Visual Acuity Outcomes after Cataract Extraction in Adult Latinos

The Los Angeles Latino Eye Study

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Purpose: To determine prevalence, primary causes, and risk indicators of visual impairment in cataract-operated eyes.

Design: Population-based cross-sectional study of adult Latinos.

Participants: Two hundred sixty-one participants with cataract extraction.

Methods: Participants underwent an in-home interview and a comprehensive ophthalmologic examination. Visual impairment in the cataract-operated eye was defined by presenting visual acuity (PVA) of 20/40 or less or best-corrected visual acuity (BCVA) of 20/40 or less. The association of cataract extraction status (aphakic, pseudophakic) and severity of visual impairment was evaluated. Risk indicators associated with visual impairment by BCVA in the worse-seeing cataract-operated eye were evaluated.

Main Outcome Measures: Visual acuity, causes of visual impairment, and risk indicators associated with visual impairment.

Results: Of the 261 participants with at least one cataract extraction and a complete clinical examination, 100 (38%) participants had undergone a unilateral extraction and 161 (62%) had undergone bilateral extractions. The prevalence of visual impairment was 41% (n = 107) defined by BCVA and 60.5% (n = 158) defined by PVA in the worse-seeing cataract-operated eye, and 32.2% (n = 136) defined by BCVA versus 48.1% (n = 203) defined by PVA in all cataract-operated eyes. Uncorrected refractive error, age-related macular degeneration, and diabetic retinopathy were the primary causes of visual impairment, accounting for 49% in worse-seeing cataract-operated eyes and 57% in all cataract-operated eyes. Self-reported history of glaucoma, barriers to eye care, and unmarried participants were independent risk indicators associated with visual impairment ($P<0.05$).

Conclusions: Despite cataract surgery, a significant proportion of participants had residual visual impairment. Refractive correction eliminated visual impairment in 15% to 20% of the participants, demonstrating the need for regular ophthalmologic examinations in cataract-operated patients. *Ophthalmology 2008;115:815–821*

Cataract is one of the principal causes of blindness in the world[1] and is the leading cause of visual impairment in the United States among white persons, black persons, and Latinos.[2] Because Latinos comprise the fastest-growing segment of the United States population, it is important to examine the role of cataract in their visual health. According to United States Census data from 2000, 12% of the residents in the United States are Latino or Hispanic, and by 2050, this number is projected to grow to 25%.[3] A recent population-based study found the prevalence of all lens changes to be as high as 19.5% in Latinos 40 years and older,[4] and another study found that cataract and glaucoma are the primary causes of vision loss in Latinos in the United States.[5] Because the median age in Latinos is 10 years less

Originally received: December 12, 2006.
Final revision: May 25, 2007.
Accepted: May 25, 2007.
Available online: September 12, 2007. Manuscript no. 2006-1430.

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Presented at: Association for Research in Vision and Ophthalmology Annual Meeting, May 2006, Fort Lauderdale, Florida.

Supported by the National Eye Institute and National Center on Minority Health and Health Disparities, Bethesda, Maryland (grant nos. EY-11753, EY-03040), and an unrestricted grant from Research to Prevent Blindness, Inc., New York, New York. Dr Varma is a Research to Prevent Blindness Sybil B. Harrington Scholar.

The authors have no proprietary or commercial interest in any materials discussed in the article.

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ISSN 0161-6420/08/$–see front matter
doi:10.1016/j.ophtha.2007.05.052

than that of the rest of the United States population, we must plan in advance for healthcare as this population ages. To do so efficiently, we need to assess not only the prevalence but also the outcomes of cataract surgery in Latinos.

In 1999, 1.6 million cataract procedures costing $3 billion were performed on Medicare beneficiaries. Cataract care consumes approximately 60% of Medicare's budget for vision and 12% of their total budget.[6] Despite the enormous cost and burden of cataract surgery, few population-based studies have evaluated postoperative visual impairment and causes of visual impairment in cataract-operated individuals. Most of these studies have been conducted in developing countries.[7–11] To the best of the authors' knowledge, there has been no such study of the Latino population despite recent reports demonstrating that the prevalence of pseudophakia and aphakia is higher in Hispanics than in white or black persons.[12] Therefore, it is important to evaluate the visual acuity outcomes after cataract extraction in adult Latinos.

