



VISION CHARACTERISTICS OF ADULT IRLLEN FILTER CANDIDATES: CASE STUDIES

■ Mitchell Scheiman, O.D.
Penni Blaskey, Ph.D.
Michael Gallaway, O.D.
Elise Ciner, O.D.
Maria Parisi, O.D.

ABSTRACT

Individuals with "Scotopic Sensitivity Syndrome" have been reported to have symptoms including eye strain, headaches, blurred vision, double vision and words moving on the page. In a recent study we demonstrated that 95% of our subjects identified as candidates for Irlen filters did have significant and readily identifiable, vision anomalies. 57% of the subjects had received vision care within the past year, yet testing revealed that 90% of these subjects had significant vision problems which had not been corrected. More than 50% of the subjects that we have studied to this point have been adults with long histories of reading and learning problems. This paper presents three detailed case reports of adult subjects presenting for an Irlen filter screening. Implications for optometric care are discussed.

KEY WORDS

Irlen lenses/filters, tinted lenses, colored lenses, accommodative convergence anomalies

In a recent paper¹ we reported on a sample of subjects who were part of a study to assess the effectiveness of Irlen filters. Vision anomalies were detected in 35 of the 39 subjects (90%). The most common type of vision anomaly found was in the category of binocular vision problems including convergence insufficiency, convergence excess, basic esophoria, basic exophoria, fusional vergence dysfunction and vertical hetero-phoria. Twenty of the 35 subjects (57%) with vision problems had binocular vision disorders. The next most common category of vision disorder detected was accommodative anomalies. Twelve of the 35 subjects (34%) had accommodative disorders, including accommodative insufficiency, accommodative excess and accommodative infacility; and 9 of the 35 (26%) had ocular motility dysfunction. Ten subjects (29%) had problems in a variety of areas, including uncorrected or improperly corrected refractive error, uncorrected presbyopia and hysterical amblyopia.

We also found that 57% of the subjects had a vision examination within the past year. 90% of these had significant vision problems.

The significance of these findings is that they are in direct conflict with Irlen and other advocates of Irlen filters who have claimed that clients who test positive for scotopic sensitivity syndrome do not

have vision problems.²⁻⁹ They suggest that all of their clients receive an eye examination within one year of the Irlen testing and as a result of this policy they are convinced that their clients do not have vision problems. The findings of our recent study demonstrate that this assumption is invalid.

Although our initial expectation was that we would primarily attract a population of school-age children with learning disorders, we were surprised that 52% of our subjects were adults (18 years and older) with long histories of reading and learning problems. This was one of the interesting, unexpected findings of our research and we felt that a more detailed description of the vision characteristics of these patients would be helpful to optometrists.

The purpose of this paper is to provide more detail about the vision characteristics of some adult patients who express interest or a desire to seek help from the use of Irlen filters. In addition we provide information about the efficacy of optometric intervention for these subjects. We feel that this information will be helpful to optometrists to counsel adult patients inquiring about Irlen filters. In this paper we will not present any specific information about the actual effectiveness of Irlen filters. Such information has been previously reported.¹⁰

CASE REPORTS

We have selected three cases that were representative of the adult subjects in our previous studies. The subjects selected were recruited through the use of direct radio and newspaper advertising for an Irlen filter research project. It is important to emphasize that these were not people who were seeking vision care. They all felt that they had the signs and symptoms associated with Scotopic Sensitivity Syndrome and were hoping to receive Irlen filters. All subjects received a complete optometric examination which included the following tests:

- Visual acuity at distance and near
- Nearpoint of convergence
- Cover test at distance and near
- Stereopsis testing at near
- Refraction
- Base-out and base-in vergence at distance
- Base-in and base-out vergence at near
- Negative relative accommodation (NRA), positive relative accommodation (PRA)
- Monocular accommodative facility testing
- Amplitude of accommodation (push up method)
- MEM retinoscopy
- Fixation disparity analysis (disparometer)
- Developmental Eye Movement Test^a

CASE ONE

FM, a 50-year-old male and self-employed roofer, had seen the "60 Minutes" television segment on Irlen filters and felt that he might benefit from these tinted lenses. He dropped out of high school after the 10th grade and reported that reading was always difficult for him. His main concern was that he felt reading was not enjoyable because it required excessive effort. He complained of intermittent diplopia, eyestrain and eyes burning after just short periods of reading. He felt that he had to hold reading material far away in order to see clearly. At the age of 44 he received eyeglasses and was instructed to wear them for distance and to remove them for reading. His last eye examination was two years previous and no change in prescription was recommended. The only information he had

been given about his vision status is that he was nearsighted and required glasses to see clearly. His health history was negative and he was not taking any medication.

