

STUDY ON CLINICAL PROFILE OF PATIENTS WITH AMBLYOPIA: A HOSPITAL BASED PROSPECTIVE STUDY.

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Abstract

Objectives: This present study was to evaluate the clinical profile of patients with amblyopia.

Methods: A detail history, clinical examinations and relevant investigations were performed to all cases of amblyopia. Cycloplegic refraction under atropine sulphate 1 % eye ointment for 5-10 years and eye drop homatropine 2 % for 11-20 years age group was performed. Management material was tissue paper and micropore tape for patching. It was done in the form of 3 hours or 6 hours patching. Visual improvement tested every month upto 3 months and then after 3 months by Snellen's distant visual acuity or Landolt C chart.

Results: Data was analyzed by using simple statistics methods with the help of MS-Office software.

Conclusions: Amblyopia was commonly seen in children. Anisometropic amblyopia was very common. Refractive error was commonly seen in cases with hypermetropia with astigmatism, myopia with astigmatism and hypermetropia. Majorities of these cases had 2-4D and 4.25-6D refractive error differences and had 6/24-6/12 visual acuity. Alternate divergent and unilateral partially accommodative convergent were the most common type of squint seen. Majorities of cases with anisometropic amblyopia had seen >2 snellen's line improvement of visual acuity in 3 hours patching regimens. Hence, early intervention is ideal, with appropriate management and treatment amblyopia patients are likely obtain a successful outcome, and possibly full resolution.

Key words: Children, amblyopia, refractive error, visual acuity

Introduction:

Amblyopia is reported to be present in about 1–5% of children [1,2], and it affects children's development, their academic work, and various aspects of their social life. It has also been reported that people who have amblyopia in one eye are about twice as likely to develop vision disorders in both eyes when reaching a certain age [3].

Amblyopia has been described as unilateral or bilateral reduction in best-corrected visual acuity caused by form vision deprivation and/or abnormal binocular interaction, without a visible organic cause commensurate with this visual loss [4]. It remains the most common cause of preventable unocular vision loss in children and young adults [5]. Timely diagnosis and management of amblyopia is crucial because the visual loss is correctable, if appropriate

measures are applied at appropriate time [6]. It is not uncommon to see clinicians getting puzzled over diagnosis of a case of diminution of vision, whether it is functional amblyopia or otherwise. Various treatment options have been tried for management of amblyopia. These are refractive correction, occlusion therapy, penalization, drug therapy, and refractive surgery. There is a lot of confusion still to the best possible management protocol for treating a child with amblyopia [7]. Objectives of our study were to evaluate the clinical profile of patients with amblyopia.

MATERIALS & METHODS

This present study was conducted in Department of Ophthalmology, VIMS, Pawapuri, Bihar, India during a period from March 2018 to January 2019.

A total of 50 patients of diagnosed cases of amblyopia with age group 5 years to 20 years with irrespective of sex were enrolled in this study.

Inclusion Criteria of this study were the amblyopic patients with age group 5-20 years, amblyopia associated with strabismus, anisometropia, 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 was the** patients of past treatment of amblyopia. use of current vision therapy or orthoptics. Prior intraocular surgery suggestive of stimulation deprivation amblyopia. Patients having ocular cause for reduced visual acuity and having form deprivation amblyopia. (Note: inclusion and exclusion criteria were taken from ATS4). **Methods:** Detail history by parents including age of onset as noticed, age of presentation to hospital and any previous treatment taken were noted. Ocular examination including uncorrected visual acuity (UCVA) and best corrected visual acuity (BCVA) with help of Snellen’s visual acuity chart or Landolt 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 was done by indirect ophthalmoscope. Cycloplegic refraction under atropine sulphate 1 % eye ointment for 5-10 years and eye drop homatropine 2 % for 11-20 years age group was performed. Management material was tissue paper and micropore tape for patching . It was done in the form of 3 hours or 6 hours patching. Visual improvement tested every month upto 3 months and then after 3 months by Snellen’s distant visual acuity or Landolt C chart.

STATISTICAL ANALYSIS

Data was analyzed by using simple statistics methods with the help of MS-Office software.

OBSERVATIONS

In this present study, we were enrolled a total of 50 patients amblyopia with age group 5 years to 20 years. Most of the cases 30(60%) of amblyopia were seen in age group of 5-10 years. And male and female ratio was 3:2.

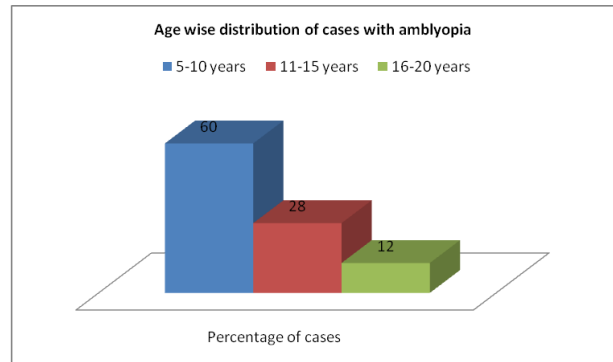


Figure 1: Showing age wise distribution of cases with amblyopia.

