

CLINICAL PROFILE OF AMBLYOPIA PATIENTS BETWEEN 5-15 YEARS OF AGE

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ABSTRACT

BACKGROUND

The aim of the study is to-

1. Diagnose strabismic, anisometropic and mixed amblyopia in age group 5-15 years.
2. Analyse these patients for age, sex, type of refractive error, type of squint, type of fixation pattern and classify them aetiologically.
3. Study effectiveness of different amblyopia treatments in this age group.

MATERIALS AND METHODS

Patients in 5-15 years of age in a period of two years were selected and assessed for amblyopia, which included a detailed history, visual acuity, retinoscopy, ocular movements and alignment, slit lamp examination, fundus examination. Patients were given amblyopia treatment and assessed for improvement.

Settings and Design- Hospital-based descriptive study in a period of two years.

RESULTS

In 32 amblyopic patients, maximum patients were of age group between 5-7 years. 53.12% of patients were females. Amblyopia was predominant among anisometropic patients (75%) with maximum of refractive error difference between 2.00 D to 4.00 D. Amongst them, maximum amblyopes were having hypermetropia with astigmatism (37.50%). In the strabismic type, esotropia was more common. Patients showing more than 2 Snellen's line improvements after patching for 2 hrs. were 77.27% and for 6 hrs. were 22.72%. After part-time patching, maximum improvement in BCVA (best corrected visual acuity) was seen in anisometropes ($P < 0.0001$) followed by strabismic ($P = 0.025$) and least with mixed ($P = 0.026$) amblyopes.

CONCLUSION

Amblyopia is treatable if detected earlier. Lack of community or preschool vision screening was the main cause for late pickup of amblyopic children for timely management and hence significant visual impairment associated with the condition.

KEYWORDS

Amblyopia, Anisometropia, Strabismus, Patching.

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BACKGROUND

Amblyopia has been defined as reduced vision in an eye in the absence of any ophthalmoscopically detectable retinal anomaly or any disorder of afferent visual pathways, which may cause the defect (Duke Elder).¹

The upper limit of the critical time when children are most vulnerable to amblyopic disorders is around 8 years.^{2,3,4} Most vision loss is preventable or reversible with

right kind of intervention at earliest otherwise permanent vision loss can occur if corrective measures are not taken in time.⁵

This hospital-based study assesses the extent of amblyopia among children between 5-15 years.

AIM AND OBJECTIVES

1. To diagnose refractive, anisometropic and mixed amblyopia in patients of age group 5-15 years attending ophthalmic OPD in a period of two years.
2. To analyse these patients, age, sex, type of refractive error, type of squint, type of fixation pattern and classify them aetiologically.
3. To study effectiveness of different amblyopia treatments in this age group.

MATERIALS AND METHODS

This was a hospital-based descriptive study done in a period of two years in tertiary care centre.

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All consecutive patients during the study period who were diagnosed as having amblyopia were included. Detailed history was asked to parents or guardians including the age of onset as noticed by them, age of presentation to the hospital and any previous treatment taken. Ocular examination included Uncorrected Visual Acuity (UCVA) and Best Corrected Spectacle VA (BCSVA) testing with the help of Snellen's visual acuity chart or Landolt C chart. Ocular position, ocular movements and associated squint or nystagmus was noted. Slit lamp examination was done to rule out anterior segment pathology and for posterior segment evaluation, direct and indirect ophthalmoscopy was done. Cycloplegic refraction under atropine sulphate 1% eye ointment for 5-7 years and cyclopentolate 1% for 8-15 years age group was performed.

In case of management, material used for patching include micropore eye patch, micropore eye tape and green eye shed. It was done in the form of 2 hours or 6 hours patching. Visual improvement tested every 15 days up to 2½ months and then after 6 months by Snellen's distant V/A or Landolt C chart.

Inclusion Criteria

- We have included amblyopic patients of 5-15 years age group.
- Amblyopia associated with strabismus, anisometropia, or both were included.
- Strabismic amblyopia- Amblyopia in the presence of a heterotropia at distance or near fixation in the absence of any anisometropia.
- Anisometropic amblyopia- Includes patients who had amblyopia in the presence of anisometropia that is 0.5 D or greater in spherical equivalent or a 1.5 D or greater difference in astigmatism in any meridian between the eyes in the absence of any measurable heterotropia at distance or near.
- Visual acuity criteria in both eyes without cycloplegia (using Snellen's chart)-
 - a. Visual acuity in sound eye $\geq (6/12)/(20/40)$.
 - b. Visual acuity in amblyopic eye $\leq (6/12)/(20/40)$ and $\geq (6/60)/(20/200)$.
 - c. Inter-eye acuity difference ≥ 2 Snellen's lines.

Note: Above criteria is taken from ATS4.⁶

Exclusion Criteria

- Amblyopia treatment in the past.
- Use of current vision therapy or orthoptics.
- Prior intraocular surgery suggestive of stimulation deprivation amblyopia.
- Patients having form deprivation amblyopia.
- Patients having ocular cause for reduced visual acuity.

Note: Above criteria is taken from ATS4.⁶

RESULTS

Of the total patients examined in the age group of 5-15 years in two years, 32 patients were found to be amblyopic. The assessment included a detailed history, visual acuity, retinoscopy, ocular movements and alignment, slit lamp examination, fundus examination for posterior segment pathology. Patients were given amblyopia treatment and assessed for improvement.

Of the total 32 number of amblyopic patients, maximum patients were in the age group of 5-7 yrs. (Table No. 1). Males were 46.88% and females were 53.12%.

