JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

TREATMENT OF ASTIGMATISM WITH DISPOSABLE SOFT CONTACT LENSES

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ABSTRACT

In two studies that explored the myths and reality of CL fitting and wear, Ephron and colleagues argued about how practitioner and consumer attitudes change more slowly than technology and knowledge, which advance quite rapidly. 30 patients with soft toric lenses having more than 1.25 D of corneal astigmatism (25 eyes; Group A) or having 0.75–1.25 D of corneal astigmatism (22 eyes; Group B) and 30 patients with soft spheric lenses having 0.75–1.25 D of corneal astigmatism (28 eyes; Group C) or less than 0.75 D of corneal astigmatism (23 eyes; Group D) were included in the study. All patients had their biomicroscopic characteristics, autorefractometry, corneal topography, and corrected and uncorrected monocular visual acuity measured using logMAR both before and after putting in their contact lenses. Three metrics astigmatic neutralization, visual success, and retinal deviation were used to assess the effectiveness of the contact lens fitting. After soft toric lens application, spheric dioptres, cylindric and keratometric astigmatism, and retinal deviation reduced markedly in Groups A and B ($P < 0.05$). Group C had a reduction in spherical and retinal dioptres (P 0.05), but no change in cylindric or keratometric astigmatism ($P > 0.05$). Visual acuity and residual spherical equivalent refraction maintained within acceptable limits with the usage of toric and spheric contact lenses.

KEYWORD: Astigmatism, Soft Toric Lenses, Soft Spheric Lenses, Spherical Equivalent Refraction, Surface Topography

INTRODUCTION

Astigmatism correction using toric contact lenses has been an increasingly important part of the contact lens fitting process in recent years. Always evident is the need for lenses that not only feel good on the eye but also provide stable and undistorted vision. Many new designs for toric contact lenses have been introduced in an effort to increase their stability on the eye and capitalize on the vast unrealized potential of astigmatic or toric lenses. The seminar was meant to educate attendees on the different stabilization methods used in modern toric soft contact lenses. Manufacturers can reliably produce toric lenses, and current design improvements have made toric fitting more predictable.

It has been estimated that the time it takes for clinical research to be implemented into general healthcare settings is 17 years. It's well known that a number of procedures are required, such as conducting both laboratory and clinical studies on humans, drafting and implementing recommendations, and putting the results into practice. It is estimated that 30–40% of patients do not get treatment in line with the greatest available scientific data since changing people's habits as part of standard medical care is notoriously difficult. Focusing on CL practice in light of this knowledge raises questions regarding the prevalence of certain beliefs and the uptake of best practices in the field of eye care.

Due to the fast development of CL materials and care systems, as well as our expanding knowledge of how these variables influence ocular physiology, it is likely that some outdated beliefs endure despite the abundance of new information. Ephron and coworkers addressed the discrepancy between the rapid rate of development in technology and knowledge and the slower pace of change in practitioner and customer attitudes in two publications that examined the myths and reality of CL fitting and wear. After three decades have passed since those papers were published, it becomes useful to examine some current popular myths concerning soft CL fitting.

Within its scope, this investigation examines evidence for 10 commonly held beliefs. The review is broken down into three sections: (1) challenges faced by the CL and care system; (2) issues faced by patients; and (3) challenges faced by businesses. Given the thirty-year gap since Ephron and colleagues first addressed this issue, the fact that six of the subjects described in this study were also addressed in those early studies may come as a surprise. Despite indisputable advances in technology and clinical understanding, there remains a reluctance to abandon outdated views about CL's efficacy, appropriateness, and profitability.

Many people are born with astigmatism since the condition is typically inherited. It may also be caused by the weight of the eyelids pressing on the cornea, poor body alignment, or prolonged close work. Without treatment, you can have headaches, weariness, eyestrain, and difficulty seeing objects at any distance. Eyeglasses or contact lenses, if recommended by a doctor, may correct almost all cases of astigmatism. If additional vision issues like myopia or hyperopia are absent, then corrective lenses may not be necessary at all for those with mild astigmatism. Corrective lenses are often required if the degree of astigmatism is moderate to high.

