

**Research Article**

## **A comparative Study of Strabismic and Anisometropic Amblyopic Patching Treatment**

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### **ABSTRACT**

**Introduction:** Amblyopia is the most common cause of monocular vision loss in children with an estimated prevalence of approximately 2% in the United States. A developmental disorder of spatial vision, amblyopia is clinically defined as decreased best-corrected visual acuity (VA) in one, or less frequently both eyes, in the absence of any obvious structural anomalies or ocular disease. **Aims and objectives:** The basic aim of the study is to compare the strabismic and anisometropic amblyopic patching treatment among local population of Pakistan. **Material and methods:** This comparative study was conducted in Department of Ophthalmology, Independent Medical College, Faisalabad during January 2018 to August 2018. The data were collected from 80 patients of both genders. The selected age group were 5 to 10 years old. Monocular and binocular visual acuity was taken by using Snellen's chart at the distance of 6 m. After pupillary reactions and ocular motility were assessed, cover-uncover test and prism cover test were performed in strabismic patients. **Results:** The data were collected from 80 patients of both genders. Patching dosage was evaluated in 2 concurrent clinical trials of children 3 to <7 years of age. The effectiveness of 2 hours of daily patching was compared to 6 hours of daily patching in children with moderate amblyopia of 20/40 to 20/80 and 6 hours of daily patching was compared to full-time daily patching in children with severe amblyopia of 20/100 to 20/400. **Conclusion:** It is concluded that improvement of vision after three months of initial patching treatment was comparatively greater than further 3 months of patching.

**Key words:** Patients, Amblyopia, Patching

### **INTRODUCTION**

Amblyopia is the most common cause of monocular vision loss in children with an estimated prevalence of approximately 2% in the United States. A developmental disorder of spatial vision, amblyopia is clinically defined as decreased best-corrected visual acuity (VA) in one, or less frequently both eyes, in the absence of any obvious structural anomalies or ocular

disease. It is associated with abnormal visual experience, most commonly strabismus, anisometropia, or form deprivation that occurs during a sensitive period of visual development in infancy or early childhood<sup>1</sup>.

Amblyopia is reported to be present in about 1–5% of children, 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<sup>2</sup>. The treatment of amblyopia is therefore extremely important. In conventional clinical ophthalmology, the gold standard for amblyopia treatment is wearing complete refractive correction glasses. In addition, occlusion therapy by using an eyepatch on the healthy eye is used for more aggressive treatment<sup>3</sup>. Occlusion therapy is important because there are reports that approximately 70% of patients do not regain good visual acuity by only wearing eyeglasses<sup>4</sup>. However, occlusion therapy has side effects, such as occlusion amblyopia, skin rashes, and mental distress, and compliance is extremely poor. In recent years, due to the development of image technology, a variety of amblyopia treatment devices that present the visual target to only the amblyopic eye under open binoculars have been developed<sup>5</sup>.

The standard treatment for amblyopia is occlusion therapy, which involves patching of the dominant eye to encourage the use of an amblyopic eye<sup>6</sup>. In young children, this treatment is quite effective with 75% of the children showing improvement in visual acuity. However, its effectiveness decreases in older children and adults<sup>7</sup>.

**Aims and objectives**

The basic aim of the study is to compare the strabismic and anisometropic amblyopic patching treatment among local population of Pakistan.

**MATERIAL AND METHODS**

This comparative study was conducted in Department of Ophthalmology, Independent

Medical College, Faisalabad during January 2018 to August 2018. The data were collected from 80 patients of both genders. The selected age group were 5 to 10 years old.

**Data collection:** Exclusion criteria included neurological impairment, nystagmus, macular and optic nerve disease. Monocular and binocular visual acuity was taken by using Snellen’s chart at the distance of 6 m. After pupillary reactions and ocular motility were assessed, cover-uncover test and prism cover test were performed in strabismic patients. The patients who were responding to the occlusion therapy, patching time was reduced. Detailed information and instructions to the parents and children regarding poor compliance to patching therapy and visual outcomes of patching therapy were explained.

**Statistical analysis**

Two-way ANOVA was performed to study the contributions. A chi-square test was used to examine the difference in the distribution of the fracture modes (SPSS 19.0 for Windows, SPSS Inc., USA).