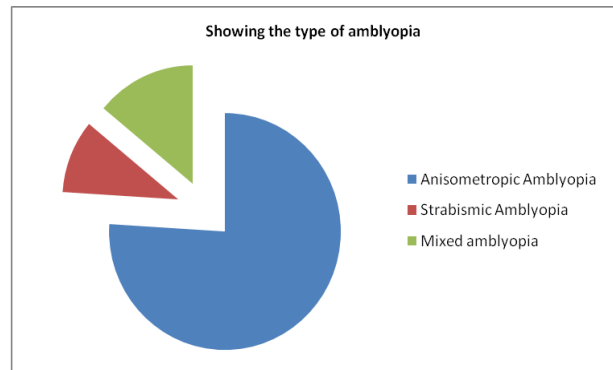


Figure 2: Cases showing type of amblyopia.

In this present study, most of the patients had anisometric amblyopia 38(76%).

Table 1: Grading of amblyopes according to BCVA.

Grading	Visual acuity	No. of cases	Percentage
Mild	6/24-6/12	32	64%
Moderate	6/60-6/36	18	36%
Total		50	100%

In this study, grading of majorities of cases 32(64%) had 6/24-6/12.

Table 2: Type of squint in cases of amblyopia (N=18).

Type of squint	No. of cases	Percentage of cases
Unilateral Partially Accommodative Convergent Squint	7	38.89%
Alternate Convergent Squint	-	-
Unilateral Divergent Squint	1	5.56%
Alternate Divergent Squint	9	50%
Vertical Squint	1	5.56%
Total	18	100%

Most common type of squint was alternate divergent squint 9(50%). Second most common was unilateral partially accommodative convergent squint 7(38.89%).

Table 3: Relation of refractive error and amount of anisometropia in among total cases of anisometropic amblyopia. (N=38).

Type of refractive error	2-4 D	4.25-6 D	6.25-6d	>8D	Total No. of cases	% of cases
Hypermetropia	6	3	1	0	10	26.31%
Hypermetropia With Astigmatism	6	2	2	2	12	31.58%
Myopia	-	4	1	1	6	15.79%
Myopia With Astigmatism	5	3	1	1	10	26.31%

Out of 38 cases of anisometropic amblyopia, majorities of cases 12(31.58%) had hypermetropia with astigmatism. Among them most of the cases (6) had 2-4D refractive error. 10(26.31%) cases had only hypermetropia. Among them majorities (6) were 2-4 D refractive error differences. Myopia with astigmatism was seen in also 10(26.31%) cases. Among them majorities of cases (5) had 2-4 D refractive error differences.

Table 4: Results of 3 hours and 6 hours of patching group showing >2 Snellen’s line improvement in visual acuity amongst 50 patients of amblyopia.

Types Of Amblyopia	3 hours	6 hours
Strabismic Amblyopia	5	0
Anisometropic Amblyopia	30	8
Mixed Amblyopia	5	2
Total	40(80%)	10(20%)

In this present study, majorities of amblyopia cases 40(80%) had > 2 Snellen’s line improvement in patching were seen in 3 hours. Among them, 30(60%) and 8(16%) cases of anisometropic amblyopia were seen improvement in 3 hours and 8 hours in patching respectively. In mixed amblyopia, >2 Snellen’s improvement was seen in 3 hours in 5 cases. And 2 cases were seen in 6 hours.

DISCUSSIONS

Amblyopia results from abnormal development of the visual system in early childhood. The visual cortex needs continuous, clear and focused visual impulses to develop normally.[1-7] Children with amblyogenic risk factors, if not treated, are vulnerable to functional reduction of visual acuity (VA), causing amblyopia [8,9].

In this present study, most of the cases 30(60%) of amblyopia were seen in age group of 5-10 years. Second common age group of amblyopic patients 14(28%) was 10-15 years. Male and female ratio was 3:2.

ZhaleRajavi, et al [10] were concluded that amblyopia significantly decreased with older age (P=0.014) . There was no statistically significant difference

between boys and girls in the prevalence of amblyopia at different age groups. Amblyopia was found in 34.8% and 15.6% of esotropic and exotropic subjects, respectively, while only 1.8% of orthotropic ones had amblyopia. In addition, amblyopia was observed in 25% of subjects with anisometropia and strabismus (mixed amblyopia).

In our present study, most of the patients had anisometric amblyopia 38(76%). Mixed amblyopia and strabismic amblyopia were found in 7(14%) and 5(10%) cases respectively.

