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Part-time occlusion therapy for strabismic amblyopia in children (7-12years old)

¹Dr. Alfaitouri .M. Fathalla, ²Dr.Sideenah Badr.M.J, ³Dr. Gumma Almusmari.

^{1,2}MD Ophthalmology Omar Al - Mukhtar University, Al-Beida-Libya.

³Department of Ophthalmology, Faculty of Medicine Tobruk University, Tobruk-Libya.

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Corresponding author: Dr. Alfaitouri .M. Fathalla

Abstract

Background: Amblyopia is defined as unilateral, or (rarely) bilateral, decrease of best-corrected visual acuity for which there is no pathological or anatomical explanation in the eye or visual pathway. It is the most common cause of monocular visual impairment in both children and young adults. Occlusion therapy with full – time patching of the sound eye is strongly considered as the best treatment option in case of amblyopia. Treatment of amblyopia in older children age 6 to 7 years was thought to be ineffective. Various studies have described conflicting results varying from no effect of age to a highly significant effect.

Purpose: To assess the effect of part-time occlusion therapy on the visual acuity of children aged 7-12years with strabismic amblyopia.

Materials and Methods: prospective study included 24 unilateral amblyopic (strabismic) children in the age group of 7-12 years. Baseline testing included measurement of visual acuity, cycloplegic refraction using atropine, and a complete ocular examination of both eyes. Refractive error was corrected, for at least 6 weeks before study inclusion.

Result: 24 children aged 7-12 years with strabismic amblyopia divided into four groups. Provided in Table 1. The four groups were matched for age and pre-treatment BCVA. Post-treatment visual acuity was measured at completion of 12 weeks and was compared with pre-treatment visual acuity. The results showed significant visual improvement in all four groups at the end of the study period.

Conclusion: part-time occlusion therapy showed significant improvement in visual acuity in children aged 7-12 years with mild to moderate strabismic amblyopia and can be considered as treatment option of amblyopia in this age group specially for those with poor full -time patching compliance. **Keywords:** Wolfram syndrome, polyuria, secondary urological abnormalities, diabetes mellitus, diabetes insipidus, optic atrophy, deafness, DIDMOAD.

Keywords: Strabismus, amblyopic, part-time occlusion, Visual acuity

Introduction

Materials and methods

Prospective study included 24 unilateral amblyopic (strabismic) children in the age group of 7-12 years. Baseline testing included measurement of visual acuity, cycloplegic refraction using atropine, and a complete ocular examination of both eyes. Refractive errors were corrected, for at least 6 weeks before study inclusion.

with best corrected visual acuity (BCVA) in the amblyopic eye of 6/9 or less post - refractive correction for six weeks pre- study inclusion. Patients were divided into 4 groups of 6 children each ,receives two hours, four hours, six hours or full- time occlusion therapy. Study group were prescribed patching of Sound (non-amblyopic eye)as following: Group 1: two hours .Group 2: four hours. Group 3: six hours. Group 4: full time for seven days / week Patients with previous amblyopia treatment within one year, past history

of intraocular surgery ,allergy to patch or bandage adhesive were excluded.

Study group were prescribed patching of Sound (non-amblyopic eye) as following: Group 1: two hours .Group 2: four hours. Group 3: six hours.Group 4: full time for seven days / week. Near visual activities (such as performing routine home work) for at least one hour during patching was instructed. Sound eye was patched for all waking hours .Patch allowed to be removed during the night but it to be applied first thing in the morning. Follow-up every 4 weeks was done for a period of 12 weeks. During each follow-up visual acuity was assessed and recorded on the same visual acuity chart projector visual out come in the amblyopic eye at 12 weeks was reported. patient who gained at least two lines of vision between the first and the final visit, defined as Amblyopia responder, The Patient were further subdivided into (mild-moderate) and severe amblyopia .

RESULTS

24children aged 7-12 years with strabismus amblyopic divided into four groups. Provided in Table 1. The four groups were matched for age and pre-treatment BCVA. Post-treatment visual acuity was measured at completion of 12 weeks and was compared with pre-treatment visual acuity using paired t-test [Table 1]. The results showed significant visual improvement in all four groups at the end of the study period.