Astigmatism may be treated using cylinder-containing corrective eyeglasses or contact lenses. The capacity of these lenses to bend light is asymmetrical. Refractive or laser eye surgery may also be used to treat astigmatism by altering the cornea's curvature. Despite the fact that there are several refractive surgeries available, each patient needs a tailor-made plan of action. Refractive procedures may only be performed on eyes that are in good condition, without issues like retinal detachment, corneal scarring, or other eye diseases.

LITERATURE AND REVIEW

Carole Maldonado-Codina et al (2020) Purpose The purpose of this study was to examine whether or not the wearer's reported level of comfort while using modern daily disposable soft toric contact lenses was correlated with their reported level of satisfaction with their eyesight. Methods In a prospective, crossover, randomized, single-masked trial, 38 regular users of soft contact lenses tried out three different daily disposable toric lenses, each for a full week. Biomicroscopy scores, lens fitting (including rotation and rotational stability), high and low contrast visual acuity, subjective vision quality, and subjective ocular surface comfort were measured during dispensing and follow-up visits. We used numerical grading scales from 0–10 for the subjective ratings. Age, sex, visit, phase of crossover ('phase'), lens type, lens rotation, lens rotational stability, visual acuity, cylinder power, and subjective vision quality were all considered in a linear regression model that was then refined using backward stepwise regression to determine how these factors affected comfort scores. Results Thirty-six people averaged 31.1 years old when they finished the research. Subjective vision quality ($F = 127.0$; p 0.0001), phase ($F = 7.2$; $p = 0.001$), and lens type ($F = 4.9$; $p = 0.009$) were all shown to be correlated with comfort ratings. High levels of subjective visual quality were correlated with high levels of comfort. The model did not show any statistically significant relationship between visual acuity and outcome. Conclusion This study provides evidence that implies daily disposable soft toric lenses may exacerbate ocular pain feelings if they are also thought to impede vision. Comfort and subjective vision quality were positively correlated more strongly than comfort and objective vision tests.

Indrajeet Kumar et al (2022) It was noted by Ephron and coworkers in two papers that explored the myths and reality of CL fitting and wear that the rate of change in practitioner and consumer attitudes lagged far behind that of technology and knowledge. Group B consisted of 30 patients whose corneal astigmatism was more than 1.25 diopters (D), while Group A consisted of 30 patients whose corneal astigmatism was between 0.75 and 1.25 D (22 eyes). Both groups wore soft tori and soft spheric lenses (23 eyes; Group D). All patients had pre- and post-contact lens measurements of corneal topography, autorefractometry, biomicroscopic features, and corrected and uncorrected monocular visual acuity with log

MAR. Contact lens fits were evaluated based on their ability to improve astigmatism, visual acuity, and retinal deviation. comparison between tori and spherical contacts. The average age (6 standard deviations) of the 60 participants was 27.56 years, and the average spherical and cylinder refractive errors were 23.6862.01 and 21.2860.36 diopters, respectively. High- and low-contrast visual acuities with tori lenses were better than with spherical lenses at both stages of the fitting procedure and in the follow-up (tori high-contrast: 20.06560.078 and low-contrast: 0.13360.103 vs. spherical high-contrast: 0.00160.104 and low-contrast: 0.22460.107). When tori contact lenses were fitted, electromyography-measured eyestrain was reduced with them than with spherical lenses, but not at the follow-up.

Cox et al (2018) The goals of this study are to determine whether or not soft toric contact lenses (TCLs) are more time-consuming to fit clinically than soft spherical contact lenses (SCLs) and whether or not TCLs enhance patient-reported outcomes. Regular contact lens users with a spherical vertex refraction of +4.00 to +0.25 D or 0.50 to 9.00 D and a cylinder refraction of 0.75 to 1.75 DC were randomly allocated to be put into a TCL or SCL in both eyes, with neither eye's wearer being aware of which lens type they were receiving. The length of time it took for the fitting to go well was tracked. Both the original and modified versions of the Convergence Insufficiency Symptom Survey (CISS) and the National Eye Institute Refractive Error Quality of Life Instrument (NEI-RQL-42) were filled out after 5 days. Subjects were fitted with the new lens design after a brief washout (TCL or SCL). The results were analyzed using linear mixed models for the fitting time and CISS score, a generalized linear model for the successful fit, and Wilcoxon tests for the NEI-RQL-42. There was a total of 60 participants (71.7% female; mean age [SD] = 27.5 5.0 years). Comparing the TCL and SCL, the average fitting time was 10.24.3 minutes (LS mean difference (TCLSCL)=1.2, P=0.22), with the SCL taking slightly longer at 9.06.5 minutes. The overall NEI-RQL-42 score was higher for patients who used toric contact lenses compared to those who wore SCL (P=0.006), as were scores on the subscales measuring patients' clarity of vision and satisfaction with correction. Clinical symptom scores decreased by 15% in CISS patients (LS mean difference [TCLSCL]=2.20, P=0.02). Patients with mild to severe astigmatism may benefit from TCLs because of the perceived improvements in results.