The Los Angles Latino Eye Study (LALES) is a population-based, cross-sectional study that examines the prevalence of ocular disease, visual impairment, and related risk indicators in Latinos 40 years of age and older living in Los Angeles County, California. The objectives of the present study were: (1) to compare the prevalence of visual impairment in cataract-operated participants defined by presenting visual acuity (PVA) and best-corrected visual acuity (BCVA); (2) to assess the causes of visual impairment by BCVA in cataract-operated participants; (3) to determine the risk indicators for visual impairment in cataract-operated participants.

Patients and Methods

Study Population

The study population included self-identified Latinos 40 years of age and older living in La Puente, California. Six census tracts of La Puente were chosen because they are representative of the demographic and socioeconomic characteristics of the Latino population of Mexican origin in Los Angeles County, California, and the United States. Details of the study design, sampling plan, and baseline data have been presented elsewhere.[13] Briefly, between February, 2000, and May, 2003, eligible residents were given information about the study and were invited to participate. Before any data were collected, written informed consent was obtained from each study participant. Approval for conducting the study was obtained from the Los Angeles County/University of Southern California Medical Center Institutional Review Board. All study procedures adhered to the principles outlined in the Declaration of Helsinki for research involving human subjects.

Sociodemographic and Clinical Examination Data

Details of the in-home interview and clinical examination were presented elsewhere.[13] After obtaining informed consent from participants, a trained interviewer conducted a detailed in-home interview to obtain demographic information, risk factors, history of ocular and medical conditions, access to care, and acculturation and insurance status. Barrier to care was measured by a 1-item questionnaire: "During the past 12 months, was there any time when you needed eye care or surgery but did not get it?" Eligible individuals then were scheduled for a comprehensive eye examination at the LALES local eye examination center, performed by an ophthalmologist and ophthalmic technicians. Presenting visual acuity and BCVA were measured according to the Early Treatment of Diabetic Retinopathy Study (ETDRS) protocol. The PVA was measured for each eye (right eye first followed by left eye) with the individual's existing refractive correction at 4 m. The ETDRS protocol was used with a retroilluminated, modified ETDRS distance chart. The PVA was scored as the total number of lines read correctly. Near vision was measured with the participant's present reading prescription using the modified ETDRS near-vision acuity chart.

Definitions of Visual Impairment

Visual impairment in the cataract-operated eye was defined by 2 criteria: (1) a PVA of 20/40 or worse or (2) a BCVA of 20/40 or worse. The severity of visual impairment was classified as mild (20/40–20/63), moderate (20/80–20/160), or severe (≤20/200).

Determination of Primary Causes of Visual Impairment

Details of the procedures to determinate the primary causes of visual impairment were presented elsewhere.[14] Using standard clinical criteria, a thorough chart review of all available clinical data was conducted, including clinical examination findings, lens grading, fundus photographs, and all information provided by the examining ophthalmologist, and a final determination of the cause of vision loss for each eye was made. In addition to ocular diseases being considered as the primary causes of visual impairment, uncorrected refractive error also was considered as a cause. Uncorrected refractive error in a cataract-operated eye was defined as visual acuity of 20/40 or less by PVA but visual acuity of more than 20/40 by BCVA.

Determination of Risk Indicators for Visual Impairment

Anderson's behavioral model was used to evaluate the risk indicators for visual impairment.[15,16] This model suggests that people's use of health services is a function of their predisposition to use services measured by demographic and social factors, enabling factors that facilitate or impede use and need for services as perceived by people or as evaluated by health professional. Predisposing variables include age, gender, marital status (married and living with partner, not married, or not living with partner), acculturation score, birthplace (United States born, foreign born), generation status, and language preference. The enabling variables include education, income, and insurance status. The need variables include distance vision, near vision, barrier to care, and history of eye disease.

