	11.53	12.69

Table 3: Comparison of age group between gender (N=100)

Age Group	Gender		Chi square	P value
	Male (N=59)	Female (N=41)		
6 To 10 Years	16 (27.12%)	17 (41.46%)	2.251	0.134
11 To 16 Years	43 (72.88%)	24 (58.54%)		

Table 4: Descriptive analysis of gaze in the study population (N=100)

Gaze	Frequency	Percentages
Esotropia	15	15.0%
Exotropia	2	2.0%
Alternate esotropia	2	2.0%
Alt exotropia	1	1.0%
Orthophoria	79	79.0%
Hypertropia	1	1.0%

Table 5 : Descriptive analysis of UCVA, BCVA categories in the study population (N=100)

Parameter	UCVA		BCVA	
	RE - N(%)	LE - N(%)	RE - N(%)	LE - N(%)
Better than 6/18	31(31%)	36(36%)	53(53%)	57(57%)
6/18 to 6/60	47(47%)	44(44%)	42(42%)	40(40%)
Worse than 6/60	22(22%)	20(20%)	5(5%)	3(3%)

Table 6 : Descriptive analysis of type of refractive error in the study population (N=100)

Type of Refractive Error	Frequency	Percentage
Myopia	25	25.0%
Hypermetropia	46	46.0%
Myopic Astigmatism	24	24.0%
Hypermetropic Astigmatism	5	5.0%

Table 7: Descriptive analysis of laterality of Amblyopia in the study population (N=100)

Laterality of Amblyopia	Frequency	Percentage
Unilateral	63	63.0%
Bilateral	37	37.0%

Table 8: Descriptive analysis of degree of amblyopia in the study population (N=100)

Degree of amblyopia	Frequency	Percentage
Moderate	75	75.0%
Severe	25	25.0%

Table 9 : Descriptive analysis of type of amblyopia in the study population

Type of Amblyopia	Frequency	Percentage
Anisometropic amblyopia	44	44.0%
Ametropic amblyopia	24	24.0%
Strabismic amblyopia	12	12.0%
Meridional amblyopia	10	10.0%
Visual deprivation amblyopia	5	8.0%
Combined amblyopia	2	2.0%

Table 10: Descriptive analysis of affected eye in the study population

Affected Eye	Frequency	Percentage
Right Eye	33	33.0%
Left Eye	30	30.0%
Both Eye	37	37.0%

DISCUSSION

In the present study, the mean age was 12.11 ± 2.93 years with age ranging from 6 to 16 years and was found that 67% of children were between 11-16 years age group and 33% were 6-10 years. In contrast to another study conducted by Alarepe AT et al reported that mean age of presentation was 9.2 ± 2.8 years with age ranging from 4 to 16 years [10] Magdalene D et al reported that maximum number of patients were found in the age group of 11-16 (63.58%)[11].

In our study, there is gender discrepancy with male (59%) predominance similar findings were reported by Ikuomenisan SJ et al, Magdalene D et al and Marthala H et al [9,11,12] But in other studies like Alarepe AT et al reported that there were more female children and Aldebasi YH reported that there was no statistical difference in gender for amblyopes ($P > 0.05$).[13]

We noticed that right eye (33%) was commonly affected when compared to left eye (30%) and unilateral amblyopia (63%) found to

be more common than bilateral amblyopia (37%) which was similar to studies conducted by Ikuomenisan SJ et al, Marthala et al and Aldebasi YH.[9,12,13]

In our study 79% of children were orthophoric followed by 15% with esotropia, 2% of exotropia and alternate esotropia and 1% each alternate exotropia and hypertropia. Marthala H et al reported that Esotropia of 33.12%, Exotropia 21.87% and orthotropia in 45% of cases.[12]

In our study maximum number of children presented to the hospital with defective vision ranging from 6/18 to 6/60 and after correction maximum number were found to be better than 6/18 which was similar to another study conducted by Marthala H et al.[12]

In our study that hypermetropia (46%) was found to be the most common refractive error followed by myopia (25%), myopic astigmatism (24%) and hypermetropic astigmatism (5%). In contrast to another study conducted by Marthala H et al the most common refractive error was found to be hyperopic accounting about 37.50%, Hyperopic astigmatism 25%, Myopia 1.87% and Myopic astigmatism 35.62%.[12]

We also found that the most common amblyopia was anisometropic amblyopia (44%), followed by ametropic amblyopia (24%), strabismic amblyopia (12%), meridional amblyopia (10%) and least common was visual deprivation amblyopia (8%). In contrast to studies at Ikuomenisan SJ et al reported that anisometropic amblyopia of 78.6%.[9] Daigavane S et al reported that anisometropia of 53%, followed by strabismus 23%, isometropia 15%, and deprivation 8%.[14] Aldebasi YH reported that the most frequent causes of amblyopia were refractive error (94.56%) of which anisometropic amblyopia of 77.72%, Isoametropic amblyopia 16.84% and strabismus 5.44%.[13] and In Abdelrazik ST et al found that anisometropia of 54.16% followed by strabismus 25%, ametropia 12.5%, and finally deprivation 8.33%.[15]

In our study we found that many amblyopic children had moderate degree amblyopia (75%) followed by severe degree of amblyopia (25%). Almost all types of amblyopia are seen in both boys and girls except visual deprivation amblyopia and combined amblyopia which was seen only in boys in our study. Most of the types of amblyopia were more common in 11 to 16 years age group in which anisometropic amblyopia accounting about (49.25%), ametropic amblyopia (20.9%), strabismic amblyopia (10.45%) and meridional amblyopia (11.94%) of cases. Combined amblyopia and visual deprivation amblyopia are seen equally in both age group. In contrast to another Study conducted by Ikuomenisan SJ et al reported that all the types of amblyopia were more common within the age group of 4-10 years.[9]

CONCLUSION

Refractive error is the most common cause of amblyopia and is usually detected in later age because of lack of knowledge among parents.

Amblyopia is a major preventable and treatable cause of low vision in children and being the major cause of monocular or bilateral low vision in adulthood. This study shows that screening of school children is very important in early detection, prevention and treatment of amblyopic children. Government should take initiative for prevention and treatment measures for amblyopia by conducting routine school screening programme and to provide necessary facilities for same.

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