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Factors influencing occlusion therapy in refractive amblyopia

Niharika K Shetty[1], Indireddy Prathyusha[2]

1 *Professor, Department of Ophthalmology, Sri Siddhartha Medical College and Hospital, Tumakuru, Karnataka- 527107, India*

2 *Post Graduate, Department of Ophthalmology, Sri Siddhartha Medical College and Hospital, Tumakuru, Karnataka- 527107, India*

Abstract

Introduction: Amblyopia is an of important cause of preventable blindness and early detection with timely rehabilitation can prevent blindness in childhood age. It also carries a higher risk of vision loss in fellow eye. The most common method of treatment to recover the monocular function involves patching the good eye in an effort to reinforce the amblyopic eye to improve. In our study we evaluated the factors affecting occlusion therapy in amblyopia patients in terms of age, gender, amount of refractive error and the time period of occlusion as the influential factor in rehabilitation of amblyopia. **Methods:** In this observational study, all patients between 3 years to 25 years who attended the ophthalmic OPD at Sri Siddhartha Medical College, a tertiary health care centre for ocular evaluation and diagnosed with amblyopia were included in the study. The patients were evaluated for Visual acuity on Snellens visual acuity chart and then subjected to Refractive error evaluation on Unique RK 800 Autorefractometer. Anterior segment was evaluated on Slit lamp and Fundus examination was done on Direct and indirect ophthalmoscope. Post refraction and Post treatment visual acuity was evaluated for the patients on Snellens visual acuity chart. **Results:** Total of 42 patients were studied out of which 16 were males and 26 were females. All patients were between 3- 35 years of age, with maximum patients 20 (47. 6%) in the age group of 6 to 15 years. 21 patients (50%) were having a baseline visual acuity in the range of 3 meter finger counting to 6/36. The commonest refractive error was astigmatism 23(54.8%) amongst whom compound myopic astigmatism was commonest in 9 patients (21.4%). In our study the post correction visual acuity improvement was 6/24 to 6/6 which was found in maximum patients 31 (73.8%), which further improved in the post occlusion visual acuity in 35 patients (83.3%) from 6/24 to 6/6. **Conclusion:** In this study we found myopic astigmatism as the commonest refractive error in anisometropic amblyopias. Though we found a female preponderance, the gender association was not found significant in the visual recovery or the treatment response. A good improvement following occlusion treatment as well as refractive adaptation period.

Keywords: Amblyopia, Astigmatism, Refractive adaptation, Occlusion therapy.

INTRODUCTION

Amblyopia is one of the most important preventable cause of blindness and early detection with timely rehabilitation can prevent blindness in childhood age. Amblyopia is the common childhood disorder, with a prevalence of about 1-5%. It carries a higher risk of serious vision loss in fellow eye. Clinical evidence demonstrates that adults with anisometropia, uncorrected until after the age of visual maturation demonstrate some degree of amblyopia.

Amblyopia has been described by numerous authors in different ways. According to one study, amblyopia was said to be a reduced visual acuity which is known to be caused due to formation of an abnormally oriented image, a blurred image, or absence of an image projection on the retina especially in the early years of visual development.

Some have described amblyopia as a reduced visual acuity, wherein no organic abnormality is visible in the eye, most probably caused by a visual stimulus deprivation or an altered binocular stimulation.

Amblyopia remains the commonest cause for monocular impairment in adults and children. Eye, affecting almost 2-5 % of the general population. The visual factors seen to be affected were Vernier acuity, contrast sensitivity, higher spatial frequencies as well as recognition acuity. All these parameters are found to be impaired compared to the normal population. Though one involvement is more common, binocular affection is also seen [1].

Children can go into isoametropic amblyopia if greater than 4.50 D spherical hypermetropia is seen [2,3].

***Corresponding author:**
Dr. Niharika K Shetty
Professor, Department of Ophthalmology, Sri Siddhartha Medical College and Hospital, Tumakuru, Karnataka- 527107, India
Email:
niharika.shetty30@gmail.com

Myopia is known to cause uniocular amblyopia, with a difference of 2.00 in both eyes, whereas hyperopia will cause uniocular amblyopia by a difference of 1.00 diopters. Astigmatism causes amblyopia with a difference of greater than 1.50 diopters [4].

A study by Hillis *et al* found that strabismus account for 50% of cases of amblyopia, especially esotropia in children. Refractive error was seen in 17% of cases and accommodative strabismus was seen in almost 30% of the cases. Sensory visual deprivation was seen in only 3% of cases, however these contribute to dense amblyopia [3].