Impact of Visual Impairment on Daily Living

Driving difficulties subscale scores from the National Eye Institute Visual Function Questionnaire (NEI VFQ-25) were used as a surrogate to evaluate the impact of visual impairment on activities of daily living. The NEI VFQ-25 questionnaire was administered either in English or Spanish, according to participant's language preference. Details of the questionnaire and interviewers were presented elsewhere.[13,17]

Statistical Analysis

The prevalence of visual impairment defined by PVA and BCVA were calculated for both the worse-seeing cataract-operated eye and all cataract-operated eyes. Chi-square analyses were conducted to evaluate the associations of cataract extraction status (aphakic or pseudophakic) with visual impairment (none or any visual impairment). The causes of visual impairment defined by PVA were assessed for the worse-seeing cataract-operated eye and all cataract-operated eyes. The worse-seeing cataract-operated eye was defined according to the following criteria: (1) an eye with unilateral cataract extraction or (2) an eye with worse visual acuity in bilateral cataract extractions.

Univariate and stepwise logistic regression analyses were conducted to assess the risk factors associated with visual impairment defined by BCVA in the worst-seeing cataract-operated eye. An analysis of covariance was used to compare the driving difficulty subscale scores of the NEI VFQ-25 between bilateral phakic with no visual impairment (i.e., all the LALES participants with no cataract extraction and no visual impairment), bilateral pseudophakic with no visual impairment, and bilateral pseudophakic with any visual impairment. All analyses were performed using the SAS statistical package version 9.1 (SAS Institute, Inc., Cary, NC) at the $P = 0.05$ significance level.

Results

Description of Study Cohort

Of the 7789 eligible participants identified for the LALES, 6357 completed the ophthalmic examination, resulting in a participation rate of 82% (6357/7789). Of these 6357 participants, 265 (4.2%) had undergone at least 1 cataract extraction, of which 4 participants who did not have visual acuity data were excluded from the analysis. Of the 261 participants, 100 (38%) participants had undergone a unilateral cataract extraction (18 aphakic and 82 pseudophakic), and 161 (62%) participants had undergone bilateral cataract extractions (3 bilateral aphakic, 153 bilateral pseudophakic, and 5 aphakic in one eye and pseudophakic in the other eye), resulting in a total of 422 cataract-operated eyes. Overall, 181 (69%) participants with cataract extractions wore spectacles at the time of clinical examination; of these, 11 (6%) were unilateral aphakic, 57 (31%) were unilateral pseudophakic, 3 (2%) were bilateral aphakic, 108 (60%) were bilateral pseudophakic, and 2 (1%) were bilateral cataract extractions with one eye aphakic and the other eye pseudophakic.

Prevalence of Visual Impairment

Table 1presents visual impairment data defined by PVA and BCVA in worst-seeing cataract operated eyes. Among the 261 cataract-operated participants, 158 (60.5%) had some form of visual impairment defined by PVA, compared with 107 (41.0%) defined by BCVA for distance vision. There was a higher proportion of visual impairment in all the 3 visual impairment severity groups (mild, moderate, severe) when visual impairment was defined by PVA, compared with when visual impairment was defined by BCVA for distance vision.

Visual impairment defined by either PVA or BCVA was more prevalent in the aphakic group compared with the pseudophakic group ($P<0.0001$; PVA, 96.0% vs. 56.8%; BCVA, 88.0% vs. 36.0%) for distance vision. Moreover, 92% of aphakic and 14.4% of pseudophakic participants had severe visual impairment (which met the United States definition of blindness) defined by PVA compared with 72% of aphakic participants and 10.6% of pseudophakic participants defined by BCVA.

Among the 259 cataract-operated participants who had near vision visual acuity data, 248 (95.8%) had some form of visual impairment defined by PVA. Aphakics had a higher prevalence of visual impairment for near vision compared with pseudophakics (100% vs 95.3%). Chi-square analyses of the association of status of cataract extraction (aphakic or pseudophakic) and visual impairment (no visual impairment vs. any visual impairment) were significant for visual impairment defined either by PVA or BCVA for distance vision and by PVA for near vision (all $P<0.0001$).