**RESULTS**

The data were collected from 80 patients of both genders. Patching dosage was evaluated in 2 concurrent clinical trials of children 3 to <7 years of age. The effectiveness of 2 hours of daily patching was compared to 6 hours of daily patching in children with moderate amblyopia of 20/40 to 20/80 and 6 hours of daily patching was compared to full-time daily patching in children with severe amblyopia of 20/100 to 20/400. In cases of moderate amblyopia, prescribing 2 hours of daily patching with 1 hour of near activities is as effective as prescribing 6 hours of daily patching with 1 hour of near activities.

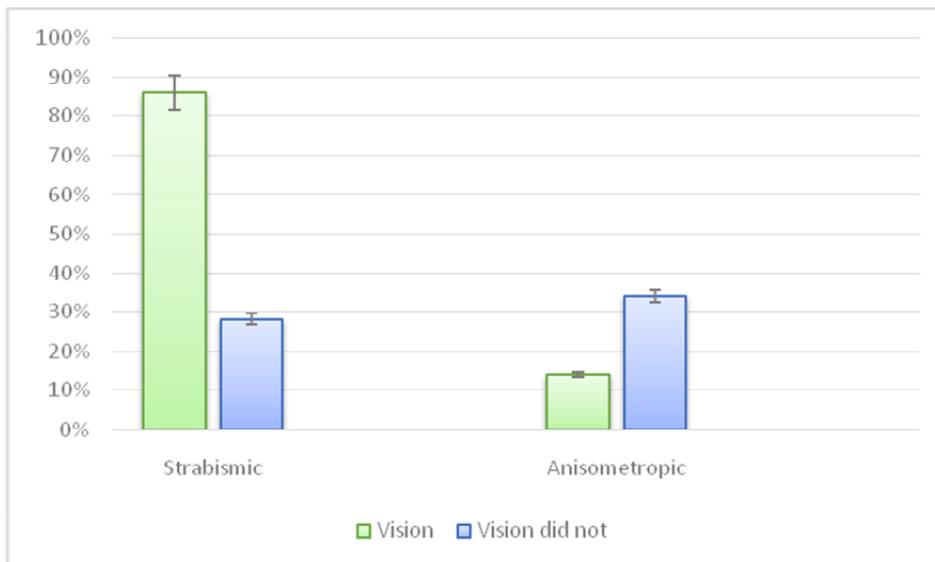
**Table 01:** Mean visual acuity (VA) improvement by prescribed treatment in moderate and severe amblyopia

Depth of Amblyopia	Prescribed Treatment	Mean VA Improvement <sup>a</sup> (logMAR lines)	Post-Treatment Mean VA	≥ 2 Lines of Improvement from Baseline (%)
Moderate Amblyopia	2 hours patching	2.4	20/32	79
	6 hours patching	2.4	20/32 <sup>-1</sup>	76
Severe Amblyopia	6 hours patching	4.8	20/50	93

	Full-time patching	4.7	20/50 <sup>-2</sup>	85
Moderate Amblyopia	≥ 6 hours patching	3.16	20/30	87
	Daily atropine	2.84	20/30 <sup>-2</sup>	82

**Table 02:** Results of initial three-months patching treatment in amblyopic eye.

Type of Amblyopia	Vision Improved	Vision did not Improved	P-Value
Strabismic Amblyopia	86%	28%	0.94
Anisometropic Amblyopia	14%	34%	



**DISCUSSION**

The compliance rate for occlusion therapy using an eye patch is low, which is problematic. The compliance rate for using the Occlu-pad in this study was however very high<sup>7</sup>. In the past, it has been reported that there is a positive correlation between frequency of hospital visits and compliance rate during amblyopia treatment<sup>8</sup>. By repeating training sessions during hospital visits, patients were able to raise their awareness for the training, which presumably led to the good compliance rate. In addition, we consider that it is a great merit that training by hospital visit can fully grasp the training time<sup>9</sup>. However, since amblyopia treatment using the Occlu-pad in a hospital setting may be a burden to patients and parents especially for people living far from a hospital, it is necessary to pay attention to this when doing this method<sup>10</sup>.