Amblyopia being a childhood disease, the impact of this disease on the lifetime of the affected patients needs to calculated, so as to understand the burden caused by the disease on the adulthood and the working age group. A study Van Leeuwen *et al* by calculated the risk of amblyopia in terms of risk of bilateral visual deterioration graded to value of binocular visual acuity < 0.5, which was found to be two times compared to the normal population, attributing to the disease burden [5].

Hence it is essential to treat amblyopia timely. Since the natural course of disease is non self limiting, and given the lifetime risk of the disease leading to bilateral visual impairement, it is imperative to treat amblyopia as early as possible.

Amblyopia is the unilateral or bilateral loss of vision caused by abnormal visual inputs especially during a critical period of visual development. The critical period is seen as the period of time during which abnormal visual inputs can result in amblyopia, but it is also the time during which amblyopia can be reversed by eliminating the abnormal visual inputs and, usually, by occluding the normal eye for some periods of time [6].

Various treatment modalities have been suggested for amblyopia, of which one of the principles say that

Depriving the normal eye of visual stimulus, can enhance the vision gain in the amblyopic eye [7-12].

A multicentric trial by Vereecken and Brabant showed that vision loss of central field in normal eye can lead to improvement up to 3 lines in the amblyopic eye. They found this effect in 28.5% of their study population [7].

The concept of critical period of amblyopia treatment is explained on the development of normal visual pathway. When a visual stimulus falls on the retina, both image forming as well as non-image forming visual information travels through the retinal ganglion cells, optic nerve to the optic chiasm into the optic tract and ends at the lateral geniculate nucleus of the thalamus. The majority of the fibers then travel from the LGN to the primary visual cortex (V1) in the occipital lobe. All cortical layers above and below V1 consist of columns that respond to a specific property of an image [13]. The ocular dominance columns compares the input from each eye. Each column responds differentially to input from one eye or another or equally to both [14,15]. These visual inputs then travel on to other areas of the visual cortex for further processing [16]. The foveal cones are known to develop over the first 24 months and continue to mature into childhood. Hence the formation of the ocular dominance columns relies on the guidance cues from retinal ganglion cells and on visual stimuli. These synaptic connections between the eye and the brain are strengthened by correlated and coordinated activity or weakened by uncorrelated activity [17-19]. After the formation of this initial circuit, there is a specific vital time period called as the critical period of age which is said to be up to 6-8 years in humans, during which modulations take place in the ocular dominance column according to the patient's image experiences. Any visual stimulus deprivation in any one eye during this vital period or the critical period, can lead to a poor development of that particular eye representation in visual area 1(V1), with simultaneous enhanced representation in the same area of the other eye [20]. Monocular deprivation during this critical period can cause a pronounced decrease in the area of V1 representing the deprived eye and a corresponding increase in representation of the unaffected eye.[20] If the visual system is exposed to factors such as vision blur and/or binocular vision suppression, they will cause a progressive reduction of visual acuity [21-24]. The vision may continue to reduce until the end of the critical period at which time visual acuity will stabilize. In isometropic amblyopia, the uncorrected refractive error in both eyes creates a blurred image on both retinas. Eventually, this visual blur disrupts normal neurophysiological development of the visual pathway and visual cortex causing vision blur in spite of with optimal visual correction. In anisometropic amblyopia, the uncorrected refractive error in one eye creates a blurred image on one retina disrupting normal visual pathway development for that eye. Over time, the visual system actively starts to inhibit or suppress the blurred image causing cortical spatial changes in the ocular dominance columns that result in a loss of visual acuity. In strabismic amblyopia, each fovea receives a different image. Abnormal binocular inhibition suppresses the image from the deviated eye can cause cortical spatial changes that result in a loss of BCVA as well as possible development of eccentric fixation in the deviated eye [25-28].

The goal of amblyopia treatment is to make the amblyopic eye to enhance its connection with the brain and simultaneously inhibit the impulses from the sound eye. The treatment is aimed at reducing the image blur which leads to an inadequate stimulus for development of cortical connections. It is also aimed at decreasing bilateral inhibition so that there is equal representation of each eye in the ocular dominance columns. This principle works best in the critical period of age.

However the American Academy of Ophthalmology, now recommends that amblyopia treatment should be given regardless of their age [29].

Response to treatment of amblyopia is usually assessed by an improvement in vision in terms of alphabets as well as increase in the number of lines on snellens visual acuity chart. However previous studies have considered the fixation criteria as well as the followability criteria for improvement in amblyopia, or the end point of the therapy.