Table 2 presents visual impairment data defined by PVA and BCVA in all cataract-operated eyes. Of the 422 total cataract-operated eyes, 203 (48.1%) eyes had any visual impairment defined by PVA, compared with 136 (32.2%) cataract-operated eyes defined by BCVA for distance vision. Visual impairment defined by either PVA or BCVA was more prevalent in the aphakic eyes compared with the pseudophakic eyes ($P<0.0001$) for distance vision. Of the 420 cataract-operated eyes that had near vision visual acuity data, 391 (93.1%) had visual impairment defined PVA.

Causes of Visual Impairment

As shown in Table 3, the 3 major primary causes of visual impairment in the worse-seeing cataract-operated eyes were uncorrected refractive error (27.2%), age-related macular degeneration (AMD; 12.0%), and diabetic retinopathy (10.1%). This was

Table 1. Visual Impairment in Worse-Seeing Cataract-Operated Eyes

Status of Cataract Extraction	Visual Impairment [n (%)]*				
	None (>20/40)	*Any (≤20/40)*	*Mild (20/40–20/63)*	*Moderate (20/80–20/160)*	*Severe (≤20/200)*
Visual impairment defined by presenting visual acuity					
Aphakic (n = 25)	1 (4.0)	24 (96.0)	0 (0)	1 (4.0)	23 (92.0)
Pseudophakic (n = 236)	102 (43.2)	134 (56.8)	69 (29.2)	31 (13.1)	34 (14.4)
Total (n = 261)	103 (39.5)	158 (60.5)	69 (26.4)	32 (12.3)	57 (21.8)
Visual impairment defined by best-corrected visual acuity					
Aphakic (n = 25)	3 (12.0)	22 (88.0)	4 (16.0)	0 (0)	18 (72.0)
Pseudophakic (n = 236)	151 (64.0)	85 (36.0)	40 (16.9)	20 (8.5)	25 (10.6)
Total (n = 261)	154 (59.0)	107 (41.0)	44 (16.9)	20 (7.7)	43 (16.5)

Chi-square tests of the association of status of cataract extraction (aphakic, pseudophakic) and visual impairment (none vs. any visual impairment) were significant ($P<0.0001$) for visual impairment defined by both presenting and best-corrected visual acuities.
*Defined as presenting or best-corrected visual acuity of 20/40 or worse in the worse-seeing cataract-operated eye.

Table 2. Visual Impairment in All Cataract-Operated Eyes

Status of Cataract Extraction	Visual Impairment [n (%)]*				
	None (>20/40)	*Any (≤20/40)*	*Mild (20/40–20/63)*	*Moderate (20/80–20/160)*	*Severe (≤20/200)*
Visual impairment defined by presenting visual acuity					
Aphakic (n = 29)	3 (10.3)	26 (89.7)	0 (0.0)	1 (3.5)	25 (86.2)
Pseudophakic (n = 393)	216 (55.0)	177 (45.0)	96 (24.4)	37 (9.4)	44 (11.2)
Total (n = 422)	219 (51.9)	203 (48.1)	96 (22.8)	38 (9.0)	69 (16.4)
Visual impairment defined by best-corrected visual acuity					
Aphakic (n = 29)	6 (20.7)	23 (79.3)	4 (13.8)	0 (0.0)	19 (65.5)
Pseudophakic (n = 393)	280 (71.3)	113 (28.8)	53 (13.5)	26 (6.6)	34 (8.7)
Total (n = 422)	286 (67.8)	136 (32.2)	57 (13.5)	26 (6.2)	53 (12.6)

Chi-square tests of the association of status of cataract extraction (aphakic, pseudophakic) and the severity of visual impairment (none vs. any visual impairment) were significant (all $P<0.0001$) for visual impairment defined by both presenting and best-corrected visual acuities.
*Visual impairment was defined as presenting or best-corrected visual acuity of 20/40 or worse in the cataract-operated eyes.

followed, in descending order, by corneal opacity (8.2%), posterior capsular opacification (7.0%), open-angle glaucoma (5.1%), retinal disorders other than retinal detachment (5.1%), retinal detachment (3.8%), myopic degeneration (3.8%), other eye disorders (1.9%), and amblyopia (0.6%).

Table 4 presents the primary causes of visual impairment in all cataract-operated eyes. The major 3 primary causes of visual impairment in all cataract-operated eyes were the same as those in worse-seeing cataract operated eyes, which were uncorrected refractive error (33%), AMD (13.3%), and diabetic retinopathy (10.8%).

