Prevalence of Visually Significant Cataract and Factors Associated with Unmet Need for Cataract Surgery: Los Angeles Latino Eye Study

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Abstract

Purpose—To estimate in a United States (U.S.) Latino population the prevalence of visually significant cataract, and to report predisposing, enabling, need, and health behavior characteristics associated with the unmet need for cataract surgery (UNCS).

Design—Population-based, cross-sectional study.

Participants—6142 Latinos 40 years and older from 6 census tracts in Los Angeles County, California.

Methods—Participants completed an in-home interview and a comprehensive eye examination which included assessment of lens opacification, using the slit lamp-based Lens Opacities Classification System II (LOCS II), and best-corrected visual acuity (BCVA). Visually significant cataract was defined by: any LOCS II grading ≥2, BCVA <20/40, cataract as the primary cause of vision impairment, and self-reported vision of fair or worse. Because cataract surgery is not needed in all persons, participants with a visually significant cataract or prior cataract surgery in at least one eye composed the at-risk cohort needing cataract surgery. UNCS was defined as any person in the at-risk cohort who had at least one eye with a visually significant cataract. Univariate and stepwise logistic regression analyses were used to identify predisposing, enabling, need, and health behavior characteristics associated with UNCS.

Main Outcome Measure—Prevalence of visually significant cataract, and odds ratios for factors associated with UNCS.

Results—Of 6142 participants who completed the interview and clinical examination, 118 (1.92%) had visually significant cataract in at least one eye. Of the 344 participants who have needed cataract surgery, 118 (29.9%) had UNCS. Independent factors associated with UNCS included health behavior - having last eye exam ≥5 years ago compared to <1 year ago (odds ratio; 95% confidence

interval [OR], 3.76; 1.71-8.25)- and enabling factors - being uninsured (OR, 2.79; 1.30- 5.19), income less than $20,000 (OR, 2.60; 1.40-5.56), and self-reported barriers to eye care (OR 2.41; 1.14-5.13).

Conclusions—Latinos in our study had a substantial unmet need for cataract surgery. As Latinos with specific health behavior and enabling characteristics were more likely to have UNCS, interventions aimed at modifying these characteristics may be beneficial in reducing the unmet need and thus reducing the burden of visual impairment related to cataract in the U.S.

Introduction

Cataract is the leading cause of visual impairment in the United States[1] (U.S.) and is among the chief causes of blindness worldwide.[2] It is estimated that over half of Americans have cataracts by age 65, and this costs Medicare approximately 3 billion dollars per year.[3] Visually significant cataracts can significantly lower health-related quality of life due to its effects on visual, functional, and psychological disability.[4-7] First-eye cataract surgery leads to improvement in functional status, driving abilities, and satisfaction with vision in up to 90% of patients,[7-9] and improved vision is maintained 7 years after surgery in up to 80% of patients. [10] In patients with bilateral cataracts, obtaining cataract surgery in the second eye has significant additional benefits in visual function including improved stereopsis, contrast sensitivity, and binocular visual acuity.[11-17]

To promote the appropriate allocation of limited eye care resources for reducing visual impairment, it is important to understand the burden of visually significant cataract, as well as factors related to not obtaining care among various populations. Several studies have provided data on the prevalence of cataract and cataract surgery on different racial/ethnic groups, with enabling factors being implicated. For example, the Salisbury Eye Evaluation (SEE) Study noted higher prevalence of cortical opacity but lower prevalence of cataract surgery in African Americans compared to Whites.[18] The Proyecto VER Study data also identified a notable prevalence of cataract in a U.S. Hispanic population in Arizona, and identified persons having medical insurance and speaking English to be more likely to obtain cataract surgery.[19] In developing regions of the world, it has been frequently reported that over half of people with cataract blindness are unoperated[20-23], and frequently cited barriers include cost, female gender, lack of awareness of treatment, and fear or skepticism of surgery.[24-28]

Latinos are the largest and fastest-growing minority group in the United States, and are more likely than non-Hispanic whites and African-Americans to have visual impairment.[29] The U.S. Census Bureau recently estimated that the number of Latinos in the U.S. will increase from 35.3 million in 2000 to 61.4 million in 2025.[30] Since the median age of Latinos is 10 years younger than the rest of the United States population, the burden of visual impairment is likely to worsen as the Latino population ages. Given that cataracts are the leading cause of visual impairment in Latinos, understanding the burden of visually significant cataracts and the factors associated with not obtaining needed cataract surgery in U.S. Latinos is important.