Ibrahim Inan Harbiyeli, et al (2022) The purpose of this research was to assess how well extended range toric soft contact lenses (TSCLs) corrected patients' vision who had keratoconus and moderate to severe astigmatism. The method used in this clinical investigation was cross-sectional and retrospective. Users of extended-range TSCL with astigmatism less than 3.0 diopters were considered. Based on the topographic pattern of astigmatism, the cases were divided into three groups: regular, irregular (non-keratoconic), and keratoconic. Subjects were also separated according on their astigmatism severity. Fifty-five patients with 82 eyes were recruited, with 28 (or 51%) being female. A median age of 24.2 ± 7.5 years (range, 8-41) was found. Eyes with regular astigmatism accounted for 43%, irregular astigmatism for 41%, and keratoconus affected 14%. In participants with keratoconus, contact lenses resulted in a statistically significant (p = 0.03) greater increase in visual acuity (VA) than eyeglasses did (p 0.001). Of the sample, 26 (31.7%) eyes had moderate (3.0 to 4.24 D) astigmatism, 30 (36.6%) eyes had moderate/high (-4.25 to —5.99 D), and 26 (31.7%) eyes had high (≤−6.0 D) astigmatism. When comparing the percentage VA improvement across groups, contact lenses were found to be statistically superior (p <0.001) than eyeglasses. This research showed that individuals with moderate to high astigmatism and a variety of astigmatic patterns may achieve good visual results using extended range TSCLs.

Anna Sulley et al (2013) The goals of this study are to (1) identify the likelihood that astigmatic individuals from three groups who do not regularly use toric contact lenses will start doing so, and (2) assess the likelihood that these individuals will be successful in maintaining regular usage of their toric lenses. There were 200 participants and 16 research facilities in the United Kingdom that took part in this randomized, bilateral, open-label, daily-wear trial for a month. Those with astigmatism, ranging in age from 16 to 60, were divided into three groups and given either a daily disposable toric soft lens (1 Day Acuvue Moist for Astigmatism, Johnson & Johnson Vision Care) or a reusable toric soft lens that needed to be replaced every two weeks (Acuvue Oasys for Astigmatism, Johnson & Johnson Vision Care). After 1 month of usage, subjects were assessed in terms of acceptable fit, orientation stability, visual acuity, quality of vision, and general comfort to determine the success rates. On the initial try, 88% of lenses were successfully positioned. Only 182 (92%) of the 198 people who were asked to stop using contact lenses went on to finish the trial. Success rates according to the established criteria were 80% (53/66) for the SW group, 74% (52/70) for the DO group, and 70% (39/56) for the Neo group when examined by topic group. In all three groups, comfort was a major factor in dropout rates, however issues with vision were more prevalent in the DO and Neo groups (13% vs. 6%). The SW group had a substantial improvement in VA using the research lenses compared to their usual lenses. When those in the DO and Neo groups (i.e., people who normally use glasses) pooled their vision, it was equivalent to what it normally is with their regular eyewear. Current lenses can be used to suit a sizable percentage of astigmatic patients who are not already using toric soft contact lenses. Both first-time contact lens users and those who had tried contacts before found that toric soft lenses provided them significant vision improvement over their glasses. Astigmatics who previously used spherical contact lenses benefit greatly from refitting with toric soft lenses. In light of these results, it seems likely that many astigmatic individuals who are not already using toric soft contact lenses will discover that they benefit from doing so.