Table 1

Groups	No. Of Patients	Mean age (yrs)	Pre-treatment mean BCVA	post-treatment mean BCVA	Mean change in BCVA
Group 1	6	9.0	0.60±0.27	0.46±0.23	0.14±0.10
Group 2	6	9.5	0.67±0.26	0.42±0.32	0.25±0.14
Group 3	6	9.0	0.80±0.29	0.51±0.20	0.29±0.13
Group 4	6	10.0	0.77±0.32	0.44±0.26	0.33±0.20

No. Number; Yrs. Years; BCVA. Best corrected visual acuity.

Table 2

Out of 24 eyes (75.00%) responded to amblyopia therapy as provided in [Table 2].

Groups	No. Of eyes	percentage	Occlusion interval
Group 1	3	12.50%	2 Hours
Group 2	4	16.67%	4 Hours
Group 3	5	20.83%	6 Hours
Group 4	6	25.00%	Full time
Total	18	75%	

least number of responders in the two hours group in visual improvement among the four groups. a significantly better outcome was seen when visual improvement in Group 3(six hours occlusion). And full-time occlusion Group 4.

Groups were further subdivided into: Subset A (mild-moderate amblyopia) and Subset B (severe amblyopia)

Comparison of various treatment protocols in Subset A (mild- moderate amblyopia): Out of the. The four groups showed in [Table 3].

Table 3

Groups	No. Of Patients	Mean age (yrs)	Pre-treatment mean BCVA	post-treatment mean BCVA	Mean change in BCVA
Group 1	4	9.25	0.47±0.19	0.32±0.23	0.15±0.13
Group 2	2	9.0	0.52±0.14	0.30±0.32	0.22±0.11
Group 3	3	8.0	0.45±0.13	0.22±0.20	0.23±0.13
Group 4	2	10.0	0.43±0.16	0.20±0.26	0.23±0.10

Comparison of various treatment protocols in Subset B (severe amblyopia): Out of the. The four groups showed in [Table 4].

Table 4:

Analysis of the result showed a significantly better visual outcome was seen in six hours group and full-time group when compared with the two hours group while comparative improvement in the four hours group was not significantly different from the two hours group. Also, there was no significant difference in visual improvement among the four hours group and the six hours group, four hours group and the full-time group, and among the six hours group and the full-time group.

DISCUSSION

Prospective study planned to compare the effect of varying part-time occlusion therapy intervals (two hours, four hours and six hours with full-time occlusion therapy) in children aged 7-12 years. We observed that part-time patching, even as short as two hours a day resulted in significant improvement in visual outcome at 12 weeks of treatment.

Various reports on occlusion therapy in older children found that the age of the patient at the beginning of treatment had a direct effect on the visual outcome.

Recently several of studies have shown a comparable beneficial effect of occlusion therapy in older children.

Brar *et al.* (9) have reported that visual acuity with full-time occlusion could be improved uniformly for strabismic amblyopia in older children. The authors observed improvement in visual acuity in 98.7% of children younger than 12 years and in 46.2% children older than 12 years at the time of initiation of occlusion therapy.

Rutstein *et al.* (2) reported that the visual acuity improvement is somewhat lesser in patients older than seven years than in younger patients.

Some studies have recently discussed the role of part-time occlusion in older children. One of these is a multi-centric study by Pediatric eye disease investigator

Group. (5) they found that the optical correction with part-time patching therapy and atropine penalization increased the responder rate from 25% to 53% regardless the severity of amblyopia. Compare to our study none of the children received atropine in the dominant eye in addition to the occlusion therapy.

Groups	No. Of Patients	Mean age (yrs)	Pre-treatment mean BCVA	post-treatment mean BCVA	Mean change in BCVA
Group 1	2	10.0	0.92±0.16	0.68±0.22	0.24±0.12
Group 2	3	8.5	0.96±0.17	0.66±0.28	0.30±0.20
Group 3	3	9.0	1.00±0.15	0.62±0.18	0.38±0.15
Group 4	5	10.2	1.00±0.16	0.54±0.24	0.46±0.24

CONCLUSION

Part-time occlusion therapy showed significant improvement in visual acuity in children aged 7-12 years with mild to moderate strabismic amblyopia and can be considered as treatment option of amblyopia in this age group specially for those with poor full-time patching compliance

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