While there have been recent estimates of the prevalence of lens opacities in Latinos[19,31,32], there is limited data regarding the prevalence of visually significant cataract and factors associated with not obtaining needed cataract surgery. The Los Angeles Latino Eye Study (LALES) a population-based, cross-sectional study of eye disease in adult Latinos living in Los Angeles County, California provided us with an opportunity to explore this. The objectives of the present study were: (1) to report the prevalence of visually significant cataract and unmet need for cataract surgery in our Latino population, and (2) to identify predisposing, enabling, need, and health behavior characteristics associated with having an unmet need for cataract surgery (UNCS).

Methods

Study Population

The LALES population is made up of self-identified Latinos 40 years of age and older living in six census tracts of Los Angeles County, California. The majority of participants were Mexican American. Approval for conducting this study was obtained from the Los Angeles County/ University of Southern California Medical Center Institutional Review Board/Ethics Committee, and all study procedures adhered to recommendations of the Declaration of Helsinki. Details of the study design, sampling plan, and baseline data have been reported elsewhere.[33] An in-home questionnaire and a complete clinical and eye examination were administered to eligible participants. Procedures related to the present study are presented below.

Clinical Data and Lens Examination Protocol

Presenting visual acuity (PVA) and best corrected visual acuity (BCVA) were recorded according to the Early Treatment of Diabetic Retinopathy Study (ETDRS) protocol. The presenting visual acuity was recorded for each eye with the individual's existing refractive correction at 4 m, and a retroilluminated, modified ETDRS distance chart was utilized. PVA was scored as the total number of lines read correctly. Near vision measurements utilized the modified ETDRS near-vision acuity chart and were based on the participant's present reading prescription. Participants who did not come to the LALES clinic were asked to undergo an in-home clinical examination by a trained ophthalmologist and trained technician; this group was not considered in the current investigation.

The lens was examined at the slit lamp following dilation with tropicamide 1% and phenylephrine 2.5%. The Lens Opacities Classification System II (LOCS II) was used to classify opacities into 5 nuclear (N0, NI, NII, NIII, NIV), 5 posterior subcapsular (P0, PI, PII, PIII, PIV), and 7 cortical (C0, Ctr, CI, CII, CIII, CIV, CV) grades of increasing severity, according to photographic standards.[30] Phakic status (phakic, pseudophakic, or aphakic) of each eye was also documented. If lens assessment was not possible, the reasons for not grading any regions in one or both eyes were recorded. The reproducibility of lens grading was evaluated by comparing LOCS II grading between 2 examiners. The assessment, which consisted of performing replicate grading on 50 participants independently, was measured for agreement using proportionally weighted κ statistics. Results showed moderate to good inter-grader agreement.

Definition of Visually Significant Cataract and Unmet Need for Cataract Surgery (UNCS)

A person with visually significant cataract was defined by having, in either eye: any LOCS II grading of ≥2, best-corrected visual acuity of <20/40 in the cataractous eye, cataract as primary cause of vision impairment in that eye, and patient report that general vision was fair, poor, very poor, or blind (as opposed to excellent, very good, or good). Because cataract surgery is not needed in all persons, any participants with visually significant cataract in at least one eye or with prior cataract surgery in at least one eye were considered to be in the at-risk cohort for needing cataract surgery. Unmet need for cataract surgery (UNCS) was defined as any person in the at-risk cohort who had at least one eye with visually significant cataract.

Risk Factor Assessment

The independent variables investigated in this study were taken from the interview data of LALES participants and were conceptualized based on 4 main categories in Andersen's model of healthcare utilization: predisposing, enabling, need, and health behavior characteristics.[35]

Predisposing characteristics are those that exist before illness and may describe tendency of an individual to use a healthcare service. In our study, these included: age, female gender (vs. male), being born outside United States (vs. in United States), marital status of never married, divorced, separated, or widowed (vs. married or living with partner), ≤12 years of education (vs. >12 years), employment status of retired or not working (vs. working), preferred speaking language of Spanish or mostly Spanish (vs. English, mostly English, or both equally), and low acculturation level (vs. high). Using the Cuellar 9-item, 5-point Acculturation Rating Scale for Mexican Americans, low acculturation was defined as ≤1.9, and high acculturation was defined as >1.9. This scale was based on preferred language and which languages the participant could speak, read, and write.[36,37]

