A STUDY OF THE EFFECT OF THE WESLEY-JESSEN DURASOFT 3 OPAQUE SOFT CONTACT LENS ON PERIPHERAL FIELDS

by

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APRIL 1, 1989

ABSTRACT

The Wesley-Jessen Durasoft 3 Opaque Soft Contact Lens is designed not only to correct errors in refraction but to cosmetically change the appearance of a person's eye color, especially those individuals with darkly pigmented irides. An evaluation was made on twelve individuals in three select age groups to determine if these lenses have any effect on peripheral vision. Specifically, reducing the peripheral extent of the visual field.

Peripheral fields were examined using a I-4e and a I-3e target on a Goldmann Perimeter. Isopters were first plotted without the contact lens on the eye and later with the lens in place.

Results showed that the Opaque Soft Contact Lens does indeed reduce the peripheral extent of the visual field, especially in a situation where the pupil would normally be dilated such as dim illumination. Furthermore, this contact lens-induced depression of the peripheral field appears to have it's greatest effect at the temporal aspect of the field and seems to have a more pronounced effect with age.

INTRODUCTION

Since it's introduction into the contact lens market, the Wesley-Jessen Durasoft 3 Opaque Soft Contact Lens has become a very popular means of cosmetically changing the appearance of an individuals eye color. Indeed, for those with darkly pigmented irides it may be the only means of achieving this change since tinted lenses do little to mask or alter their iris color. To do this however, Wesley-Jessen had to create a lens that is effectively "painted" on the front surface so as to mask the individuals own eye color. Cosmetically, this lens has received both high acclaim and staunch criticism for the appearance that it creates.

But what about the vision it creates? The very design of this lens precludes a certain amount of light from entering the mid and peripheral cornea that would otherwise contribute to the overall image perceived. An evaluation was attempted to determine whether or not this feature could have any effect on the individuals peripheral vision.

Two questions were paramount: (1) Does the somewhat artificial pupil that is created by this contact lens have the ability to reduce the peripheral extent of an individual field when the subjects own pupil would normally be much larger? (2) Would this reduction in peripheral vision, if any, vary with the age of the individual?

Several well known facts about visual fields theoretically support the possibility of a reduction in peripheral vision with this lens in place. First, it is known that miosis causes an artificial contraction of all isopters in the visual field.[1] Second, it is also known that any media opacity whether it be corneal, lenticular, or vitreal also has the ability to cause an overall depression of the field.[2]

Because the isopters of the normal visual field are also depressed with age[3] it was also determined to evaluate whether this lens would have more of an effect on the peripheral vision of the elderly than the young.

The present study evaluated twelve individuals in three age categories with respect to their peripheral vision. Using a Goldmann Perimeter with a I-4e and I-3e target, peripheral isopters were plotted for each individual. A second set of isopters using the same target stimuli were then plotted for each individual with the contact lens in place. The two were then compared to determine if a reduction in the peripheral extent of the visual field was caused by the Opaque contact lens.

A brief summary of the optical qualities and characteristics of the Wesley-Jessen Durasoft 3 Opaque Soft Contact Lens follows.

OPTICAL CHARACTERISTICS OF THE WESLEY-JESSEN DURASOFT 3 OPAQUE SOFT CONTACT LENS

Wesley-Jessen's Opaque Soft Contact Lens is an extended wear, lathe-cut lens made of phemfilcon 55%. It is manufactured in both 8.3 millimeter and 8.6 millimeter base curves with a diameter of 14.5 millimeters. Powers range from +6.00 diopters to -8.00 diopters and the lens has a dK of 16.00.[4]

In other words, it is the same lens as the Wesley-Jessen D3-X4 with the exception of the colored front surface. The opaque design that is imprinted on the front surface is arranged in a circumferential pattern of many small dots that leaves both a 5 millimeter central clear zone and approximately a 1 millimeter clear limbal zone.

METHODS

The study was conducted at Omni Eye Services, Inc. in Chattanooga, Tennessee in 1989. Perimetry and fitting of the contact lenses were performed by the author and overseen by the Assistant Clinical Director at the Center.

Subjects were invited to participate in the study who had come to the clinic for routine vision examinations and were diagnosed by staff Optometrists and Ophthalmologists as being free from optical, retinal, or neurological disease and fit into the age categories of either 20-30, 40-50, or 60-70.

The spectacle prescriptions ranged from -3.50 diopters to +0.75 diopters. Astigmatic components ranged from 0 to -1.75 diopters with-the-rule and against-the-rule. All individuals had Snellen acuity of 20/20.

To negate the effect that varying pupil sizes between individuals may have, all subjects were dilated with one drop of 1% Tropicamide. When a dilation of at least 8 millimeters was achieved a kinetic field was plotted on the uncorrected and dilated eye using a Goldmann Perimeter. Peripheral isopters were established using a I-4e target (1000 apostilbs) and a I-3e target (315 apostilbs) on a standard background of 31.5 apostilbs.