Association of Risk Indicators and Visual Impairment

In the univariate analyses for the predictors of visual impairment defined by BCVA in the worse-seeing cataract-operated eye, significant risk indicators were: marital status, history of glaucoma, history of AMD, not obtaining needed glasses, not obtaining needed eye care, and number of visits for eye care in last 12 months (all $P<0.05$). These variables then were candidates for stepwise logistic regression analysis, which revealed that 3 of them were significant independent indicators of visual impairment defined by BCVA in the worse-seeing cataract-operated eye. First, the participants with a self-reported history of glaucoma were approximately 3 times more likely to have visual impairment in cataract-operated eyes compared with participants who did not have glaucoma (odds ratio, 2.9; 95% confidence interval, 1.3–6.7). Second, participants who reported having a barrier to care were more than twice as likely to have visual impairment in cataract-operated eyes compared with participants who did not have a barrier to care (odds ratio, 2.6; 95% confidence interval, 1.1–6.2). Third, participants who were not married or were not living with their partners were almost twice as more likely to have visual impairment compared with participants who were married and living with their partners (odds ratio, 1.9; 95% confidence interval, 1.01–3.4). There were no statistically significant interactions between the risks indicators included in the model.

Table 3. Primary Cause of Visual Impairment in Worse-Seeing Cataract-Operated Eye

Primary Cause of Visual Impairment	Visual Impairment in Worse-Seeing Cataract-Operated Eye [n (%)]*			Total [n (%)]
	Mild (20/40–20/63)	*Moderate (20/80–20/160)*	*Severe (≤20/200)*	
Uncorrected refractive error†	36 (52.2)	5 (15.6)	2 (3.5)	43 (27.2)
Age-related macular degeneration	6 (8.7)	3 (9.4)	10 (17.5)	19 (12.0)
Diabetic retinopathy	2 (2.9)	9 (28.1)	5 (8.8)	16 (10.1)
Corneal opacity	2 (2.9)	4 (12.5)	7 (12.3)	13 (8.2)
Posterior capsular opacification	6 (8.7)	2 (6.3)	3 (5.3)	11 (7.0)
Open-angle glaucoma	3 (4.4)	2 (6.3)	3 (5.3)	8 (5.1)
Other retinal disorders	1 (1.5)	2 (6.3)	5 (8.8)	8 (5.1)
Retinal detachment	0 (0.0)	1 (3.1)	5 (8.8)	6 (3.8)
Myopic degeneration	1 (1.5)	1 (3.1)	4 (7.0)	6 (3.8)
Other	0 (0.0)	1 (3.1)	2 (3.5)	3 (1.9)
Amblyopia	0 (0.0)	0 (0.0)	1 (1.8)	1 (0.6)
Unknown	12 (17.4)	2 (6.3)	10 (17.5)	24 (15.2)

*Severity of visual impairment was determined by presenting visual acuity in worse-seeing cataract-operated eye.
†Uncorrected refractive error was defined as cataract-operated eye having visual impairment when measured by presenting visual acuity (visual acuity ≤ 20/40), but no visual impairment when measured by best-corrected visual acuity (visual acuity > 20/40).

Table 4. Primary Cause of Visual Impairment in All Cataract-Operated Eyes

Primary Cause of Visual Impairment	Visual Impairment [n (%)]*			Total [n (%)]
	Mild (20/40–20/63)	*Moderate (20/80–20/160)*	*Severe (≤20/200)*	
Uncorrected refractive error†	57 (59.4)	7 (18.4)	3 (4.4)	67 (33.0)
Age-related macular degeneration	8 (8.3)	5 (13.2)	14 (20.3)	27 (13.3)
Diabetic retinopathy	5 (5.2)	10 (26.3)	7 (10.1)	22 (10.8)
Unknown	5 (5.2)	1 (2.6)	12 (17.4)	18 (8.9)
Corneal opacity	3 (3.1)	5 (13.2)	8 (11.6)	16 (7.9)
Posterior capsular opacification	9 (9.4)	3 (7.9)	3 (4.4)	15 (7.4)
Glaucoma	5 (5.2)	2 (5.3)	4 (5.8)	11 (5.4)
Other retinal disorders	2 (2.1)	2 (5.3)	5 (7.3)	9 (4.4)
Myopic degeneration	1 (1.0)	1 (2.6)	5 (7.3)	7 (3.5)
Retinal detachment	0 (0.0)	1 (2.6)	5 (7.3)	6 (3.0)
Other	1 (1.0)	1 (2.6)	2 (2.9)	4 (2)
Amblyopia	0 (0.0)	0 (0.0)	1 (1.5)	1 (0.5)