A study by Atilla *et al* found that younger amblyopes responded faster to the occlusion treatment when evaluated by maintenance of the fixation as well as by appreciation of movements, in comparison to adult amblyopes. But these end point criteria didn't hold good, as the children required a maintenance therapy as they grew old and after more accurately measurable criteria were applied [30]. Hence these criteria are not preferred either for diagnosis or for treatment response evaluation in amblyopia patients.

Another protocol for amblyopia treatment is the refractive adaptation period followed by occlusion treatment. Anisometropia amblyopes have shown improvement in vision after a period of spectacle correction and refractive adaptation is considered an important component of amblyopia treatment rather than starting occlusion therapy earlier [31].

The conventional treatments for amblyopia include refractive correction, occlusion, and atropine penalization. Optimal refractive correction itself can resolve at least one-third of cases with untreated anisometropic amblyopia and even some untreated strabismic amblyopia [31]. If amblyopia is not resolved, occlusion or pharmacological penalization with atropine on the better eye may be prescribed simultaneously or after refractive correction is provided. Pharmacological therapy which includes drugs like levodopa, carbidopa, and citicoline were used in past. Other treatments like Cambridge stimulator and pleoptics were used earlier in the treatment

of amblyopia [32-35]. However, occlusion of the nonamblyopic eye remains the mainstay of treatment [35].

Many studies have limited the amblyopia therapy to less than 6-7 years [36-38]. But many others have reported better outcome in older patients[39-42].

Literature also shows some studies which determined the hours of occlusion required. They suggested that the age of commencement of treatment, the baseline visual acuity and the cause of amblyopia were the potential determinants of the outcome [43].

In terms of age, older children required more hours of occlusion [44]. It was seen that 3 hours of occlusion improved vision in children less than 4 years, but the patients more than 6 years required patching from 3 hours to 6 hours depending on their response. It was seen that though longer occlusion hours hastened the response, no change was documented in the final visual outcome [44].

Also longer hours of occlusion might compromise the compliance of the patient with the treatment. Hence fewer hours of occlusion is advised initially to the patients [43].

For further understanding the protocol for amblyopia treatment, it has been proposed that severe amblyopia required full time or at least 6 hours of patching for equivalent response as against amblyopias of mild to moderate degree which responded to 2 hours of patching depending on the aeitiology [45-48].

The response to 2hours of patching of amblyopic eye in mild to moderate amblyopia is found to be comparable to 6 hours or full time patching in 7to 12 years age group children [49].

Hence the standard care for Anisometropic amblyopia includes primarily dispensing of refractive correction following cycloplegic retinoscopy. A refractive adaptation of 4-6 weeks is advisable [50]. If no improvement in visual acuity is documented, occlusion treatment is started for the amblyopic eye.

The factors to be considered while Carrying out occlusion therapy involves the type of occlusion. The types of occlusion practiced are full, partial and sectoral.

The second factor governing occlusion are the light transmission into the eye, which can be controlled by using a non-transmitting opaque occlusive patch. These patches occlude both light as well as form vision. Apart from the above two factors, the total hours of patching also influences the treatment outcomes [51].

Hence the patching of the better eye with a completely non-transmitting patch is the preferred mode of treatment for amblyopia However the total wearing time of the patches remains variable. The end point of the treatment also remains variable lacking standardization and is always governed by the outcome.

The amount of visual acuity gain following the treatment was not found to be proportional to duration of occlusion therapy. Most studies found maximum improvement achieved by the end of 6 weeks of occlusion. Further only marginal improvement was seen on extending the treatment up to 12 weeks. Though the better response was seen in children less than 4years of age, as compared to children greater than 6 years of age.

One factor which has emerged as an influential one to alter the effectiveness of occlusion treatment, is the age of treatment. This knowledge can be further applied to roll out a standard guideline for pediatric visual screening age limit. Refractive adaptation followed by occlusion treatment have an additive effect on the visual outcome [52].

Even with spectacle correction plus occlusion or atropine penalization, there may be about one-third of amblyopia having poor response to treatment. Eyes with poor initial visual acuity, the presence of significant astigmatism, and age of over 6 years are identified as risk factors for non-improvement [53]. Compliance with amblyopia treatments has a major effect on response to therapy [54].

If amblyopia is not treated it can not only have an economic burden to the society but it can also lead to psychological disorder in children as well as in adults.

