

Double Trouble: Patient Satisfaction Following Non-surgical Intervention for Diplopia

Authors:

Ann Macfarlane, DOBA

Karen Peadar, Dip ApSc(Orth) DOBA

Address for Communication:

Bankstown/Lidcombe Hospital

Eldridge Rd Bankstown, 2200 NSW

AUSTRALIA

ABSTRACT

Background: A review of 24 consecutive referred patients, presenting with diplopia was conducted to determine whether the patient found Orthoptic intervention to be beneficial.

Method: The severity and frequency of the diplopia was evaluated by the patient pre and post intervention using a modified Likert scale. The Orthoptic intervention included either Fresnel prisms, occlusion, or use of a head posture.

Results: Post intervention, a high percentage (83%) reported no diplopia and improved satisfaction.

Conclusion: Diplopia intervention is beneficial and results in a high level of patient satisfaction.

Key words: Diplopia, Orthoptic intervention, patient satisfaction

INTRODUCTION

Diplopia is a frequent symptom referred to our Orthoptic team for intervention. Unlike young children, adults are less likely to suppress the diplopic image therefore effecting activities of daily living, such as reading or driving a car.¹ Patients may be self conscious about their ocular alignment, also reporting nausea and dizziness.¹ Current research reports that poor vision including impaired depth perception is strongly linked with falls in older Australians.²

The role of the Orthoptist in cases of diplopia is to assess the extent and variation of the condition and provide non-surgical intervention. This can relieve symptoms, improve comfort, restore confidence and assist patients in returning safely to daily activities.^{3,4}

The aim of this project was to determine whether the methods of diplopia intervention currently used by our Orthoptic department resulted in patient satisfaction. Our project was conducted, as an Orthoptic Department Quality Improvement project approved by the Division of Community Health and Allied Health, Bankstown Health Service 2003.

Successful diplopia intervention requires an accurate history. Binocular diplopia must be established, along with its type, frequency and severity.^{5,11} It is also important to establish the onset of the diplopia, as generally 6 months is the minimum time to wait for any possible recovery before surgical intervention.^{3,11}

The main aim of intervention is to help the patient regain fusion or make them comfortably monocular.⁴ When possible

restoring binocular single vision is essential for patient comfort and it is also best practice.^{3,4}

The non-surgical interventions for diplopia used in this study, included Fresnel prisms, partial or complete occlusion or the use of a head posture.

The primary aim of prism therapy is to join the two images, and reduce the power of the prism when and if the diplopia resolves. Fresnel prisms restore binocular single vision, are temporary, durable, flexible, re-useable and light weight. Ease of application and the fact that they can be used in sections⁴, i.e. cut and fitted to upper or lower areas of the spectacle lens makes fusion achievable in various positions of gaze.^{6,7} They are also inexpensive compared to the purchase of spectacles. Prisms are very successful in managing both horizontal and vertical diplopia caused by ocular nerve palsies⁸, or as a complication of eye surgery eg cataract surgery.⁹ The disadvantages of Fresnel prisms include the cosmetic appearance, blurred vision, and decreased contrast. Patients may also complain that the prism causes the effect of looking through a Venetian blind.⁴

In cases where prisms are not successful, occlusion or a head posture can be used. Occlusion will eliminate one of the two images. This will result in the patient being monocular with the disadvantage of having a decreased visual field as well. Partial occlusion can eliminate diplopia in a certain direction of gaze, with the associated advantage of allowing the patient to be binocular in the remainder of their visual field.¹⁰

A head posture may be naturally adopted by a patient by turning the face to one side, tilting the head, or raising the chin. This places their eyes in a position where the diplopia is not present.¹ The Orthoptist can also teach the patient how to position their head in one or any combination of these positions.

Current literature often suggests that the above methods of intervention be trialled and mentions the likelihood of success in certain cases^{9,11} however there appears to be little detailed information available about a patient's perception of the success of intervention or reference to alleviation of patient symptoms. This study provides information in this area.

METHODS

Participants

The files of 24 consecutive patients who were referred to the service for diplopia intervention were reviewed. All participants regardless of age or gender were included in the study. Patients included in-patients and out patients.

Instrumentation

The impact of the diplopia intervention was reviewed. A modified Likert scale was used to determine the severity of the diplopia prior to and following intervention. Zero being not severe and 10 being most severe. The frequency of their diplopia was also scaled from zero to ten. Zero being never present and 10 being always present.

Procedure

All patients had a neurological condition which required a full Orthoptic assessment and the impact of the intervention was documented. The Orthoptic assessment included: (a) A detailed history and analysis of symptoms especially diplopia (onset, type, direction of gaze, severity, and frequency). (b) Visual acuity at 6m and 1/3m. (c) A Cover test at 6m and 1/3m. (d) An Ocular motility assessment including a diplopia chart or Hess chart.

(e) A visual field test. (f) An assessment of visual neglect.

Prior to diplopia intervention the patients were asked to scale the severity and frequency of their diplopia from zero to ten. Immediately following the intervention the patients were asked to scale the severity and frequency again. For the purpose of this study a health outcome (Gold standard) was set. If the severity and the frequency both rated zero post intervention, then the health outcome had been achieved. In cases where the health outcome was not achieved, details of the post intervention symptoms were recorded. The type of intervention used was based on clinical judgment, Fresnel prisms, being the preferred option.

