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Two Hours vs Six Hours Occlusion Regimen: A Comparative Study for Anisometropic Ambylopia

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Abstract
Aim: *To compare two hours vs. six hours occlusion regimen in moderate anisometropic amblyopia in combination with one hour near vision activities in children aged 4-9 years.*
Materials and Methods: *a cross sectional study was conducted in the department of Ophthalmology, ASCOMS for a period of six month post refractive error correction involving 30 children aged 4-9 years with moderate anisometropic amblyopia. The children were randomly divided into two equal groups: Group A was put on two hours occlusion of the better eye and Group B on six hours occlusion per day along with one hour of near vision activities. The data was analyzed by paired T-test method.*
Results: *The visual acuity in both the groups showed significant improvement, the mean LogMAR BCVA in Group A improved from 0.39 to 0.12 and Group B showed improvement from 0.40 to 0.12 respectively, both the difference being stastically significant (p=0.001) respectively. However, no significant difference was observed between Group A and Group B in post occlusion visual acuity after six months of follow up.(p=1.000)*
Conclusion: *In moderate anisometropic amblyopia, both two and six hours of occlusion after refractive error correction and when combined with one hour near vision activities produce equivalent amount of improvement in children of younger age group (4-9 years) provided there is good compliance.*
Keywords: *Ambylopia, occlusion, refractive error, eye-patch.*

Introduction

Amblyopia is unilateral or bilateral developmental condition characterized by reduced vision, which is minimum two lines less than the normal or two lines less in affected eye in monocular amblyopia and is not associated with any ophthalmoscopic abnormality. If properly and timely evaluated and treated, amblyopia is a reversible condition.[1]

Amblyopia accounts for 1-2% of reduced vision in children with majority associated with strabismus and anisometropia.[2]

Amblyopia can be mainly differentiated into refractive, strabismic and stimulus deprivation. Refractive amblyopia can be further classified into anisometropic (the refractive power of the two eyes is unequal), ametropic (high refractive error)

and meridonial (refractive error along a meridian or an axis). The present approach to treating amblyopia constitutes correction of the refractive error with spectacles followed by patching or occlusion of the better eye.[3]

Though occlusion remains the mainstay of amblyopia treatment yet the duration for which occlusion should be done per day remains a matter of debate till today. Pediatric Eye Investigator Group has undertaken many clinical studies prospectively to address the efficacy of full time occlusion vs. part time occlusion.[4-8]

The aim of our study is to compare two hours occlusion regimen with six hours occlusion as a treatment for moderate anisometropic amblyopia in children of 4-9 years age group.

Materials and Methods

Among the total children who visited eye OPD in Department of Ophthalmology, 30 children with moderate anisometropic amblyopia were included in our randomized cross sectional study for comparing two hours vs. six hours occlusion therapy with one hour of near vision activities after taking informed consent from parent.

Inclusion criteria involved children aged 4-9 years of age, patients with moderate anisometropic amblyopia who had not undergone occlusion therapy in the past.

Children who were unwilling to participate, had amblyopia due to etiology other than anisometropia, had associated neurological or ocular associations or had history of intra or extra-ocular surgery were excluded from the study. Also, children in whom visual acuity could not be assessed by standard charts were excluded. Refractive correction was given four weeks prior to initiation of occlusion therapy. Patients were randomly distributed into two groups;

Group A- in which occlusion was given for two hours per day in sound eye and

Group B- in which 6 hours occlusion was given in the sound eye .

Visual acuity was measured at each follow up.

Pre- and post-occlusion visual acuity within the groups and post occlusion visual acuity between the groups were compared after 6 months of follow-up with standard charts and then converting to LogMAR using appropriate tables. The data was analyzed by paired T-test method.

Table 1-Age distribution of children

Age	Number (%age)
4 - ≤ 5	4(13.33%)
5 - ≤ 6	4(13.33%)
6 - ≤ 7	8(26.6%)
7 - ≤ 8	7(23.3%)
8 - ≤ 9	7(23.3%)
Total	30

Mean Age (± SD) = 6.46 ± 1.59 years

Table 2- BCVA in children before and after occlusion

BCVA (mean ± SD)	Group A [2 hours]	Group B [6 hours]
Pre-occlusion	0.39 ± 0.15	0.40 ± 0.18
Post-occlusion	0.12 ± 0.12	0.12 ± 0.12
P Value	0.001	0.001

Results

A total of 30 children in the age group of 4-9 years with moderate anisometropic amblyopia were part of this study. Patients were randomly but equally distributed into two groups. The mean age of children in this study was 6.46 ± 1.59 years. There were 16 males and 14 females included in the study. [Table 1]

The Pre-occlusion Mean BCVA (LogMAR) in Group A was 0.39 which improved to 0.12 with two hours of occlusion per day of sound eye at six months follow up. In case of Group B, after six hours of patching per day in better eye, the Pre-occlusion Mean LogMAR BCVA showed an improvement from 0.40 to 0.12 at six months follow up.[Table-2]

The improvement in Mean visual acuity post-occlusion treatment in both the groups was stastically significant (p=0.001 respectively) when compared to the pre-occlusion visual acuity. Whereas, the post-occlusion visual acuity of the two groups was compared, no significant difference was found stastically (p=1.000).

Discussion

Patching or occlusion of the better eye after correction of refractive error remains the main treatment modality of amblyopia therapy. However, the duration for which occlusion should be done remains inconclusive.

In our study, occlusion regimen of two hours per day duration was compared with six hours in combination with one hour near vision work. Both the groups showed significant improvement, though no stastically significant difference was seen among the two groups post-occlusion. Similar results were seen by Repka MX et al [8] in their randomized trial in children in the age group of 3-7 years at the end of four month follow up. A comparative study conducted by Bansal RK et al [9] also showed significant improvement in both the groups.

Wallace D K[10] in their study also found modest improvement in moderate to severe amblyopic children of 3-7 year age group when given two hours occlusion along with one hour near visual activities after five weeks of follow up. Pang Y et al[11] found significant improvement in in children with myopic anisometropic amblyopia when occlusion and near vision activities were added to refractive correction. In a comparative study done by Clearly M [12]the efficacy of patching after spectacle correction was found to be significant (74%) within first six months of occlusion.

Many studies comparing the full time occlusion regimen against part time occlusion have shown favorable results for the latter as seen in a comparative study which found that full time occlusion when compared to part time(6 hours) patching in children less than 7 years with severe amblyopia was equally effective[6]. Similarly, In a multicentric randomized trial, the efficacy of 6 hours patching for moderate amblyopia was found to be similar to full time patching in children aged between 3-7 years at 6 months follow up [7].A meta- analysis involving three randomized controlled studies, a full time occlusion showed no significant difference when compared to part time occlusion. In fact, full time occlusion as less as six hours per day was found to give maximum improvement.[13]

Though the six monthly follow up between the two groups showed stastically insignificant difference (p=1.000), but the compliance in Group B (6 hours per day) was a big challenge as compared to Group A(2 hours per day). We found it to be primarily associated with the older age group and summer season. Older children found it cosmetically unacceptable especially when made to wear the patch outside home. Moreover, hot and humid season made it difficult for children irrespective of age to tolerate the patch. These factors apart from socio-economic status, pattern of life were found to be key factors affecting the compliance to occlusion.[14-16]

Conclusion

In moderate anisometropic amblyopia, both two and six hours of occlusion after refractive error correction and when combined with one hour near vision activities produce equivalent amount of improvement in children of younger age group (4-9 years) provided there is good compliance.

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