METHODOLOGY

The study included 30 patients with corneal astigmatism of more than 1.25 diopters (25 eyes; Group A) or between 0.75 and 1.25 diopters (22 eyes; Group B), and 30 patients with corneal astigmatism of less than 0.75 diopters (23 eyes; Group D) who wore either soft toric or soft spherical lenses. Table 1 details the toric and spherical contact lens parameters that were used. Patients who were willing to use contacts were selected, while those with ocular surface illnesses or a tear film functional deficiency were not. Patients gave their written, informed permission.

All patients had their eyes examined prior to and at least 20 minutes after inserting their contacts to measure their corrected and uncorrected monocular visual acuity with logMAR, biomicroscopic properties, autorefractometry, and corneal topography using a placido disk-based corneal mapping system, transferring data to color mapping software. By custom-fitting spherical lenses to the average spherical equivalent prescription, we were able to achieve optimal corneal coverage, horizontal and vertical centration, and movement.

After the toric soft lenses settled, the scribe markings were placed within a range of 0° to 10° with respect to the lens marking site. Contact lens deposits, axial rotation, and centralization were identified during biomicroscopic analysis. Using the slit light, we were able to determine the lens's position relative to the lazer inscriptions, and then record the resulting rotations. There were three criteria used to determine the success of a contact lens fitting.

1. Astigmatic neutralization: Effective neutralization of various corneal astigmatism diopters was compared by dividing residual astigmatism after contact lens application by initial or total corneal astigmatism determined before contact lens application, yielding a percentage. ratio of cylinders with residue to those with no residue.

Table 1 Specifications of toric and spherical contact lenses

Group As–B	No.	Central thick (mm)	Groups C–D	No.	Central thick (mm)
Focus® toric (Ciba)	13	0.14	Focus visitint (Ciba)	13	0.1
Freshlook® toric (Wesley Jessen)	19	0.11	Freshlook LT (Wesley Jessen)	19	0.08
SL-66 toric (Bausch and Lomb)	15	0.19	SL-66 (Bausch and Lomb)	20	0.1

2. Visual success: Comparison of corrected visual acuity in logMAR was done with both contact lenses and glasses. Successful application was defined as a difference in visual acuity of less than 2.0 lines, with success rate being determined on an ad hoc basis.

3. Mean retinal deviation (absolute spherical equivalent fraction): Patients' auto refractometric residual refractive errors were defined in a way similar to that reported to reduce the complexity of the combined impact of spherc and cylindrical power. The average of the diopter readings throughout the major meridian was used to determine the deviation. The axis of rotation was overlooked. Total and residual retinal deviations, respectively, were determined as the group means before and after contact lens administration. Success was defined as a residual retinal deviation smaller than 0.50 D. Each group's success rate was calculated by calculating the average ratio of (individual) residual to total retinal deviation values.

The information was recorded in an Excel spreadsheet and analyzed using SPSS (15.0). Descriptive analysis was used to determine central tendency measures including means, standard deviations, and ranges. Tukey's procedure for comparing several groups utilizing analysis of variance (ANOVA), paired samples test, and, where necessary, post hoc t-tests was used. In this case, statistical significance was determined to exist at the P<0.05 level for the proper mean square error derived from the analysis of variance.

RESULTS

Sixty people had their 98 eyes examined. There was no significant difference in mean age between groups A, B, C, and D (25.9 years (±8.4), 29.4 years (±8.7), 25.07 years (±4.5), and 23.3 years (±5.5), P= 0.712). It was 15 women to 10 men in Group A, 12 women to 10 men in Group B, 15 women to 13 men in Group C, and 14 women to 9 men in Group D.

Table 2 provides a statistical breakdown of the average spherical power of corrective lenses, as well as the average cylinder and keratometric astigmatism. Mean retinal deviations were 3.30 diopters (1.7 diopters) in Group D (P = 0.458), 3.27 diopters (±3.24) in Group A, 4.37 diopters (±3.0) in Group B, and 3.52 diopters (±2.2) in Group C. Mean spheric, cylindric and keratometric values in diopters according to the groups assessed over contact lenses, following contact lens application are provided in Table 3.