To establish which Fresnel prism would be used, the angle of the deviation was measured using a prism bar. The minimum correction which provided the patient with comfortable single vision was also established.¹¹ Then by using a Fresnel prism the power was confirmed by the patient. The patient was also asked to choose which eye they preferred to have the prism placed over. This is vital for patient satisfaction as not all patients prefer the non dominant eye, or the eye with the weaker vision. If the Fresnel prism was only required for near or distance then it would be cut to size before attaching it to the appropriate section of the patient's spectacle lens. If the patient had vertical and horizontal diplopia, an oblique prism was used to allow correction of both with a single Fresnel prism.¹¹

Analysis

The results were analysed using descriptive statistics as well as qualitative information.

RESULTS

There were 8 male and 16 female subjects, aged between 28yrs and 93yrs with a mean age of 65yrs. All patients had binocular diplopia, 22 of recent onset and 2 resulting from decompensating strabismus. Table 1 shows that the majority of the patients, 19, had an ocular cranial nerve palsy. These were distributed fairly evenly between the three ocular cranial nerves. One patient presented with an internuclear ophthalmoplegia and one with a convergence failure. Two patients presented with a decompensated strabismus.

Table 1: Aetiology of Diplopia n=24

Aetiology of diplopia	n=24
III Nerve Palsy	5
IV Nerve palsy	6
VI Nerve Palsy	8
Internuclear Ophthalmoplegia (INO)	2
Convergence failure	1
Decompensating Strabismus	2

Table 2: Summary of Treatment Methods

Method	Patient number (N = 24)	
Prisms	On whole lens	11
	On part of lens	6
Occlusion	Totally occluded	5
	Partially occluded	1
Abnormal Head Posture		1

Table 2 presents a summary of the treatment methods used to eliminate the diplopia. Following intervention 20 out of 24 patients had no diplopia. 17 cases were managed with Fresnel prisms, 11 of these cases required a prism over the whole lens, one of which was tilted at 45 degrees to successfully neutralise vertical and horizontal diplopia caused by a Fourth Nerve Palsy. 5 cases required a prism for distance only and one case required a prism on a bifocal segment, as diplopia was only present while reading.

Occlusion was used in 6 cases where either the angle size was too large for prism neutralisation (3 cases) or the angle was variable (1) or diplopia was directional

(2 cases). In one case partial occlusion was used to prevent diplopia in depression and right gaze only, (partial left Third Nerve Palsy) and allow the patient to remain binocular in the other positions of gaze. A head posture was taught for one case of a small angled, partial Third Nerve Palsy where fusion was achieved with a slight head tilt.

Table 3: Severity and Frequency Rating of Diplopia

Table 3: Patient Rating of Severity and Frequency of Diplopia

Rating	Intervention state	Mean	Range
Severity Rating 0 = not severe 10 = most severe	Pre intervention	8.35	2.5 -10
	Post Intervention	0.4	0 - 5
Frequency Rating 0 = never present 10 = always present	Pre intervention	8.29	5 -10
	Post intervention	0.94	0 - 5

The data in table 3 shows an overall reduction in the mean severity and frequency of diplopia following intervention. The patient's subjective opinion about the severity of the diplopia pre intervention ranged from minimal (2.5) to maximal (10). Post intervention most patients (20) reported the gold standard of no diplopia and therefore a zero ranking for severity. Similarly, the reported frequency of the diplopia pre intervention ranged from a mid range score (5) to severe (10). Post intervention the minimum response was 0 (20 patients) and the maximum response selected was 5 (4 patients). Of the four patients who reported diplopia post intervention, table 4 shows that the severity and frequency rating was considerably less than their pre-intervention rating.

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Table 4: Details of Patients who experienced diplopia post intervention

Patient		Patient A	Patient B	Patient C	Patient D
Residual diplopia		Intermittent	intermittent	Right gaze only	Right gaze only
Severity rating					
0 = not severe	Pre intervention	10	10	10	10
10 = most severe	Post intervention	2.5	5	0	0
Frequency rating					
0 = never present	Pre intervention	10	10	10	5
10 = always present	Post intervention	2.5	5	5	5

DISCUSSION

The results of this study showed that most patients were successfully treated with prisms the remaining patients benefiting from occlusion or the use of a head posture. The 4 patients who still had diplopia post intervention decided to persist with the Fresnel prisms as this gave them the most satisfaction. As this study focused on satisfaction immediately following intervention, an area for further study would be to remeasure patient satisfaction months later as satisfaction may change. When using occlusion it's important to consider the use of partial occlusion so binocularity is maintained in other positions of gaze. Prisms should be considered firstly as they enable the patient to remain binocular. Although the literature reports several disadvantages of using Fresnel prisms the patients in this study did not report any. The fact that prism powers required by our patients did not exceed 15 prism dioptres most likely contributed to the patients not reporting a blur in visual acuity or decrease in contrast. In cases where prisms are not effective, occlusion or head posture should be trialled. Diplopia intervention is beneficial and results in a high level of patient satisfaction.

CONCLUSION

Diplopia intervention is an area of expertise for the Orthoptist. The desired result is single binocular vision or, if this is not possible, comfortable monocular viewing. Our results showed that most patients regain comfort through non-surgical orthoptic intervention.

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