*Severity of visual impairment was determined by presenting visual acuity in worse-seeing cataract-operated eye.
†Uncorrected refractive error was defined as cataract-operated eye having visual impairment when measured by presenting visual acuity (visual acuity ≤ 20/40), but no visual impairment when measured by best-corrected visual acuity (visual acuity > 20/40).

Impact of Visual Impairment on Daily Life Activities

The covariate adjusted mean scores for driving difficulties from the NEI VFQ-25 questionnaire were lower for bilateral pseudophakics with visual impairment (mean, 59.3; standard error, 4.7) compared with bilateral pseudophakics with no visual impairment (mean, 80.7; standard error, 2.1) or compared with the LALES participants with bilateral aphakia and no visual impairment (mean, 89.2; standard error, 0.3; $P<0.05$). The mean scores were adjusted for number of comorbidities, gender, and income.

Discussion

The Los Angles Latino Eye Study is the largest United States population-based survey of eye disease in any racial or ethnic group. The participation rate of 82% in the LALES is comparable with other population-based studies.[18–21] To the best of the authors knowledge, there are no published data on prevalence of visual impairment, causes of visual impairment, and risk indicators for visual impairment in cataract-operated eyes among Latino populations.

The prevalence of any visual impairment defined by PVA among the cataract-operated LALES participants was similar to that found in recent population-based surveys in several countries.[7–9,22] The difference in the prevalence of visual impairment defined by BCVA compared with PVA indicates that visual impairment in 15% to 20% of the cataract-operated participants can be improved by refractive correction alone. A chart review revealed that 16% of aphakic participants were not wearing corrective lenses at the time of clinical examination. Improper use of appropriate aphakic spectacles may result in visual impairment in aphakic participants. Among the pseudophakic participants, the prevalence of any visual impairment in the worse-seeing cataract-operated eye changed from 56.8% as defined by PVA to 36% as defined by BCVA, a difference of approximately 20%. This emphasizes the need to ensure that the implanted intraocular lens is of appropriate power and that postoperative pseudophakic cataract patients obtain corrective lenses when necessary. However, among aphakic participants, the prevalence of any visual impairment changed from 96% as defined by PVA to 88% as defined by BCVA, a difference of only 8%. This indicates that a significant portion of visual impairment among aphakics is the result of reasons other than refractive error. Overall, the prevalence of visual impairment in pseudophakic participants is lower than in aphakic participants, indicating that pseudophakics have better visual acuity outcomes after cataract extraction. This is similar to the findings reported in other studies.[11,23,24] Although PVA is most indicative of an individual's visual acuity while performing daily activities, the use of BCVA to define visual impairment not only provides information on the degree of improvement that can be expected from refractive correction, but also makes possible the comparative evaluation of aphakic and pseudophakic participants by ensuring that there will be no further improvement in visual acuity by refraction alone. The absence of published data for near vision outcomes after cataract surgery in population-based studies makes it difficult to compare these data with that of other ethnic populations.