With the contact lenses, the average percentage of corneal astigmatism was neutralized as follows: Group A: -52% (±28%), Group B: -53% (±26%), Group C: -94% (±25%), and Group D: 126% (±16%) (P = 0.000). The negative sign denotes a reduction in the contact lens surface cylinder compared with the initial corneal surface power. Means of the visual acuities corrected with glasses were 0.02 logMAR (±0.04) in Group A, 0.005 logMAR (±0.002) in Group B, 0.0 logMAR (±0.0) in Group C, and 0.0 logMAR (±0.0) in Group D (P = 0.065). In Group A, those who used contacts had an average visual acuity of 0.02 logMAR (±0.01), whereas in Group B, Group C, and Group D, the average was 0.025 logMAR (±0.04), 0.015 logMAR (±0.01), and 0.0 logMAR (±0.0), respectively (P = 0.106).

Residual mean retinal deviations following contact lens fitting were 0.04 D (±0.40) in Group A, 0.11 D (±0.53) in Group B, 0.26 D (±0.43) in Group C, and 0.20 D (±0.25) in Group D (P = 0.240). The average of the ratios of residual/total mean retinal deviation was: 0.25 D (±0.34) in Group A, 0.17 D (±0.21) in Group B, 0.12D (±0.07) in Group C, and 0.18 (±0.41) in Group D (P = 0.415). During the statistical analysis, following soft toric lens application, spheric dioptres, cylindric and keratometric astigmatism, and retinal deviation reduced considerably in Groups A and B (P = 0.0).

Both the spherical equivalent refraction and the spherical dioptres decreased in Group C (P =0.01). No significant shift was seen in cylinder (P = 0.547) or keratometric (P = 0.286) astigmatism. Group D had a reduction in spherical dioptres and spherical equivalent refraction (P = 0.0) and cylindric astigmatism (P = 0.045), but no change in keratometric astigmatism (P = 170) and an increase in astigmatic neutralization.

Table 2 Spectacle spheric, cylindric, keratometric and retinal deviation mean values in diopters according to the groups before contact lens application

	Group A (toric > 1.25 D)	**Group B** (toric 0.75–1.25 D)	**Group C** (spheric 0.75–1.25 D)	**Group D** (spheric < 0.75 D)	P
Age	25.9 ± 8.4	29.4 ± 8.7	25.07 ± 4.5	23.3 ± 5.5	0.030
Gender (Female/Male)	15/10	12/10	15/13	14/9	0.712
Mean spheric power D	−2.48 ± 3.14	−3.08 ± 3.03	−3.25 ± 2.1	−3.13 ± 1.8	0.361
Mean cylinder D	−1.7 ± 0.37	−1.03 ± 0.22	−0.54 ± 0.44	−0.33 ± 0.21	0.000
Keratometric astigmatism D	−1.46 D ± 0.24	−1.13 D ± 0.43	−1.03 ± 0.2	−0.40 ± 0.22	0.000
Total mean retinal deviations	3.27 ± 3.24	4.37 ± 3.0	3.52 ± 2.2	3.30 ± 1.7	0.458

Table 3 Spheric, cylindric, keratometric and retinal deviation mean values in diopters, astigmatic neutralization and visual acuity (Snellen lines) according to the groups after contact lens application

	Group A (toric > 1.25 D)	Group B (toric 0.75–1.25 D)	Group C (spheric 0.75–1.25 D)	Group D (spheric < 0.75 D)	P
Sphere	0.25 (± 0.41)	0.20 (± 0.55)	0.70 (± 0.4)	0.06 (± 0.28)	0.540
Cylinder	−0.57 (± 0.31)	−0.59 (± 0.34)	0.50 (± 0.45)	0.22 (± 0.21)	0.002
Keratometric astigmatism	0.74 (± 0.35)	0.62 (± 0.38)	−0.97 (± 0.34)	−0.49 (± 0.33)	0.000
Astigmatic neutralization	52% (± 28%)	53% (± 26%)	94% (± 25%)	126% (± 16%)	0.000
Visual acuity (logMAR)	0.02 (± 0.01)	0.025 (± 0.04)	0.015 (± 0.01)	0.0 (± 0.0)	0.106
Residual mean retinal deviations	0.04 (± 0.40)	0.11 (± 0.53)	0.26 (± 0.43)	0.20 (± 0.25)	0.240
Residual/Total mean retinal deviations	0.25 (± 0.34)	0.17 (± 0.21)	0.12 (± 0.07)	0.18 (± 0.41)	0.415

No significant differences were found between groups A, B, or D in terms of spherical or cylindric dioptres, keratometric astigmatism, or retinal deviation. However, we did find a significant difference between groups C and D in terms of the ratio of residual to total mean retinal deviation (P = 0.008). We defined a positive answer as one that met both the subjective criterion of a difference in visual performance of fewer than two rows between spectacles and contact lenses and the objective criterion of a difference in retinal deviation of less than 0.50 diopters. Group C (96% of eyes) had a visual acuity loss of 2.0 lines or less, but Groups A, B, and D (100%) all did.