Sl. No.	Age in Years	No. of Cases	Percentage
1.	5-7	15	46.88
2.	8-10	08	25
3.	11-13	03	9.37
4.	14-15	06	18.75
		32	100

Table 1. Age Distribution

Sl. No.	Type	No. of Cases	Percentage
1.	Strabismic amblyopia	03	9.38
2.	Anisometropic amblyopia	24	75
3.	Mixed amblyopia	05	15.62
		32	100

Table 2. Showing Type of Amblyopia in Affected Eyes

Sl. No.	Grading	Visual Acuity	No. of Cases	Percentage
1.	Moderate	6/60-6/36	10	31.25
2.	Mild	6/24-6/12	22	68.75
			32	100

Table 3. Grading of Amblyopes according to BCVA

Sl. No.	Type of Squint	No. of Cases	Percentage
1.	Unilateral partially accommodative convergent squint	3	100
2.	Alternate convergent squint	0	0
3.	Unilateral divergent squint	0	0
4.	Alternate divergent squint	0	0
5.	Vertical squint	0	0
		3	100

Table 4. Type of Squint in 03 Cases of Strabismic Amblyopia

Sl. No.	Type of Refractive Error	2.00-4 D	4.25-6 D	6.25-8 D	>8 D	Total	Percentage
1.	Myopia	-	3	1	0	04	16.67
2.	Myopia with astigmatism	4	1	0	0	05	20.83
3.	Hypermetropia	4	1	1	0	06	25.00
4.	Hypermetropia with astigmatism	4	3	2	0	09	37.50
		12	8	4	0	24	100
Table 5. Relation of Refractive Error and Amount of Anisometropia in 24 Cases of Anisometropic Amblyopia							

Sl. No.	Type of Amblyopia	2 Hours	6 Hours
1.	Strabismic amblyopia	02	0
2.	Anisometropic amblyopia	14	5
3.	Mixed amblyopia	01	0
		17	5
Table 6. Results of 2 Hours and 6 Hours of Patching Group Showing >2 Snellen's Line Improvement in Visual Acuity Amongst 32 Amblyopes			

Esotropia was more significantly associated with amblyopia than exotropia. Amongst 5 cases of mixed amblyopia, 4 of them had unilateral partial accommodative convergent squint and one had unilateral divergent squint. All of the anisometropes showed foveal fixation while remaining showed eccentric fixation. Maximum of refractive error difference was found between 2.00-4.00 D. Amongst them, maximum amblyopes were having hypermetropia with astigmatism (37.50%) (Table Number 5). Depth of amblyopia and associated strabismus in amblyopic patient is directly related to the status of binocular vision. Among 22 patients showing more than 2 Snellen's line improvement, 2 hours patching group patients were 17 (77.27%) and 6 hours patching group patients were 5 (22.72%). Anisometropes responds best to part-time patching regime.

DISCUSSION

Amblyopia is one of the most common causes of visual impairment in children with a prevalence varying between 0.2% and 12% depending on the subsets of the population studied.⁷ The main cause of amblyopia varies between studies depending on the characteristics of the study sample and how amblyopia is defined. Incidence of amblyopia in this study was noted to be 0.99%. An incidence of below 3% was reported by various authors: McNeil (1955)⁸ 2.7%, Flom and Neumaier (1966)⁹ 1%, N. C. Desai et al (1977)^[10] 2.67% and Saxena R et al (2016)¹¹ 2%. Incidence of amblyopia more than 3% has been noted by Theodore (1944)¹² 4%, De Roth (1945)¹³ 4.5%, S. D. Gupta et al (1968)¹⁴ 7.41%, Alemayehu Woldeyes, Abonesh Girma et al (2008) 9.1%¹⁵ and Riyad Banayot (2016)¹⁶ 13.8%. In our study, causes of amblyopia were strabismus in 9.38% combined in 15.62% and anisometropia in 75% (Table No. 2). In Goel et al study (1983),^[17] anisometropic were 61.3%, strabismic 9.7% and mixed were 25%. In Fernandez (1968)^[18] study, anisometropic 39.6% and mixed were 3.2%.

Our study results of occlusion are based on neuronal theory of amblyopia (Table No. 6). Oliver et al¹⁹ studied results of occlusion treatment in 227 children of age group 2-11 years. Children above 8 years were 37 (16.3%) and below 8 years were 190 (83.7%). At the end of study, after full-time occlusion, mean visual acuity in younger age group was 20/30, whereas older children achieved mean visual acuity of 20/40. The difference was one line of Snellen's chart and was significant. In our study, we have analysed the result of part-time occlusion in age group of 5-15 years. Although, we cannot directly compare two studies. Our results suggest that children who were younger than 13 years had significantly better chance of improvement in visual acuity.

It is known that therapeutic measures for amblyopia are less effective after seven to eight years. Timely diagnosis and treatment is likely to reduce the prevalence of amblyopia. Age alone should not be used as a factor to decide whether or not to treat a child for amblyopia. "The opportunity to treat amblyopia does not end with the preschool years." The National Eye Institute is supporting a one-year follow-up study to determine the percentage of amblyopia that recurs among the children who responded well to treatment.

The BCVA in the amblyopic eye showed a significant association with the diagnosed subtype of amblyopia with anisometropic amblyopia having the best visual acuities at presentation.²⁰

Timely diagnosis and treatment is likely to reduce the prevalence of amblyopia as it has been seen in many other countries that have taken up mass education and visual screening at community levels.^{21,22,23} There is a need to manage these cases at secondary level centres and establish proper referral systems so that healthcare services at tertiary centres are not overburdened.²⁴ Finally, even though the present study suffers from selection bias, as the data were hospital based, the findings may be helpful in stimulating to conduct further population and school-based studies.

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