In our study we are aiming to determine the factors affecting occlusion therapy in amblyopia patients in terms of age, gender, amount of refractive error and the time period of occlusion as the influential factor in rehabilitation of amblyopia.

MATERIALS AND METHODS

All patients between 3 to 25 years who attended the ophthalmic OPD at Sri Siddhartha Medical College at a tertiary health care centre for ocular evaluation and were diagnosed with amblyopia were included in the study. All the patients in the age group of 3 to 25 years with refractive cause of amblyopia (anisometropic and Isoammetropic amblyopia) were dispensed with the corrective glasses. A time period of 6 weeks was given for refractive adaptation and then occlusion therapy was started. The treatment protocol followed was 2 hours of occlusion for the normal eye followed by near work. The patients were evaluated for Visual acuity on Snellens visual acuity chart and then subjected to Refractive error evaluation on Unique RK 800 Autorefractometer. Hirschbergs corneal reflex test was done to evaluate the heterotropia, to categorise strabismic amblyopia. Anterior segment was evaluated on Slit lamp and Fundus examination was done on Direct and indirect ophthalmoscope. Fixation pattern was documented for all the patients on direct ophthalmoscope. Post treatment visual acuity was evaluated for the patients on Snellens visual acuity chart and the compliance to the treatment was noted. Tests of significance was applied for all the tables, and the associations were evaluated by Fishers Exact test.

RESULTS

Table 1: Gender distribution of patients studied

Gender	No. of patients	%
Male	16	38.1
Female	26	61.9
Total	42	100.0

Table 2: Age distribution of patients studied

Age in years	Gender		Total
	Male	Female	
0-5 yrs	0(0%)	1(3.8%)	1(2.4%)
6-10 yrs	6(37.5%)	4(15.4%)	10(23.8%)
11-15 yrs	4(25%)	6(23.1%)	10(23.8%)
16-20 yrs	2(12.5%)	7(26.9%)	9(21.4%)
21-35 yrs	4(25%)	8(30.8%)	12(28.6%)
Total	16(100%)	26(100%)	42(100%)

P= 0.471, Fisher Exact Test

Table 3: Baseline Visual Acuity

Baseline Visual Acuity	Gender		Total
	Male	Female	
6/6- 6/12	1(6.3%)	3(11.5%)	4(9.5%)
6/18- 6/24	5(31.3%)	4(15.4%)	9(21.4%)
6/36- 6/60	3(18.8%)	8(30.8%)	11(26.2%)
CF at 5mt - 3mt	4(25%)	6(23.1%)	10(23.8%)
CF at 2mt - close to face	3(18.8%)	4(15.4%)	7(16.7%)
HM - PL positive	0(0%)	1(3.8%)	1(2.4%)
Total	16(100%)	26(100%)	42(100%)

P= 0.817, Fisher exact test not significant

Table 4: Type of Refractive Error

Type of Refractive Error	Gender		Total
	Male	Female	
Myope	3(18.8%)	7(26.9%)	10(23.8%)
Hypermetropia	5(31.3%)	4(15.4%)	9(21.4%)
astigmatism	8(50%)	15(57.7%)	23(54.8%)
Total	16(100%)	26(100%)	42(100%)

P= 0.461, Chi –Square not significant

Table 5: Type of Astimagitism

Type of Astimagitism	Gender		Total
	Male	Female	
No astigmatism	8(50%)	11(42.3%)	19(45.2%)
Simple myopic	2(12.5%)	4(15.4%)	6(14.3%)
Simple hypermetropic	0(0%)	0(0%)	0(0%)
Compound myopic	2(12.5%)	7(26.9%)	9(21.4%)
Compound hypermetropic	0(0%)	1(3.8%)	1(2.4%)
Mixed	4(25%)	3(11.5%)	7(16.7%)
Total	16(100%)	26(100%)	42(100%)

P= 0.668 Fischer Exact not significant

Table 6: Other Associated Disease

Other Associated Disease	Gender		Total (n=42)
	Male (n=16)	Female (n=26)	
No association	13(81.3%)	21(80.8%)	34(81%)
Squint	3(18.8%)	4(15.4%)	7(16.7%)
Nystagmus	0(0%)	0(0%)	0(0%)
VKC	1(6.3%)	0(0%)	1(2.4%)
Stye	0(0%)	1(3.8%)	1(2.4%)
Episcleritis	0(0%)	1(3.8%)	1(2.4%)
Cataract	0(0%)	0(0%)	0(0%)