The contact lens was then placed on the eye and the patient was allowed to adapt to the lens for approximately ten minutes. An 8.6 millimeter base curve was chosen and the color was Sapphire Blue.

Following inspection to see that the lens was well centered and moving properly with each blink a second set of isopters were plotted using the same set of target stimuli.

For each individual several points along the vertical and horizontal meridians were analyzed to give an average reduction in isopter size for that meridian. Averages were then tallied for the group as a whole for both isopters and are displayed in Table 1 and Table 2. Data in Table 3 represents the average reductions based on the age categories to determine any age variance in the effect of the lens.

RESULTS

The results of the study show that all twelve individuals demonstrated a reduction in the extent of their peripheral field while wearing the Opaque Contact Lens. The reduction was easily demonstrated in the I-4e isopter but not near as consistent or large of a reduction was demonstrated in the I-3e isopter.

In addition, for all individuals the largest reduction of the I-4e isopter occurred along the temporal meridian and averaged around 6.4° with a maximum of 9.0°. The smallest reduction for all individuals occurred along the superior meridian and averaged only 1.0° with a maximum of 2.0°. Again, no consistency was demonstrated in the I-3e isopter.

Once the data was organized into three groups based on age it became apparent that the older the group, the larger the reduction in isopter size. Indeed the only two individuals who demonstrated a reduction in all meridians for the I-3e isopter were in Group III; the oldest group.

DISCUSSION

The Wesley-Jessen Opaque Soft Contact Lens, though a cosmetically appealing choice for many people, is not without it's negative effects on vision.

It appears that the lens will cause a reduction in the peripheral vision of most, if not all patients. The occurence of this reduction is consistent with that previously reported by Josephson and Caffery.[5]

Since this study was performed on individuals with their pupils dilated it more realistically represents the field reduction that can occur in dim illumination. An example of this would be driving a car at night. While the reduction due to the contact lens is certainly not enough to reduce the field beyond what is legally necessary to drive, it may be enough to slightly slow the reflexes that depend on stimulation of the peripheral retina for activation. This may be of special concern since the largest reduction occurs in the temporal field which is normally the farthest extent of our visual field.

This effect takes on even larger implications if the individual is over forty years of age since the effect seems to be exaggerated in the elderly.

CONCLUSION

Individuals being fit for the Wesley-Jessen Opaque Soft Contact lens should be informed of the possibility of reduced peripheral vision in certain circumstances. Patients should be cautioned to be particularly careful in dim illumination situations such as driving a car at night.

Though representing only a small minority of those wearing the Opaque Contact Lens, this information should be especially reinforced to the elderly.

TABLE 1.

AVERAGE REDUCTION OF I-4e ISOPTER (deg)
ALONG EACH MERIDIAN

	AGE	NASAL	SUP.	INF.	TEMP.
SUBJECT 1	22	2	0	2	4
2	24	3	1	3	5
3	26	4	2	5	6
4	26	2	0	3	4
5	41	4	0	4	6
6	43	4	1	5	7
7	47	3	1	4	6
8	48	4	1	5	7
9	60	5	2	6	8
10	62	5	1	7	7
11	64	4	1	5	8
12	66	6	2	7	9
AVERAGES:		3.8°	1.0°	4.7°	6.4°

TABLE 2.

AVERAGE REDUCTION OF I-3e ISOPTER (deg)
ALONG EACH MERIDIAN

	AGE	NASAL	SUP.	INF.	TEMP.
SUBJECT 1	22	0	0	1	2
2	24	1	-1	0	1
3	26	1	0	2	1
4	26	-1	1	-1	0
5	41	1	0	1	2
6	43	0	0	1	-1
7	47	-1	0	2	3
8	48	-2	-1	1	1
9	60	2	1	3	4
10	62	1	0	1	2
11	64	0	0	1	2
12	66	2	1	3	5
AVERAGES:		.25°	.08°	1.0°	1.7°

TABLE 3.

CLASSIFICATION BY AGE GROUP

GROUP I: Subject #1, #2, #3, #4

GROUP II: Subject #5, #6, #7, #8

GROUP III: Subject #9, #10, #11, #12

AVERAGE REDUCTION OF I-4e ISOPTER (deg) ALONG EACH MERIDIAN

	NASAL	SUP.	INF.	TEMP.
GROUP I	2.8°	.75°	3.3°	4.8°
GROUP II	3.8°	.75°	4.5°	6.5°
GROUP III	5.0°	1.5°	6.3°	8.0°

AVERAGE REDUCTION OF I-3e ISOPTER (deg) ALONG EACH MERIDIAN

	NASAL	SUP.	INF.	TEMP.
GROUP I	.25°	0.0°	.50°	.75°
GROUP II	-.50°	-.25°	1.3°	1.3°
GROUP III	1.3°	.50°	2.0°	3.3°

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