In 2002, Moseley et al. [11] reported the results of 13 anisometropic and strabismic amblyopes who were prescribed refractive correction only, they showed for the first time that amblyopic subjects can gain significant improvements in visual outcome with refractive correction alone. In a later study [12], 14 of 65 amblyopic subjects (interocular difference in visual acuity of >0.1) had a resolution of their amblyopia with glasses alone, and no further treatment was required. The mean improvement in visual acuity for the 65 patients was 0.18 LogMAR with the majority of cases achieving maximum improvement within the first 18 weeks of wearing refractive correction. There was no significant difference in the level of

improvement between different types of amblyopia, (anisometropic, strabismic or strabismus with anisometropia) $p= 0.29$. However, a recent survey of orthoptists reported 94% prescribe a period of refractive correction before implementing further treatment, although this is lower for strabismic (75%) or strabismic and anisometropic amblyopia (79%) [13]. This period of refractive correction is also commonly referred to as refractive adaptation or refractive treatment [12].

In our present study, majorities of patients 32(64%) were visual acuity 6/24-6/12. And 6/60-6/36 visual acuity was seen in 18(36%) patients of amblyopia.

In patients with strabismic amblyopia, alternate divergent squint was seen in 9(50%) cases, unilateral partially accommodative convergent squint was seen in 7(38.89%) cases. And 1(5.56%) cases had unilateral divergent and vertical squint. In relation of refractive error and amount of anisometropia in total cases of anisometropic amblyopia (38), hypermetropia with astigmatism was seen in most of the cases 12(31.58%). Among them majorities of cases (6) had 2-4D refractive error differences. And each of 2 cases had 4.25-6 D, 6.25-6d and >8D refractive error differences respectively. And second most common type of refractive error was myopia with astigmatism and hypermetropia. In myopia with astigmatism (10), majorities of cases (5 and 3) had 2-4D and 4.25-6 D refractive error differences respectively. In hypermetropia cases (10), majorities (6 and 3) had 2-4 D, 4.25-6D refractive error differences respectively. In myopia (6), majorities of cases (4) had 4.25-6 D refractive error differences.

In terms of >2 snellen's line improvement of visual acuity in 3 hours and 6 hours in patching, most of the cases of amblyopia 40(80%) were seen in improvement in 3 hours. 30(60%) cases of anisometropic amblyopia were seen improvement in 3 hours. 8(16%) cases were seen in 6 hours. 5(10%) cases of mixed amblyopia were seen improvement in 3 hours and 2(4%) cases were seen improvement in 6 hours. Similarly, strabismic amblyopia 5(10%) cases were seen improvement in 3 hours.

Amblyopia is present when the best corrected visual acuity (BCVA) cannot reach 20/20 or 6/6. It is a mostly unilateral, but sometimes bilateral, decrease of best corrected visual acuity in the absence of any structural or pathological anomalies. Also, one or more of the below amblyogenic factors must be present before the age of six to eight years to qualify

the vision loss as functional amblyopia. These factors include [15] a constant, unilateral eso or exotropia, [14] either anisometropia, bilateral isometropia, or unilateral or bilateral astigmatism of amblyogenic amount, or [15] some form of stimulus deprivation or image degradation[15]. These amblyogenic factors prevent a healthy visual pathway from forming between the eye and the brain during the critical period of neurodevelopment (08 years old), thus resulting in a decrease in BCVA [16].

Aside from a decrease in best corrected visual acuity, amblyopes may suffer from an array of associated deficits. Amblyopes will often present with associated increased sensitivity to contour [15] interaction or crowding, spatial distortions, impaired stereoacuity and abnormal binocular summation, unsteady and inaccurate monocular fixation, poor eye tracking skills, reduced contrast sensitivity, and inaccurate accommodation. Although these deficits are much more evident in [17,18] the affected eye, the 'uninvolved' eye has been shown to also be affected. Children with amblyopia[18] have been shown to perform poorly relative to their nonamblyopic counterparts in education, employment, sports, and socioeconomic achievement. Given the potential lack of symptoms and the adverse effects of amblyopia on visual skills and overall development it is important that a child receive a comprehensive ocular and visual evaluation as early in life as possible [19,14].

CONCLUSIONS

This study concluded that the amblyopia was commonly seen in children. Most common amblyopia was anisometropic amblyopia. Refractive error was commonly seen in cases with hypermetropia with astigmatism, myopia with astigmatism and hypermetropia. Majorities of these cases had 2-4D and 4.25-6D refractive error differences. Majorities of cases had 6/24-6/12 visual acuity.

Alternate divergent and unilateral partially accommodative convergent were the most common type of squint seen. Majorities of cases with anisometropic amblyopia had seen >2 snellen's line improvement of visual acuity in 3 hours patching regimens. Hence, early intervention is ideal, with appropriate management and treatment amblyopia patients are likely obtain a successful outcome, and possibly full resolution, no matter their age. Patients should be monitored closely and frequently during and after amblyopia treatment to allow for treatment modification as needed and to watch for amblyopia

recurrence. And due to high prevalence of anisometropic amblyopia in terms of refractive error, provision of glasses should be specifically attended by parents and supported by the Government.

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