Enabling (or "disabling") factors affect an individual's ability to use healthcare services. In our study, these included: having no health insurance (vs. having health insurance), having no vision insurance (vs. having vision insurance), annual household income <$20,000 (vs. ≥ $20,000), not being usually seen at a clinic or doctor's office (vs. usually seen at clinic or doctor's office), not having a regular physician (vs. having a regular physician), trouble getting glasses (vs. no trouble getting glasses), or self-reported barriers to obtaining eye care in the past year (vs. no barriers).

Need variables indicate an individual has reason to obtain health care services. In our study, these included: history of diabetes (vs. no diabetes history), history of hypertension (vs. no hypertension history), current or past smoker (vs. never smoker), general health of good, fair, or poor (vs. excellent or very good health), and presence of ≥2 comorbidities (vs. <2 comorbidities).

Health behavior characteristics consider personal health practices that may interact with the use of formal health services, and in our study, this included: last complete eye examination >5 years ago and 1-5 years ago (vs. last eye examination ≤1 year ago).

Statistical Analysis

The number of LALES participants with unilateral or bilateral visually significant cataract, as well as the number who obtained unilateral or bilateral cataract surgery, were determined and stratified by age and gender. Risk factors for those having an UNCS were assessed with stepwise logistic regression (Hosmer DW, Lemeshow S. Applied Logistic Regression. New York, NY: John Wiley & Sons, Inc; 2001). The at-risk cohort used in the risk factor analysis included participants with visually significant cataract in 1 or both eyes and those who had had prior cataract surgery in 1 or both eyes. Odds ratios and their corresponding 95% confidence intervals were reported. All variables that were significant at the 0.20 significance level were included in the multivariate model. Those variables that remained significant at the 0.05 significance level remained in the final model. Additionally, variables that were excluded at the univariate level were added back into the multivariate model to determine if confounding existed. Goodness of fit, discrimination, and diagnostics were performed on the final model to verify that the model was a good fit of the data, and that there were no outlying covariate observations which could have impacted and biased the estimation of the odds ratios. All analyses were done using Statistical Application Software version 9.1 (SAS Institute; Cary, NC) and STATA version 9.0 (STATA Corp LP; College Station, TX).

Results

Study Population

A total of 6357 (82%) participants completed both a home interview and an eye examination. Of these, 6142 (97%) underwent an in-clinic examination at the LALES Eye Evaluation Center

and were considered in the current investigation. Details regarding participants have been previously published.[33]

Of the 6142, 82 participants had a visually significant cataract in one eye with a non-cataractous natural lens in the other eye, and 21 participants had bilateral visually significant cataracts. Fifteen participants had a visually significant cataract in one eye and prior cataract surgery in the other eye, 75 participants had prior cataract surgery in one eye and a non-cataractous natural lens in the other eye, and 151 participants had undergone bilateral cataract surgery. 5798 had no present or prior visually significant cataract. Of note, the 15 participants with visually significant cataract in one eye and prior cataract surgery in the other eye were included in: (a) the prevalence estimates for both any visually significant cataract and any prior cataract surgery, and (b) the group having unmet need for cataract surgery (UNCS).

Age- and Gender-Specific Prevalence of Any Visually Significant Cataract

The overall prevalence of people with any current visually significant cataract in the LALES population was 1.92% (118/6142) (Table 1). The age-specific prevalences of LALES participants with visually significant cataract were: 0.25% (6/2364) for ages 40-49, 0.76% (14/1853) for ages 50-59, 2.6% (31/1195) for ages 60-69, 7.2% (42/584) for ages 70-79, and 17% (25/146) for ages 80 and over (P <0.0001). The prevalence of visually significant cataract among males was 1.72% (44/2558) among males and 2.06% (74/3584) among females (P=0.33).

Age- and Gender-Specific Prevalence of Any Prior Cataract Surgery

The overall prevalence of people with any prior cataract surgery is 3.92% (241/6142) (Table 1). The age-specific prevalences were: 0.63% (15/2354) among ages 40-49 years, 0.11% (20/1853) among ages 50-59 years, 4.7% (56/1195) among ages 60-69 years, 17% (99/584) among ages 70-79 years, and 35% (51/146) among ages 80 years and older (P=0.65). The prevalence of any prior cataract surgery was 3.99% (102/2558) among males and 3.88% (139/3584) among females (P=0.35).