The mean residual retinal deviation for all of these individuals was less than 0.50 degrees. The proportion of patients with less than 0.50 D of residual retinal deviation was 80% in Group A, 95% in Group B, 78% in Group C, and 95% in Group D (Table 4). (Table 4). When we regarded less than one row of spectaclecontact lens difference for visual performance in Groups A, B, C, and D, success percentages were 80%, 100%, 78.2%, and 82% accordingly. Patients in Groups B and C, who were prescribed toric and spherical lenses, respectively, for low astigmatism between 0.75 and 1.25 D, showed statistically significant differences in residual corneal astigmatism (P = 0.005) and astigmatic neutralization (P = 0.048).

Visual success rate (<2-line loss) was lower in Group C (96%) than Group B (100%) (P = 0.674), and success with residual retinal deviation (0.50 D) was lower in Group C (78%) than Group B (95%) (P = 0.551), but these differences were not statistically significant. When comparing Groups B and C, the astigmatic neutralization value was 53% (26%) and 94% (25%), respectively. After applying toric lenses, the astigmatism on the anterior surface was neutralized and the bow tie appearance was disseminated over the periphery based on the residual astigmatism in Groups A and B, as determined by the topographic data analysis. In Groups C and D, however, the bow tie effect was almost equally projected on the anterior surface topography after spheric lenses were applied, in comparison to values obtained before to contact lens administration.

DISCUSSION

Soft contact lenses' dioptric power on the eye depends on a number of factors, including their off-eye power, the angle at which they are positioned on the eye, the amount of hydration in the lens, and the shape of the cornea. Patient-reported outcomes and subjective visual data provide useful clues, but more objective methods like autorefraction and topography will strengthen our assessment. Taking into account the evident refraction of the eye with the toric and spheric soft contact lenses in place allows one to evaluate the efficacy of the fitting method. To estimate the likelihood of vision impairment due to residual refractive error, we determined the average retinal deviation.

The mean retinal deviation is a geometric optical calculation used to characterize the degree of defocus at the retinal plane by averaging the absolute values of the major meridians (spherical power, cylindrical power, and axis). This should not be confused with spherical equivalent because it gives us the angle of departure from the retinal plane. In place of retinal deviation, the midpoint of the main meridians is used to define spherical equivalent. In order to foretell how optical mistakes will affect one's vision, researchers looked at the correlation between the two. Before, 457 Focus toric soft contact lenses were tested using this approach. The study concluded that 83.5% 1.7% of the lenses were within one line of their target prescription.

Table 4 Visual success and residual retinal deviation success rates according to the groups

	Group A (toric > 1.25 D)	Group B (toric 0.75–1.25 D)	Group C (spheric 0.75–1.25 D)	Group D (spheric < 0.75 D)	P
Visual success rates (<2 line loss)	100% (25/25 eyes)	100% (22/22 eyes)	96% (27/28 eyes)	100% (23/23 eyes)	0.243
Residual retinal deviation success (<0.50 D)	80% (20/25 eyes)	95% (21/22 eyes)	78% (22/28 eyes)	95% (22/23 eyes)	0.068

Notes: Less than two rows of spectacle-contact lens difference during visual acuity measurement and residual retinal deviation less than 0.50 D was accepted as successful.