Table 7: Macular Fixation

Macular Fixation	Gender		Total
	Male	Female	
Foveal	11(68.8%)	21(80.8%)	32(76.2%)
Peri foveal	4(25%)	2(7.7%)	6(14.3%)
Parafoveal	1(6.3%)	3(11.5%)	4(9.5%)
Total	16(100%)	26(100%)	42(100%)

P= 0.408, Fisher Exact not significant

Table 8: Foveal reflex

Foveal reflex	Gender		Total
	Male	Female	
Yes	16(100%)	25(96.2%)	41(97.6%)
No	0(0%)	1(3.8%)	1(2.4%)
Total	16(100%)	26(100%)	42(100%)

P=1.000, Fisher Exact Not significant

Table 9: Post Correction Visual Acuity

Post Correction Visual Acuity	Gender		Total
	Male	Female	
6/6- 6/12	3(18.8%)	9(34.6%)	12(28.6%)
6/18- 6/24	8(50%)	11(42.3%)	19(45.2%)
6/36- 6/60	5(31.3%)	4(15.4%)	9(21.4%)
CF at 5mt - 3mt	0(0%)	2(7.7%)	2(4.8%)
CF at 2mt - close to face	0(0%)	0(0%)	0(0%)
HM - PL positive	0(0%)	0(0%)	0(0%)
Total	16(100%)	26(100%)	42(100%)

P=0.412, Fisher Exact test not significant

Table 10: Post Occlusion Visual Acuity

Post Occlusion Visual Acuity	Gender		Total
	Male	Female	
6/6- 6/12	5(31.3%)	14(53.8%)	19(45.2%)
6/18- 6/24	8(50%)	8(30.8%)	16(38.1%)
6/36- 6/60	3(18.8%)	2(7.7%)	5(11.9%)
CF at 5mt - 3mt	0(0%)	2(7.7%)	2(4.8%)
CF at 2mt - close to face	0(0%)	0(0%)	0(0%)
HM - PL positive	0(0%)	0(0%)	0(0%)
Total	16(100%)	26(100%)	42(100%)

P= 0.269, Fisher exact not significant

DISCUSSION

In our study group we had 26 (61.9%) females and 16(38.1%) male population, in a study by Huang *et al*, they found that amblyopia prevalence did not differ by the gender. (p value= 0.77), the female preponderance in their study was not significant [55].

In another study by Meena Bhatia *et al* it was found that Anisometropic amblyopia was more in males (76.7%) than in females (23.3%) [56].

However another study by Taylor and Feldman, have reported that there exists no predilection for either the eye or the gender for development of amblyopia [57].

In our study, on age wise evaluation of amblyopia manifestation we found that 21(49.8%) were in 0 to 15 years age group, which amounted almost up to 50% of our study population. In a study by Stephanie *et al* it was found that the cumulative incidence was 2% to 4 % in children aged up to 15 years [58].

In table 3 we have recorded the baseline visual acuity as, or the uncorrected visual acuity in our study population. We found that 69.1% (29 patients) had a visual acuity below 6/36 on Snellens visual acuity chart. Out of these almost 42.9% patients had a visual acuity below 6/60 on snellens visual acuity chart.

This visual acuity qualifies for economic blindness as proposed by the NPCB.

This can also be classified as preventable blindness as timely correction with spectacles and amblyopia therapy in certain patients can completely rehabilitate these patients.

On applying Fisher Exact test it was found that the Baseline visual acuity was not significantly associated with the gender.

In table 4 we have evaluated the type of refractive error in our subjects, we found that 54.8% (23 patients) were having astigmatism. Though it was found more frequently in females it was not statistically significant on fisher exact test. Hence in our study the most amblyogenic refractive error was astigmatism.

In another study by Manish *et al*, astigmatic amblyopia was found in 41.93% of cases, hypermetropia in 32.25% and Myopia in 25.8% of cases [59].

Our findings almost corresponded to their findings.

Uncorrected astigmatism is known to cause reduced visual acuity, vernier acuity, contrast sensitivity across a range of spatial frequency, measures of grating acuity, recognition acuity and stereo acuity [60].

This can be fully corrected by spectacle treatment and thus can reduce the risk of amblyopia over most of the above mentioned visual functions.

However it has been demonstrated that orientation dependent blur during the early visual development due to uncorrected astigmatism will lead to orientation dependent visual deficit despite of optical correction or emmetropization [61].

In table 5 we have discussed the specific type of astigmatism with the gender predilection, no association was seen between the type of astigmatism or the gender predilection.

We found compound myopic astigmatism in approximately 27.7 % of cases. The second commonest type of astigmatism was mixed astigmatism 7 (16.7%).