Prevalence of Unmet Need for Cataract Surgery (UNCS)

Of the 344 participants who have needed cataract surgery, 118 (29.9%) had an UNCS. This included 21 people with bilateral visually significant cataracts and 97 people with unilateral visually significant cataract (15 of whom had had cataract surgery in the other eye). 226 (65.7%) had obtained all needed cataract surgery.

Factors Associated with UNCS

Frequency distributions of various factors associated with having UNCS were evaluated based on the at-risk cohort currently or previously needing cataract surgery (Table 2). Following Andersen's model of healthcare utilization, several predisposing, enabling, and health behavior variables had significant univariate associations with UNCS.

Our multivariate logistic model for UNCS also investigated the cohort currently or previously needing cataract surgery. Independent factors associated with having UNCS were reported based on odds ratios adjusted for other associated factors (Table 3). Risk factors, in order of strength and significance, included: having last eye exam ≥5 years ago compared to <1 year ago (odds ratio [OR], 3.76; 95% confidence interval [CI], 1.71-8.25); being uninsured (OR, 2.79; 95% CI, 1.30-5.19); having income less than $20,000 (OR, 2.60; 95% CI, 1.40-5.56); and having self-reported barriers to eye care (OR, 2.41; 95% CI, 1.14-5.13). The former represents a measure of health behavior while the latter 3 measure enabling characteristics.

Risk factor analyses were performed for subgroups with the at-risk group consisting of those: (a) having bilateral visually significant cataract (n=21), and (b) having visually significant cataract in one eye and prior cataract surgery in contralateral eye (n=15). In the subgroup analysis of the 21 individuals with bilateral visually significant cataracts, factors associated with UNCS were consistent with those observed in persons with any visually significant cataract. In this subgroup analysis, the independent risk factors for UNCS were: having an eye exam ≥5 years ago compared to less than 1 year ago (OR, 3.39; 95% CI, 1.61-7.09); being uninsured (OR, 2.41; 95% CI, 1.26-4.63); having income less than $20,000 (OR, 2.30; 95% CI, 1.20-4.46); and having self-reported barriers to eye care (OR, 2.13; 95% CI, 1.07-4.26). A similar subgroup analysis was conducted on the 15 individuals with visually significant cataract in one eye and cataract surgery in the contralateral eye. The factors associated with UNCS in this subgroup were again consistent with those noted in persons with any visually significant cataract (results not shown). Finally, after adjusting for covariates, persons who had had previous cataract surgery in one eye were less likely to have an unmet need for cataract surgery (OR, 0.27; 95% CI, 0.12-0.63).

Discussion

The Los Angeles Latino Eye Study (LALES) is the largest population-based study of eye disease in any ethnic or racial group in the United States. The findings of the current investigation revealed that: (1) The prevalence of visually significant cataract is 1.92% in our U.S. Latino population ages 40 and over, (2) Nearly 1/3 of those who have needed cataract surgery had an unmet need for cataract surgery (UNCS), and (3) Independent factors associated with having an UNCS in the LALES population consisted of enabling and health behavior characteristics.

Prevalence of Visually Significant Cataract

In our sample of 6142 Los Angeles Latinos ages 40 years and older, the prevalence of current visually significant cataract was 1.92%. Using data regarding age-specific prevalence of current visually significant cataract among LALES participants and data on the Hispanic/ Latino population from the U.S. Census Bureau, it can be estimated that 179,989 U.S. Latinos ages 40 and over have an unmet need for cataract surgery.[38]

Age-specific prevalences of visually significant cataract of persons in the LALES population (Table 2) are similar to those noted in Proyecto VER[19], a population-based study of Mexican Americans in Arizona. In Proyecto VER, where visually significant cataract was defined as having best-corrected visual acuity less than 20/40 with presence of severe lens opacity according to the Wilmer Cataract Grading Scheme, the age-specific prevalences of visually significant cataract were: 0.1% among those ages 40-49, 0.23% among those ages 50-59, 3.0% among those ages 60-69, 8.9% among those ages 70-79, and 18.5% among those ages 80 and over. While age-specific prevalences of visually significant cataract for LALES participants are comparable to a similar U.S. Hispanic population, differences in age distributions and methods for defining visually significant cataract preclude comparison of overall prevalence with other study populations in the U.S. and worldwide.