The most common causes of visual impairment other than uncorrected refractive errors in cataract-operated participants were AMD, followed by diabetic retinopathy, corneal opacity, posterior capsular opacification, glaucoma, and retinal disorders other than retinal detachment. This correlates with the high prevalence of AMD (9.7% individuals showed evidence of early AMD and 0.5% showed evidence of advanced AMD) and diabetic retinopathy (47% of individuals with definite diabetes mellitus) in a population-based study of Latinos in Los Angeles.[25,26] In addition, previous studies have shown the most common causes of low vision to be cataract, diabetic retinopathy, and AMD in the overall LALES cohort.[14] Uncorrected refractive errors and posterior capsular opacification

were the primary causes of almost 40% of visual impairment in the cataract-operated participants. Uncorrected refractive errors can be treated easily in cataract-operated participants by providing corrective lenses. Posterior capsular opacification is a well-recognized, vision-impairing complication of cataract extraction that usually is identified during a routine ophthalmologic examination and can be resolved easily with yttrium–aluminum–garnet laser capsulotomy. It can be difficult for a patient to appreciate the difference between visual impairment resulting from failure of cataract surgery and visual impairment resulting from undetected, coexisting, or new-onset ocular pathologic features. The patient mistakenly may attribute visual impairment to failure of cataract surgery and may not seek future treatment for cataract of the fellow eye or other ocular disease. Therefore, it is important to have a detailed preoperative examination that differentiates between visual impairment resulting from cataract and visual impairment with cataract to identify ocular pathologic features that may cause visual impairment after cataract extraction. Postoperative follow-up and regular management of cataract surgery patients is essential to detect not only postoperative complications and comorbid ocular disease, but also to identify and correct refractive errors. In this way, physicians and patients can maximize the benefits of cataract extraction.

The biologic and socioeconomic risk indicators associated with visual impairment in cataract-operated adult Latinos include history of glaucoma, barrier to eye care, and a marital status of single, separated, divorced, or widowed. It is not surprising that a positive history of glaucoma, which is a vision-impairing ocular disease, was found to be a significant risk indicator. This study confirms the importance of this history as a marker for visual impairment in individuals who have undergone cataract extraction.

The explanation for barrier to eye care as a risk indicator is likely to be multifactorial and includes economic, cultural, and educational influences. This study does not differentiate between these factors. However, to address the barrier to eye care as a risk factor for visual impairment in cataract-operated adult Latinos, it is important to develop educational and behavioral change programs to encourage access to eye health services by the Latino population.

Individuals who are single, separated, divorced, or widowed are less likely to have the social support needed for adequate eye care and access to health services. Moreover, studies have shown that separated, divorced, or widowed individuals had worse physical and mental health and that such status has a direct influence on cardiovascular, endocrine, immune, and neurosensory mechanisms and an indirect influence on health outcomes as a result of depression and general health habits.[27,28] Instituting a program to facilitate access to eye health services by Latinos, as mentioned above, would provide a support system for those without spouses or partners.

The lower mean scores from the driving difficulty subscale of the NEI VFQ-25 in bilateral pseudophakics with any visual impairment reflects the impact of visual impairment in the daily life activities of those who have undergone cataract surgery. An effort should be made to evaluate the impact of visual impairment after cataract surgery on health-related quality of life and activities of daily living.

Study Strengths and Limitations

The Los Angles Latino Eye Study is the largest population-based epidemiologic study of eye disease in Latinos in the United States. The main strength of the study is that it evaluates the outcomes of cataract surgery in a population-based sample and in the real-world rather than in a sample of convenience in a medical center follow-up study, where better outcomes are more likely. The large sample sizes (overall and by age group), high participation rate, and use of objective measures of visual acuity also contribute to the strength of the study.

Limitations of the LALES include a possible bias in the rates of visual impairment because of the high participation rates of females and older Latinos. Although the LALES cohort's age distribution was similar to the United States Latino population, 94.7% of participants were of Mexican ancestry, whereas only 60% of the United States Latino population is of Mexican descent. Therefore, these data are applicable primarily to Latinos of Mexican American descent, the largest ethnic subgroup of Latinos in the United States. Another limitation includes the lack of information gathered regarding the time between surgery and the study and intraoperative and postoperative complications. Therefore, no comment can be made on these factors and their influence on the visual outcomes of cataract surgery.

In summary, these results show that a significant degree of visual impairment remains after cataract extraction in adult Latinos. This study demonstrates that many of the underlying causes of this visual impairment are amenable to improvement or correction by careful clinical follow-up. Finally, creating a program that facilitates access to ophthalmic healthcare services by Latinos would address many of the risk indicators associated with visual impairment in cataract-operated adult Latinos.

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