

Clinical Profile Of Amblyopia In A Tertiary Health Care Centre In Central India

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Abstract: Introduction: Amblyopia is major cause of blindness in world. It is functional reduction in visual acuity of an eye during critical period of visual development. Most sensitive period for development of amblyopia is from 6 weeks after birth till 6 months although visual maturation continues till 6-7 years of age. This study was conducted with **Aim and Objective:** to diagnose refractive, anisometric and mixed astigmatism in patients of 5-15 years attending ophthalmic OPD in a period of two years. To analyse these patients age, sex, type of refractive error, type of squint, type of fixation pattern and classify them etiologically. To study effectiveness of different amblyopia treatments in this age group. **Methodology:** Patients were selected in the age group of 5-15 years of age 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. **Results:** In 60 amblyopic patients, maximum patients were of age group between 5-7 years. There were more females as compared to males. Amblyopia were predominant among anisometric participants with maximum of refractive error difference between 2-4 D. Amongst them maximum amblyopes were having hypermetropia with astigmatism (32.5%) in the strabismic type esotropia was more common. Patients showing more than 2 Snellen's line improvements after patching for 2 hours were 48 (80%) and 6 hours patching group patients were 12 (20%). 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 pick up of amblyopic children for timely management and hence significant visual impairment associated with the condition.

Key Words: Amblyopia, Anisometropia, Strabismus, Patching.

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I. Introduction:

Amblyopia is defined as unilateral or bilateral decrease in visual acuity caused by form vision deprivation or abnormal binocular interaction for which no cause can be detected on physical examination of eye and which under appropriate circumstances depending on type of amblyopia and age of patient, may be reversible by appropriate. Being the most common cause of blindness in childhood. Child is most vulnerable to amblyopic disorder at the age of 8 years. Most vision loss is preventable with right kind of intervention at earliest otherwise permanent vision loss can occur if corrective measures are not taken in proper times. This study was conducted with aim and objective: to diagnose refractive, anisometric and mixed astigmatism in patients of 5-15 years attending ophthalmic OPD in a period of two years. To analyse these patients age, sex, type of refractive error, type of squint, type of fixation pattern and classify them etiologically. To study effectiveness of different amblyopia treatments in this age group.

II. Material And Methods:

Study was conducted for duration of two years in a tertiary health care centre in central India. It was prospective, interventional type of study. All consecutive patients during the study were diagnosed as amblyopia were included in the study with due consent signed by their parents, relatives. Detailed history was asked to parents or guardians including age of onset as noticed by them, age of presentation to hospital and any previous treatment taken. Ocular examination included uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA) with help of Snellen's visual acuity chart or Landolf 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 eyedrop homatropine 2 % for 8-15 years age group was performed. Management material used for patching include micropore eye patch, micropore eye

tap, green eye shed. It was done in the form 2 hours or 6 hours patching. Visual improvement tested every 15 days upto 2 ½ months and then after 6 months by Snellen's distant v/a or Landolf c chart.

Inclusion Criteria: Amblyopic patients of 5-15 years age group, Amblyopia associated with strabismus, Anisometropia, or both were included, Strabismic amblyopia, Anisometropic amblyopia. Visual acuity criteria in both eyes without cycloplegia (using snellen's chart): **a.** Visual acuity in sound eye $\geq 6/12$, **b.** Visual acuity in amblyopic eye $\leq 6/12$ and $\geq 6/60$, **c.** Inter eye acuity difference ≥ 2 snellens lines.

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

Note: inclusion and exclusion criteria were taken from ATS4.

III. Results:

Of the total patients examined in the age group of 5-15 years in two years 60 patients were found to be amblyopic. Detailed history, Visual Acuity, Retinoscopy, Ocular Movement and alignment, Slit Lamp Examination, Fundus examination for posterior segment pathology. Patients were given amblyopia treatment and assessed for improvement. Of the total 60 amblyopic patients, maximum patients were in the age group of 5-7 years. Males were more as compared to females.

Table 1: Showing age wise distribution of patients

Age In Years	No. Of Cases	%
5-7	31	51.6
8-10	16	26.6
11-13	7	11.6
14-15	6	10
	60	100

Table 2: Showing type of amblyopia in affected eyes

Type	No. Of Cases	%
Strabismic Amblyopia	08	13.3
Anisometropic Amblyopia	43	71.6
Mixed Amblyopia	9	15.1
	60	100

Table 3: Showing grading of amblyopes according to BCVA

Grading	Visual Acuity	No. Of Cases	%
Moderate	6/60-6/36	26	43.3
Mild	6/24-6/12	34	56.6
		60	100

Table 4: Showing type of squint in strabismic amblyopia

Type Of Squint	No. Of Cases	%
Unilateral Partially Accommodative Convergent Squint	08	40
Alternate Convergent Squint	-	-
Unilateral Divergent Squint	01	05
Alternate Divergent Squint	11	55
Vertical Squint	-	-
	20	100

Table 5: Showing relation of refractive error and amount of anisometropia in 43 cases of anisometropic amblyopia.

Type Of Refractive Error	2-4 D	4.25-6 D	6.25-6d	>8 D	Total	%
Myopia	-	4	2	0	06	13.9
Myopia With Astigmatism	6	3	2	0	11	25.58
Hypermetropia	7	4	1	0	12	27.9
Hypermetropia With Astigmatism	7	3	2	2	14	32.5
	20	14	07	2	43	100

Table 6: Showing results of 2 hours and 6 hours of patching group showing >2 snellen's line improvement in visual acuity amongst 60 amblopes

Types Of Amblyopia	2 Hours	6 Hours
Strabismic Amblyopia	08	00
Anisometropic Amblyopia	32	09
Mixed Amblyopia	08	03
	48	12

Amblyopia was more significantly associated with esotropia than exotropia. Amongst 9 cases of mixed amblyopia 8 of them had unilateral partial accommodative convergent squint and 1 had unilateral divergent squint. All of the anisometropes showed foveal fixation while remaining showed eccentric fixation. Maximum of refractive error difference was found between 2-4D followed by 4.25-6D. Amongst them maximum amblyopes were having hypermetropia with astigmatism 31.6% (Table No.5). Depth of amblyopia and associated strabismus in amblyopic patient is directly related to the status of binocular vision. Amongst 34 (56.6%) patients showing more than 2 Snellen's line improvement while <2 line Snellen's 26 (43.3%). 2 hours patching group patients were 48 (80%) and 6 hours patching group patients were 12 (20%). Anisometropes responds best to part time patching regime.

IV. 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 subsets of the population studied. 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 1.2% . An incidence of below 3 % was reported by various authors: Mcneil (1995) 2.7% , Flom and Neumaier(1996) 1 % , Labhesetwar (1974) 0.3%, Saxena r et al (2016) 2 % . Incidence of amblyopia >3% has been noted by Theodore (1944) 4 % , De Roth (1945) 4,5% , S.D. Gupta et al (1968) 7.41%, Alemayehu Woldeyes, Aboneshgirma et al (2008) 9.1%, Riyadbanayot (2016) 13.8%. In our study causes of amblyopia were strabismus 13.3%, combined in 15.1% and anisometropia in 71.6% (table 2). In Thiagarajans study (1972) anisometropic were 50%, strabismic were 9.51% and mixed were 24.9%. In Fernandez (1968) study anisometropic 61% and mixed were 3.2%. Our study results of occlusion are based on neuronal theory of amblyopia (Table 6). Oliver et al 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 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 7-8 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 doesnot end with the pre school 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. 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. There is a need to manage these cases at secondary level centres and establish proper referral systems so that health care services at tertiary centres are not overburdened. 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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