Umet Need for Cataract Surgery

Nearly 1/3 of people who have needed cataract surgery in the LALES population have an UNCS. Such measures of unmet need have not been reported in the literature regarding U.S. populations. However, studies from developing regions of the world, particularly those that are unable to provide similar levels of care as may be present in the developed world, have frequently reported that the proportion of those with cataract *blindness* that is unoperated is well over 50%.[20-23]

Four independent risk factors were associated with an UNCS among LALES participants. In terms of the Health Behavior Model for healthcare utilization[35], the "enabling" (or more appropriately, "disabling") factors included having no health insurance, income <$20,000, and self-reported barriers to eye care, and the health behavior factor consisted of having last eye exam ≥5 years ago. Enabling characteristics are modifiable and describe an individual's means for accessing healthcare, and an individual's health behavior characteristics may be a reflection of opportunity cost barriers or personal attitudes and choices.

When compared to those with health insurance (including private, Medicare, MediCal, or any other health insurance), uninsured participants were more likely to have an UNCS. In the year 2000, 32% of U.S. Hispanics of any race were uninsured. This was compared to 10% of non-Hispanic whites, 19% of African Americans, and 18% of Asian Americans and Pacific Islanders.[39] Insurance coverage is strongly linked to access to health services and improved health outcomes[40-42], so broadening insurance coverage for U.S. Hispanics should be a key strategy for policymakers to reduce the UNCS. However, other barriers must be addressed in order to address fully the UNCS among U.S. Hispanics.

Having household annual income below $20,000 was the second factor associated with having an UNCS. While income level may affect ability to acquire insurance in some cases, it is also independently associated with unmet need in our population. Past studies have associated income level to perceptions of lack of access to health care services, despite having insurance. [43] This perception may result because lower income individuals are not advised appropriately about their healthcare benefits. However, it is important to note that low income level was *not* collinear with education, or with variables of acculturation such as country of birth, preferred speaking language, or index of acculturation. Thus, it is also possible that lower income individuals assign less value to healthcare activities, or that they simply have higher opportunity costs (long work hours, transportation difficulties, etc.) associated with obtaining healthcare.

In fact, the third independent associated with unmet need, self-report of barriers to eye care, suggest the significance of opportunity costs in predicting an UNCS in this Latino population. In our LALES participants with an UNCS and who reported having barriers to eye care, the most commonly cited barriers included: cost (n=15), care not available when needed (n=9), lack of transportation (n=6), long wait time to get appointment (n=5), concern of lost wages (n=4), long wait time in clinic (n=3), and inconvenient clinic hours (n=3). Interestingly, other presented choices, such as no Hispanic staff at clinic, staff not speaking Spanish, or disrespectful staff, received little to no response by participants with an UNCS. These data provide insight into reasons for not obtaining cataract surgery in Latinos. For example, co-payments among the insured, as well as full payment among the uninsured, may represent significant barriers to obtaining needed cataract surgery. Additional economic barriers are related to logistical issues such as inconvenient clinic locations and hours, time constraints of strict work schedules, and transportation difficulties. In Los Angeles particularly, public transportation is time-consuming, difficult to access efficiently, and therefore is likely to contribute to decreased utilization of eye care services. One study using focus groups to explore perceived barriers to eye care in older African Americans reported that transportation was the most cited barrier.[44] A previous study of the LALES population exploring compliance with recommendations for follow-up care in Latinos reported reasons for not obtaining follow-up care to be: cost, lack of knowledge of where to go for care, and unavailability of health care. [45] Overall, eye care barriers reported by our LALES participants with an UNCS are largely due to logistical and economic issues, and these barriers should be addressed in order to reduce unmet cataract surgery need.

Having last eye exam ≥5 years ago, a measure of individual healthcare behavior, was the fourth independent factor associated with having an UNCS. This highlights the importance of investigating the role of personal health practice patterns in understanding causes for unmet cataract surgery need in LALES participants.