It has been postulated that, in eyes without astigmatism all stimulus orientations focus at a single point. But in uncorrected astigmatics, the orthogonal planes focus at different retinal loci.

The viewing of far focal points is out of focus for myopic and mixed astigmatics, however hyperopic astigmatics and the mixed astigmatics can focus the hyperopic planes. Hence the Myopic and mixed astigmatism patients are more often found to experience meridional amblyopia [62].

Hyperopic astigmatism patients tend to accommodate and focus the less hyperopic plane. Sometimes they accommodate between the two extreme focal planes. Hence these patients are at a low risk for meridional amblyopia. However the risk for amblyopia in terms of reduced vision persists in them also [63,64].

In Table 6 we have discussed the other common associated diseases with astigmatism. We found no significant gender association with the same on Fischer Exact.

We found almost 34 (81%) coming as refractive cause, whereas about 7 (16.7%) were found to have Squint.

In a study by Cathy William, they have quoted that 38% were strabismic amblyopia, 37% were anisometropic and 24% were both strabismic and Anisometropic. They further quoted Ptosis, corneal injury, and cataract amounting up to 3% of cases [65].

Table 7 discussed the fixation pattern in every patient included in the study, this was done to correspond to the post therapy visual gain.

In our study we found 32 (76.2%) patients with macular fixation. The post occlusion visual acuity was found to be above 6/24 in 83.3% of cases in our study.

In a study by Jing Jin *et al*, it was found that there is a greater fixation shift in amblyopic eye in refractive amblyopia patients. They considered this fixation shift as an indicator of Functional Visual gain [66].

The foveal area has the highest visual acuity, which goes on reducing as the fixation moves away from the fovea. The study by Weiter *et al*, suggested that parafoveal region up to 0.25 Disc diameter from the fovea was between 20/25 to 20/50. Further moving by 0.5 Disc diameter lead to a fall of visual acuity between 20/50 to 20/100. Any shift of fixation greater than 1.00 Disc diameter drops the best achievable visual acuity to finger counting [67].

In table 8, we have tried to evaluate the presence of a good foveal reflex.

We found almost 41 (97.6%) patients having foveal fixation, showing a better chance of rehabilitation.

Fovea being the area of best fixation, occlusion of the dominant eye could cause harmful effects to those eyes, was pointed out by Arruga *et al*.[68] However limited hours of occlusion, as practiced most commonly reduces this risk.

Further Brinker *et al* have showed the significance of usage of a red filter in amblyopic eyes with eccentric fixation. It was proposed that, since fovea has only cone photoreceptors, use of red filter while undergoing occlusion treatment can preferentially stimulate only cones of the amblyopic eye and can also bring about central fixation in the amblyopic eye [69].

A study by Scully and Von Noorden actually showed that, mere occlusion of the dominant eye can bring back the eccentric fixation back to fovea in the amblyopic eye [70-72].

In table 9 we have evaluated the effect of refractive adaptation of 6 weeks following the treatment with glasses.

We found almost 73.8% of the patients having visual acuity between 6/6 to 6/24 following a refractive adaptation of 6 weeks, which was seen in only 30.9 % as a baseline visual acuity before treatment.

In a study by Stewart *et al* they concluded that, refractive adaptation helps to appropriately evaluate mainstream therapies of amblyopia, such as occlusion and penalization. The advantage of it being that children may start occlusion with improved visual acuity, which will

increase the compliance to treatment, and in some cases may avoid unnecessary patching as in occlusion treatment [73].

In our 10th table we have entered the post occlusion visual acuity, we found 83.3 % patients having a visual acuity between 6/24 to 6/6 and almost no patients with visual acuity less than 3/60 as against the pre treatment visual acuity was between 6/24 to 6/6 in only 30.9% of cases. And there were almost 19.1% of cases with visual acuity less than 3/60.

Hence there was a good improvement seen following refractive adaptation and occlusion treatment in our study.

Also the total number of patients in 6/6 to 6/12 vision was increased from 4 (9.5%) to 19 (45.2%) post refractive correction and Occlusion therapy.

CONCLUSION

In our study we found myopic astigmatism as the commonest refractive error in anisometropic amblyopias. Though we found a female preponderance, the gender association was not found significant in the visual recovery or the treatment response. We could establish a good improvement following occlusion treatment as well as refractive adaptation period.

However a larger sample size may be required to further substantiate these facts as well as the gender associations.

Conflict of Interest

There is no conflict of interest in this study.

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