It has been suggested that open-type binocular treatment can obtain good amblyopia training results, compared to occlusion therapy with an eye patch. Oliver et al reported that children older than 8 years showed a significant improvement in their visual acuity, almost as good as that in younger children. Rutstein and Fuhr reported that age above 8 years, visual acuity of 6/12 or better could be obtained in only 27% of patients<sup>11</sup>. However, in this study visual acuity of 6/12 or better could be obtained in 30% of patients older than 8 years. However, In this study there was a child aged 8 years presented with anisometropia, best corrected visual acuity 6/24 after giving patching trial of 6 hours, visual acuity improved to 6/12 and then after six months reached to 6/7.5 .Visual improvement initially was faster in the patching group, but after six months analysis the difference of both patching group was small<sup>12</sup>.

## CONCLUSION

It is concluded that improvement of vision after three months of initial patching treatment was comparatively greater than further 3 months of patching. Since compliance rates for the device were also found to be very high, this combination treatment offers a promising alternative to conventional treatment of amblyopia.

## REFERENCES

1. Chia, M. Dirani, Y.-H. Chan et al., "Prevalence of amblyopia and strabismus in young singaporean chinese children," *Investigative Ophthalmology & Visual Science*, vol. 51, no. 7, pp. 3411–3417, 2010.
2. H. T. Lim, Y. S. Yu, S.-H. Park et al., "The Seoul Metropolitan Preschool Vision Screening Programme: Results from South Korea," *British Journal of Ophthalmology*, vol. 88, no. 7, pp. 929–933, 2004.
3. R. Van Leeuwen, M. J. C. Eijkemans, J. R. Vingerling, A. Hofman, P. T. V. M. De Jong, and H. J. Simonsz, "Risk of bilateral visual impairment in individuals with amblyopia: the Rotterdam study," *British Journal of Ophthalmology*, vol. 91, no. 11, pp. 1450–1451, 2007.
4. S. A. Cotter, "Pediatric eye disease investigator group. treatment of anisometropic amblyopia in children with refractive correction," *Ophthalmology*, vol. 113, no. 6, pp. 895–903, 2006.
5. J. M. Holmes, R. W. Beck, R. T. Kraker et al., "Impact of Patching and Atropine Treatment on the Child and Family in the Amblyopia Treatment Study," *JAMA Ophthalmology*, vol. 121, no. 11, pp. 1625–1632, 2003.
6. M. P. Wallace, C. E. Stewart, M. J. Moseley, D. A. Stephens, and A. R. Fielder, "Compliance with occlusion therapy for childhood," *Investigative Ophthalmology Visual Science*, vol. 54, pp. 6158–66, 2013.
7. M. Burian, "Occlusion amblyopia and the development of eccentric fixation in occluded eyes," *American Journal of Ophthalmology*, vol. 62, no. 5, pp. 853–856, 1966.
8. S. L. Li, A. Reynaud, R. F. Hess et al., "Dichoptic movie viewing treats childhood amblyopia," *Journal of American Association for Pediatric Ophthalmology and Strabismus*, vol. 19, no. 5, article no. 2273, pp. 401–405, 2015.
9. K. R. Kelly, R. M. Jost, L. Dao, C. L. Beauchamp, J. N. Leffler, and E. E. Birch, "Binocular ipad game vs patching for treatment of amblyopia in children a randomized clinical trial," *JAMA Ophthalmology*, vol. 134, no. 12, pp. 1402–1408, 2016.
10. Li, B. Thompson, D. Deng, L. Y. L. Chan, M. Yu, and R. F. Hess, "Dichoptic training enables the adult amblyopic brain to learn," *Current Biology*, vol. 23, no. 8, pp. 308–309, 2013.
11. T. Handa, H. Ishikawa, N. Shoji et al., "Modified iPad for treatment of amblyopia: A preliminary study," *Journal of American Association for Pediatric Ophthalmology and Strabismus*, vol. 19, no. 6, pp. 552–554, 2015.
12. N. Yazdani, R. Sadeghi, H. Momeni-Moghaddam, L. Zarifmahmoudi, A. Ehsaei, and B. T. Barrett, "Part-time versus full-time occlusion therapy for treatment of amblyopia: a meta-analysis," *Journal of Current Ophthalmology*, vol. 29, no. 2, pp. 76–84, 2017.