It is important to note that the 4 factors associated with an UNCS were consistently identified as being risk factors for UNCS even when the group at risk was defined as (a) persons with bilateral visually significant cataracts or (b) persons with a visually significant cataract in one eye and having had prior cataract surgery in the other eye. This provides further support for the robustness of the factors that have been identified in our models for unmet need for cataract surgery. Finally, persons who had had cataract surgery in one eye were less likely to have an UNCS compared to those who had not had cataract surgery. One explanation for this observation is that some persons who have had cataract surgery in one eye and have a cataract in the second eye may be satisfied with their functional vision and may not report having visual difficulties in their daily life.

In our study, it is interesting that predisposing variables related to acculturation, as measured by country of birth, preferred speaking language, and acculturation score, were *not* important in predicting an UNCS in our LALES population. In contrast, the Proyecto VER study of U.S. Hispanics found English as preferred speaking language, along with health insurance, to be the most important factors associated with having obtained cataract surgery.[19] One explanation for these differences may be that there are regional differences in the need for communication in English to access and obtain cataract surgery. Thus, for example in Proyecto VER which was conducted in an urban and rural population, the resources to obtain cataract surgery available for English-speaking Hispanics may be significantly better than in a metropolitan city based population such as was studied in LALES.

In summary, our risk factor model for having an unmet need for cataract surgery in the LALES population underscores the importance of: (1) improving health insurance coverage for U.S. Latinos, (2) making eye care more accessible via practical solutions such as transportation assistance and efficiency and convenience of eye service visits, and (3) promoting community-level public health campaigns targeted at older U.S. Latinos exploring current health behavior patterns and promoting eye health awareness.

Comparison to Other U.S. Ethnic Studies of Cataract Surgery Prevalence

The overall prevalence of having obtained cataract surgery among LALES participants was 3.92% (241/6142). Of the 241 persons who had had cataract surgery, 151 persons had undergone bilateral cataract extraction. Of the 90 persons who had had cataract extraction in one eye, 15 persons had a visually significant cataract in the contralateral eye. Age-specific prevalence of having obtained surgery for LALES are compared to that for Mexican Americans in Proyecto VER, African Americans and Caucasians in the Salisbury Eye Evaluation (SEE) Study, and Caucasians in the Beaver Dam Eye Study in Table 4.[18,19,46] The age-specific prevalence for obtaining surgery is lower in the LALES Mexican American population as compared to the Proyecto VER Mexican American population from Arizona. In comparison to the SEE study (Caucasians and African Americans) and Beaver Dam Eye Study (Caucasians), age-specific prevalences for obtaining surgery in LALES are similar to Caucasians and higher than African Americans in the 60-69 age group, but higher than both racial groups in the oldest age groups. Reasons for these variations may be related to differing biologic risks for cataract among the populations, differing health practices and/or barriers to care among the populations *at the time of the study*, or regional variability in ophthalmologist threshold for performing cataract surgery. However, when comparing the age-specific prevalence for having obtained cataract surgery in LALES to estimated age-specific prevalences of the total U.S. population, which are based on a combination of several

population-based studies, LALES participants have comparable prevalences of cataract surgery.[31]

Our study results should be considered in light of certain limitations. First, our data consists of examination and interview data from one time point, thus we had no information regarding planning for cataract surgeries in the near future or timing of cataract surgeries already obtained. For example, members of our group of 15 who had one visually significant cataract and one eye with prior cataract surgery may have had plans for a second surgery, but this data was unavailable to us. Second, while our definition of visually significant cataract was defined by: worse than 20/40 visual acuity, self-report of fair or worse vision, and cataract as primary cause of visual impairment (as determined by examiner), it did not specifically ask participants about whether they would like to obtain cataract surgery. However, since we incorporated a self report of fair/poor vision, we believe it is a better measure of visually significant cataract than just an assessment of visual acuity.

In summary, our U.S. Latino population had a significant UNCS, and if extrapolated nationwide, it may be estimated that approximately 180,000 U.S. Latinos aged 40 and over have an unmet need for cataract surgery. Given the aging of this population, this unmet need is likely to grow. Given that there are modifiable enabling and health behavior characteristics that were independently associated with this unmet need, intervention aimed at these factors should be considered. It is possible that these targeted interventions may significantly reduce the burden of cataract-related visual impairment in Latinos.