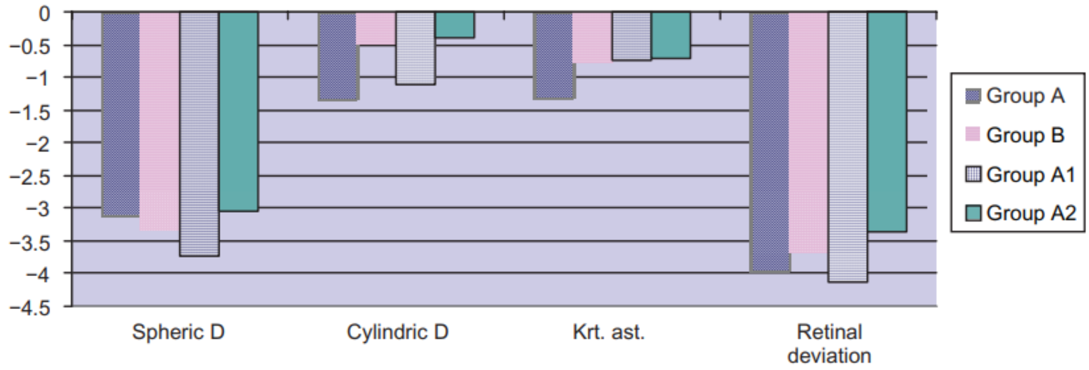

Figure 1 Spheric, cylindric, keratometric and retinal deviation mean values in diopters according to the groups before contact lens application.

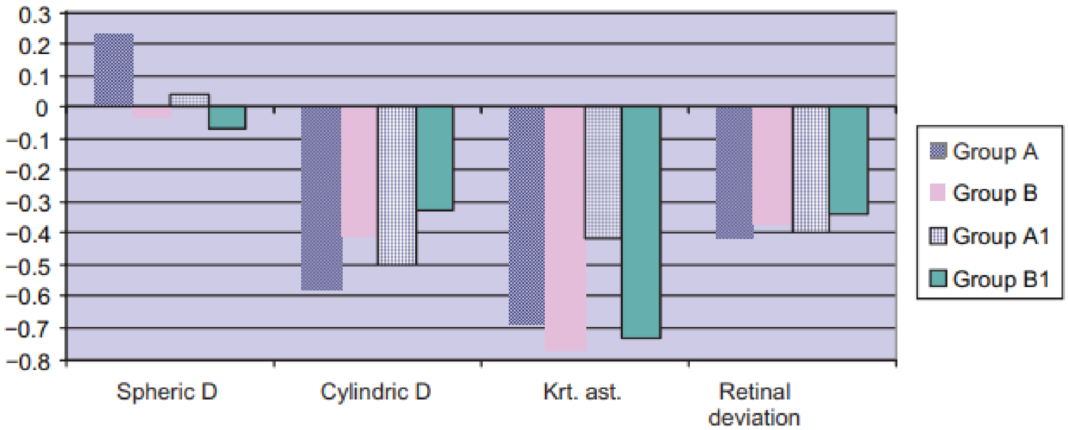

Figure 2 Spheric, cylindric, keratometric and retinal deviation mean values in diopters according to the groups after contact lens application.

Consistent with prior research, we found that corneal astigmatic neutralization values for Groups A and B soft toric lenses ranged from -52% (± 28%) to -53% (± 26%), whereas values for Groups C and D soft spherical lenses ranged from -94% (± 25%) to 126% (±16%). When comparing lenses with 0.06 mm and 0.12 mm central thicknesses, scientists found that the thicker lenses had somewhat superior acuity. It has also been shown that using a hydrogel soft contact lens vs one made from a higher modulus spherical silicone hydrogel material has no appreciable effect on the amount of astigmatism disguised. Similar to previous publications, we found that lens thickness had no effect on the amount of astigmatism disguised while using spherical hydrogel contact lenses with a central thickness ranging from 0.08 mm to 0.1 mm in the current investigation.

CONCLUSION

Contact lenses, both Toric and spherical, helped keep visual acuity and residual spherical equivalent refraction within healthy parameters. While toric lenses were able to generate central neutralization and a decrease in the corneal cylinder in mild to moderately astigmatic eyes, spherical lenses were unable to mask the corneal toricity that was measured by topography. The results of this research showed that both visual acuity and residual retinal deviation may be kept within acceptable ranges by using either toric or spherical contact lenses. Topography revealed an increase in corneal astigmatism, even in low astigmatism, with the use of spherical lenses, while the use of toric lenses resulted in central neutralization and a reduction in corneal cylinder. In people with mild astigmatism, toric lenses are the best option.

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