We asked FM to complete a symptom questionnaire. His answers are listed in Table 1 (Page 176).

Examination Results

His current glasses were:

OD: +0.25 -1.00 x 110

OS: Plano -0.50 x 95

and, according to FM, he had been instructed to wear these glasses only for distance.

Visual acuity without correction was 20/50 for the right eye and 20/50+2 for the left eye. At near the uncorrected acuity was 20/30 in the right and the left eye. The subjective refraction was: OD: -0.75 -1.25 x 95 and OS: -0.75 -1.00 x 85. Visual acuity was 20/20 in each eye with this prescription. The cover test with correction was ortho at distance and 6 exophoria at near. With an add of +2.00 OU, 100 seconds of stereopsis was measured using the Randot Stereotest and the base-out ranges at near were x/4/-10 and base-in was x/26/22. The negative relative accommodation (NRA) was +1.50 and the positive relative accommodation (PRA) was -1.25. The nearpoint of convergence through the near add indicated a break at four inches and recovery at 12 inches using a penlight target.

A certified Irlen screener also administered the Irlen screening battery and found that FM tested positive and was an excellent candidate for Irlen filters.

Management

Based on these findings we reached a diagnosis of convergence insufficiency, compound myopic astigmatism and presbyopia. It was difficult to understand the logic behind his current eyeglass prescription. It provided neither adequate acuity nor comfort at distance or near. We prescribed the following prescription:

OD: -0.75 -1.25 x 95

OS: -0.75 -1.00 x 85

+2.00 add OU

With this prescription, FM reported that he was able to hold reading material at a closer distance and that the glasses improved the clarity of reading material. However, he was still uncomfortable when reading and continued to experience intermittent diplopia.

We, therefore, prescribed a vision therapy program to treat the convergence insufficiency. FM was seen for 12 office visits of vision therapy, each lasting 45 minutes. Initially an emphasis was placed on voluntary convergence and increasing positive fusional vergence amplitude. During this stage of therapy we primarily used techniques such as the Brock string,^{11,a} red-green barrel card,^{11,a} variable tranaglyphs,^{11,a} the aperture rule,^{11,a} free space circles^{11,a} and the random dot vergence program from Computer Orthoptics.^{12,b} As these skills improved we incorporated negative fusional vergence techniques using the same materials (variable tranaglyphs, the random dot vergence program from Computer Orthoptics, the aperture rule and free space circles). The last third of the therapy session was devoted to procedures designed to improve fusional vergence facility and fusional vergence combined with versions. To accomplish these objectives we utilized the instrumentation listed above but introduced movement of the target or the patient. We also used the step vergence program from Computer Orthoptics.

Post Treatment Symptoms and Findings

After prescription of the new glasses and completion of the vision therapy program we re-administered the symptom questionnaire. There were very significant positive changes in FM's ability to read comfortably. These changes are illustrated in Table 1, which compares the pre- and post-vision therapy symptom questionnaires.

A reevaluation of his optometric findings was also performed and revealed significant improvements in the nearpoint of convergence and positive fusional vergence. Table 2 compares the pre- and post-vision therapy findings.

The Irlen filter screening battery was also repeated with FM wearing his correct prescription and after vision therapy. The results of this screening indicated that FM no longer tested positive on the Irlen screening test and was no longer a candidate for Irlen filters.

CASE TWO

ED, a 38-year-old male, had read an article about Irlen filters and felt that he might benefit from this treatment ap-

TABLE 1

ANSWERS TO SYMPTOM QUESTIONNAIRE BEFORE AND AFTER VISION THERAPY: CASE 1

How long can you do "nearwork" such as reading, writing, computer work without discomfort (e.g., headaches, eye ache, burning, stinging, watering, blurriness, double vision, loss of concentration or tiredness)?

Before: 15 minutes
After: Up to one hour

How often do you get headaches?

Before: Occasionally (25% of the time)
After: Never

If you experience headaches when reading, how bothersome are they:

Before: Minimally bothersome
After: Minimally bothersome

Do your eyes pull, ache, or water when you do nearwork?

Before: Very often (75% of the time)
After: Occasionally (25% of the time)

Does the reading material ever become blurry, run together or jump when you do nearwork?

Before: Very often (75% of the time)
After: Never (0% of the time)

Does the reading material ever become double when you do nearwork?