Acknowledgments

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Table 1

Prevalence of Any Visually Significant Cataract[*] and Any Prior Cataract Surgery in Los Angeles Latino Eye Study (LALES) Participants (n=6142)

Age in years (n)	Prevalence of any Visually Significant Cataract % (n)	Prevalence of any Prior Cataract Surgery % (n)	At-risk Cohort for Risk Factor Analysis of UNCS % (n)
40-49 (n=2364)	0.25% (6)	0.63% (15)	0.89% (21)
50-59 (n=1853)	0.76% (14)	1.1% (20)	1.7% (31)
60-69 (n=1195)	2.6% (31)	4.7% (56)	7.2% (86)
70-79 (n=584)	7.2% (42)	17% (99)	23% (134)
≥80 (n=146)	17% (25)	35% (51)	49% (72)
Gender (total n)			
Male (n=2558)	1.72% (44)	3.99% (102)	5.47% (140)
Female (n=3584)	2.06% (74)	3.88% (139)	5.69% (204)
TOTAL (n=6142)	1.92% (118)[†]	3.92% (241)[‡]	5.60% (344)

[*] Visually significant cataract defined as: a) LOCS II grade of ≥ 2, and b) best-corrected visual acuity of <20/40, and c) cataract as primary cause of vision impairment, and d) patient report that general vision is fair/poor/very poor/blind (as opposed to good/very good/excellent).

[†] Of 118 with visually significant cataract, 21 had bilateral visually significant cataract and 97 had unilateral visually significant cataract (15 of whom had previous cataract surgery in contralateral eye).

[‡] Of 241 with prior cataract surgery, 151 had bilateral surgery and 90 had unilateral surgery (15 of whom had visually significant cataract in contralateral eye).

UNCS=Unmet Need for Cataract Surgery

Table 2

Frequency distribution and univariate associations of risk indicators for unmet need for cataract surgery[*] (UNCS) among Los Angeles Latino Eye Study (LALES) participants

| | Unmet Need for Cataract Surgery | | |
| | YES (n=118) | NO (n=226) | |
Risk Factors	n (%)	n (%)	P-value
PREDISPOSING			
Age group			0.65
Mean (±SD)	70.2 (±11.6)	70.8 (±11.7)	
40-49 (index)	6 (5.1%)	15 (6.6%)	0.65
50-59	14 (12%)	17 (7.5%)	
60-69	31 (26%)	55 (24%)	
70-79	42 (36%)	92 (41%)	
≥80	25 (21%)	47 (21%)	
Gender			
male (index)	44 (31%)	96 (69%)	
female	74 (36%)	130 (64%)	0.35
Country of birth			
United States (index)	40 (34%)	77 (66%)	
Other	78 (34%)	149 (66%)	0.97
Marital status			
Married/ With partner (index)	49 (28%)	123 (72%)	
Never married, Separated/Divorced, Widowed	69 (40%)	102 (60%)	0.02
Education (years)			
≥12 years (index)	15 (23%)	50 (77%)	
<12 years	102 (37%)	176 (63%)	0.04
Employment status			
Employed (index)	14 (34%)	27 (66%)	
Retired	47 (28%)	119 (72%)	0.39
Not working	57 (42%)	80 (58%)	0.46
Acculturation score			
>1.9 (index)	77 (35%)	80 (66%)	
≤1.9	41 (34%)	146 (65%)	0.9
Language			
Spanish or mostly Spanish (index)	9 (14%)	56 (86%)	0.008
English, mostly English, or both equally	35 (32%)	73 (68%)	
ENABLING			
Health insurance			
Yes (index)	72 (28%)	189 (72%)	
No	46 (55%)	37 (45%)	<0.0001
Vision care insurance			
Yes (index)	63 (29%)	158 (71%)	
No	55 (45%)	66 (55%)	0.002
Income level			
>=$20,000 (index)	22 (23%)	73 (77%)	
<$20,000	77 (37%)	129 (63%)	0.02
Usually seen at a clinic/doctor's office			
Yes (index)	81 (29%)	199 (71%)	
No	37 (58%)	27 (42%)	<0.0001
Having a regular physician			
Yes (index)	70 (28%)	179 (72%)	
No	48 (51%)	47 (49%)	0.0001
Trouble getting glasses			
Yes (index)	34 (40%)	50 (60%)	
No	75 (33%)	153 (67%)	0.21
Self-reported barriers to eye care			
Yes (index)	25 (50%)	25 (50%)	
No	84 (32%)	178 (68%)	0.02
NEED:			
History of diabetes (self-reported)			
No (index)	85 (38%)	137 (62%)	
Yes	33 (27%)	89 (73%)	0.37
History of hypertension (self-reported)			
No (index)	55 (34%)	105 (66%)	
Yes	63 (34%)	121 (66%)	0.98
Smoking status			
Never-smoker (index)	73 (36%)	132 (64%)	
Ex-smoker	31 (32%)	65 (68%)	0.57
Current smoker	11 (30%)	26 (70%)	0.49
Comorbidities			
<2 (index)	38 (36%)	68 (64%)	
≥2	80 (34%)	158 (66%)	0.64

