

The Use of WJ Prosoft Contact Lenses for Outdoor Sports Vision Enhancement

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Abstract:

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Purpose: This study was conducted at the Ferris State University outdoor softball facility to evaluate the performance of six FSU softball players wearing Wesley Jessen Prosoft contact lenses. **Methods:** The study was done in two sessions on the same day. During the first session, half the players were wearing the Prosoft lenses and the other half were wearing their clear lenses. During the second session, the players initially wearing the Prosoft lenses wore their clear lenses and the players initially wearing their clear lenses wore the Prosoft lenses. A pitching machine was used to deliver an optical yellow softball to the batters on the softball field. Two observers, who did not know which lenses the subjects were wearing in a given session, evaluated the players' hitting performance during each session. A comparison between the "clear lens (control) group" and the "Prosoft lens (experimental) group" was conducted using a two-tailed, paired t test. **Results:** A slight improvement in performance was noted for five of the six players while wearing the Prosoft lenses versus their clear lenses, but no overall, statistically significant difference was noted between the two groups. **Conclusion:** Enhanced performance while wearing the Prosoft lens for softball competition was not demonstrated in this study.

Key words: contact lenses, hydrophilic; sports medicine; baseball; spectrophotometry

Background

The photopically adapted human eye is most sensitive to the wavelength range



between 500nm to 600nm with peak sensitivity at 555nm.¹ Some sports use balls that have maximum luminance in this range and the color of these balls is termed “optic yellow”(Figure 1). This color is used presumably to enhance the visibility of the balls.

Figure 1:
Optic Yellow
Softball

Wesley Jessen Prosoft contact lenses are a sports vision contact lens marketed towards sports that use an optical yellow ball. They are a soft contact lens made of phemfilcon A material with a water content of 55% and are classified in the FDA group # 4 (meaning the lens is made of a high water content, ionic polymer material). The lenses are an edge to edge light teal tint (Figure 2) with a dK value of 16.1 and center thickness of 0.05mm (for a -3.00D lens).



Figure 2: Prosoft Contact Lens

Previous studies have reported that there is a marked improvement in reaction time along with an improvement in contour recognition and depth perception when blue light is filtered out of the visible light spectrum.² The Prosoft sports lens theoretically mutes background colors and accentuates optic yellow by selectively transmitting and absorbing specific wavelengths of the visible spectrum. The lenses therefore are purported to enhance the perception of the optic yellow ball by making it stand out against the muted background environment.

Methods

This study conducted at the Ferris State University softball field, using optic yellow softballs, evaluated the performance of six FSU softball players wearing the WJ

Prosoft contact lens. The players ranged in ages from eighteen to twenty-two years old with an average age of twenty years old. Prior to the actual study, the players presented to the clinic at the Michigan College of Optometry at Ferris State University for a brief eye exam consisting of visual acuity, keratometry, slit lamp evaluation and a contact lens fitting. All six of the softball players were established contact lens wearers. Each player in the study had no significant astigmatism and was fit with spherical Prosoft contact lenses. Once the lenses were received, an evaluation of the fit and visual acuities was again performed. All six subjects achieved visual acuity of 20/20 or better OD and OS with all lenses.

The players were all fit with the Wesley Jessen Prosoft contact lens with the following parameters; base curve of 8.6mm, diameter of 14.5mm, and powers ranging



Figure 3: Batting Session

from plano to $-5.00D$. At the time of the study, the Prosoft contact lenses were only available in a base curve of 8.6mm and spherical powers ranging from $+6.00D$ to $-8.00D$. Currently, the contact lenses come in a variety of different base curves including 8.3, 8.6, and 9.0mm as well as expanded powers of $+20.00D$ to $-20.00D$. Toric lenses are not available at this time.

The powers that were ordered were the same dioptric powers as those of the players' everyday clear contact lenses.