Before: Very often (75% of the time)
After: Never (0% of the time)

Immediately following prolonged nearwork, do objects at distance appear blurry for a short period of time?

Before: Occasionally (25% of the time)
After: Never (0% of the time)

Do your eyes feel tired and/or do you lose concentration when you do nearwork?

Before: Every time that I read (100% of the time)
After: Occasionally (25% of the time)

TABLE 2

PRE- AND POST-VISUAL FINDINGS FOR CASE 1

Test	Pre-	Post-
Nearpoint of convergence Break:	4 inches	1 inch
convergence Recovery:	12 inches	2 inches
Cover test (dist)	ortho	ortho
Cover test (near)	6 exophoria	6 exophoria
Base-out at near	x/4/-10	x/20/10
Base-in at near	x/26/22	16/22/16
NRA (+2.00 add)	+1.50	+1.50
PRA	-1.25	-1.25
Accomm Amp	OD 4 D	4D
	OS 4D	4D
MEM	OD +0.50	+0.50
	OS +0.50	+0.50

proach. He had returned to school about a year ago to work toward his MBA. He complained that after reading for about 30 minutes he began to experience difficulty concentrating. He often had to reread and he felt his comprehension was inadequate. After several hours he had to close one eye in order to continue reading. These problems were interfering with his ability to complete his readings for school. According to ED he had worn eyeglasses since childhood for nearsightedness and his left eye had always been much more nearsighted than his right eye. Five years ago he had radial keratotomy performed on his left eye. He felt that he saw much better and had not worn glasses since the surgery. His last examination was about one year previous by the same doctor who performed the radial keratotomy procedure.

Examination Results

Visual acuity without correction was 20/40 in the right eye and 20/25+2 for the left eye. At near the uncorrected acuity was 20/20 in the right eye and 20/25 in the left eye. The subjective refraction was OD: -0.50 -0.50 x 90 and OS: +1.25. Visual acuity was 20/20 in each eye for distance and near viewing with this prescription. Without the prescription the cover test revealed anisophoria. Specifically, with the right eye fixating, the cover test at distance and near was ortho. With the left eye fixating there was a 4-6 PD esophoria at distance and near.

The cover test with correction was ortho at distance and near. One hundred seconds of stereopsis was measured using the Randot Stereotest without the correction and 50 seconds with the prescription. With the prescription, base-in ranges at distance were x/4/-1 and base-out were x/15/12. At near the base-in vergence ranges were 14/18/10 and the base-out ranges were x/18/4. The NRA was +2.50 and the PRA was -2.25. The nearpoint of convergence was 2 inches/3 inches. The amplitude of accommodation was 7 D in each eye.

Management

Based upon these findings we felt that his discomfort when reading was likely associated with the induced anisometropia and anisophoria secondary to the radial keratotomy procedure. We prescribed the following prescription:

OD: -0.50 -0.50 x 90
OS: +1.25

He was instructed to wear these glasses when reading. At a reevaluation four weeks later he reported that he was significantly more comfortable when reading and felt that virtually all of his complaints were eliminated. Because his symptoms were relieved with the Irlen screening, he chose not to pursue the Irlen screening. As a result, a symptom questionnaire was not administered.

CASE THREE

KK, a 32-year-old female photographer, had heard about Irlen filters from a friend and she contacted us after seeing our advertisement for a research project investigating Irlen filters. She reported that she had always had difficulty with reading. She complained of words moving on the page, losing her place, severe eyestrain after only 5-10 minutes of reading, sensitivity to bright lights and the need to read in dim light. Because of these problems, she had specifically chosen a profession in which she felt she would not have to be involved with a great deal of reading and paperwork. She was wearing contact lenses prescribed by her current optometrist and her last examination was no more than six months ago. In previous examinations she had been told that she was nearsighted and needed either eyeglasses or contact lenses. No other vision problems had been described to her. Her health history was negative and she was not taking any medication.

Examination Results

Her current glasses were

OD: -2.00 sphere

OS: -2.25 sphere

Visual acuity at distance and near with correction was 20/20 for the right and left eye. The subjective was OD: -2.00 and OS: -2.25. With this correction, the cover test with correction was 4 exophoria at distance and a 12-14 PD intermittent (deviated 25% of the time) alternating, exotropia at near. Twenty seconds of stereopsis was measured using the Randot Stereotest. The NRA was +1.50 and the PRA was -2.50. The nearpoint of convergence was receded with a break at 12 inches and recovery at 18 inches using a penlight. Base-out vergence at near was x/4/-4 and base-in vergence was x/18/12. Accommodative amplitude using the push up method was 7 D in both the right and

left eyes. Accommodative facility testing was performed monocularly with her distance correction in place. We found that she was unable to complete even one cycle per minute because of an inability to clear the target through +2.00 lenses.