	Unmet Need for Cataract Surgery		
	YES (n=118)	NO (n=226)	
Risk Factors	n (%)	n (%)	P-value
General health			
Excellent/very good (index)	13 (29%)	32 (71%)	
Good/fair/poor	105 (35%)	194 (65%)	0.41
HEALTH BEHAVIOR:			
Last complete eye examination			
< 1 yr ago (index)	32 (28%)	84 (72%)	
Between 1-5 yrs ago	25 (23%)	83 (77%)	0.13
Over 5 yrs ago	36 (64%)	20 (36%)	<0.0001

*
Unmet need for cataract surgery (UNCS) was defined by an individual having: any current visually significant cataract with visually significant cataract defined as: a) LOCS II grade of ≥ 2, b) best-corrected visual acuity of <20/40, c) cataract as primary cause of vision impairment, d) patient report that general vision is fair/poor/very poor/blind (as opposed to good/very good/excellent). Given this definition, the 15 with prior surgery in one eye but remaining visually significant cataract in contralateral eye were considered to have UNCS.

SD=standard deviation

Table 3

Independent risk indicators[*] for unmet need for cataract surgery[†] (UNCS) among at-risk[‡] Los Angeles Latino Eye Study (LALES) participants

Risk Indicators	Odds Ratio (95% CI)	P-Value
ENABLING:		
No Health Insurance (vs. Health Insurance)	2.79 (1.30, 5.19)	0.0036
Income <$20,000 (vs. ≥$20,000)	2.60 (1.40, 5.56)	0.0069
Self-reported Barriers to Eye Care (vs. No Barriers)	2.41 (1.14, 5.13)	0.022
HEALTH BEHAVIOR:		
Last Eye Exam ≥5 Yrs Ago (vs. <1 Yr Ago)	3.76 (1.71, 8.25)	0.001

[*] Based on a multivariate logistic regression model.

[†] Unmet need for cataract surgery (UNCS) was defined as any person in the at-risk cohort who had at least one eye with a visually significant cataract, with visually significant cataract defined as: a) any LOCS II grade of ≥ 2, b) best-corrected visual acuity of <20/40, c) cataract as primary cause of vision impairment, d) patient report that general vision is fair/poor/very poor/blind (as opposed to good/very good/excellent). Given this definition, the 15 with prior surgery in one eye but remaining visually significant cataract in the contralateral eye were also considered to have UNCS.

[‡] At-risk cohort consisted of participants with a visually significant cataract in at least one eye or prior cataract surgery in at least one eye.

CI=confidence interval

Table 4

A comparison of cataract surgery prevalence among U.S. population-based studies

Study (year of study) Racial/Ethnic Group	Age Range (years)	Sample Size	Age-specific Prevalence of Obtaining Surgery %				
			40-49	50-59	60-69	70-79	≥80
Beaver Dam Study (1988-90)							
Caucasian	43-84	4926	$0.83^{\dagger}$	1.2	4.3	11	22
SEE Study (1993-5)							
African American	65-84	621	N/A	N/A	$2.8^{\ddagger}$	4.6	11
Caucasian	65-84	1791	N/A	N/A	$4.9^{\ddagger}$	10	23
Proyecto VER (1994-7)							
Mexican American	≥40	4751	0.9	2.2	8.2	25	55
LALES (2000-3)							
Mexican American	≥40	6142	0.63	1.1	4.7	17	35

† ages 43-49 only

‡ ages 65-69 only

U.S.=United States

N/A=Not applicable

SEE=Salisbury Eye Evaluation

LALES=Los Angeles Latino Eye Study