The study was conducted over two sessions done the same day at the FSU softball field (Figure 3). During the first session, three players wore the WJ Prosoft contact lenses and the other three wore their everyday clear contact lenses. The second session was just the opposite, in which those players who initially wore Prosoft lenses wore their

clear lenses while those who initially wore clear lenses wore the Prosoft lenses. This outdoor study was conducted on a bright, cloudless, sunny day. The lenses were worn for a thirty-minute adjustment period prior to stepping into the batting cage. The players hitting performance was evaluated by two observers who did not know whether clear lenses or Prosoft contact lenses were being worn by each individual during either hitting session. The observers recorded a score on a numerical scale, from zero to four, on each swing of the bat. The score was based on the type of contact made with the ball. The grading scale was as follows:

Score	Degree of Contact
0	None
1	ball went behind the player
2	ball went vertically up or down from batter
3	ball hit was a “pop fly” or “grounder”
4	Ball was hit solid in a line drive fashion

During both sessions, all six subjects took twenty swings. The batters received pitches from a Jugs-style pitching machine set at 86mph to keep consistency between all subjects (Figure 4). The standard collegiate softball safety equipment and regulations were utilized throughout the study. Hitting performance scores were recorded by both observers for each swing. An average hitting performance score was derived from the two observers’ mean scores.

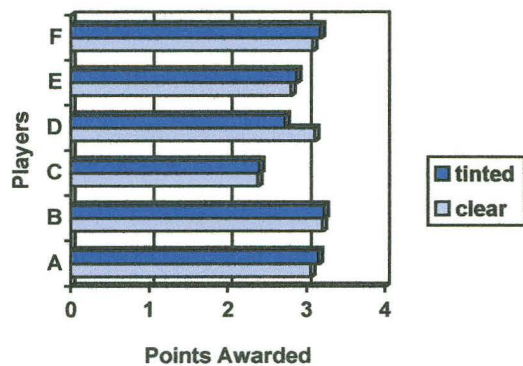


Figure 4: Pitching Machine

After hitting with the Prosoft lenses, a subjective questionnaire was completed by the players. They rated the performance of the contact lenses based on how well they felt the lenses improved their batting skills and whether they would or would not recommend these lenses to the rest of their teammates who did not participate in the study. The players wore the WJ Prosoft contact lenses during their practices and games for two weeks after the study. At this time the players completed another subjective questionnaire to evaluate the long-term effects of the Prosoft contact lens.

Results

Graph 1: Individual Graded Averages

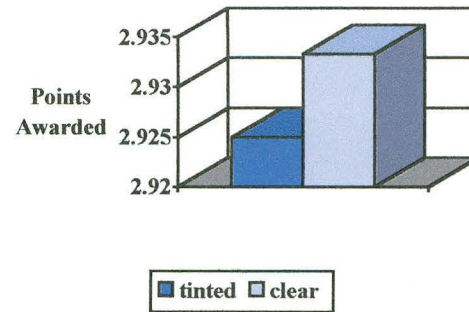


The points awarded by the two observers were combined and averaged to give a more accurate representation of the player's level of performance. The following graphs represent each player's individual scores during the batting drill as well as the composite average of all the players: (Graph1) (Graph2).

Of the six players, five of them showed some improvement with the Prosoft contact lens and one of the players showed a decrease in performance with the tinted lenses. The overall average score was 2.925 when wearing the Prosoft contact lenses and 2.933 when wearing clear lenses. This slight difference is not statistically significant using a two-tailed, paired t-test.

Even though the results of the hitting performance are similar between experimental and control groups, the responses to the subjective questionnaire which was completed by every player in the study after hitting with the Prosoft contact lenses was quite remarkable. All six of the players said that they would

Graph 2: Overall Average Scores



recommend the Prosoft contact lens to teammates who were not part of the study. Three of the six players believed that the tinted lenses did in fact help with their performance. The questionnaire also asked the players to quantify any improvement in their hitting performance. On a scale of one to five, with five being the most improvement, the average response was 4.33 with a range of four to five. Three of the six players said their hitting was about the same when using the Prosoft contact lenses.