Management

Based on these findings, we made the diagnosis of myopia and convergence insufficiency with a secondary accommodative excess. We, therefore, prescribed a vision therapy program to treat these conditions. KK was seen for 20 office visits of vision therapy of 45 minutes each. Initially an emphasis was placed on monocular accommodative techniques, voluntary convergence and increasing the positive fusional vergence amplitude. During this stage of therapy we primarily used techniques such as Hart chart rock, accommodative rock with loose lenses, Brock string, red-green barrel card, variable tranaglyphs, random dot vergence program from Computer Orthoptics, the aperture rule and free space circles. As these skills improved we incorporated negative fusional vergence techniques using the same materials (variable tranaglyphs, random dot vergence program from Computer Orthoptics, the aperture rule and free space circles). The last third of the therapy session was devoted to procedures designed to integrate accommodative therapy under binocular conditions, improve fusional vergence facility and fusional vergence combined with versions. To accomplish these objectives we utilized the instrumentation listed above but introduced the use of plus and minus

lenses binocularly and movement of the target or the patient.

Post Treatment Symptoms and Findings

After completion of the vision therapy program we reevaluated KK. There were significant changes in her nearpoint of convergence, positive fusional vergence, accommodative facility and NRA findings. These changes are illustrated in Table 3.

KK also reported very positive changes in symptoms. Although she was not in the habit of reading after years of being unable to do so, she had been able to read for over 1 1/2 hours without any discomfort. Words no longer moved on the page and she was no longer sensitive to bright lights. As a result of the significant changes in her reading comfort, she no longer felt the need to be tested for Irlen filters.

SUMMARY

These cases are representative of adult subjects we have seen in our research investigating the effectiveness of Irlen filters. An almost universal finding has been the presence of significant refractive, accommodative, binocular vision and ocular motility problems. This is true in spite of the fact that these people have received periodic routine eye care in the past. One very important issue, therefore, was that many of these individuals had not received appropriate vision care for many years. Accommodative, binocular vision problems and refractive conditions such as presbyopia and anisometropia were not

TABLE 3

PRE- AND POST-VISUAL FINDINGS FOR CASE 3

Test	Pre-	Post-
Nearpoint of convergence	12 inches	1 inch
Break:	18 inches	2 inches
Recovery:	4 exophoria	2 exophoria
Cover test (dist)	12-14 int XT	8-10 exophoria
Cover test (near)	x/4/-4	18/36/26
Base-out at near	x/18/12	12/24/18
Base-in at near	+1.50	+2.50
NRA	-2.50	-2.50
PRA	OD 0 cpm, fails +	12 cpm
Accomm Facility	OS 0 cpm, fails +	12 cpm
Accomm Amp	OD 7 D	7 D
	OS 7 D	7 D
MEM	OD Plano	+0.25
	OS Plano	+0.25

properly managed. Because these individuals had been repeatedly assured that they had no ocular or visual problems they believed that their symptoms were unrelated to vision.

Another interesting commonality was histories of individuals who had dropped out of school and made career decisions based on their inability to read comfortably. They were attracted to the concept of Scotopic Sensitivity Syndrome because it described their symptoms so well and offered help and understanding for their problems for the first time.

These case reports also illustrate the success when we have treated adult patients using lenses and vision therapy. In most cases patients reported significant improvement in symptoms and have no longer felt the need to pursue Irlen filters.

This paper demonstrates important points which optometrists should keep in mind when confronted with adult patients who are seeking advice about Irlen filters. First, there is now evidence which demonstrates that at least some adults who feel they need Irlen filters actually require good vision care. If it is an individual who has not yet been seen for an examination and is simply seeking advice, it is critical to make the person aware that there is a very strong possibility he has an easily recognizable and readily treatable vision problem. Second, even if he has been examined recently it would be important to recommend an additional evaluation designed specifically to determine if an accommodative, binocular or ocular motility problem is present.

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FOOTNOTES

- a. This equipment is available from Bernell Corporation, 750 Lincolnway E., P.O. Box 4637, South Bend, IN 46634.
- b. This equipment is available from R & C Instruments, 99 W. Jackson St., P.O. Box 109, Cicero, IN 46034.

Corresponding author:
Mitchell Scheiman, O.D.
Pennsylvania College of Optometry
1200 W. Godfrey Ave.
Philadelphia, PA 19141
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