When wearing the Prosoft contact lenses, every player mentioned that the softball did appear much brighter and did appear to stand out against the background. In contrast, when the subjects removed the Prosoft contact lenses, some mentioned that it felt like they had just taken off a pair of sunglasses and that everything appeared brighter. The subjects experienced no difference in the comfort between the Prosoft sports contact lens and their current habitual contact lenses. Some of the comments written by the players included:

“It really makes the ball stand out.”

“I felt like I made better contact with the ball.”

“I feel good about these lenses and would wear them when I play.”

In spite of the subjective responses to the WJ Prosoft contact lenses, we found that most of the subjects experienced a slight decrease in visual acuity of approximately a $\frac{1}{4}$ line when wearing the Prosoft contact lenses compared to clear lenses of the same power. For example, someone who was seeing 20/15 with his or her everyday clear contact lenses saw 20/15⁻² with the Prosoft lenses. One hypothesis for this slight decrease in the subjects' visual acuity is because the Snellen acuity letters are black and not optic yellow.

When initially inserting the Prosoft lens, many of the subjects experienced some degree of difficulty getting the contact lens to stay on the cornea. The lens seemed to be fitting too loose, always sliding inferior or falling out of the eye after the few initial blinks following insertion.

This was found to be the same whether the subject was a new or experienced contact lens wearer. The contact lenses settled after a few moments with the eyes closed.

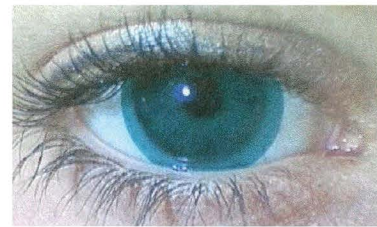


Figure 5: Centered Prosoft

Once the Prosoft lens was on the eye and stable, slit lamp evaluation showed a very well centered lens on all six of the subjects (Figure 5). Movement was minimal in most cases, ranging from no movement at all to 0.25mm. The subjects in the study wore the contact lenses for only a short period so oxygen deprivation was of no major concern. The manufacturers recommended use for the Prosoft contact lenses is during sporting activities only. Therefore, a tight fit with minimal movement is preferred.

Cosmetically, the lens was easily visible to the naked eye making it easier to determine that the subjects were wearing tinted contact lenses. The tint of the contact



Figure 6: Cosmetic Visibility of the Prosoft Contact Lens

lens, being a teal color (as seen in the figure 6), is not a common color of the normal iris. In addition, most tinted contact lenses have a clear edge zone that is not visible, but the edge-to-edge color of the Prosoft lens overlaps the corneal limbus on most people and is therefore easy to notice.

Conclusion

There was a slight but statistically insignificant decrease in batting performance outdoors when wearing the Prosoft contact lenses compared to clear lenses. One player's batting performance influenced this overall decrease. Besides having a visual effect, the Prosoft lenses also seemed to have a psychological effect on the players. When observing the players and conversing with them after the study, some players stated they felt more confident in their softball hitting abilities. One player even wrote on her questionnaire, "whether they work or not, they provide mental confidence, which is great."

Compared to a previous study done in the winter of 2001 at the Ferris State University indoor batting facility with the Prosoft lenses, the players noticed less of a visual effect outdoors than indoors. The indoor results showed an increase batting performance with the Prosoft contact lenses, but this increase was statistically insignificant³.

A possible follow-up study may be conducted to evaluate the performance of tinted contact lenses for indoor tennis play. Some considerations that may be factored

into the study are an increase in the number of subjects and the usage of different types of tinted contact lenses including the WJ Prosoft contact lens.

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¹ Hart Jr. WM. *Adler's Physiology of the Eye* 9th edition. St. Louis: Mosby Yearbook, 1992: 442-459.

² Rigel L. Sports-Vision Lens Can Enhance Image Clarity. *Contact Lens Spectrum*; September 2000: 39-43

³ Zehnder C., Tuchowski J. The Use of WJ Prosoft Contact Lenses for Sports Vision Enhancement.